User Manual

MDCMS

Change and Distribution Management from Midrange Dynamics

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1 Overview of the MDCMS Manual

This manual is a guide for installing and using the Midrange Dynamics Change Management System. This manual will refer to this system as MDCMS. MDCMS is a tool that helps manage source and objects throughout the development, migration, modification, and distribution life cycle.

2 Starting MDCMS

The MDCMS menu is accessed by typing MDCMS from a command line. Press F4, if necessary, to select a product instance other than the default instance.

```
MDLCMS                              COMPANY NAME                          4.09.15
SCRN1                             MDCMS MAIN MENU                         7:36:08

                   Opt  Description
                    1   MDCMS Setup Menu

                    2   Object Manager
                    3   RFP Manager

                    4   RFP History
                    5   Object History/Archive

                    6   Project Manager

                    7   MDXREF

                    8   Send RFP to Remote System
                    9   Receive RFP from Remote System

           Selection: _

F3=Exit    F6=Messages    F8=Submitted Jobs    F11=View Output    F21=Sys Command
```

Option 1: MDCMS Setup Menu
The first step in preparing to use MDCMS is the *MDCMS Setup Menu*. This portion of MDCMS defines the environment, object types and methods of source and object management. It is a mandatory process for using MDCMS.

Option 2: Object Manager
The *Object Manager* function contains the daily processes for checking out source or objects from application environments, making modifications to the checked-out source, and requesting the installation of the changes back into the application environments.

Option 3: RFP Manager
The *RFP Manager* function provides the means to create, manage, submit, approve and install Requests for Promotion, which are installation packages containing 1 or more objects for deployment.

Option 4: RFP History
The *RFP History* function lists all installed Requests for Promotion to view the activity logs, perform a rollback or to copy a completed RFP to a new RFP.

Option 5: Object History/Archive
The *Object History/Archive* function is a post-installation process for reviewing Source and Object installations. The installation process archives the source or object that is being replaced in application environments. This function provides a method of retrieving previous versions of application source or rolling back objects.

Option 6: Project Manager
Project Manager. Here, users may create and maintain requests for work to be done on a Project or Task basis.

Option 7: MDXREF
MDXREF is a tool used to view the inter-relationship between objects. This includes what and how programs use files, what and how files relate to one another, the complete process flow of applications, etc. See the MDXREF manual for instructions and more information.

Options 8 & 9: Send RFP to Remote System / Receive RFP from Remote System
When MDCMS is installed on 2 or more IBMi systems or logical partitions, application changes may be transported quickly and safely between the systems/partitions. This allows for a development system to be separate from a production system with very little hassle. Or, it allows for unlimited remote IBMi systems to send and receive updates simultaneously.

Function Keys:
F3=Exit – Exit MDCMS
F6=Messages – Display messages
F8=Submitted Jobs – Work with submitted jobs
F11=View Output – Display the MD Output panel and other spool files
F21=Sys Command – Command line prompt

3 Setting up MDCMS

```
CMSMNU2                          COMPANY NAME                          4.09.15
SCRN1                        MDCMS Setup Menu                          7:36:32

   Opt  Description                    Opt  Description
    1   Application Groups              11   System Settings
    2   Promotion Levels                12   Email Settings
    3   Attributes                      13   Services
    4   Commands/Scripts                14   Logging
    5   Templates                       15   User Groups
    6   OS/400 Locations                16   Project Costs
    7   Distribution Levels
                                        17   Push Settings Data to Locations
    8   Security Settings (MDSEC)       18   Send Settings to Remote System
    9   License Keys                    19   Receive Settings from Remote System
   10   Interface Settings              20   Create Config Deployment Settings
                                        21   MDCMS Configuration Report


      Selection: __

F3=Exit    F6=Messages    F8=Submitted Jobs    F11=View Output    F21=Sys Command
```

The ***MDCMS Setup Menu*** consists of several options that are used to define the overall system environment for MDCMS and options for replicating the environment on remote systems.

Option 1: Application Groups
Defines the name of each business application process within MDCMS.

Option 2: Promotion Levels
Defines the object environments (library list) of the applications including the job descriptions and approval, installation and archiving settings.

Option 3: Attributes
Defines the installation libraries for each source and object type within an Application/Promotion Level.

Option 4: Commands
Defines the default commands per Attribute or Promotion for compiling and installing objects.

Option 5: Templates
Definition Templates for Object Authority, Replication and searching that can be applied to Attributes.

Option 6: OS/400 Locations
Defines the connection properties for DDM, MDWorkflow and file transfer between this partition and all target OS/400 partitions.

Option 7: Distribution Levels
Defines the target levels on remote locations for the sending of Promotion Packages.

Option 8: Security Settings (MDSEC)
Defines user authority to MDCMS and MDXREF and provides tools to manage authorization lists and DDM security. MDSEC may also be started by typing the command MDSEC on a command line.

Option 9: License Keys
Allows for the update of the MD product license keys in case the previous keys are about to expire or a new MD product license is to be added.

Option 10: Interface Settings
Configure the interface between MDCMS and 3rd-party tools Jira, ServiceNow and Synon/2E and to configure the REST service APIs provided by MDCMS for exchanging information with external tools.

Option 11: System Settings
Defines the system-level settings, such as the title to be displayed at the top of most MD product screens, the ID to identify the system that sends a promotion package, and the naming format to use for temporary libraries. Applied MDCMS patches can be viewed and rolled back from here as well.

Option 12: Email Settings
Defines the connection properties to a SMTP server, email logging and a list of email addresses to be used by the MDMAIL and MDMAILF email APIs.

Option 13: Services
Defines the job queue, start and end times for each of the MDCMS batch services.

Option 14: Logging
Lists each of the log tables in MDCMS and allows the administrator to set the retention period for each log entry type.

Option 15: User Groups
Defines User Groups and Group Types that can be used for email recipients, projects and MDWorkflow test acceptance.

Option 16: Project Costs
Defines the rules for applying the cost per hour to entered time for Projects.

Option 17: Push Settings Data to Locations
Sends some or all settings to a remote IBM i system using a DDM Push connection definition.

Option 18: Send Settings to Remote System
Sends some or all settings for a Promotion Level to a remote IBM i system using a file transfer connection definition.

Option 19: Receive Settings from Remote System
Receives settings for a Promotion Level from a remote IBM i system that had been sent using option 18 on that system.

Option 20: Create Config Deployment Settings
Generate an Application to manage the MDCMS product, including the deployment of new versions, patches, license keys and settings.

Option 21: MDCMS Configuration Report – generate an excel file with a sheet for each configuration file in MDCMS.

3.1 Application Groups

The Application Maintenance function defines application software into manageable groups for MDCMS.

```
MDCAPPL                          COMPANY NAME                          11/19/11
SCRN1                          Application Codes                        7:36:53

                                                      Position to Appl: ____
Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Linked Apps  L=Levels

 Opt  Appl  Description                              RFP Start Lnk Cst Jrn Trg Stm
  _   MD2K  MD2000 Interface Applications              160002  Y   N   Y   N   N
  _   ACCT  XYZ Accounting Package                      80002      Y   Y   Y   Y
  _   IBUS  International Business System              490000  Y   Y   Y   Y   N




                                                                          Bottom
 F3=Exit    F6=Add    F11=Output
```

Screen Definitions:
Position to Appl
This is used to position the display to a specific Application Group.

Opt
2=Edit – Change the Description of an Application Group
3=Copy – Copy values for Entity to a new Application Group. Any child elements like levels, attributes, etc. are not copied.
4=Delete – Delete an Application Group. This is only possible if there are no Levels defined for the Application Group
5=Display – View all information for the Application Group
7=Rename – Rename the application code to a new value. When renamed, the application code in all related tables for configuration, activity and history are also renamed. The original value is only retained in API logs for audit reasons.
If the flag Rename in Synced Locs is set to Y, the application code will also be renamed on each location defined in the OS/400 Locations settings that actively connect via DDM.
A=Linked Apps – Manage the list of Applications that contain objects that reference objects existing in the selected Application
L=Levels – list all promotion levels defined for the selected application

Application Code
This is a 6-character abbreviation of an Application Group to be used by MDCMS, MDXREF and MDSEC.

Description
A brief title to identify an Application Group.

RFP Start Index
The start position of new RFP numbers. An RFP number is the identifier for an installation package. By default, MDCMS spaces the range for RFP numbers 40000 positions apart so that each application has its own range of numbers. If preferred, applications can start at any point, including at the same point as other applications. MDCMS ensures that any generated number is not already in use by the same or other application.

Automatically Reapply Constraints
Y – When a physical file is installed for the given application, automatically reapply all constraints that were defined for the previous version of the file. If the new version of the file already contains a constraint of the same name, the new version of the constraint will remain in place and not be overwritten by the old version.

N – Any constraints will not be automatically reapplied

This value is the default for all files in the application and partition, and can be overridden for specific files.

Automatically Reapply Journaling
Y – When a physical or logical file is installed for the given application, automatically reapply journaling based on the settings defined for the previous version of the file.

N – Journaling will not be automatically reapplied

This value is the default for all files in the application and partition, and can be overridden for specific files.

Automatically Reapply Triggers
Y – When a physical file is installed for the given application, automatically reapply all system (non-SQL) triggers that were defined for the previous version of the file. Any SQL triggers that should be re-applied should be requested for recompile and placed on same RFP as the file.

N – Any triggers will not be automatically reapplied

This value is the default for all files in the application and partition, and can be overridden for specific files.

Allow RFP Compile Resume
This flag determines what should occur if an exception occurs in an RFP during the Submit (bundle) phase, when multiple objects are on the RFP and the compile/validation process for at least one of the objects was successful.

Y – The RFP Status will be set to SE=Submission Error and the developer can make corrections to the source or object in error or any object request after the one in error. Any requests in the RFP that were already processed are in a lock state. Once the RFP is submitted for promotion again, it will resume at the errored object request, which can save a lot of time for the developer when the RFP is very large.
If an object needs to be added to the RFP or if a processed object needs to be modified, the RFP will need to be Reset from status SE back to status 01 using the Reset option on the RFP.

N – If an error occurs, the entire RFP will be automatically reset back to status 01. Once the RFP is submitted for promotion again, it will start over from the beginning.

Auto-Merge RFP in Send List
When a user requests to submit an RFP for promotion, MDCMS checks if any of the objects in the RFP are currently requested to be sent to other levels within open RFPs in the Send List. If any are found, this flag determines what should occur.

O – Optional – the developer will be given the option to have the RFPs in the Send List auto-merge into the new RFP or to leave the existing RFPs separate.

Y – The open RFPs in the Send List will always merge into the new RFP once it is installed.

N – The open RFPs in the Send List will always remain separate. Since the Send is dynamic, though, the prior RFPs will send the newest version of the source or object. Manual merging directly in the Send List is still possible for authorized users.

Auto-Merge Received RFP

When a sent RFP is received onto the target partition, MDCMS checks for object request conflicts for each received object request. For each conflict, the following rules are applied in the order listed:

1. If object checked out for modification locally for the target level, the received object will be requested in unlocked mode.
2. Orphaned object requests (requests not on an RFP) will be automatically deleted and replaced with the received request.
3. If object requested for a different application, the received object will be requested in unlocked mode.
4. If object is from a prior send of the same RFP, the entire RFP will be replaced by the newly received RFP.
5. If object requested for an RFP that is beyond status 01 (requests assigned), the received object will be requested in unlocked mode.
6. Otherwise: the value of this parameter determines what to do with the conflict
   Y – the existing RFP will be merged with the newly received RFP with the newly received objects having priority over the existing objects in the case of duplicates. The description of the received RFP will be appended to the existing description, if different.
   N – no automatic merging - all newly received objects will stick together in a new RFP and any duplicate objects will be requested in unlocked mode.

Auto-Delete LFs in Unmanaged Lib

When an RFP is requested to be submitted for deployment, MDCMS checks if there are any unrequested logical files that are based on requested physical files. If this is the case, and the logical file resides in an unmanaged library, it can be automatically deleted during the installation phase. An unmanaged library is a library that isn't the target for any MDCMS attributes. A typical use case are indexes that are generated by the system for performance reasons.

Y – automatically delete unrequested, dependent logical files residing in unmanaged libraries
N – prompt the user to decide if specific logical files should be deleted or not

Auto-End Jobs Locking Files

During the installation phase of an RFP, MDCMS attempts to get a lock on all files that are to be installed. If a job is locking one of the files, this parameter specifies if MDCMS should automatically end that job.

S – Automatically end QSQSRVR or QZDASOINIT jobs only (default)
N – Do not automatically end jobs locking files to be installed
Y – Automatically end any jobs locking files to be installed

Update Object Description's User Defined Attribute with Attribute

Y – When an object is installed for the given application, automatically put the MDCMS attribute value in the object description's user defined attribute.

N – The object description's user defined attribute will not be automatically updated

Update Object Description's Object Control Level with RFP #1
F – When an object is installed for the given application, automatically put the MDCMS From RFP value in the object description's Object Control Level.

O – When an object is installed for the given application, automatically put the MDCMS Origin RFP value in the object description's Object Control Level.

C – When an object is installed for the given application, automatically put the MDCMS Current RFP value in the object description's Object Control Level.

N – The object description's Object Control Level will not be automatically updated

The combination of the RFP types #1 and #2 make up position 8 of the Object Control Level. It is necessary to store this in the object because it designates the type of RFPs stored in the object. The types of RFP's being stored in objects could change for future stamping after some stamping was already done to some objects.

Update Object Description's PTF with RFP #2
F – When an object is installed for the given application, automatically put the MDCMS From RFP value in the object description's PTF.

O – When an object is installed for the given application, automatically put the MDCMS Origin RFP value in the object description's PTF.

C – When an object is installed for the given application, automatically put the MDCMS Current RFP value in the object description's PTF.

N – The object description's PTF will not be automatically updated

Update Object Description's APAR with Appl and Level
Y – When an object is installed for the given application, automatically put the MDCMS Appl and Level values in the object description's APAR.

N – The object description's APAR will not be automatically updated

Update Object Description's LICPGM with Project, Task and Subtask
Y – When an object is installed for the given application, automatically put the MDCMS Project, Task and Subtask values in the object description's LICPGM fields. The format will be project-task.subtask. LICPGM consists of 2 7-character fields that are separated from each other on the screen, so if the value is more than 7 characters, it will be split between the 2 fields.
If there are multiple tasks assigned to an object, the object's LICPGM will get stamped with the lowest task.

N – The object description's LICPGM will not be automatically updated

Function Keys:
F3=Exit
F6=Add –Add a new Application Group
F11=Output – Display the MD Output panel and other spool files

3.1.1 Linked Applications

View and Manage the list of Applications that contain objects that reference objects existing in the selected Base Application.

```
MDCALNK                          COMPANY NAME                          01/22/14
SCRN1                        Linked Applications                       08:22:59

Base Appl: TEST  Test äpp

Linked.: Y = Objects in selected Appl reference Objects in Base Appl
Inc Lib: Y = Include Base Appl RFP Temp Libs when compiling Linked Appl RFP

Linked  Inc Lib  Appl  Description
  Y        Y     DATA  Test Data 22
  Y        _     INV   Inventory Application
  _        _     BSIS  Rene Test 2
  _        _     SKIK  Test Data 22


                                                                      Bottom
F3=Exit    F11=Output
```

All defined Applications are listed on this screen. The Applications that are currently linked to the Base Application are listed first.

Linked
Y - The Application contains objects that reference objects in the Base Application indicated at the top of the screen. If an Application is linked, MDCMS will show the referencing objects when using the option Include Related Objects from the Object Manager for an object in the Base Application.

For example, a file in the Base Application is checked out. The programmer then uses option I=Include Related Objects in the Object Manager to check out impacted programs, etc. MDCMS will first show dependencies within the same Base Application and then will proceed to show the dependencies in each linked application.

When submitting an RFP for Promotion from the Base Application, MDCMS will also check and warn the programmer of any dependencies in the linked Applications.

The Level Number in the Linked Application must match the Level Number in the Base Application for the Referencing to be considered.

Inc Lib
Y – Any temporary MDCMS Installation Libraries for Base Application RFPs will be included in the library list during the compile of objects for a Linked Application RFP. The libraries will be placed after the temporary libraries for the Linked RFP but before the rest of the library list.

This is typically relevant for environments, such as Production, that have the RFPs compiled and prepared during the day and then have the installation itself occur at a later time.

For a Base Application RFP to be considered, the status of the RFP must be one of the following:
02 – Waiting for Approval
03 – Waiting for Installation
IP – Installation Pending
04 – Installation Job submitted but not yet started

3.2 Promotion Levels

Promotion Level Maintenance defines and sequences the specific environments for the installation of objects for an Application.

```
CMC220                          COMPANY NAME                            4.09.06
SCRN1                  Promotion Level Maintenance                      7:37:14

                                                 Nxt BsO Chk RFP RFP RFP RFP
         Appl Lvl Description          Job Desc  Lvl Lvl Out Rcv Sbm Apr Ins
Filters: ____  __ ____________________ _________  __  __  _   _   _   _   _

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  C=Clean  J=JOBD  L=Libraries
 P=Placeholders V=Validate  X=XREF
                                                 Nxt BsO RFP RFP RFP RFP
  Appl Lvl Description                    Job Desc Lvl Lvl Rcv Sbm Apr Ins
_ JRN  10  Journal Inspector              JRN10             N   N   Y   Y
_ OLY  10  Olympic Test Environment       OLY10           8 N   N   N   Y
_ OPER 10  Operations Environment         BLD10     20      N   N   Y   N




                                                                       Bottom
 F3=Exit    F6=Add    F11=Output    F21=Sys Command
```

Screen Definitions:
Filters
Filter the list of Promotion Levels based on the values entered into the individual fields. For the Appl, Description, and Job Description filters, a Promotion Level will be listed if any part of the field matches the value entered in the filter.

Option
2=Edit – Change the parameters of a Promotion Level
3=Copy – Copy a Promotion Level's parameters to a new Promotion Level and optionally copy all attributes, commands, scripts, distribution levels and Level Placeholders to a new level as well. See the following Sections for more information:

- Specify Library Names for Copied/Received Levels
- Update Attribute Templates for Copied/Received Levels
- Specify Level Placeholder Values for Copied/Received Levels

4=Delete – Delete a Promotion Level
5=Display – Display the parameters for a Promotion Level
7=Rename – Rename the level number to a new value. When renamed, the level number in all related tables for configuration, activity and history are also renamed. The original value is only retained in API logs for audit reasons.
C=Clean – Delta Level Cleanup Menu. From here, a full Reset or the source, object and data libraries can be performed, or stranded object and source requests can be reported on and selected to be deleted. See section Delta Level Cleanup for more details.
J=JOBD – Display/Modify the job description for the Promotion Level
L=Libraries – view a list of all Object Libraries/Folders and Source Libraries that are defined as target libraries by attributes defined for the level. If authorized, a new value for the name of a library can be entered, which will be applied to all attributes in the level that use that library.
P=Placeholders – View/Define custom placeholder variables to be used, with a different value possible for each variable and promotion level.
V=Validate – Create a validation report for the level. See section Promotion Level Validation Report for more details.
X=XREF – Navigate directly to the MDXREF Cross Reference build screen for the level. This is so that the information for the level can be added quickly for help with setting up attributes for the level.

Promotion Level Parameters:

Application
This is a 6-character abbreviation of an Application Group to be used by MDCMS.
The Application Group must exist - see Application Group Maintenance.

Install Level
This is a 3-digit numeric identification of the Promotion Level. The levels are in sequential numeric order. The lowest numeric value represents the lowest Promotion Level and the highest represents the highest Promotion Level.

Example:
10 = Test
50 = Quality Control
90 = Production

Description
A brief statement to identify the Promotion Level.

Job Description
This is the Job Description used for compiling and deploying objects for an application installation.
Press F4 on the field to browse the list of existing job descriptions or to create a new job description.

To create job descriptions from MDCMS, you must be authorized to MDSEC code 11 (System Settings) and your user profile requires a minimum of change authority to the CRTJOBD command. When changing/deleting job descriptions, sufficient authority must exist for the specific object.

The MDCMS Job Description maintenance screen provides access to the following key parameters:

- Job Queue – the job queue to submit deployment jobs (RFPs) to by default. It's recommended that each Promotion Level has its own Job Queue and that the queue is limited to 1 active job to limit the risk of compiles missing new information in a concurrent RFP. F4 can be pressed on the Job Queue to create/modify job queues.
- User – the user that the RFP job will run under, which is typically the owner of the application environment.
- Description
- Library List – the library list that will be used to be able to locate the appropriate source and objects in the correct order during the compile phase or if executing commands for exit point processes.

If other job description parameters need to be viewed/modified, press F10=All Parameters from the detail screen.

Next Level
If objects that have been installed into this level are to be migrated to a higher level on the same system, then the number entered here identifies the level for the objects to be migrated to. If a migration from this level should not occur (either directly or indirectly), then the next level should remain blank.

Direct Migration

Y – The migration to the next level occurs directly from this level

N – If a Next Level value is defined, then after installation into this level, the objects are sent to a level on a different system and those objects are eventually sent back to this system directly to the next level.

This is typically used when the next level places the objects into the core (Production) libraries after having gone through user testing.

Archive Generations

This is the default number of maximum archived copies to store for source, objects or data collections. If, for example, a level is set to 3 archived copies, then up to 3 iterations of change will be archived. When a specific source member or object is changed for the 4th time, the 1st change is removed from archive history and the cycle is continued. A maximum of 99,999 generations are possible.

Data collections (*DATA or *DTAGRP) attributes can individually set a different maximum value of between 0 and 99 due to the potential large size of those items.

Provide Indirect Source

Y – If a Next Level value is defined and flag Direct Migration is set to N, Provide Indirect Source may be set to Y. This indicates to MDCMS that source will not be sent to a different system, but should be staged on this system for migration to the next level once the objects are sent back to this system.

This is typically used on a system prior to Production when source is not allowed on Production. Then, the core libraries on this system will contain the correct source version that correlates to the object in Production.

N – Source is not staged for indirect migration to the next level

Based on Level

If multiple versions of the same application are managed, they are to be identified by level. The Based on Level represents the application version that existed prior to this level. This provides 2 features:

1) When an object is checked out of the Install Level, but the source or object is not found in the chain for that level, MDCMS will then check if it exists in the chain for the Based on Level and then that level's Based on Level, etc. This allows for each new version of an application to be a delta of the prior version.
2) When an object is checked out of the Based on Level, MDCMS will prompt for resolution of the objects in the newer Level(s) to ensure that fixes in older versions of objects get pushed forward to newer versions.

For example:
Install Level = 10 and represents version 1.1.
Based on Level = 9 and represents version 1.0.

When object is requested for version 1.1 and isn't found, MDCMS looks in version 1.0.
When a fix is made in version 1.0, MDCMS prompts user for resolution of fix in version 1.1.

Exist Only
This flag is relevant when a Based on Level is defined.
Y – only prompt for resolution of an object in this level when the object already exists within the level's chain. This is recommended when the Based On resolution features are to be used for a level that is a delta of the based on level but contains only certain custom objects rather than all changes for a new version of those objects.

N – prompt for resolution for existing or new objects. This is recommended when using Based On resolution features for new versions of an application.

Resolution Required
Y – Before an RFP can be submitted, all new, modified or deleted objects that exist in newer version levels of the application must be resolved. Resolution prompting occurs when another level is based on this level and the object exists there as well, or it is a new object with Exist Only=N.

N – The programmer can submit the RFP for this level without resolving all version conflicts.

Allow Checkout
The Allow Checkout flag specifies if objects may be requested for modification in the Object Manager for this level. Only levels that are lower than the lowest "Next Level" are allowed a value of Y.

Y – Allow for the direct request to modify an object. This value is recommended to only be used on the development system.

N – Do not allow for the direct request to modify an object. Updates, recompiles and migrations from a lower level or a remote system are allowed.

Allow Receipt
The Allow Receipt flag specifies if objects may be received from another system into this level.

Y – Allow RFPs to be received for this level.
N – Do not allow RFPs to be received for this level.

Delta Object Level
The Delta Object Level flag specifies if only new or modified objects (delta objects) are intended for this level. Technically, a delta level consists of libraries that reside at the top of the library list at run-time and the lower libraries belong to the core permanent environment.

An entry of 'N' specifies that objects remain permanently in this level.

An entry of 'Y' will allow for the automatic deletion of objects. The objects will be deleted when all of the following requirements are filled:

- The exact same object (based on the internal MDCMS Object version ID) with the same MDCMS attribute is installed into a level with a higher level number than this level
- The attribute for the object at a later level in the migration path uses an Object Deletion Level template that includes this level

Delta Source Level
The Delta Source Level flag specifies if only new or modified source (delta source) are intended for this level.

An entry of 'N' specifies that source members remain permanently in this level.

An entry of 'Y' will allow for the automatic deletion of source members. The members will be deleted when all of the following requirements are filled:

- The exact same object (based on the internal MDCMS Object version ID) with the same MDCMS attribute is installed into a level with a higher level number than this level
- The attribute for the object at a later level in the migration path uses a Source Deletion Level template that includes this level

Emergency Level
The Emergency Level flag specifies if only temporary source/objects (emergency objects) are intended for this level and should be removed again when the objects are then installed into the standard levels. An entry of 'Y' will allow for the automatic deletion of source or objects. The source or objects will be deleted when all of the following requirements are filled:

- The Delta Object and/or Delta Source flags are set to Y depending on if emergencies pertain to Objects, Source or both
- An object with the same name and with the same MDCMS attribute is installed into a later level in the migration path. The internal MDCMS Object version ID does not need to match.
- When pertaining to objects, the attribute for the object at a later level in the migration path uses an Object Deletion Level template that includes this level.
- When pertaining to source, the attribute for the source at a later level in the migration path uses a Source Deletion Level template that includes this level.

An entry of 'N' specifies that source/objects remain permanently in this level or it is a standard Delta level.

Limit Archived Source
Y – the number of generations of archived source for a specific source member or IFS source is limited to the number defined in field Archive Generations.
N – there isn't a limit for source generations – all generations will be stored

Level Check Warnings
The Level Check Warnings flag specifies if MDCMS should compare the file level ID in programs submitted for installation with the file level ID in this level.

N – This validation process will be skipped for this level during the submission of an RFP.

Y – Each program in a promotion for this level will be checked for file level ID mismatches or missing files in the environment. If a problem is found, the RFP will be flagged as containing warnings and each warning is listed in the RFP log.

Target OS Release
The value used for compile placeholder ##TGTRLS## to ensure that objects are created for the appropriate version for the target systems.

*DSTQ – the oldest defined release in the distribution levels for the application

Auto Receive
The Automatic RFP Receipt flag is used to specify if a Promotion sent from a Remote System will automatically be received and all objects to be received are automatically requested for this Level.

N – An authorized user must receive the Promotion using option 9 from the Main Menu.

Y – Submit the Receive job to batch the moment that the Promotion is finished being sent from a Remote System. If the user id of the sender exists on the local system, then the sender's user id will be used for the receipt. If not, then the user defined in the Job Description for the Promotion Level will be used.

Auto Submit
The Automatic RFP Submit flag is used to specify if a Promotion will automatically be submitted once it is successfully received or is installed into a lower level.

N – An authorized user must submit the Promotion

Y – The promotion will be submitted to batch the moment that the Promotion is finished being received onto the local System or the moment that a Promotion is finished being installed into a lower level for the same application. If errors are encountered during the previous process, then the Promotion will not be submitted.

S – The promotion will be submitted to batch the moment that the prior level's Promotion has been closed in the send list, if that Promotion was successfully sent to at least one target level.
For example, the local copy of production shouldn't be updated until installation is complete on all target production systems. If the prior level closes the RFP in the send list once installed or ignored for all targets, then the local copy will be automatically updated at that time.

W – The promotion will be submitted to batch the moment that the Promotion is finished being received onto the local System. Or, the submit will automatically occur the moment that a Promotion is finished being installed into a lower level for the same application and MDWorkflow acceptance has been completed for all objects for the prior Promotion into the lower level. If errors are encountered during the previous process, then the Promotion will not be submitted.

Auto Approve
The Automatic RFP Approval flag is used to specify if a Promotion Level requires an approval before objects are installed into an Application Environment.

N – Approvals for all attributes in the level will require that an authorized user must approve the promotion before MDCMS will allow it to be installed. The approval step occurs after the Submit portion has completed successfully. Authority is granted per level in MDSEC with codes 42 (RFPs submitted by different user) and 52 (RFPs submitted by same user).

T – Approvals for all attributes in the level will be based on Object Approval Templates

Y – Approval to install occurs automatically, except when Objects are included for an attribute requiring User or Template approval

Example:
TEST Application Environments are commonly used by programmers - set flag to 'Y'
PRODUCTION Application Environments usually require approval - set flag to 'N' or 'T'.

Auto Launch MDRapid
The Automatic Launch MDRapid flag is used to specify if data copies for modified files should commence immediately after install approval is granted. This flag is ignored if MDRapid isn't required for the promotion.

N – MDRapid must be launched by an authorized user

Y – MDRapid (pre-emptive data copying) will automatically begin as soon as Approval is granted.

Auto Install
The Automatic RFP Installation flag is used to specify when objects are installed into an Application Environment once the preparation and approval is complete.

N – An authorized user must submit the RFP for scheduled installation or the MDINSRFP API may be called to install the RFP.

R – The promotion will be installed as soon as approval is granted, if MDRapid is not required, but will wait for an authorized user to schedule the install if MDRapid is required.

Y – The promotion will be installed as soon as approval is granted (and MDRapid is complete, when applicable).

This flag is usually set to N for production environments. Then, when the compilation and error checking portion is complete, the programmer can schedule the installation to occur when no one is actively using the application.

Auto Close Sent RFP
The Automatic Close Sent RFP flag is used to specify if a Promotion will automatically be closed in the Send listing once a certain status has been reached.

N – An authorized user must always manually close the Promotion in the Send list.

S – The Promotion will close once sent to all default levels

R – The promotion will close once successfully received on each of the default target locations. If a warning occurs during receipt, the promotion will remain open.

I – The promotion will close once successfully installed on each of the default target locations. If a warning occurs during installation, the promotion will remain open.

Function Keys:
F3=Exit
F4=Browse – Browse the defined application groups when the cursor is on the appl field or browse/maintain the job description when the cursor is on the job description field
F6=Add – Add a new Promotion Level
F11=Output – Display the MD Output panel and other spool files
F21=Sys Command – Command line prompt

3.2.1 Promotion Level Considerations

1. It is important to have a deployment life cycle defined for an application and to have the Promotion Levels set up to match the migration strategies of the Application.

2. The default for checking out source or objects for a development modification is based on the lowest level of an Application Group that allows checkout. MDCMS will automatically search up the chain of levels based on the next level values, followed by the chain of based on levels, if the source or object does not exist in the base level. Search templates can also be defined to look elsewhere for the components.

3. The Job Description for a level is very important to the installation process. The Library List and User Profile defined in the Job Description must be correct.

4. To save time, it is best to completely define all attributes and commands for the base promotion level. Afterwards, that level can be copied with Option 3 and all attributes and commands will also be copied to the other levels. Or, all attributes and commands can be sent to another partition using option 18 from the Setup menu.

3.2.2 Level Build/Cleanup

This Build/Cleanup Menu is requested by using option C for a Promotion Level in the Promotion Level listing.

Option 1 - Generate Residual Delta Objects List

This option collects a list of all objects in the level's libraries/folders (based on the Attribute definitions) that were installed using an MDCMS attribute applied to an Object Deletion Template.

The level must be defined as a Delta Object Level for this option to be enabled.

An object will be added to the collection if it doesn't have an active request to migrate from the level.

Press Enter to submit the generation to batch. Once finished, the Last Run/Status column will show the date and time of the run. The results can be viewed/managed using Option 2.

Option 2 – Work with Residual Delta Objects List

This option lists all objects collected in option 1.

Fields

Result Code	MDCMS assigns a result code to each entry based on information collected. The list of all possible codes is available by pressing F4 on the Result filter field.
Obj Higher Lvl	The level number in the chain of levels above the selected level where the object also exists. If a number isn't displayed in the detail screen, then the object doesn't exist above the selected level.
Req Higher Lvl	The level number in the chain of levels above the selected level where an object request for the object exists. If a number isn't displayed in the detail screen, then the object isn't requested above the selected level.
Req in Send RFP	An active RFP number in the send listing that contains the object to be sent from this level
Deleted by	The user and date/time that selected to delete the object using this option
Last Installed	The date/time of the most recent installation of the object into the selected level.
RFP	The RFP used for the most recent installation of the object into the selected level.
User	The user assigned to the most recent installation of the object into the selected level.
Project	The project/task/subtask of the most recent installation of the object into the selected level.
Attribute	The MDCMS attribute assigned to the most recent installation of the object into the selected level.

Options
4=Delete – Delete the object from the library or folder
5=View – View full details of the object
H=History – bring up the Installation History screen for the given object
X=MDXREF – bring up the MDXREF screen for the given object

Function Keys
F8=WRKJOB – Work with the submitted job used to collect the data, if still on the system
F9=Delete All – Delete all objects in the list based on the current filter values at the top of the screen
F15=Print – Create an MD report containing all objects in the list based on the current filter values at the top of the screen. Afterwards, use F11 to view/print/export the report.

Option 3 - Generate Residual Delta Source List

This option collects a list of all source in the level's libraries/folders (based on the Attribute definitions) that were installed using an MDCMS attribute applied to a Source Deletion Template.

The level must be defined as a Delta Source Level for this option to be enabled.

A source will be added to the collection if it doesn't have an active request to migrate from the level.

Press Enter to submit the generation to batch. Once finished, the Last Run/Status column will show the date and time of the run. The results can be viewed/managed using Option 4.

Option 4 – Work with Residual Delta Source List

This option lists all objects collected in option 3.

Fields

Result Code	MDCMS assigns a result code to each entry based on information collected. The list of all possible codes is available by pressing F4 on the Result filter field.
Src Higher Lvl	The level number in the chain of levels above the selected level where the source also exists. If a number isn't displayed in the detail screen, then the source doesn't exist above the selected level.
Req Higher Lvl	The level number in the chain of levels above the selected level where an object request for the source exists. If a number isn't displayed in the detail screen, then the source isn't requested above the selected level.
Req in Send RFP	An active RFP number in the send listing that contains the source to be sent from this level
Deleted by	The user and date/time that selected to delete the source using this option
Last Installed	The date/time of the most recent installation of the source into the selected level.
RFP	The RFP used for the most recent installation of the source into the selected level.
User	The user assigned to the most recent installation of the source into the selected level.
Project	The project/task/subtask of the most recent installation of the source into the selected level.
Attribute	The MDCMS attribute assigned to the most recent installation of the source into the selected level.

Options
4=Delete – Delete the source from the source file or folder
5=View – View full details of the source
H=History – bring up the Installation History screen for the given object of the installed source
X=MDXREF – bring up the MDXREF screen for the given object of the source

Function Keys
F8=WRKJOB – Work with the submitted job used to collect the data, if still on the system
F9=Delete All – Delete all sources in the list based on the current filter values at the top of the screen
F15=Print – Create an MD report containing all sources in the list based on the current filter values at the top of the screen. Afterwards, use F11 to view/print/export the report.

Option 5 – Full Level Build/Reset

This option does the following:

- All libraries, source files and IFS folders are automatically created (when not already existing) and authority is applied to them based on parameters available in the confirmation screen.
- provides the option to delete any source, non-database objects and IFS files from one or more selected libraries, if the level is defined as a delta level.
- Provides the option to create/refresh any database objects based on another level or to delete the database objects in one or more selected libraries, if the level is defined as a delta level.

Initial Build/Reset Screen Fields

Remove All Source	Y=all source in selected libraries/folders for the level will be deleted
Remove All IFS Objects	Y=all IFS files residing directly in the selected IFS folders will be deleted
Including Subfolders	Y=If removing IFS Objects, any subfolders will be recursively deleted too
Remove All Non-DB Objects	Y=all system objects in selected libraries for the level will be deleted if they aren't a data area, physical file or logical file
Database Object Handling	1=do nothing with data areas, physical files or logical files 2=clear the data any existing physical files 3=all data areas will be replaced by those in the selected from Level, physical and logical files will be removed in not in the selected from Level, will be replaced if not the same format as the version in the selected from Level, and copied from the select from Level if not existing in the delta level. Additionally, any existing data will be cleared. 4=all data areas will be replaced by those in the selected from Level, physical and logical files will be removed in not in the selected from Level, will be replaced if not the same format as the version in the selected from Level, and copied from the select from Level if not existing in the delta level. Additionally, the records in the tables will be refreshed with the data in the selected from Level. 5=Remove Objects=all data areas, physical files and logical files in the selected libraries will be removed
Replace DB with Object from Level	The level number in the same Application that contains the Database objects to replicate from
Auth Template New Libraries	The MDCMS Object Authority template to apply to any libraries created by the Reset function
Auth Template New Folders	The MDCMS Object Authority template to apply to any folders created by the Reset function
New Source Files from Level	The level number in the same Application that contains the source files to use as a reference for the length of new source files to create in the target level

Once the parameters have been set, press Enter to continue to the list of folders and libraries that are to be included in the Reset process. By default, none of the entries will be included. Use option 1=Include to include an entry or press F13 to include all entries. The entries are based on the attribute definitions for the selected delta level.

After the selections are made, press Enter to continue to the confirmation screen.
Press Enter to submit the reset process to batch. Once finished, the Last Run/Status column will show the date and time of the run. The object log can be viewed using Option 6 and the source log can be viewed using Option 7.

3.2.3 Promotion Level Validation Report

This report searches for potential problems in the attribute settings and objects for a promotion level. The report is requested by using option V for a Promotion Level in the Promotion Level listing.

```
MDLVLVL                          Company Name                        22.05.12
SCRN1                      Level Validation Report                   20:41:32


  Appl Lvl
  ACCT 10  Accounting app

  WARNING It is important that the cross-reference information for the
          Libraries impacted by the Level Attributes is up-to-date prior to
          creating this Report


  Include Source Change Date Comparison . .  Y   Y/N
  Submit Report Job to Batch  . . . . . .  Y   Y/N



Enter=Continue   F12=Cancel
```

The reporting process looks for the following issues:

- Non-existent Object Library or IFS Folder
- Non-existent Source Library
- Non-existent Source File or Message File
- Managed Library that hasn't been Cross-Referenced
- Object Types in Managed Library without a defined Attribute
- Source not found in target Source File or Search List for Object
- Source Change Date and maximum Record Date for Source Member does not match Object – this check can be excluded by entering N at the Include prompt

The generated output is available from the MD Output Panel (F11) and from there can be viewed, printed or exported.

3.2.4 Custom Level Placeholders

Placeholder variables can be defined per Promotion Level and then be used as replacement variables at runtime for commands, IFS/Remote scripts, Email bodies and SQL Scripts.

The following list screen is available using option P=Placeholders on a level in the Promotion Levels settings.

```
MDCLVAR                          COMPANY NAME                           2.04.19
SCRN1                      Custom Level Placeholders                   17:09:19

          Appl  Lvl  Placeholder Description      Value
Filters: ____  __   ______      ________________  ________________

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View

Opt Appl Lvl ID       Description                 Value
 _  TEST 10  MYTIME   My time in seconds to compl 910
 _  TEST 30  OTHLIB   the other library           california
 _  TEST 50  OTHLIB   Other Library               MMORGAN



                                                                      Bottom
F3=Exit   F6=Add
```

Screen Definitions:
Filters
Filter the list of Placeholders based on the values entered into the individual fields. For the Placeholder, Description, and Value filters, a Placeholder will be listed if any part of the field matches the value entered in the filter.

Option
2=Edit – Change the description or value of a placeholder for the level
3=Copy – Copy a placeholder
4=Delete – Delete a placeholder
5=View – Display the placeholder details

Placeholder Parameters:

Application
This is a 4 character abbreviation of an Application Group to be used by MDCMS.
The Application Group must exist - see Application Groups.

Install Level
This is a 2-digit numeric identification of the Promotion Level. The level must exist – see Promotion Levels.

Placeholder
The placeholder ID, which must be 6 alphanumeric characters in length and not already be defined in the list of fixed placeholders or as Placeholder IDs for Project/Task Custom fields.

Description
A description of the Placeholder for the level.

Value
The replacement value for the placeholder to be used at runtime for the command or script.

3.2.5 MDUPDLWC – Update Level Placeholder Value command

MDCMS is delivered with a command-based API that allows external tools or applications to update the value for existing Level Placeholders.

The MDCMS command is named ***MDUPDLWC*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command.

Successful MDUPDLWC transactions are logged in file MDCMS(ENV)/MDDLVARHST and visible from Settings->Logging.

MDUPDLWC Parameter Table

Name	Type	Length	Valid Values and Format
Placeholder	CHAR	6	unique ID - Required
Application	CHAR	6	*ALL - Apply the update to existing entries for all applications otherwise - Apply the update to existing entries for the specific application
Level Number	DEC	3	0 - Apply the update to existing entries for all application levels otherwise - Apply the update to existing entries for the specific application level
New Placeholder Value	CHAR	160	The value to apply to existing placeholder entries
MDCMS Instance	CHAR	5	Specifies the MDCMS environment that should be used for the API. The ID correlates to the suffix of the MDCMS library name. Special values: *DFT – default instance (no suffix) *SAME – the current instance based on the library list

3.3 Attributes

The Attribute Maintenance function defines the destination of objects and source that are installed during the promotion process. Each destination for an Application/Level and Object (or source or message) type is uniquely identified by an Attribute. This attribute is then used for setting command definitions, object authority, etc…

When initially defining attributes for a new application, it is best to **start out by pressing F9** to automatically generate the most common attributes, compile commands, and object authorities. Special object handling can then be individually maintained from the attribute maintenance screens.

Once all attributes are set for a given promotion level, the easiest way to propagate those settings to another promotion level on the same system is to specify 'copy attribute settings' when copying the promotion level. The easiest way to propagate the settings to a promotion level on another system is to send the settings using options 17 or 18 from the settings menu.

```
MDCCMEM                          COMPANY NAME                              4.09.18
Filters:                      Attribute Maintenance                       12:52:42
    App/Lvl Type    Attribute  Desc       Object Lib Src Lib    Src File   Sq C D L
    ____ __ _______ __________ __________ __________ __________ __________ __ _ _ _

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  C=Cmd/Scrp  D=Dest  L=Links
 T=Templates
Opt Appl Lvl Type    Attribute  Object Lib      Src Lib    Src File    Sq C D L
 _  MD   10  *CMD    ACMD       MDADMT          MDADMT     QCMDSRC      9 Y   Y
 _  MD   11  *CMD    ACMD       MDADMT          MDADMT     QCMDSRC      9 Y
 _  MD   12  *CMD    ACMD       MDADM71         MDADM71    QCMDSRC      9 Y Y
 _  MD   13  *CMD    ACMD       MDADMT          MDADMT     QCMDSRC      9 Y
 _  MD   14  *CMD    ACMD       MDADMT712       MDADMT712  QCMDSRC      9 Y
 _  MD   15  *CMD    ACMD       MDADM712        MDADM712   QCMDSRC      9 Y Y
 _  MD   30  *CMD    ACMD       MDADMP          MDADMP     QCMDSRC      9 Y
 _  MD   50  *CMD    ACMD       MDADM           MDADM      QCMDSRC      9 Y
 _  MD   10  *CMD    CCMD       MDCMST          MDSRCT     MCCMD        9 Y
                                                                   More...
 F3=Exit   F4=Browse   F5=Refresh   F6=Add   F8=Toggle Desc   F9=Gen Dft Attr
```

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of attribute records which exactly match those filters. For example, enter '10' in the lvl filter to see only attribute records for level '10'. For the Attribute, Object Lib, Src Lib and Src File filters, records will be included if the initial string matches. For example, enter 'TE' in the Src Lib filter to see all records with a source library beginning with TE.

Sq is the Compile Sequence Filter

C specifies if any commands are defined for the Attribute. Use value N to see only attributes without commands.

D specifies if Deletion Level templates are assigned to the Attribute. Use value N to see only attributes without Deletion Level templates.

L specifies if other Attributes are Linked to the Attribute. Use value N to see only unlinked attributes

Opt
2=Edit – Change the parameters of an attribute
3=Copy – Copy the parameters of an attribute to a new attribute
4=Delete – Delete an attribute
5=View – Display the parameters of an attribute
7=Rename – Rename the attribute code to a new value. When renamed, the attribute in all related tables for configuration, activity and history are also renamed. The original value is only retained in API logs for audit reasons.
C=Cmd/Scrp – Edit the default compile and installation commands or scripts for an attribute
D=Dest – View/edit the options of what should be sent to target systems (source, object, both, or neither) for the specific attribute.
L=Links – Edit the list of attributes that should prompted to check out, when a programmer checks out an object for this attribute
T=Templates – View/edit the templates to be assigned to the attribute for replication, deletion, etc…

Appl
This is a 6-character abbreviation of an Application Group to be used by MDCMS.
The Application Group must exist - see Application Group Maintenance.

Level
This is a 3-digit numeric identification of the Promotion Level as defined in the Promotion Level Maintenance.

Type

all IBMi object types	Standard IBMi object types (*PGM, *FILE, *CMD, etc...) that exist in standard QSYS libraries. These objects may be compiled from a source member or may be handled as an object only.
*DATA	A MDCMS object type to migrate some or all data records into a physical file while leaving the file description intact. All records in the file prior to the installation can be archived and rolled back if parameter Archive Generations is > 0 for the attribute.
*DTAGRP	A MDCMS object type to define a collection of files (1 or more) with common key values for their records. The records for each file matching the requested value will be migrated. See the next section for more information. The specific data records impacted by the installation of a *DTAGRP object can be archived and rolled back if parameter Archive Generations is > 0 for the attribute. **NOTE:** Robot Schedule data can also be managed within MDCMS using the *DTAGRP Attribute (see details in next section of this manual)
*DUMMY	A MDCMS object type to allow information to be migrated without any actual object being involved.
*IFS	A MDCMS object type to handle objects that are stored in the Integrated File System.
*MNUDDS	A MDCMS object type to handle all relevant objects and source for a DDS menu. This means that the display file, message file, menu object, display source, and command list source are all managed by a single reservation.
*MSGD	A MDCMS object type to handle individual message descriptions to be stored in a message file.
*PIPE	A MDCMS object type to contain objects that will be built, tested and deployed using a Pipeline server such as Azure, Bamboo, Bitbucket, GitLab or Jenkins. MDOpen is required to define the Pipeline servers as well as the Pipelines to apply to the attribute.
*REMOTE	A MDCMS object type to physically deploy objects that reside on non-IBM i platforms using FTP. MDOpen is required to define the FTP servers and request the objects.
*SOURCE	A MDCMS object type to handle source-only items such as copybooks.

*SQLALS	An SQL Alias using the SQL name for the alias. Additionally, use the For Database and For Library fields for the attribute to define the location of the table or view that the alias points at for the given level. A compile command (typically RUNSQLSTM) must be defined for the attribute to create the alias at installation time. Enter a valid Object Authority template, which is applied to the DDM file created on behalf of the SQL Alias.
*SQLCST	An SQL Constraint using the SQL name for the constraint. A RUNSQLSTM command of type 3 (Post-Installation) must be defined for the attribute to create the constraint at installation time.
*SQLFUN	An SQL Function using the SQL name for the function. A compile command (typically RUNSQLSTM) must be defined for the attribute to create the function at installation time. It's recommended to define the SQL long schema name for the Object Library value (if different than system library name) for functions to avoid having to look it up at installation time.
*SQLIDX	An SQL Index using the SQL name for the index.
*SQLMQT	An SQL Materialized Query Table using the SQL name for the table. A compile command (typically RUNSQLSTM) must be defined for the attribute to create the table at installation time.
*SQLPRC	An SQL Procedure using the SQL name for the procedure. A compile command (typically RUNSQLSTM) must be defined for the attribute to create the procedure at installation time. It's recommended to define the SQL long schema name for the Object Library value (if different than system library name) for procedures to avoid having to look it up at installation time.
*SQLSCR	An SQL Script to manipulate data in tables. The Object Library is the SQL schema name that is the target for the SQL statements in the script. The object replication template can be used to repeat the statements for several libraries during a single deployment. A RUNSQLSTM command of type 3 (Post-Installation) must be defined for the attribute.
*SQLSEQ	An SQL Sequence using the SQL name for the sequence
*SQLTAB	An SQL Table using the SQL name for the table.
*SQLTRG	An SQL Trigger using the SQL name for the. A RUNSQLSTM command of type 3 (Post-Installation) must be defined for the attribute to create the trigger at installation time. Enter a valid Object Authority template, which is applied to the CLE program created on behalf of the SQL Trigger.
*SQLUDT	An SQL User Defined Type using the SQL name for the type.
*SQLVAR	An SQL Variable using the SQL name for the variable. A compile command (typically RUNSQLSTM) must be defined for the attribute to create the variable at installation time. Enter a valid Object Authority template, which is applied to the service program created on behalf of the SQL Variable.
*SQLVW	An SQL View using the SQL name for the view.

Attribute
This field is used to uniquely identify each source or object attribute to be handled by MDCMS. Standard IBMi object attributes can be used or the user may define customized attributes.

Example:
1. Standard IBMi object attributes or source types are, for example, RPG, CBL, PF, LF, DSPF, PRTF.
2. User defined source types may look like RPG1. The definition in MDCMS could be for special compilers for RPG type programs using a specific application compiler or different RPG compiler defaults. It could also be to have the source or object placed in a different library than standard RPG programs.

Description
An optional description to further clarify the purpose of the attribute

Object Library
This field identifies where an application object resides for a specific Application, Level, Type, and Attribute. This is used when installing an object into an environment.

This is left blank for source-only items.
For *IFS and *REMOTE attributes, the directory path is to be entered here beginning with the root.
For *DATA and *DTAGRP attributes, the file library should be entered here. If data shouldn't be copied into a library for the given level, special value *NONE can be used – this can be useful when the level is for a delta database environment so that the target files may not exist. MDCMS will internally retain the data from the prior library for migration or send to the next level.
For *SQL attributes (except *SQLPKG), the SQL name of the target library should be entered here.

Source File
This field identifies the source file for a specific Application, Level, Type, and Attribute. This is used when installing source into an environment.

For message descriptions, this is the name of the message file.

*IFS – use this value if the source is stored in IFS and enter the full path of the directory in the Source Library field
*REQONLY – use this value for an attribute that has source defined for it at lower levels, but the source and object shouldn't be deployed to this level or higher. Instead, only the request record will travel with the RFP without actions being taken. This is typically used for copybooks or ILE modules on a production system where the source or modules aren't allowed/needed, but when the RFP returns to the copy of production on the development system, then source will be indirectly pulled from the delta development environment for deployment into the production copy environment.

This field is left blank for object-only items.

Source Library
This field identifies the source library for a specific Application, Level, Type, and Attribute. This is used when installing source into an environment.
If the source is contained in source members, the library containing the source files is used.
If the source is stored in IFS, the value is the complete IFS path of the directory containing the source files.
For message descriptions (*MSGD), this is the library where the message file is located.

*TEMP – temporarily migrate source for compiles, but don't keep the source in the target environment. Typically used for production environments where persistent source isn't allowed.

This field is left blank for object-only items.

Dft Source Naming
By default, the name of the source is the same as the name for the object and is defined as ++OBJNAM++. If source names for the attribute have different names as for the object, the naming pattern can be entered here. For example, use ++OBJNAM++.sql to automatically assign the suffix .sql to the end of the source name when checking out the object. Each object checked out can individually be assigned a different source and MDCMS retains this information for future checkouts of the object.

Dft Source Type
The type to apply by default when requesting to generate a new source member.
This type is also applied when MDCMS converts source that has been imported from Git, SVN or other file systems.

Archive Generations
This flag is only relevant for *DATA or *DTAGRP attributes.

The number of generations of the entire file (in the case of *DATA) or the specific impacted records (in the case of *DTAGRP) that will be archived, providing the ability to view the prior state of the records or to roll back to the prior state if necessary. The archived records are copied to a stream file in IFS and then zipped to reduce storage requirements as much as possible.

If set to 0, the prior data is not archived and can't be rolled back at a later date. This is only recommended if disk space availability is minimal or if the data is otherwise saved prior to installations. *DTAGRP attributes require a minimum of 1 generation.

Retain Data Set for Migration to next Level
This flag is only relevant for *DATA or *DTAGRP attributes.

Y = when the data collection is prepared for deployment into the initial level, only records in that collection will migrate to higher levels regardless if changes or additions are made to the files in the initial level. For example, 2 records are migrated into level 10 which also has 10 other records matching the same filter criteria. Only the 2 records will continue on to level 20.

N = the data collection is freshly prepared at each level. For example, 2 records are migrated into level 10 which also has 10 other records matching the same filter criteria. All 12 records will continue on to level 20.

Allow *NONE
This flag is only relevant for *DATA or *DTAGRP attributes.

Y = when an object request of the given attribute is checked out, *NONE as a value is allowed because the data will already be in the library for the target level.

N = the developer library to migrate the data from must be defined for the checkout request.

Server Location
The target server that *REMOTE objects for the given attribute should be deployed to. Press F4 to select from the list of target servers. MDOpen must be used to manage the target server list as well as to check out *REMOTE files and folders.

*NONE can be used to indicate that the *REMOTE objects shouldn't be physically deployed to a remote server for this promotion level. The requests will merely travel with the RFP to the next level in the migration path.

In the case of *IFS attributes, a server name can be stored in this field. The value will then be used by occurrences of the ##SERVER## placeholder by commands and scripts for an IFS file using the attribute.

Require Approval
Y – If an RFP contains a request for the given attribute, an authorized user must approve the RFP before it can be installed even if the Attribute's level is set to auto-approve RFPs.
T – If an RFP contains a request for the given attribute, approval will be based on Object Approval Templates, even if the Attribute's level is set to auto-approve RFPs.
N – The auto-approve flag for the Attribute's level determines if the RFP is auto-approved or not.

Compile Sequence
The compile sequence is used by MDCMS to sequence the order of object compiles during a request for promotion. The sequence is in ascending order.

The compile sequence is automatically set for all object types except *DTAGRP and *FILE.

***DTAGRP** - the compile sequence is by default 16, and the data records are only migrated after the installation is complete. If a lower compile sequence is entered, the records will be migrated during compile time based on the sequence, in case the compiler for other objects depends on that data. When the compile step for all objects in the RFP is complete, the data migration will be rolled back and re-migrated after the installation is complete.

***FILE** - Recommended compile sequence for files:
Reference file = 3
Physical files = 4
Logical files = 5
Display/Printer files = 7

SQL Views (*SQLVW) are set to sequence 6, which is why display and printer files are 7, as they may reference field definitions in views.

Acceptance Group Type
If MDWorkflow is licensed for the partition, a user group type can be defined for the attribute. When defined, once objects of the given attribute are installed into the target level, a member of the group defined for the impacted project(s) must review and then accept the results of the installation before the RFP can continue to the next level in the migration path.

This group type will be in addition to any Acceptance Group Types defined for all objects for the level. This way, this additional acceptance is only necessary for these special attributes. For example, a DBA group may need to review configuration data or database changes in the test environment before the RFP can be promoted to QA.

Ignore Dependencies
Y – Any non-Database Relation dependencies over a file, module, service program or copybook Object Request of the given attribute will not be considered when checking for missing dependencies during the RFP Pre-Submit Warning process and they will not be auto requested when using Continuous Integration from Git. The dependencies will still be shown when explicitly asking to request dependencies for an Object Request.
N – All dependencies will be considered for an Object Request of the given attribute.

Copy from Library
This parameter is displayed for *DATA and *DTAGRP attributes. If a library name is entered, data will be copied from that library down to the developer library at checkout rather than from the target library of the attribute.

For Database
The name of the Relational Database for an SQL Alias to point to. Press F4 to select from the list of defined RDB entries. The value of this field corresponds to placeholder ##RMTRDB##, which should be placed in the SQL script to dynamically handle the location of the target table or view when the CREATE ALIAS script is invoked.

For Library
The system name of the Library for an SQL Alias to point to. The value of this field corresponds to placeholder ##RMTLIB##, which should be placed in the SQL script to dynamically handle the location of the target table or view when the CREATE ALIAS script is invoked.

Function Keys:
F3=Exit
F4=Browse – Browse the list of valid values for a field.
F6=Add – Add an environment attribute
F8=Toggle Desc – toggle the listing display between a single line per row without the attribute description and a 2nd line per row with the attribute description
F9=Gen Dft Attr – Generate default attributes for a promotion level

3.3.1 Templates for Attribute

Various templates can be assigned to an attribute to affect its behaviour based on the definition of the template. This eliminates the need to generate complex definitions individually for each attribute. The template screen automatically appears in the 2nd step of adding a new attribute. To view/modify the templates assigned to an existing attribute, use option T=Templates.

Object Authority Template
The name of the template containing the Object Authority Definition to apply to objects for this template. This template is required for all object types except *SOURCE, *MSGD, *DATA, *DTAGRP and *DUMMY.

The template type must correspond to the object type:
IFS - *IFS object types. The authority for IFS source is automatically applied from the *DFTIFS template
OS400 – OS/400 object types
REMOTE – *REMOTE object types

IFS Source Authority Template
If an attribute is defined to deploy source to an IFS folder (source file = *IFS), then an Object Authority template of type IFS needs to be assigned to the attribute. The IFS file will then have the template's authority applied at the time of deployment.

Object Replication Locs Template
When an installation occurs, an object using this attribute will always be deployed to the defined Object Library.
If that same object should be replicated to additional libraries for the same environment, then the name of the Object Replication Template that contains the list of locations should be entered.

Common Usage Examples:

1) The complete set of physical and logical files for production is also stored in Month-End and Year-End libraries. If the format for a file changes, then the format change could be replicated to the Month-End and Year-End libraries at the same time of the format change for production. The data for each library/file is mapped back appropriately.
2) Multiple web servers are used in the same environment for load balancing purposes. Replication can be used to deploy remote object changes to each of those servers at the same time.

Source Replication Locs Template
When an installation occurs, a source member using this attribute will always be deployed to the defined Source Library or Directory.
If that same source member or IFS file should be replicated to locations for the same environment, then the name of the Source Replication Template that contains the list of locations should be entered.

Object Search Locations Template
When checking out an object that doesn't contain source, the defined Object Library for the attribute and level will be checked for existence. If it doesn't exist in that location, MDCMS checks in the target locations for the higher levels on the local partition. If the object still isn't found, an Object Search Location template can be used to search additional libraries/directories for the object.

Source Search Locations Template
When checking out source, the defined Source Library/File for the attribute will be checked for existence. If it doesn't exist in that location, MDCMS check in the target locations for the higher levels on the local partition. If the source still isn't found, a Source Search Location template can be used to search additional libraries/directories for the source. In the case of source members, the source locations can be on remote systems if DDM is implemented.

Object Deletion Levels Template
If objects should be removed from delta or emergency levels after installation into this level, the Deletion Level template defining the list of levels can be entered here.

Source Deletion Levels Template
If source should be removed from delta or emergency levels after installation into this level, the Deletion Level template defining the list of levels can be entered here.

In the case of source members, the levels can be on remote systems if DDM is implemented.

Source Comments Template
If comments should automatically be generated in the source code during deployment for the attribute, apply the template matching the commenting format intended for that attribute.

MDRapid Usage Template
If MDRapid is licensed for the system to minimize downtime during the deployment of database changes, and the attribute is a *FILE, *SQLIDX, *SQLTAB or *SQLVW type, a MDRapid template can be applied to the attribute to indicate when and how MDRapid should be launched for files using that attribute.

Code Review
If the source code for an object request of this attribute should undergo an automatic Code Review by a tool such as SonarQube once it has been deployed into this level, a Code Review template can be applied. Code Review templates must be defined using MDOpen, but the list of defined templates can be viewed and selected from by pressing F4 on the Code Review Template field.

Automated Testing
If the object requests of this attribute should undergo Automated Testing by MDTest or Testbench from Original Software once it has been deployed into this level, an Automated Testing template can be applied. Automated Testing templates must be defined using MDOpen, but the list of defined templates can be viewed and selected from by pressing F4 on the Automated Testing Template field.

Git Commit
If the source code (or IFS file) for object requests of this attribute should be committed to a local Git Repository and then pushed to the Git origin server. The commit/push will occur once the RFP is installed for any code that is different from the code already in the repository. The Git Commit template processing can also automatically create branches to hold the changes and create Pull Requests to merge the changes into another branch. Git Commit templates must be defined using MDOpen, but the list of defined templates can be viewed and selected from by pressing F4 on the Git Commit Template field.

SQL Package Template
SQL Package Templates manage the location and existence of SQL Packages for Programs and Service Programs containing embedded SQL statements. SQL Package Templates can be applied to *MODULE and *PGM attributes to ensure the correct target library for the SQL Packages on the CRTSQL* commands and SQL Package Templates can be applied to *PGM and *SRVPGM attributes for automatically creating and deleting SQL Packages during RFP deployment of the programs.

3.3.2 *DTAGRP Attribute

*DTAGRP is a special MDCMS object type to define a collection of files (1 or more) with common key values for their records. The records from the first member for each file matching the requested value will be migrated.

For example, 3 files have a field containing the table ID. A user wishes to migrate all records in each file where the table ID = “ABC”. The user simply requests object name “ABC” using a *DTAGRP attribute that describes the 3 files and relevant field for each file. MDCMS will then migrate the records to the next level(s).

If a rollback is performed for ABC, the record contents for table ID ABC will be restored to the state prior to the installation.

Note: If you wish to migrate records from a different member of a multi-member file, the *DATA attribute type should be used instead.

```
MDCATDG                          COMPANY NAME                              10/01/11
SCRN1                    Generate Standard Attributes                      10:37:46


Appl: TEST  Lvl: 10  Attribute: CSSADD      Library: TESTOBJ10

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=Display

Opt File       Field 1    Type 1  Field 2    Type 2  Field 3    Type 3  Opt Mnd
 _  MDAINV     CSTNBR         7N                                 REP  N
 _  MDALIC     CSTNBR         7N  PRDCOD         3A  BILLYN     FIX     REP  Y



                                                                      Bottom
F3=Exit   F5=Refresh   F6=Add
```

The list of files for a particular *DTAGRP attribute are maintained by pressing F8 from the attribute detail screen.

File
The name of the file that must exist in the object library defined for the attribute. Press F4 to browse using MDXREF.

Field
The name of the field to use as a record filter for the file. Up to 3 fields may be defined per file. Every record in the file where the value for these fields matches the value requested in the Object Manager will be included in the data set. Press F4 to browse the list of fields in the file. Alphanumeric or Numeric fields are allowed for use as the record filter. Be certain that the ordering of the fields match the order for the other files in the Data Group.

If no fields are specified for the file, then all records will be included in the data set.

Starting Pos / Length
If the field is alphanumeric, a substring of the field can be used for the key value by specifying the starting position and length of the substring. If these 2 fields are left blank, then the entire field is used for the key value.

Fixed Value
Each defined field for the file may have a fixed value so that a value for that field doesn't need to be entered for each object request.

Blank – the value is entered as a variable in the object request name
*EMPTY – only records where this field is blank (or 0 for numeric fields) will be migrated
Value – only records where this field contains this value will be migrated

Record Option
*ADDNEW – any records that don't already exist in the table for the given field values will be added when migrated into this level. The file itself must be defined as uniquely keyed to use this feature.

*REPLACE – all records for the given field values will be replaced by the records being migrated. The *REPLACE option is permitted for any physical file, regardless of key definitions for the file.

*UPDADD – existing records with matching field values will be updated and new records will be added. The file itself must be defined as uniquely keyed to use this feature.

Records Mandatory
Y – 1 or more records must be available to migrate, otherwise the installation will fail
N – records with matching field values are not mandatory for this file

3.3.3 Requesting a *DTAGRP migration in the Object Manager

The records are requested using option M or N in the Object Manager. Enter the value for each variable field (fields without a fixed value defined) in the object name. If more than 1 field is defined for a file in the Data Group, separate the values with a comma. Trailing spaces should not be entered.

If the value for an alphanumeric field should be blanks, enter special value *EMPTY for that field.

Use option D to delete all records in the files where the keys equal the value of the object requested.

Example of Object Name
The example Data Group contains a variable alphanumeric field, a variable numeric field, and a fixed value field with value Y.

In the Object Manager, the programmer would enter the alphanumeric key value, a comma, and then the numeric key value:

EXAMPLE STRING, 75

When deploying the RFP, all records where field 1 = EXAMPLE STRING, field 2 = 75 and field 3 = Y would be migrated.

After pressing Enter to Request a Data Group value with option M or N, a confirmation screen will be displayed with the following 2 parameters:

Copy Data from Dev Library
*NONE – the data already exists in the initial level and the collection is copied from that level to any higher levels when subsequent RFPs are installed.

Otherwise, enter the name of the Developer Library that the data will be copied from.

Copy Data to Dev Library
N – nothing will be copied to the Developer Library
Y – if the Data Group files do not exist in the Developer Library, they will be created. Once existing the current applicable records in the target library for level will be copied to the files in the Developer Library.

3.3.4 *DTAGRP for managing Robot Schedule data

Robot Schedule can also be managed within MDCMS using the *DTAGRP Attribute.

The purpose of this feature is for the migration of Robot Schedule job schedule data from a user's pre-production system that contains their test version of the Robot Schedule product to their production system that contains their Robot Schedule product version.

Setup

When setting up the *DTAGRP Attribute for managing Robot Schedule data, follow these steps:

Using the F6=Add from the Attribute Maintenance panel (MDCCMEM/SCRN1) fill in the parameters as shown here.

Application
Specify the Application Group code that the Attribute will be added for. Since Robot Schedule exists once per partition, it is best to be an application containing a single level per partition.

Level
Specify the Application Group code Level value that the Attribute will be added for.

Object Type
Specify a value of *DTAGRP

Object Attribute
Specify the name of the Attribute that will help you recognize it as being specific for Robot Schedule.

Object Library
The library that contains the Robot Schedule database. This is typically ROBOTLIB.

Allow *NONE
This must be set to Y.

The remaining field values depend on your preferences. Pressing ENTER on the Add Attribute Record panel will bring you to the Attribute Data Group Files panel. Use the ***F6=Add*** function key to add the following record:

File Name
Enter a File Name value of *ROBOT

The remaining field values will be set automatically by MDCMS.

Object Request and Migration

The user should use the standard method available within the Robot Schedule product for creating, changing, or deleting job schedule entries. MDCMS will be used to distribute those changes to product instances on other partitions.

The name of the actual Robot Schedule job name will be used when requesting and migrating within the MDCMS Object Manager for either option M-Modify Object or option D-Delete Object.

When an object request is initiated on the originating system that contains the schedule job to be exported, the ***Copy Data from Library*** parameter should be set to *NONE as it is not necessary to copy any data to the user's development environment. When the object request is then added to an RFP, it is done so for the purpose of sending the updated (or deleted) Robot Schedule job entry from the originating system to the various target systems. When the local RFP is processed for deployment to the target system, the Robot API RBTMRG is used with parameter DIRECTION (*EXPORT) to place all of the job information in library RBTMRGLIB. MDCMS then saves the library to a save file for the RFP package and sends it to the target system.

When the installation of the RFP occurs on the target system, the Robot API RBTMRG is used with parameter DIRECTION(*IMPORT) to restore the Robot Schedule library RBTMRGLIB from the RFP save file and then migrate the job schedule information directly into the user's production version of Robot Schedule.

When a delete is performed at installation time the Robot API RBTBCHDLT is used to remove the job entities from Robot Schedule.

IMPORTANT NOTES:

- When the scheduled job entry being imported had already existed within the target system, the job history will be deleted by the Robot API.
- The Robot API does not handle REACT jobs correctly. The Robot scheduled job should be sent to the target system without any REACT parameters defined and then the REACT parameters should be added to the scheduled job on the target system after the migration has been installed.

3.3.5 Generate Standard Attributes

In order to quickly define attributes and compile commands for a new promotion level, or for a new library within a promotion level, F9 may be pressed from the Attribute Maintenance screen.

```
MDCCMED                          COMPANY NAME                          04.09.19
SCRN1                  Generate Standard Attributes                    10:37:46

Appl/Level  . . . . TEST01 100
Object Library  . . ___________   Name, *NONE
Obj Auth Template . *DFT400___    Name

Source Library/Dir. ____________________________________________________________
____________________________      Name, *NONE, *TEMPIFS, *TEMPMBR
IFS Src Auth Templ. *DFTIFS___

Check/Select Usage. N             N=No, S=Yes via Sys Catalog, X=Yes via MDXREF
Update Existing . . _             Y/N

Attribute Prefix  . *NONE         Prefix, *NONE
       or Suffix  . *NONE         Suffix, *NONE

Filter by:
  Object Category . ___________   1=Database, 2=Non-Database, 3=Interface
  Object Type . . . ________
  Sytem Attribute . ___________


Enter=Continue   F3=Exit   F4=Browse
```

The first screen is used to get the default settings for all common attributes that are to be generated. After Enter is pressed, the next screen is displayed where the attributes may be selected.

Application
This is a 6-character abbreviation of an Application Group to be used by MDCMS.
The Application Group must exist - see Application Group Maintenance.
Press F4 with the cursor on the field to select a defined Application/Level pair

Level
This is a 3-digit numeric identification of the Promotion Level as defined in the Promotion Level Maintenance.
Press F4 with the cursor on the field to select a defined Application/Level pair

Object Library
The name of the library where the objects are stored.
Press F4 with the cursor on the field to select a library already defined in MDXREF. If the library isn't in MDXREF, press F11 to select from all libraries on the partition for the given namespace.

The object library doesn't have to already exist. MDCMS will prompt to create the library for you. If you don't want to create the library at this time, but would like to define the attributes to use for the library, command key F8 will be provided to skip the library creation.

Special values:
*NONE – no object destination to be defined for the attributes.

Obj Auth Template
The Object Authority template to apply to the attributes to be generated using this process. When an object of the given attribute is deployed to the target Application Level, the object authority rules defined by the template will be applied to the object.
Press F4 with the cursor on the field to manage and select a Template ID.

Source Library/Dir
The name of the library or IFS Directory where the source is stored.

The source library doesn't have to already exist. MDCMS will prompt to create the library for you. If you don't want to create the library at this time, but would like to define the attributes to use for the library, command key F8 will be provided to skip the library creation. MDCMS will not automatically create a source IFS folder.

Special values:
*NONE – no source destination to be defined for the attributes
*TEMPIFS – temporary source to be stored in the IFS and then discarded as soon as the RFP deployment is complete.
*TEMPMBR – temporary source to be stored in a source file and then discarded as soon as the RFP deployment is complete.

IFS Source Auth Template
The Object Authority template to apply to IFS source folders for the attributes to be generated using this process. When IFS source of the given attribute is deployed to the target Application Level, the object authority rules defined by the template will be applied to the IFS source file.
Press F4 with the cursor on the field to manage and select a Template ID.

Check/Select Usage
If and how the existence of objects matching a given attribute should be checked in the target library.
N=No – don't check for the types of objects that exist in the target library
S=Yes via Sys Catalog – the IBM system catalog for the target library will be checked. This can take some time but doesn't require that the cross-referencing is already built over the library. Any attributes that match objects in the library will be automatically selected for inclusion.
X=Yes via MDXREF – the MDXREF information for the target library will be checked. This is very fast, but requires that the cross-referencing is already built over the library. Any attributes that match objects in the library will be automatically selected for inclusion.

Update Existing
N – if the attribute already exists for the application level, don't overwrite it
Y – if the attribute already exists for the application level, overwrite it with the default parameters for the attribute

Attribute Prefix
A set of characters to place at the beginning of each system attribute for the naming of MDCMS attributes. For example, 'AA' would result in the MDCMS attribute of AARPG for RPG programs. No prefix will be generated, if the value *NONE is entered.

Attribute Suffix
A set of characters to place at the end of each system attribute for the naming of MDCMS attributes. For example, 'AA' would result in the MDCMS attribute of RPGAA for RPG programs. No suffix will be generated, if the value *NONE is entered. You have the choice of a prefix or a suffix. Both simultaneously is not allowed.

Filter by Object Category
1 – limit the attribute listing to standard database attributes
2 – limit the attribute listing to standard non-database attributes
3 – limit the attribute listing to interface attributes (JDE World and Synon/2E)

Filter by Object Type
limit the attribute listing to attributes of an entered type, such as *PGM

Filter by System Attribute
limit the attribute listing to attribute names containing the entered value

Once the information is entered on the initial screen, press Enter to continue to the attribute listing.

```
MDCCMED                          COMPANY NAME                          12.07.20
SCRN2                    Generate Standard Attributes                  20:19:10

Appl: MD    Lvl: 13  Object Lib: MMORGAN     Source Lib: MMORGAN

Type options, press Enter.
 1=Select   W=Work with Objects

    Object   System
Opt Type     Attribute  Description
 _  *MODULE  RPGMOD     RPG Module
 _  *PGM     RPG        OPM RPG Program
 _  *PGM     RPGLE      ILE RPG Program
 _  *PGM     SQLRPG     OPM SQL RPG Program
 _  *PGM     SQLRPGLE   ILE SQL RPG Program
 _  *SOURCE  RPGLESRC   ILE RPG Copybook
 _  *SOURCE  RPGSRC     OPM RPG Copybook

                                                                    Bottom
Enter=Continue   F5=Refresh   F12=Back
```

Use option 1 to select each attribute that should be generated.
Option W can be used for attributes pertaining to actual objects for further review of the contents of the object library.

Once the selections have been made, press Enter to verify the selections and modify any of the properties for specific attributes.

```
MDCCMED                             MD Dev                             12.07.20
SCRN3                    Generate Standard Attributes                  20:25:44

Appl: MD    Lvl: 13  Object Lib: MMORGAN
                     Source Lib: MMORGAN

Make any adjustments and press Enter to generate attributes

Object  System     MDCMS              Gen Comp  Source
Type    Attribute  Attribute   Stat   Commands  File
*MODULE RPGMOD     RPGMOD____  NEW       Y      QRPGLESRC__________
*PGM    RPGLE      RPGLE_____  NEW       Y      QRPGLESRC__________
*PGM    SQLRPGLE   SQLRPGLE__  NEW       Y      QRPGLESRC__________
*SOURCE RPGLESRC   RPGLESRC__  NEW       N      QRPGLESRC__________
                                                                Bottom
Enter=Confirm   F4=Browse
F12=Back
```

The attribute name can be changed for specific attribute.
If the attribute is applicable for a source member, the source file name can be changed. If the source file doesn't exist, MDCMS will prompt to create it. This can be ignored by using F8 when it appears.

If the attribute is applicable for source in the IFS, a subfolder can be selected for the attribute which is relative to the parent path of the source folder entered on the first screen.

F4 can be used to browse the list of source files or subfolders.

3.3.6 Linked Attribute Checkout Definitions

When an object for a particular attribute is checked out in the Object Manager, the programmer can be prompted to check out other objects that frequently need to be changed at the same time. This is most commonly used for selecting all components for a 4GL, Case Tool or other Middleware process when a program is checked out. The list of linked attributes can be managed by entering option L for the parent attribute.

```
MDCLNKC                          COMPANY NAME                          19.04.13
SCRN1                    Linked Checkout Definitions                   22:22:40

    Appl Lvl  Attribute   Library
    MD   10   RMCBL       MDREPT

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=Display

Opt Attribute  Dft Rcmp Typ Pattern/Expression                      File
 _  RFUN        N   N   SQL MDFUN                                   MDDRFUN
 _  RLBL        N   N   FIX ++OBJNAM++IO
 _  RSCREEN     N   N   FIX ++OBJNAM++


                                                                        Bottom
F3=Exit   F5=Refresh   F6=Add
```

Opt
2=Change – Change the definition for a linked attribute
3=Copy – Copy the definition
4=Delete – Delete the definition
5=View – display the definition

Function Keys:
F5=Refresh
F6=Add – Add a new Linked Attribute Checkout Definition

Linked Attribute Checkout Definition Detail

```
MDCLNKC                          COMPANY NAME                          19.04.13
SCRN2                  Edit Linked Checkout Definition                 22:27:43

 Appl: MD    Lvl: 10  Attribute: RMCBL       Definition Number:   2

 Linked Attribute .  RFUN______
 Request by Dft . .  N  Y/N
 Link for Recomp  .  N  Y/N
 Object Name Type .  S  F=Fixed Name Pattern, S=SQL Column Expression

Name Pattern or SQL Column Expression  (value ++OBJNAM++ replaced at runtime)
MDFUN_____________________________________________________________________________

 SQL Input File . .  MDDRFUN___
   Library  . . . .    MDREPT____

Condition:
MDPGM = "++OBJNAM++"_______________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

 Enter=Confirm    F4=Browse    F8=Test Definition    F12=Previous
```

Linked Attribute
Enter the name of an existing MDCMS attribute for the same application and level whose object should be prompted for checkout when an object for the parent attribute is checked out. Multiple definitions for the same linked attribute are allowed, as long as the resulting object names will be different.

Request by Dft
Y – The object will already be selected for checkout when the prompt screen is displayed
N – The object will be displayed but not already selected for checkout in the prompt screen

Link for Recomp
Y – The programmer will be prompted to check out the linked object even if the parent object is requested for recompile
N – The programmer will not be prompted to check out the linked object when the parent object is requested for recompile

Object Name Type
F – Fixed Name Pattern – a name pattern is provided to determine the name of the linked object
S – SQL Column Expression – an SQL column expression (as used in a SELECT statement), SQL Input file and an optional SQL condition will be used to determine the name of the linked object

Name Pattern or SQL Column Expression
If fixed naming is used for the definition, specify the constant value pattern to be used for the object name. The string ++OBJNAM++ can be used anywhere within the pattern and will replaced with the name of the parent object at run-time.

If SQL naming is used, enter the name as a valid SQL expression for a column. The expression can be any combination of table field names and constants. ++OBJNAM++ can be used within the expression and will be replaced with the name of the parent object at run-time.

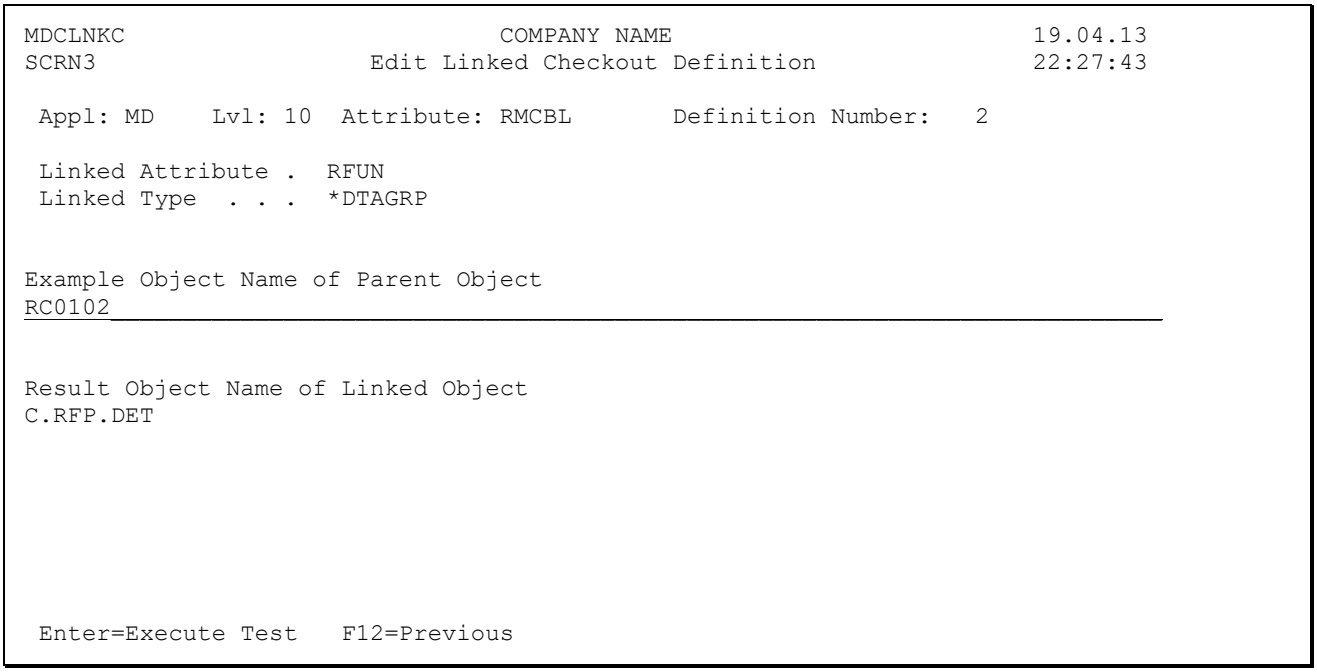
SQL Input File
If SQL naming is used for the definition, specify the name and library of the file that the object name will be derived from.

Condition
If SQL naming is used for the definition, optionally specify a valid SQL condition (without the WHERE clause) to appropriately limit the records in the file that would be used to provide the object name.

If more than 1 record exists for the file/condition, only the first record will be used to provide the object name.

Function Keys:
Enter=Confirm
F4=Browse – browse the list of possible fields, files or libraries when using SQL naming
F8=Test Definition – Immediately run a test to ensure that the definition correctly generates the object name

Linked Attribute Definition Test



Example Object Name of Parent Object
Enter a potential name for an object checked out for the parent attribute. Then, press Enter to have MDCMS generate the Linked Object name based on the Fixed Pattern or SQL definition.

3.4 Commands

The Attribute Command displays are used to define the command defaults that are used to compile and manage objects. Each Application Group/Level/Attribute that requires a default command should be defined here. Default commands may also be defined to run for each promotion of objects, regardless of the types of objects in the promotion package.

```
CMCCMST                        COMPANY NAME                              4.09.06
SCRN1                  MD Default Command Maintenance                    7:39:30

          Appl  Lvl  Attribute   Type  Command               Description
Filters: ____  __   __________   _    ____________________  ________________

Type options, press Enter.
 2=Change   3=Copy   4=Delete   5=View

Opt Appl Lvl Attribute Typ Seq Command
 _  ACCT 90  *RFP       1      CALL PGM(ACCTLIB/CHKUSERS)
 _  ACCT 90  CLP        C      CRTCLPGM PGM(##OBJLIB##/##OBJNAM##) SRCFILE(#..
 _  ACCT 90  DSPF       C      CRTDSPF FILE(##OBJLIB##/##OBJNAM##) SRCFILE(#..
 _  ACCT 90  LF         C      CRTLF FILE(##OBJLIB##/##OBJNAM##) SRCFILE(##S..
 _  ACCT 90  PF         C      CRTPF FILE(##OBJLIB##/##OBJNAM##) SRCFILE(##S..
 _  ACCT 90  PF         3   10 STRJRNPF FILE(##OBJLIB##/##OBJNAM##) JRN(JRNL..
 _  ACCT 90  PRTF       C      CRTPRTF FILE(##OBJLIB##/##OBJNAM##) SRCFILE(#..
 _  ACCT 90  RPG        C      CRTRPGPGM PGM(##OBJLIB##/##OBJNAM##) SRCFILE(..
 _  ACCT 90  RPG36      C      CRTS36RPG PGM(##OBJLIB##/##OBJNAM##) SRCFILE(..
                                                                    Bottom
 F4=Browse  F6=Add  F7=Obj Cmds  F8=Description  F9=Gen RFP Cmds  F10=Scripts
```

Option 4 Screen Definitions
Filters
Appl/Lvl
Enter a value here to limit the listing to a specific application or level.

Attribute
Enter part or all of an attribute to limit the listing. For example, enter C to list only commands with an attribute starting with C.

Type
Enter a value here to limit the listing to a specific command type. See the next section for detailed information about each type of command available within MDCMS.

Command
Enter a string here to limit the listing to commands containing that string. For example, enter SRC to list only commands containing the string SRC.

Description
Enter a string here to limit the listing to commands with a description containing that string.

Opt
2=Change – Change the text and run-time attributes for the selected Command
3=Copy – Copy a command
4=Delete – Delete a command
5=View – display a command

Function Keys:
F4=Browse – Browse the list of valid values for a filter field.
F6=Add – Add a new Attribute Command

F7=Obj Cmds – List/Manage all commands that are defined to be executed for objects with a specific or generic name. Commands that have been processed during the installation of an RFP, and that have the Reuse Command flag set to Y, will automatically show up in this list. Commands can also be created from here for objects that are not yet requested. Alternatively, option C can be used on an existing Object Request to manage commands for that specific object. Navigate to the Commands/Scripts for Object section for help with the individual parameters.
Object Specific Scripts can be managed by pressing F10=Scripts from with the Object Specific Commands screen.

F8=Description/Command – Toggle the listing between the command to execute and the description of the command.

F9=Gen RFP Cmds – Generate *RFP commands in order to notify users by email when specific events occur. When F9 is pressed, the first screen allows you to select one or more application levels that should contain the commands. The second screen then allows you to select each command type, or exit point, for when the MDMAILF command should run. MDCMS then generates the commands for each selected exit point for each selected level.

Once the commands are generated, further customization can be performed on the commands from the command settings. This is particularly necessary for the Waiting for RFP Approval command type, since the group or user responsible for approving the RFP will need to be entered into the appropriate parameter.

F10=Scripts – Manage scripts that are defined for *IFS and *REMOTE attributes.

3.4.1 Add or Change display

```
CMCCMST                          MD Demo System                            8.07.16
SCRN2                    MD Default Command Maintenance                    22:52:00

Appl/Lvl.: ______ ___   Desc: ________________________________________
Attribute: __________   *gen*, *RFP, *ALL     Run for Modifications: Y  Y/N
Type.....: __                                         Recompiles...: Y  Y/N
Sequence.: ___                                        Deletes......: N  Y/N
Frequency: _  O=Object, R=RFP                         Updates......: N  Y/N
User Prof: __________                        Ignore Errors.........: N  Y/N
Obj Type.: *ANY         *ANY, type           Keep MD Libs in Libl.: N  Y/N
Spec Def.: Y  Y=Run if specific def exists   Placeholders in SQL..: N  Y/N
Command
CRTCBLPGM PGM(##OBJLIB##/##OBJNAM##)SRCFILE(##SRCLIB##/##SRCFIL##)________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

 F4=Browse    F7=Insert Placeholder    F12=Previous
```

Screen Definitions:

Appl/Lvl
The Application Group and Level that the attribute resides in.

Desc
An optional description of the command

Attribute
This field indicates which MDCMS Attribute(s) defined for the target level that the Command Definition should be applied to.

*RFP – the command will run once each time a promotion is run, regardless of the objects contained in the RFP.

Specific Attribute – The command definition is for a specifically defined MD Attribute, such as CLLE

Generic Attribute – The command definition is for any MD Attribute that matches the generic naming pattern. For example SQL*LE would mean that the command is applied to every attribute starting with SQL and ending with LE.

*ALL – all attributes for the target level are defined to use this command.

When a generic attribute value or the *ALL value is used, the Object Type can be set to a specific type. For example, if the command definition should be applied to every program attribute, then set Attribute to *ALL and Obj Type to *PGM.

Run for Modifications
Flag stating if the command should run for new or changed objects.

Run for Recompiles
Flag stating if the command should run for recompiled objects.

Run for Deletes
Flag stating if the command should run for deleted objects.

Run for Updates
Flag stating if the command should run for updated objects.

Type
The Type value designates when a command should run

B	Pre-Object Request Validation	runs when a user or process attempts to request (checks out) an object. Command MDCHKOBJ must be used and this provides an organization with the ability to add custom validation rules before a request can be created. See section MDCHKOBJ API for more information.
M	Object Request	runs after an object is successfully requested (checked out)
C	Compile	used to compile the object from source code or to create the ILE Program/Service Program
D	Data Copy	• *FILE attributes – determines how the existing records in a physical file should be mapped to the new format when a physical file is installed. Data Transformation must be disabled for the file in order for MDCMS to consider a Data Copy command. It can be disabled using option F=File Data Transformation from the Object Manager and then pressing F10. The data copy command can use CPYF, in which case the parameters FROMMBR, TOMBR and MBROPT are considered. All other keywords in the CPYF command are ignored. Only 1 command may be defined for *FILE mapping. Other commands, such as RUNSQLSTM or CALL, may also be used for mapping the data in a changed file from the old format to the new format. If such a command is used, it is critical to use the ##OFF placeholders so that MDCMS can correctly provide the location of the old file format. • *DATA attributes – determines how and which data records should be copied from one environment to another. All keywords except FROMFILE and TOFILE are then used when the CPYF command is run. Only the CPYF command is permitted for *DATA attributes
U	Update	runs during the installation process for updates to existing objects. This command is mandatory for objects requested for update (*UPDATE). An example would be the UPDPGM command to update existing ILE programs without migrating or recreating the object. The Update Command may optionally also be used to update an existing object using the modified source. An example for this would be the CHGPF command to update the format of a physical file for a modified DDS source. In this case, the source would be checked out using the M (modify) option and at installation time, the Update command would be used (as long as a compile command is not defined for the attribute or an update command is defined for the object).
L	Object Lock	runs during the compile or installation process when a required object or source is locked. Separate field Wait before Usage specifies the amount of time to wait before executing the command. Multiple commands can be defined in order to have a lock escalation process in place.
V	Pre-Submit Validation	runs when user selects to submit an RFP for promotion. Command MDCHKRFP must be used and this provides an organization with the ability to add custom validation

		rules before an RFP can be submitted. See section MDCHKRFP API for more information.
1	Pre-Compile	runs prior to compiling objects
P	Post-Compile	runs after all object compilations are successfully completed
E	Compile Error	runs when the compile phase of an RFP fails to complete successfully.
A	RFP Approved	runs after an RFP has been approved for installation
J	RFP Rejected	runs after an RFP has been reset from Waiting for Approval status
F	MDRapid Waiting to Launch	runs after an RFP has been approved and MDRapid is required for the RFP
G	MDRapid Started	runs to indicate that MDRapid has begun copying data for changed files
H	MDRapid Completed	runs after all existing records in the changed files has been copied to inform the users that the installation can be started.
I	MDRapid Error	runs when the MDRapid Data Copy phase of an RFP fails to complete successfully.
IR	RFP Ready to Install	Runs once one of the following situations occurs: 1. Submit and Approval phases are complete and MDRapid isn't necessary and the installation isn't automatic. 2. MDRapid has reached the sync point and installation isn't automatic
2	Pre-Installation	runs prior to installing objects into the environment
3	Post-Installation	runs after the installation of objects is complete, but before the application is considered free to use again. If command fails, it can be flagged to roll back the installation.
4	Installation Error	runs when the installation phase of an RFP fails to complete successfully. This type could be used, for example, to send an email or SMS to the installer if a weekend Installation fails.
Q	Installation Archive/Cleanup	Runs when the installation is complete and the application is considered free to use again. When the command is defined at the RFP level, it can be used for post-installation notification or other activities that won't trigger a rollback if the command fails. When the command is defined at the Object/Attribute level, it can be used to perform additional processing on the archived source and objects. For example, command MDCMPPFM can be invoked to generate a comparison report between the prior and new code in source members.
W	Installation Warning	runs if an RFP Installation completes, but with warnings. Warnings can occur if data cannot be copied or if a Post-Installation Command fails to run successfully.
S	RFP Test Status Accepted	runs if an RFP Test Status is Accepted in MDWorkflow
T	RFP Test Status Rejected	runs if an RFP Test Status is Rejected in MDWorkflow
CB	Code Review Starting	Runs immediately prior to MDCMS sending source to a code review tool. This occurs during the cleanup phase of an RFP
CC	Code Review Completed Clean	Runs once a SUCCESS status is returned to MDCMS from the code review tool
CD	Code Review Completed Dirty	Runs once a FAIL status is returned to MDCMS from the code review tool
CE	Code Review Technical Error	Runs if a technical error occurs while trying to run a code review
TB	Automated Testing Starting	Runs immediately prior to MDCMS initiating automated testing. This occurs during the cleanup phase of an RFP
TC	Automated Testing Completed Clean	Runs once a SUCCESS status is returned to MDCMS from the automated testing tool
TD	Automated Testing Completed Dirty	Runs once a FAIL status is returned to MDCMS from the automated testing tool
TE	Automated Testing Technical Error	Runs if a technical error occurs while trying to run automated testing

5	Pre-Send	runs prior to sending an RFP to one or more remote systems. It will either run once per send batch or once per target location, depending on the frequency flag.
O	Data Copy during Send	Available for *DATA attributes only. Determines which data records should be sent to a remote location based on the INCCHAR and INCREL parameters of the CPYF command. The command is run separately for each target location. Placeholder ##SVFLOC## could, for example, be used to filter by the location ID, if a column in the table contains that value.
6	Post-Send	runs after an RFP has been successfully sent to one or more remote systems. It will either run once per send batch or once per target location, depending on the frequency flag.
7	Send Error	runs in case the send of an RFP fails to complete successfully. It will either run once per per send batch or once per target location, depending on the frequency flag.
X	All Send Locations Terminated	Runs when all default locations for a sent RFP have terminated either due to an exception or the completion of the installation on the target location.
8	Post-Receive	runs after an RFP has been successfully received from a remote system
9	Receive Error	runs in case the receipt of an RFP fails to complete successfully
R	Receive Warning	runs in case the receipt of an RFP completes, but with warnings
Z	Object Request Deleted	Runs when an object request is deleted (except when normally deployed as part of an RFP).

Command Types **A, E, F, G, H, I, J**, **L, R, V, W, S, T, X, CB, CC, CD, CE, TB, TC, TD, TE, 5, 6, 7, 8, and 9** are only valid at the RFP Level (Usage Attribute = *RFP).

Sequence

The sort sequence of the command at run time, in case multiple commands for command type are defined. The sequence is used across all levels of specificity such that less specific commands can run before or after more specific commands if the sequence number is lower or higher. See the Spec Def parameter for more information.

Frequency (Command Type 1, P, 2, 3 or 4 when for Attributes)

O – The command will run for every object in the RFP that is assigned to the given Attribute.
R – The command will run for the first object in the RFP that is assigned to the given Attribute and then ignored for any additional objects for the same Attribute.

Frequency (Command Type 5 or 6 when for *RFP)

B – The command will run each time an RFP is sent to a batch of target locations
L – The command will run for each target location that is sent to during a batch run.

User Prof

By default, commands executed during an RFP run under the profile of the user profile defined on the job description of the application level for the RFP. If a specific command should run under the authorities of a different user, that user ID can be entered here. As a safety precaution, the user placing a value in this field must have authority to use that entered user profile in order to save the command definition.

Ignore Errors

Y – Continue with RFP processing even if the command fails.
N – Cease and Rollback RFP processing if the command fails

Will always be ignored unless for 1, C, P, 2, D, U and 3

Obj Type
Only include the command for attributes of the given type (Ignored for *RFP commands)
*ANY – include for any object type

Keep MD Libs in Libl
N – The MD Libraries (MDCMS, MDSEC and MDXREF) are removed from the library list before the command is invoked. This assures that any MD Objects with the same name as your objects are not used.
Y – The MD Libraries are left in the library list. This is necessary when MD Objects, such as interface programs, MDMAIL or MDMAILF, are needed to process the command.

Spec Def
N – The command will not run if a more specific command of the same command type is defined.
Y – The command will run even if a more specific command of the same command type is defined.

Order of Specificity (from most specific to least specific)
1. A command defined for a specific object
2. A command defined for objects of a generic naming pattern
3. A command defined for a specific attribute
4. A command defined for attributes of a generic naming pattern
5. A command defined for attribute *ALL

Example 1 – A compile command defined at the attribute level will typically be set to N, so that if a compile command is defined at the object level, the attribute level command will not run.

Example 2 – A post-compile command may be set to Y when it is needed for all program attributes, including those with post-compile commands defined for specific objects or attributes.

Placeholders in SQL
N – The SQL member or IFS file used by a RUNSQLSTM command does not contain MDCMS placeholders – no conversion will occur
Y – The SQL member or IFS file used by a RUNSQLSTM command contains MDCMS placeholders – MDCMS will create a temporary copy of the script and convert the placeholders in the copy to the actual runtime values. This flag should also be set to Y when a script is used for any of the MDCMS *SQL type attributes to create those objects, even if a placeholder isn't present, so that MDCMS can automatically qualify the object.

This flag is only relevant for object-related command types using the RUNSQLSTM command. The placeholders embedded in the SQL script may be delimited by ++ instead of ## to avoid code page issues.

Wait before Usage
If the command type is L (Lock Wait for Object), the number of seconds to wait before an object lock condition causes the command to be executed can be defined.

If multiple L commands are defined, each command waits the number of seconds defined for that command after the prior command has completed.

For example:
Command 1 waits 15 seconds before sending an email to the user that submitted the RFP.
Command 2 waits 300 seconds before sending an email to the entire operations group (plus the 15 seconds wait for command 1)
Command 3 waits 3600 seconds before rolling back the RFP (plus the 315 seconds from commands 1 and 2).

Command
The IBM i or user-defined command to be performed. Enter the name of the command and then press F4 to fill in the keywords.

Some placeholder parameter values may be used and are substituted by MDCMS at run-time. The placeholder value may be typed directly into the command or the cursor may be positioned in the command and F7 pressed to insert the value from a list.

For Lock Wait command types, special value *ROLLBACK can be used to automatically roll back an RFP if an Object Lock condition occurs.

Function Keys:
F4=Browse – Browse for values.
F7=Insert Placeholder – Insert placeholder value into command string at the location of the cursor. A list of all fixed placeholder values followed by all placeholders for custom fields will be displayed to select from.

3.4.2 Attribute Command Considerations

This function is directly related to the Source/Object Attribute Maintenance. The commands are used during the RFP compile and Installation processes and the defaults entered for a command will affect the object's attributes.

It is essential that the generic ## names are used within the compilation commands for the object library and name, and source library and name. Otherwise, the installation process will not work properly.

If a command is to run for every RFP for an Application/level and is not based on the installation of a specific object-type, use the attribute *RFP.

If a command is intended to be used only for a specific object or for a specific RFP, then define the command within the Command Override function in the Object Manager or RFP manager.

3.4.3 Fixed Command Placeholder Values

The fixed placeholder parameters are:

Value	Type	Length	Title	Description of Value Origin
##OBJLIB##	CHAR	240	Object library	During the compile phase, this is the developer library/folder or temporary RFP build library. During the install phase, this is the Object Library/Folder defined for the Object's attribute/replication template. For SQL entities, this will be the SQL long name for the library.
##SYSLIB##	CHAR	10	System Name of an Object Library	The 10-Character System name for an object library, when required for use in a command instead of the SQL long name for SQL entities.
##OBJNAM##	CHAR	128	Object name	Name of the requested Object
##SYSNAM##	CHAR	10	System Name of an Object	The 10-Character System name for an object, when required for use in a command instead of the SQL long name for SQL entities.
##OBJTYP##	CHAR	7	Object type	Object Type for the requested object
##OBJATR##	CHAR	10	Object Attribute	The system attribute of the object (not the MDCMS attribute)
##OBJDSC##	CHAR	50	Object Description	The object description
##SRCLIB##	CHAR	240	Source library	The target Source Library/Folder defined for the Object's attribute/replication template
##SRCFIL##	CHAR	10	Sourcefile name	The target Source File defined for the Object's attribute/replication template
##SRCNAM##	CHAR	128	Source Name	The name of the source member or IFS file for the requested object
##SRCATR##	CHAR	10	Source Attribute	The system attribute, or source type, of the source member (not the MDCMS attribute)
##SRCDSC##	CHAR	50	Source Description	The source member description
##APPLIC##	CHAR	6	Application code	The Application Code of the RFP
##PROLVL##	INT	3	Promotion Level	The Promotion Level of the RFP
##ATTRIB##	CHAR	10	Attribute	The MDCMS Attribute code
##REQNBR##	INT	11	Request Number	The unique identifier of an object request
##OBJREQ##	CHAR	10	Object Requester	The user that has requested the Object
##REQRSN##	CHAR	6	Request Reason	MODIFY, DELETE, RECOMP or UPDATE
##REQDAT##	CHAR	10	Request Date	The date that the object was checked out, formatted to match system locale including century
##REQTIM##	CHAR	8	Request Time	The time of day that the object was checked out in format HH:MM:SS
##MODULE##	CHAR	2800	ILE Bound Modules	The list of bound modules for the creation of ILE Programs or Service Programs
##ENTMOD##	CHAR	23	ILE Entry Module	The bound module containing the Program Entry Procedure for the creation of ILE Programs
##SRVPGM##	CHAR	2800	ILE Bound Service Programs	The list of bound service programs for the creation of ILE Programs or Service Programs
##TGTRLS##	CHAR	8	Target Release	The target OS release for the compilation of modules and programs. The value used will be the lowest release defined for the distribution levels for the given Application, unless a specific value is defined for the promotion level.
##OFFLIB##	CHAR	10	Old File Format File Library	The name of the library containing the old version of the file when mapping data to the new format for a file

##OFFNAM##	CHAR	10	Old File Format File Name	The name of the file containing the old version of the file when mapping data to the new format for a file
##OFFMBR##	CHAR	10	Old File Format File Member	The name of the file member containing data for the old version of the file when mapping data to the new format for a file
##FRMLIB##	CHAR	240	Object Library to Migrate from	The developer library/folder that the object will be migrated from. Typically used at checkout to handle conversion routines.
##FRMSLB##	CHAR	240	Source Library to Migrate from	The developer library/folder that the source will be migrated from. Typically used at checkout to handle conversion routines.
##FRMSFL##	CHAR	10	Source File to Migrate from	The developer source file that the source will be migrated from. Typically used at checkout to handle conversion routines.
##OBLLIB##	CHAR	240	Level Object Library/Folder	This is the Object Library/Folder defined for the Object's attribute/replication template, regardless of the RFP phase when the placeholder is used.
##SERVER##	CHAR	50	Server	The target server address for a *REMOTE object or the server name for a *IFS object.
##RMTRDB##	CHAR	18	Remote Relational DB for Alias	The target database of the table or view that an SQL Alias should point to
##RMTLIB##	CHAR	10	Remote Library for Alias	The system name of the target library of the table or view that an SQL Alias should point to
##GITBRN##	CHAR	80	Git Branch	The name of the Git Branch that an object request originated from.
##GITREV##	CHAR	40	Git Revision	The Git Revision hash of the commit that an object request originated from
##GITSVR##	CHAR	10	Git Server ID	The MDCMS Git server ID that an object request originated from
##GITURL##	CHAR	240	Git Server URL	The Git URL defined for the MDCMS Git Server that an object request originated from
##SVNREV##	CHAR	11	SVN Revision	The string representation of the SVN Revision number that an object request originated from
##SVNSVR##	CHAR	10	SVN Server ID	The MDCMS SVN server ID that an object request originated from
##SVNURL##	CHAR	240	SVN Server URL	The SVN URL defined for the MDCMS Git Server that an object request originated from
##PRIOBJ##	CHAR	128	Prior Version of Object Name	The object name of the prior version of the object at archiving time. Used only with the Q command type.
##PRILIB##	CHAR	240	Prior Version of Object Library	The library/folder containing the prior version of the object at archiving time. Used only with the Q command type.
##PRISLB##	CHAR	240	Prior Version of Source Library	The library/folder containing the prior version of the source at archiving time. Used only with the Q command type.
##PRISFL##	CHAR	10	Prior Version of Source File	The source file containing the prior version of the source at archiving time. Used only with the Q command type.
##PRISNM##	CHAR	128	Prior Version of Source Name	The source name of the prior version of the source at archiving time. Used only with the Q command type.
##ERRMSG##	CHAR	240	Error Message	The message text explaining why the RFP failed
##SYSTIT##	CHAR	40	System Title	Title of system defined in System Settings

##RFPNBR##	INT	7	RFP number	The Request for Promotion Number
##RFPDSC##	CHAR	160	RFP description	RFP description
##RFPPRG##	CHAR	10	RFP requester	User assigned to the RFP
##RFPSBM##	CHAR	10	RFP submitter	User that submitted the RFP for compile
##RFPSBD##	CHAR	10	RFP Submit Date	The date that the RFP was submitted (or scheduled to submit) for the compile phase, formatted to match system locale including century
##RFPSBT##	CHAR	8	RFP Submit Time	The time of day that the RFP was submitted (or scheduled to submit) for the compile phase in format HH:MM:SS
##RFPAPR##	CHAR	10	RFP approver	User that approved the RFP for installation
##RFPAPD##	CHAR	10	RFP Approve Date	The date that the RFP was approved for installation, formatted to match system locale including century
##RFPAPT##	CHAR	8	RFP Approve Time	The time of day that the RFP was approved for installation in format HH:MM:SS
##RFPINS##	CHAR	10	RFP installer	User that installed the RFP
##RFPIND##	CHAR	10	RFP Install Date	The date that the RFP was installed (or scheduled to install), formatted to match system locale including century
##RFPINT##	CHAR	8	RFP Install Time	The time of day that the RFP was installed (or scheduled to install) in format HH:MM:SS
##RFPWFU##	CHAR	10	RFP Workflow User	The user that confirmed the MDWorkflow acceptance or rejection of an installed RFP
##RFPRCV##	CHAR	10	RFP receiver	User receiving the RFP onto the local system
##RFPSND##	CHAR	10	RFP sender	User sending the RFP to target locations
##SVFLOC##	CHAR	10	Target Location ID of Sent Savefile	The Location ID that an RFP is sent to. This placeholder is only applicable for command type O or 6.
##SVFTGT##	CHAR	80	Target Address of Sent Savefile	The Location Address that an RFP is sent to. This placeholder is only applicable for command type O or 6.
##SVFNAM##	CHAR	80	Sent Savefile Name	The name of the savefile that has been sent to a location. This placeholder is only applicable for command type O or 6.
##PROJID##	CHAR	12	Project ID	The first Project in the list of projects assigned to an object request or to object requests in an RFP.
##PRJTYP##	CHAR	10	Project Type	Project Type
##PRJTIT##	CHAR	80	Project Title	Project Title
##PRJREQ##	CHAR	10	Project requester	Project requester
##PRJAGR##	CHAR	10	Assigned Group for Project	the designated user group assigned to carry out the Project
##PRJPRG##	CHAR	10	Project programmer	the designated programmer for the Project
##PRJAUT##	CHAR	10	Project Authorizer	user that authorized work to be done for project
##PRJAPR##	CHAR	10	Project Approver	user that approved the installation of Project
##PRJCLS##	CHAR	10	Project Closer	user that closed the Project
##PRJPRI##	CHAR	1	Project Priority	The priority of the project from 1 to 5
##PRJSTS##	CHAR	1	Project Status	The current status code of the Project
##PRJEDT##	CHAR	10	Project Due Date	The date that the project is expected to complete, formatted to match system locale including century
##PRJHRE##	DEC	7,2	Project Hours Estimated	Estimated number of hours to complete the project

##PRJHRA##	DEC	7,2	Project Hours Actual	Number of hours entered to date for the Project
##PRJCSE##	DEC	9,2	Project Cost Estimated	Estimated cost to complete the project
##PRJCSA##	DEC	9,2	Project Cost Actual	Actual calculated cost based on hours entered to date for the project
##PRJTSK##	CHAR	20	Project Task String	Complete String of Project/Task ID in format of Project-Task.Subtask
##TASKID##	DEC	5	Task ID	the 5-digit ID of the task
##STSKID##	DEC	5	Subtask ID	the 5-digit ID of the subtask
##TSKTYP##	CHAR	10	Task Type	Task Type
##TSKREF##	CHAR	20	Task Ref Code	Internal Reference Code
##TSKDSC##	CHAR	80	Task Description	First line of the Task Description
##TSKREQ##	CHAR	10	Task Requester	User that created the Task
##TSKAGR##	CHAR	10	Assigned Group for Task	the designated user group assigned to carry out the Task
##TSKPRG##	CHAR	10	Assigned User for Task	the designated programmer for the Task
##TSKTGR##	CHAR	10	Test Group for Task	the designated user group expected to test the results of the Task
##TSKTUS##	CHAR	10	Test User for Task	a specific user expected to test the results of the Task
##TSKCLS##	CHAR	10	Task Closer	user that closed the Task
##TSKPRI##	CHAR	1	Task Priority	The priority of the task from 1 to 5
##TSKSTS##	CHAR	1	Task Status	The current status code of the Task
##TSKEDT##	CHAR	10	Task Due Date	The date that the task is expected to complete, formatted to match system locale including century
##TSKHRE##	DEC	7,2	Task Hours Estimated	Estimated number of hours to complete the task
##TSKHRA##	DEC	7,2	Task Hours Actual	Number of hours entered to date for the task
##TSKCSE##	DEC	9,2	Task Cost Estimated	Estimated cost to complete the task
##TSKCSA##	DEC	9,2	Task Cost Actual	Actual calculated cost based on hours entered to date for the task
##WFLURL##	CHAR	80	MDWorkflow URL	The fixed portion of the URL to connect to MDWorkflow as defined in the Email Settings
##WFLLOC##	CHAR	10	MDWorkflow Location ID	The System Location ID of the RFP, used within the URL to link to the RFP details in MDWorkflow
##JIRREF##	CHAR	20	Jira ID	The Jira Issue ID for the task or subtask
##JIRURL##	CHAR	160	Jira URL	The URL to the Jira Issue for the task or subtask
##SNOREF##	CHAR	20	ServiceNow ID	The ServiceNow incident ID for the task or subtask
##SNOURL##	CHAR	160	ServiceNow URL	The URL to the ServiceNow incident for the task or subtask

3.4.4 Special Placeholder Operators

For any placeholder, including custom level or project placeholders, special operators can be included in the placeholder string just before the trailing ## or ++ characters. The following special operators are available to use only a portion of the runtime value for the placeholder:

(position, length) can be used to use only the substring of a value.
For example, placeholder ++PROJID(1,6)++ will result in a value containing only the first 6 characters of the project ID.
Or, ++PROLVL(3,1)++ will result in a value containing the 3rd digit of a promotion level.

(TLZ) can be used to trim any leading zeroes from a value.
For example, placeholder ++RFPNBR(TLZ)++ will result in a value containing the RFP number without any leading zeroes.

3.4.5 MDCHKOBJ – Validate Object Request command

The Validate MDCMS Object Request command provides the parameters necessary for MDCMS to invoke a custom validation program prior to the completion of an Object Request.

A custom validation program can be used to provide an info, warning or error message to the developer when attempting to check out an object. To do so, this command must be defined for a specific Object command or for an attribute command using command type B=Pre-Object
Request Validation.

Command MDCHKOBJ doesn't directly invoke a program. Instead, it uses the command parameters to know the name and location of a custom program to be directly called by MDCMS when an object request is performed.

The B command type can be repeated if more than one custom program should be called.

The custom program must contain exactly the following calling parameters with each parameter individually defined:

Custom Parameter Table

Description	Direction	Type	Length
MDCMS Application Code	INPUT	CHAR	6
MDCMS Level Number	INPUT	PACKED-DEC	3,0
Object Name	INPUT	CHAR	128
Relative Path of Object	INPUT	CHAR	240
Object Type	INPUT	CHAR	7
MDCMS Attribute	INPUT	CHAR	10
Target Object Library	INPUT	CHAR	240
Target Source Library	INPUT	CHAR	240
Target Source File	INPUT	CHAR	10
User Requesting the Object	INPUT	CHAR	10
MDCMS Reason. D=Delete, M=Modify, N=New, R=Recompile, U=Update	INPUT	CHAR	1
Project ID	INPUT	CHAR	12
Task Number	INPUT	PACKED-DEC	7,0
Subtask Number	INPUT	PACKED-DEC	7,0
Message Text containing any information that the user should be notified about in regards to the Object Request. Return blanks if a message shouldn't be displayed.	OUTPUT	CHAR	360
Message Severity 10=informational message only 20=warning message, but user can continue with the Object Request 30=error message, Object not allowed to be requested	OUTPUT	PACKED-DEC	2,0

MDCHKOBJ Parameter Table

KEYWORD	Description	Type	Length
PGMNAM	Program Name - The name of the Custom Program to be invoked in order to provide additional validation of the Object Request beyond what is already performed by MDCMS.	CHAR	10
PGMLIB	Program Library - Specifies the library where the Custom Program resides. *LIBL - The program library resides in the library list at the time of execution.	CHAR	10
LIBL	The library list to use during execution to ensure any program dependencies are found. *LVL - the library list of the job description for the target level of the request *CURRENT - the current library list when the request option occurs	CHAR	8

3.4.6 MDCHKRFP – Validate RFP prior to Submission command

The Validate MDCMS RFP (MDCHKRFP) command provides the parameters necessary for MDCMS to invoke a custom validation program prior to the submission of an RFP.

A custom validation program can be used to provide an info, warning or error message to the developer when attempting to submit a specific RFP. To do so, this command must be defined for a specific RFP or for a *RFP attribute command using command type V=Pre-Submit Validation.

Command MDCHKRFP doesn't directly invoke a program. Instead, it uses the command parameters to know the name and location of a custom program to be directly called by MDCMS when an RFP is selected for submission.

The V command type can be repeated if more than one custom program should be called.

The custom program must contain exactly the following calling parameters with each parameter individually defined:

Custom Parameter Table

Description	Direction	Type	Length
MDCMS Application Code	INPUT	CHAR	6
MDCMS RFP Number	INPUT	PACKED-DEC	7,0
Message Text containing any information that the user should be notified about in regards to the RFP. Return blanks if a message shouldn't be displayed.	OUTPUT	CHAR	360
Message Severity 10=informational message only 20=warning message, but user can continue with RFP 30=error message, RFP not allowed to be submitted	OUTPUT	PACKED-DEC	2,0

MDCHKRFP Parameter Table

KEYWORD	Description	Type	Length
PGMNAM	Program Name - The name of the Custom Program to be invoked in order to provide additional validation of the RFP beyond what is already performed by MDCMS.	CHAR	10
PGMLIB	Program Library - Specifies the library where the Custom Program resides. *LIBL - The program library resides in the library list at the time of execution.	CHAR	10
LIBL	The library list to use during execution to ensure any program dependencies are found. *RFP - the library list of the job description for the target level of the RFP *CURRENT - the current library list when the submit option is requested is used	CHAR	8

3.5 Scripts

The Attribute Script displays are used to define the scripts that are used for *IFS or *REMOTE attributes. Script Maintenance is invoked by pressing F10 from the Command Maintenance display.

```
MDCCMSS                          COMPANY NAME                          7.03.16
SCRN1                         Attribute Scripts                        11:53:35

          Appl  Lvl  Attribute   Type  Script
Filters:  ____  __   __________   _    ________________

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View   S=Script Content

Opt Appl Lvl Attribute  Typ Seq Script
 _  CMP  32  IFS          3      /7.0/stop-test-glassfish.bat
 _  CMP  52  IFS          3      /7.0/stop-test-glassfish.bat
 _  MD   90  PATCH        3      /stop-global-warming.bat
 _  TEST 10  IFS          3      /7.0/stop-test-glassfish.bat
 _  TEST 10  PHP          3      /6.8.1/start-test-glassfish-2.bat
 _  TEST 10  PHP-IFS      2      /zend/ifs/shutdown.sh
 _  TEST 10  PHP-IFS      3      /zend/ifs/startup.sh
 _  TEST 10  WINAPP       2    1 /7.4/windows-stop-tomcat.bat
 _  TEST 10  WINAPP       3    1 /7.4/windows-start-tomcat.bat
 _  TEST 30  IFS          2  366 /zend/ifs/config.sh
 _  TEST 30  IFS          2  367 /zend/ifs/config.sh
                                                                    More...
F3=Exit   F6=Add   F12=Previous
```

Screen Definitions
Filters
Appl/Lvl
Enter a value here to limit the listing to a specific application or level.

Attribute
Enter part or all of an attribute to limit the listing. For example, enter C to list only scripts with an attribute starting with C.

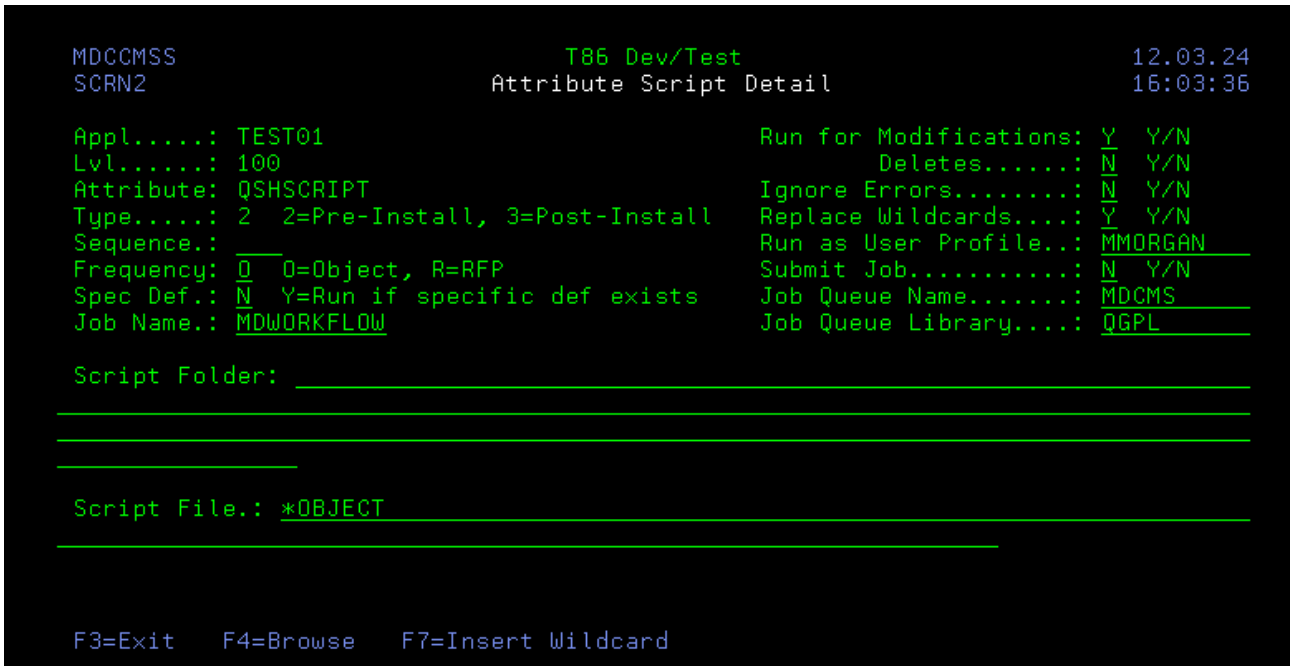
Type
Enter a value here to limit the listing to a specific script type. See the next section for detailed information about each type of script available within MDCMS.

Script
Enter a string here to limit the listing to scripts containing that string. For example, enter SRC to list only scripts containing the string SRC.

Opt
2=Edit – Change the properties for the selected Script
3=Copy – Copy a script definition
4=Delete – Delete a script definition
5=View – display a script definition
S=Script Content – view the contents of a script. Use MDOpen to edit the contents and an RFP to deploy to script to each level where it should be used.

Function Keys:
F6=Add – Add a new Attribute Script definition

3.5.1 Add or Change display



Screen Definitions:

Appl/Lvl
The Application Group and Level that the attribute resides in.

Attribute
The MDCMS attribute that the script will be tied to.
Only *IFS or *REMOTE attributes may use scripts.

Run for Modifications
Flag stating if the script should run for new or changed objects.

Run for Deletes
Flag stating if the script should run for deleted objects.

Ignore Errors
Y – Continue with RFP processing even if the script fails.
Flag will always be Y for type 3.
N – Cease and Rollback RFP processing if the script fails

Type
The Type value designates when a script should run

2	Pre-Installation	runs prior to installing objects into the environment
3	Post-Installation	runs after the installation of objects is complete

Replace Placeholders
N – The script doesn't contain placeholder values to be replaced by runtime values when executed
Y – Replace placeholder values in the script at run time

Sequence
The sort sequence of the script at run time, in case multiple scripts for the same attribute and type are defined.

Run as User
The user profile that the IFS script will run under within QSHELL

Frequency
O – The script will run for every object in the RFP that is assigned to the given Attribute.
R – The script will run for the first object in the RFP that is assigned to the given Attribute and then ignored for any additional objects for the same Attribute.

Wait for Response
Y – MDCMS waits until the Remote server confirms completion of the script execution
N – MDCMS continues without waiting for a response from the remote server

Submit Job
Y – Submit the IFS Script execution to a separate job. MDCMS will not wait for a response in this case, but instead continue with RFP processing.
N – the ifs script execution runs within this job

Job Name
The name of the submitted job that will process the IFS script

Job Queue
The name and library of the Job Queue to receive the submitted job

Script Subfolder
The relative path of the script, if it isn't directly located in the script root folder.

Script
The name of the script file located in IFS

Function Keys:
F4=Browse – Browse for values.
F12=Previous

3.6 Attribute Templates

Attribute Templates are distinct definitions that can be used for one or more Attributes across Applications and Levels.

Attribute Templates are used to configure management of:

- Object Authority
- Source and Object Replication
- Source and Object Search
- Source and Object Deletion from lower Delta environments
- MDRapid usage
- Automated insertion of comments into Source comments
- Automated Code Review
- Automated Testing
- Automated Commits to Git Repositories
- SQL Packages

These templates are accessible from the Setup Menu option 5 or by pressing F4 on the corresponding template field for an Attribute.

3.6.1 Object Authority Templates

An Object Authority Template defines the system object authorities to be applied when:

- Objects are installed into a library, IFS folder or a remote server folder
- IFS source code is installed into an IFS folder
- Developer Libraries and Source Files are created for Developer Library Naming templates
- MDCMS temporary Receive, Install, Rollback and backup libraries
- SQL Packages created using SQL Package templates

```
MDCTMOA                          COMPANY NAME                              25.11.12
SCRN1                     Object Authority Templates                       12:17:57
Filters:            *PUBLIC                                Used by:
 Type   Owner       Obj Auth  Auth List  User              Appl Lvl Library
 ______ __________ _________ __________ __________       ____ __  ______________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes  O=Other Usage
                                      *PUBLIC                  Primary     Other
Opt Template  Oth  Type    Obj Owner   Obj Auth     Auth List   Group       Users
 _  *DFTIFS        IFS     *JOBD       *OBJREF      *NONE
 _  *DFTRMT        REMOTE  *FTP        *NONE        *NONE
 _  *DFT400        OS400   *JOBD       *CHANGE      *NONE
 _  IFS1       Y   IFS     *JOBD       *OBJEXIST +  TLIST1                      1
 _  IFS2       Y   IFS     *SAME       *SAME        *SAME       *SAME           1
 _  OS4B       Y   OS400   MMORGAN     *USE         *NONE                       1
 _  OS4C       Y   OS400   *SAME       *SAME        *SAME       *SAME           1
 _  RMT00001   Y   REMOTE  *FTP        *NONE        *NONE
                                                                      Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F10=Attributes   F21=Sys Command
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Used By

Only templates that are used by attributes for the entered Application, Level or Object Library will be listed.

Options

2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template
O - List all usage of the template by elements that aren't attributes

Function Keys

F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F8=Show Desc/Show Info – toggle the listing between template information and template description
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields

Template

A 10-Character name for the template definition. The templates *DFTIFS, *DFTRMT and *DFT400 are automatically created by MDCMS at installation time with the most common object authority definitions for each type. The definitions may be modified to meet the requirements of the majority of your objects.

Atr

Y – The template is assigned to 1 or more MDCMS attributes

Template Type

IFS – Object Authority definition for objects residing in IFS
REMOTE – Object Authority definition for objects residing on other system than the IBMi

Apply Template

Flag available for OS400 objects to determine when template should be applied to a deployed object.
A – Always apply template
N – Only apply template for new objects. A modified object will retain the same authority as the object it replaced.

Obj Owner

The value entered here is the owner of the objects for the specified Attribute. It may be any valid user profile on your IBMi system. The default value of *JOBD will set the object ownership to be the value of the application level job description 'USER' value.

The value *SAME may also be given. If *SAME is used for a new object the owner is based on user running the compile phase of an RFP for compiled objects or based on the from object for copied objects. If *SAME is used for an existing object, the current object's ownership will be transferred to the object replacing it.

Auth List

If you are maintaining authorities on your system through authorization lists, enter the name of the authorization list here. Otherwise, it may be left blank.

The value *SAME may also be given. If *SAME is used for a new object, the authorization list is based on the compile at install time for compiled objects or based on the from object for copied objects. If *SAME is used for an existing object, the authorization list will be transferred to the object replacing it.

Users with Authority to Object

*PUBLIC – the authority granted to any user that is not specified in the list for the Template
Primary Group – the name of the Primary Group for an OS400 or IFS object. Press F9 from the Template Edit screen to add a Primary Group to a Template definition.
*OWNER – the Owner authority for a remote object
*GROUP – the Group authority for a remote object
Other Users – the IBMi user profiles to be granted specific authority for the Template. Press F6 from the Template Edit screen to add a user profile to a Template definition.

OS400 Authorities

Possible Single Values

*ALL	All authority
*CHANGE	Change authority
*EXCLUDE	No Authority
*SAME	The authority of the existing object is applied for the user to the authority for the object replacing it
*USE	Usage authority

OR

Possible Multiple Values (1 or more in the list applied for the same user)

*ADD	Authority to add entries to Object
*DLT	Authority to remove entries from an Object
*EXECUTE	Authority to run program or locate the object
*OBJALTER	Object Alter Authority
*OBJEXIST	Object Existence Authority
*OBJMGT	Object Management Authority
*OBJOPR	Object Operational Authority
*OBJREF	Object Reference Authority
*READ	Authority to get contents of an entry
*UPD	Authority to change contents of an entry

IFS Object Authorities

Possible Single Values

*ALL	All authority
*NONE	No Object Authority
*SAME	The authority of the existing object is applied for the user to the authority for the object replacing it

OR

Possible Multiple Values (1 or more in the list applied for the same user)

*OBJALTER	Object Alter Authority
*OBJEXIST	Object Existence Authority
*OBJMGT	Object Management Authority
*OBJREF	Object Reference Authority

IFS Data Authorities

*EXCLUDE	no data or object authority
*NONE	no data authority
*R	Read authority
*RW	Read/Write authority
*RWX	Read/Write/Execute authority
*RX	Read/Execute authority
*SAME	The authority of the existing object is applied for the user to the authority for the object replacing it
*W	Write authority
*WX	Write/Execute authority
*X	Execute authority

Remote Object Authorities

*NONE	no data authority
*R	Read authority
*RW	Read/Write authority
*RWX	Read/Write/Execute authority
*RX	Read/Execute authority
*W	Write authority
*WX	Write/Execute authority
*X	Execute authority

3.6.2 Other Object Authority Template Usage

Besides Attributes, Object Authority Templates can also be used for:

- Developer Libraries and Source Files are created for Developer Library Naming templates
- MDCMS temporary Receive, Install, Rollback and backup libraries
- Objects deployed to replication libraries as part of an Object Replication template
- SQL Packages created using SQL Package templates

To view/configure other usage of a template, enter option O=Other Usage from the Object Authority template listing.

```
MDCTOOA                          T86 Dev/Test                          4.12.25
Filters:            Other Object Authority Template Usage              12:15:29

Template: DEVLIB       Search (freetext): ____________________

Type options, press Enter.
 C=Configure

Opt Usage     ID          Description
 _  Dev Lib   TEST01/100  trunk with proj/task
 _  Temp Lib  CLM/110     Claims October DEV
 _  Temp Lib  CLM/111     Claims November DEV
 _  Obj Repl  none
 _  SQL Pkg   none




                                                                      Bottom
F3=Exit   F5=Refresh
```

Screen Definitions:

Search (freetext)

The entry of a value in this field with filter all rows so that only those containing the value will be displayed.

Usage

Dev Lib - Developer Library Naming Templates for automatically created developer libraries and source files
Temp Lib - MDCMS temporary Receive, Install, Rollback and backup libraries
Object Replication – Objects deployed to replication libraries as part of an Object Replication template
SQL Pkg - SQL Packages created using SQL Package templates

Options

C – Configure the usage of Object Authority templates for the given usage type.

3.6.3 Object Authority for Temporary MD Libraries

MDCMS creates temporary libraries during the deployment and installation process to:

- Receive objects from another system
- Package objects for installation
- Store prior version of objects
- Rollback objects

The authority applied to the temporary library is based on an Object Authority template and the template used can differ for each promotion level. To assign an authority template to levels, enter option O=Other Usage from the Object Authority template listing and then enter option C=Configure on a Temp Lib usage row.

```
MDCTLOA                            COMPANY NAME                          25.11.19
Filters:            Object Authority for Temporary MD Libraries          21:34:40
  Appl Lvl Description     Template
  ____ __  _______________ OSNEW_____

Type options, press Enter.
 1=Assign Level Libraries to Template: OSNEW_____

Opt Appl Lvl Description                                  Template
 _  TEST 10  T8 Dev Trunk                                 OSNEW
 _  TEST 11  T8 Branch 1                                  OSNEW
 _  TEST 12  T8 Branch 2                                  OSNEW
 _  TEST 30  T8 QA (local)                                OSNEW
 _  TEST 31  T8 QA Branch 1                               OSNEW
 _  TEST 32  T8 QA Branch 2                               OSNEW
 _  TEST 50  T8 Prod (local)                              OSNEW
 _  TSTB 10  Test level 10                                OSNEW
 _  TSTB 25  Emergency for v10                            OSNEW
 _  TSTB 30  Test 30                                      OSNEW
 _  TSTB 50  Test 50                                      OSNEW

                                                                        Bottom
F3=Exit    F4=Browse    F5=Refresh    F13=Repeat Opt
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Options

1 – Assign Level to Template – enter a valid template name in the field above the list and then place a 1 next to each level that should have that template assigned to it. The Template Type must be OS400.

Function Keys

F3=Exit

F4=Browse – Browse the list of valid values for a filter field or the Template field.

F5=Refresh

F13=Repeat the assign option for all levels

3.6.4 Object Replication Templates

An Object Replication Template defines the list of locations that an object should be deployed to in addition to the location defined for the object's attribute.

```
MDCTMOR                          COMPANY NAME                            25.11.12
SCRN1                    Object Replication Templates                    13:19:30
Filters:                                                          Used by:
 Type   Library/Folder             Server                          Appl Lvl
 ______ ________________________ _____________________________    ____ __

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes
    __________
Opt Template Atr Type   Replication Locations
 _   FILE MJ   Y  OS400  TSTOBJ10M, TSTOBJ10Y
 _   FOLDERS      IFS    /transfer/5_4, /transfer/6_0, /transfer/6_7_5, /transfe >
 _   ORT2       Y  OS400  DD01000020, DSAV000006
 _   ORT222     Y  OS400  IT000764, MDADMT, MDAPI
 _   T_FOLDER   Y  IFS    /T_Folder/IT/BU1, /T_Folder/IT/BU2
 _   TSTPUB        OS400  TSTPUB
 _   WEB        Y  REMOTE MD Web Server:/dev/testenv/T1_alt1, MD Web Server:/dev/ >


                                                                        Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F8=Show Desc   F10=Attributes
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Used By

Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template

A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options

2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys

F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F8=Show Desc / Show Info – Toggle listing between the template description and replication info
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields

Template
A 10-Character name for the template definition.

Atr
Y – The template is assigned to 1 or more MDCMS attributes

Template Type
IFS – Object Replication definition for objects residing in IFS
REMOTE – Object Replication definition for objects residing on other system than the IBM i
OS400 – Object Replication definition for standard IBMi or SQL objects

Description
A description of the template

Project/Task
The objects to be replicated to a specific Replication library/folder can be filtered so that they are only included if the object is changed on behalf of specified projects, tasks or subtasks.

When a location is added to a replication template, or if no projects are set in the filter list, then the objects aren't limited to a specific set of projects.

To filter by project, use option 2 to edit the library/folder and press F8 to view/manage the Project Filter list.
If a Project is added to the filter list without a task or subtask, then an object will be included if it was assigned to the project directly or any task or subtask in the project.
If a Project is added to the filter list with a specific task number, but without a subtask, then an object will be included if it was assigned to the task directly or any subtask in the task.
If a Project is added to the filter list with a specific task and subtask number, then an object will be included only if it was assigned to the subtask directly.

There is no limit to the number of Projects, Tasks and Subtasks in the filter list and an object only needs to be assigned to one of the entries in the list to be included.

Library
The list of libraries that OS400 objects will be replicated to at installation time.
generic - dynamically include any libraries that match the generic naming pattern.
*ALL – dynamically include all user libraries. This value is only valid for updating existing objects.

When a generic or *ALL value is used, any library beginning with # or Q will be omitted. If a library beginning with # or Q should be replicated to, the library must be specifically defined for the template.

Folder
The list of folders that IFS or REMOTE objects will be replicated to at installation time

Server
The list of servers that REMOTE objects will be replicated to at installation time.
In the case of *IFS attributes, a server name can be stored in this field. The value will then be used by occurrences of the ##SERVER## placeholder by commands and scripts for an IFS file using the attribute.

Add Object by Default
Y – by default, if the object doesn't yet exist in the library, it will be added.
N – by default, if the object doesn't yet exist in the library, it will not be added.
B – by default, if the object doesn't yet exist in the library, it will be added unless the object is a logical file and any of the Based-on files for that logical file are missing in the target library.

The default can be overridden for specific object requests using option O=Object Replication Rules for an object request in the Object Manager

Update Object by Default
Y – by default, if the object already exists in the library, it will be updated.
N – by default, if the object already exists in the library, it will not be updated.

The default can be overridden for specific object requests using option O=Object Replication Rules for an object request in the Object Manager

Run Install Cmd/Script
Y – if any object or attribute pre-/post-commands are defined, they will be repeated for the object in the replication library.
N – if any object or attribute pre-/post-commands are defined, they will not be repeated for the object in the replication library.

Ignore Delete Template
Y – any delete template defined for the attribute will be ignored so that the object remains in the replication location.
N – if a delete template is defined for an attribute to delete from a level used by this replication template, the deletion will also occur for the object in the replication location.

Ignore Errors
Y – if the replication of the object to the target location fails during installation time, a warning condition will be flagged, and the RFP will continue with the installation.
N – if the replication of the object to the target location fails during installation time, the RFP will automatically roll back.

Object Auth. Template
*SAME – the same Object Authority Template for the Attribute library will be used for the replication library.
Template name – the entered Template will be used for the application of Object Authorities to the Replication Library

Reference Libraries to include in LIBL at deployment
Up to 5 Libraries that will be added to the top of the library list when a logical file (including SQL indexes or views) is created at installation time to access the correct physical file libraries for the replication library.

3.6.5 Source Replication Templates

A Source Replication Template defines the list of files that a source member, IFS source or message description should be deployed to in addition to the location defined for the object's attribute.

```
MDCTMSR                          COMPANY NAME                          25.11.12
SCRN1                    Source Replication Templates                  13:28:34
Filters:                                                          Used by:
 Type  Library     File                                            Appl Lvl
 _____ __________  __________                                      ____ __

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes
   _________
Opt Template Atr Type  Replication Locations
 _  MSGS       Y  MSG   TSTOBJ10/MSGFD, TSTOBJ10/MSGTD, TSTSRCREP1, TSTSRCREP1/ >
 _  REPS       Y  SRC   TSTSRCREP1, TSTSRCREP2
 _  REPS2      Y  SRC   MDADMP, MDADMT/QCBLSRC



                                                                        Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F8=Show Desc   F10=Attributes
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Used By

Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template

A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options

2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys

F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F8=Show Desc / Show Info – Toggle listing between the template description and replication info
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields

Template

A 10-Character name for the template definition.

Atr

Y – The template is assigned to 1 or more MDCMS attributes

Template Type
IFS – Source Replication definition for source residing as files in IFS
MSG – Message Description Replication definition for messages in Message Files
SRC – Source Member Replication definition for members residing in Source Files

Description
A description of the template

Project/Task
The source to be replicated to a specific Replication library/folder can be filtered so that they are only included if the source is changed on behalf of specified projects, tasks or subtasks.

When a location is added to a replication template, or if no projects are set in the filter list, then the source aren't limited to a specific set of projects.

To filter by project, use option 2 to edit the library/folder and press F8 to view/manage the Project Filter list.
If a Project is added to the filter list without a task or subtask, then source will be included if it was assigned to the project directly or any task or subtask in the project.
If a Project is added to the filter list with a specific task number, but without a subtask, then source will be included if it was assigned to the task directly or any subtask in the task.
If a Project is added to the filter list with a specific task and subtask number, then source will be included only if it was assigned to the subtask directly.

There is no limit to the number of Projects, Tasks and Subtasks in the filter list and source only needs to be assigned to one of the entries in the list to be included.

Library/File
The list of IFS directories, message files, or source files to replicate to at installation time

Ignore Delete Template
N – if a delete template is defined for an attribute to delete from a level used by this replication template, the deletion will also occur for the source in the replication location.
Y – any delete template defined for the attribute will be ignored so that the source remains in the replication location.

Ignore Errors
N – if the replication of the source to the target location fails during installation time, the RFP will automatically roll back.
Y – if the replication of the source to the target location fails during installation time, a warning condition will be flagged, and the RFP will continue with the installation.

3.6.6 Object Search Templates

An Object Search Template defines the list of libraries or IFS directories that should be searched when checking out an object.

During check-out, MDCMS searches for objects (that don't have a source member defined for the attribute) in the following sequence:

1) The target library for the attribute
2) If the promotion level is a delta level, the higher levels will be checked in ascending order
3) If the level is based on another level, the based-on level and its higher levels are checked in ascending order
4) The search libraries in the search template in sequential order

```
MDCTMOS                          COMPANY NAME                          25.11.12
SCRN1                      Object Search Templates                     13:51:23
Filters:                                                          Used by:
 Type   Library/Folder                                            Appl Lvl
 ______ ____________________                                      ____ __

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes
          __________
Opt Template  Atr Type   Search Locations
 _  FINDASO    Y  OS400  SIVQRY, LIVQRY
 _  FINDASO12     OS400  WIVQRY, ZIVQRY
 _  FINDIFS    Y  IFS    /T_Folder/IT/javamail-1.4.3, /T_Folder/IT/javamail-1.4. >
 _  SEARCH003  Y  IFS    /T_Folder/SIT, /T_Folder/Prod
 _  SEARCH004     OS400  TSTOBJ30, TSTOBJ70


                                                                      Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F10=Attributes   F21=Sys Command
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Used By

Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template

A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields
Template
A 10-Character name for the template definition.

Atr
Y – The template is assigned to 1 or more MDCMS attributes

Template Type
IFS – Object Search definition for objects residing in IFS
OS400 – Object Search definition for standard IBMi objects

Sort Sequence
A number indicating the sort sequence for the location, in ascending order

Library
The list of OS/400 libraries that will be searched at check-out time

Folder
The list of IFS folders that will be searched at check-out time

Display Warning
If set to Y, MDCMS will always check if the object is in this library, even if found sooner elsewhere, and display a warning screen that the object was found in the location specified by the template.

This provides the ability to warn about an object already in another location when attempting to check it out.

3.6.7 Source Search Templates

A Source Search Template defines the list of source files or IFS directories that should be searched when checking out source.

During check-out, MDCMS searches for source in the following sequence:

1) The target source file/directory for the attribute
2) If the promotion level is a delta level, the higher levels will be checked in ascending order
3) If the level is based on another level, the based-on level and its higher levels are checked in ascending order
4) The source locations in the search template in sequential order

```
MDCTMSS                          COMPANY NAME                          25.11.12
SCRN1                      Source Search Templates                     21:21:42
Filters:                                                            Used by:
 Type  Library/Folder            File       System                    Appl Lvl
 ___   ____________________________ __________ ____________________________   ____ __

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes

Opt Template   Atr  Type  Search Locations
 _  IBMODP      Y   MBR   PROIB
 _  IFSSEARCH   Y   IFS   /test/30
 _  MBRSEARCH   Y   MBR   SQLLIBSRC




                                                                      Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F10=Attributes   F21=Sys Command
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Used By

Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template

A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options

2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields
Template
A 10-Character name for the template definition.

Atr
Y – The template is assigned to 1 or more MDCMS attributes

Template Type
IFS – Source Search definition for source residing in IFS
MBR – Source Search definition for source members residing in Source Files

Sort Sequence
A number indicating the sort sequence for the location, in ascending order

Library
The name of a Library containing source files

File
The name of a source file
*SRCFILE – the name of the target source file for the attribute

System
The address of the remote system containing the source file to be searched. The addresses are defined in the OS/400 Locations.
*LOCAL – the library resides on the same system partition

Display Warning
If set to Y, MDCMS will always check if the source is in this library, even if found sooner elsewhere, and display a warning screen that the source was found in the location specified by the template.

This provides the ability to warn about source already in another location when attempting to check it out.

3.6.8 Object Deletion Level Templates

An Object Deletion Level Template defines the list of levels containing Delta or Emergency objects that should be deleted when those objects are installed into the current level.
For example, the template could be assigned to attributes in the production level to delete the objects from the development and test levels.

In order for the deletion to occur, the level to delete from must have the Delta Object Level flag set to Y. If the Emergency Level flag is set to Y, and the object is found in the level, it will be deleted regardless of version. If the Emergency Level flag is set to N, the object will only be deleted if the version in the delta level is the same as the version in the level being installed into. This insures that new work in progress won't be deleted from delta libraries.

If an Object Deletion Level Template is assigned to a *DATA attribute, MDCMS will delete the entire file from the delta level if MDCMS also automatically created the file to contain the data and no additional deployments or changes have been made to the file since that creation occurred.

```
MDCTMOD                          COMPANY NAME                          29.07.14
SCRN1                      Object Deletion Templates                   21:20:10
Filters:                                                             Used by:
 Lvl                                                                   Appl Lvl
 __                                                                    _____ __

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View   7=Rename   A=Attributes

    __________
Opt Template   Atr   Deletion Levels
 _   T30         Y    10, 20
 _   T50         Y    30



                                                                        Bottom
F3=Exit    F4=Browse    F5=Refresh    F6=Add    F10=Attributes    F21=Sys Command
```

Screen Definitions:
Filters
The entry of a value into the level filter fields will result in a subsetted list of records which contain that level.

Used By
Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template
A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields
Template
A 10-Character name for the template definition.

Atr
Y – The template is assigned to 1 or more MDCMS attributes

Level
The list of levels from which to delete objects

3.6.9 Source Deletion Level Templates

The usage and handling of Source Deletion Level Templates is identical to that of Object Deletion Level Templates described in the previous section.

The one additional feature for Source Deletion Levels is that the deletion level may exist on a remote system. Use *LOCAL as the System value to delete from a level on the local system. Otherwise, enter the OS/400 location to delete the source from that system when the source is installed into the current level on the local system.

3.6.10 MDRapid Usage Templates

An MDRapid Usage Template defines the Job Queue, job priority and number of parallel jobs for the MDRapid batch jobs as well as the default minimum record count needed to require the use of MDRapid for a file or SQL table.

The usage of MDRapid permits all data to be copied from the old format of a file to the new format while the application is still in use, thus substantially reducing the amount of downtime. Once the original records are copied, MDRapid continues to mirror transactions to the new format of the file until such time that the install should occur.

```
MDCTMRP                              COMPANY NAME                          29.07.14
SCRN1                          MDRapid Usage Templates                     14:19:24
                                                                    Used by:
                                                                     Appl Lvl
                                                                     ____  __

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View   7=Rename   A=Attributes

          __________                                      LFs
Opt Template    Atr Min Rcd Cnt Job Queue   Max Cpy Only Journal    Pri Workload
 _   RAPID        Y    1,000,000 MDCMS             5   N               55 MDRAPID



                                                                        Bottom
F3=Exit    F4=Browse    F5=Refresh    F6=Add    F10=Attributes    F21=Sys Command
```

Screen Definitions:

Used By
Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template
A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields

Template Name
A 10-Character name for the template definition.

Atr
Y – The template is assigned to 1 or more MDCMS attributes

Minimum Record Count
The minimum number of records that have to exist in the current version of the file (across all members) in order for that file to be included by default in the MDRapid process. This can be overridden for specific file requests in the Object Manager. The value can be set to 0 to always use MDRapid.

Job Queue
When MDRapid runs, a single monitor job is submitted for the entire RFP and a job is submitted for each target physical and logical file. Enter the name of the job queue that these jobs should be submitted to. It should be a queue that allows a sufficient number of jobs to be concurrently active.

Job Queue Library
The library that Job Queue exists in. If left blank, MDCMS will attempt to retrieve the library from the library list.

Max Parallel Copy Jobs
The data for each physical file in an RFP being copied using MDRapid gets its own copy job to allow for parallel copying to speed up the process. However, data copies are Database- and CPU-intensive processes, so to throttle resource consumption, the maximum number of parallel copy jobs for an RFP can be set. A number between 5 and 10 is recommended, depending on resources available. MDRapid then starts n copy jobs for the files in the RFP in descending order of the number of records in the file so that the largest files start first. Once the copy step is finished for a file, the next pending copy job is started.
If the value for the Max Parallel Copy Jobs is 0, then the default of 5 will be used.

Use for Standalone LFs
If MDRapid should be used for logical files when the physical files they are based on aren't in the RFP. This is useful when the files will be replicated to many libraries in order to speed up the installation of those replications. This flag will be considered for a logical file, if the template is applied to the logical file's attribute for the target promotion level.

Job Run Priority
The run priority can be set for the jobs that are submitted by MDRapid so that they get more or less resource priority than other jobs on the system.
If the value for the Job Run Priority is 0, then the default of 20 will be used.

Workload Group
The name of a Workload Group can be defined for an MDRapid Template. Workload Groups define the maximum number of Processors used by a job assigned to the group. All jobs using the template will be assigned to the Workload Group, if entered.

Use command ADDWLCGRP to add a Workload Group.

MDRapid Journal
A persistent Journal to use when the live version of a table isn't already journaled or when MDRapid needs to journal the new version of the table to track inserts. If blank, MDRapid will automatically create a journal in the RFP temporary install library named MDRAPIDJRN.

MDRapid Journal Library
The library that Journal exists in. If left blank, MDCMS will attempt to retrieve the library from the library list.

3.6.11 Source Comments Templates

A Source Comments Template defines the text that should be automatically inserted into source code when MDCMS deploys the source to a level that allows checkout.

This template is limited to attributes defined to contain source stored as members in source files. The attributes must also be for a level that allows checkout, since MDCMS only allows modifications to source from the lowest level of a migration path.

The 3 examples in the screen below are shipped with MDCMS to help understand some of the common formatting possibilities available.

```
MDCTMSC                          MD T 8.1 dev                              8.11.17
SCRN1                    Source Comments Templates                        18:05:01
                                                                  Used by:
                                                                   Appl Lvl
                                                                   ____  __
Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes

     _________          Margins    Delimiters
Opt Template   Atr Lft Rgt Top  Left Right  Pos Comments
 _  CBLDDS      Y    7  71   6  **   *       L  ++REQDAT++ ++REQTIM++ ++OBJREQ+
 _  CL          Y    1  71   1  /*   */      L  *nl++RFPSBD++ ++RFPSBT++ ++OBJR
 _  SQL         Y    7  71   1  --           F  ++REQDAT++ ++REQTIM++ ++OBJREQ+









                                                                        Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F10=Attributes   F21=Sys Command
```

Screen Definitions:

Used By
Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template
A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F10=Attributes – List all attributes to be able to view and change the usage of the Templates

Fields

Template
A 10-Character name for the template definition.

Left Margin
The leftmost position in the source code where each row of the text should begin

Right Margin
The rightmost position in the source code where each row of the text should end. If a word doesn't finish when the right margin is reached, the entire word will be placed on the next row.

Top Margin
The earliest possible row in the source code where the comment rows should be inserted

Left Delimiter
The character(s) to use as a comment delimiter on the left side of the text so that the compiler realizes that the row contains comments.

Right Delimiter
The character(s) to use as a comment delimiter on the left side of the text so that the compiler realizes that the row contains comments.

Comment Position
F – Insert the comment at the very first row defined by the Top Margin
L – Position to the Top Margin and continue until a row is encountered that doesn't start with the Left Delimiter and place the new comment there, which is expected to be the last comment in that sequence.

Comments
The text to be inserted into the source.

Placeholders – placeholders are special values delimited by ++ that are replaced at runtime with MDCMS values. Position the cursor and press F7 to insert a placeholder into the comment field.

*nl – special value indicating to skip to the next line

3.6.12 Code Review Templates

A Code Review Template defines the parameters for interacting with SonarQube to perform automated Code Review of source code that has been deployed to the target level for assigned attributes. Code Review templates must be defined using MDOpen, but the list of defined templates can be viewed and selected from by pressing F4 on the Code Review Template field.

3.6.13 Automated Testing Templates

An Automated Testing Template defines the automated testing steps to take for deployed programs and service programs that have been deployed to the target level for assigned attributes. Automated Testing is available in conjunction with the MDTest and TestBench products. Automated Testing templates must be defined using MDOpen, but the list of defined templates can be viewed and selected from by pressing F4 on the Automated Testing Template field.

3.6.14 Git Commit Templates

A Git Commit Template is used to replicate source or IFS objects to a Git Repository when an RFP is installed. The template can also auto-create feature branches and pull requests on the origin server. This feature is useful for keeping a copy of source/objects in Git, triggering a pipeline from Git, or ensuring that changes that originated in Git are synced back to the origin server when modifications are made to the code directly on the IBM i.

Git Commit templates must be defined using MDOpen, but the list of defined templates can be viewed and selected from by pressing F4 on the Git Commit Template field.

3.6.15 SQL Package Templates

SQL Package Templates manage the location and existence of SQL Packages for Programs and Service Programs containing embedded SQL statements.

SQL Package Templates are applied to *MODULE and *PGM attributes to ensure the correct target library value is used for the SQL Packages on the CRTSQL* commands.

SQL Package Templates are applied to *PGM and *SRVPGM attributes to automatically create and delete SQL Packages during RFP deployment of the programs/service programs.

During the RFP Installation phase for a program or service program attribute assigned to an SQL Package Template:

- When requested for deletion, all SQL Packages for that program will be deleted.
- When requested for modification or recompile, all SQL Packages for the replaced program will be deleted and an SQL Package for each bound module containing SQL statements will be created.

All SQL Package activity is logged in the RFP Deployment Log and if a create or delete fails, the RFP and the Log Entry will be flagged as a warning, and the RFP will continue.

```
MDCTMSP                          T86 Dev/Test                              4.12.25
SCRN1                      SQL Package Templates                          12:29:53
                                                                  Used by:
                                                                   Appl    Lvl
                                                                   ______  ___
Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Attributes


Opt Template  Atr Description                                        Library
 _  TESTDLIB   Y  Test app with package in diff lib                  TEST500PKG
 _  TESTPLIB   Y  Test app with package in program lib               *PGM



                                                                        Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F10=Attributes  F21=Sys Command
```

Screen Definitions:

Used By
Only templates that are used by attributes for the entered Application or Level will be listed.

Position to Template
A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template; all attributes using the template will automatically be updated
A – List all attributes using the template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F10=Attributes – List all attributes to be able to view and change the usage of the Templates
F21=Sys Command – provide a system command line

Fields
Template Name
A 10-Character name for the template definition.

Atr
Y – The template is assigned to 1 or more MDCMS attributes

Description
A description of the SQL Package template.

SQL Package Library
The name of the library that the package should be defined to reside in when the module or program is created. MDCMS will replace or append the SQLPKG parameter to the create command and set this value in it when the compile command is run for the RFP.

*PGM – The library will be the same as the final target library for the module or program.

If the SQLPKG parameter already exists, the library name will be replaced by this name for the RFP compile, but the package name will be retained.

For the compile into a developer library, the library portion of the SQLPKG parameter will be set to *OBJLIB to force it into the same developer library as the module or program to ensure the target environment isn't already impacted.

This processing will occur for MDCMS compile commands with the following names:
CRTSQLCBLI
CRTSQLCI
CRTSQLCPPI
CRTSQLRPGI

Object Auth Template
The Object Authority template used to apply object authority to SQL packages created by the SQL Package template.
*PGM – Use the same Object Authority template that the program or service program attribute uses.

Use Deletion Template
Y – if a deletion template is assigned to the program or service program attribute, then delete the SQL packages for the delta program when the delta program is deleted.
N – don't delete the SQL packages for a delta program, even if it is deleted by a deletion template

Default Collection
The value to use for the Default Collection parameter (DFTRDBCOL) on the CRTSQLPKG command

Query Proc Time Limit
The time limit, in seconds, for Query processing. MDCMS will set this for the RFP job using the CHGQRYA command prior to creating the SQL packages.

*SAME – don't change the limit for the job
*NOMAX – set the time limit to unlimited

Query Proc Stg Limit
The temporary storage limit, in Megabytes, for Query processing. MDCMS will set this for the RFP job using the CHGQRYA command prior to creating the SQL packages.

*SAME – don't change the limit for the job
*NOMAX – set the temporary storage limit to unlimited

End Jobs locking Pkg
Y – if a package to be deleted is locked by other jobs, MDCMS will automatically end those jobs
N – if a package to be deleted is locked by other jobs, MDCMS will flag the entry as a warning and not process the delete/create of SQL Packages for that program.

3.6.16 Attributes for Templates

In order to see where templates are used, and to assign templates to many attributes at once, the list of attributes can be displayed for each type of template.
From the maintenance screen for a type of template, press F10 to view all attributes or enter option A for a specific template to see the attributes using that template.

```
MDCTAOA                          COMPANY NAME                           25.11.12
SCRN1                Attributes for Object Authority Templates          21:34:40
          Appl Lvl  Type    Attribute   Object Lib       Template    Temp Type
Filters: ____ __   ______  __________  ________________  __________  ______

Type options, press Enter.
 1=Assign Attribute to Template: __________

Opt Appl Lvl Type    Attribute  Object Lib           Template
 _  TEST 11  *DTAARA DTAARA     TSTOBJ11             OS4A
 _  TEST 10  *FILE   DSPF       TSTOBJ10             *DFT400
 _  TEST 11  *FILE   DSPF       TSTOBJ11             *DFT400
 _  TEST 30  *FILE   DSPF       TSTOBJ30             OS4A
 _  TEST 70  *FILE   DSPF       TSTOBJ70             *DFT400
 _  TEST 10  *FILE   LF         TSTOBJ10             *DFT400
 _  TEST 11  *FILE   LF         TSTOBJ11             *DFT400
 _  TEST 30  *FILE   LF         TSTOBJ30             OS4B
 _  TEST 70  *FILE   LF         TSTOBJ70             *DFT400
 _  TEST 10  *FILE   PF         TSTOBJ10             *DFT400
 _  TEST 11  *FILE   PF         TSTOBJ11             *DFT400
 _  TEST 30  *FILE   PF         TSTOBJ30             OS4B
 _                                                                More...
F3=Exit   F4=Browse   F5=Refresh   F13=Repeat Opt
```

Screen Definitions:

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Options

1 – Assign Attribute to Template – enter a valid template name in the field above the list and then place a 1 next to each attribute that should have that template assigned to it. The Template Type must be compatible with the object type.

Function Keys

F3=Exit
F4=Browse – Browse the list of valid values for a filter field or the Template field.
F5=Refresh
F13=Repeat the assign option for all compatible attributes

3.7 Data Copy Templates

A Data Copy Template defines a set of libraries for the copying of data from one environment to another. This is typically used to refresh test libraries with some or all data located in production libraries, without losing format and object changes made in the test environment.

There are 2 levels of capabilities available with a Data Copy Template

1) Basic capabilities – the files to copy from must be in a library on the local system and CPYF is used to copy all records in the file. If the format of the target file is different, *MAP/*DROP is used.

2) MDTransform capabilities (MDTransform License required):
   - The files to copy from can be in a library on a different system or logical partition (DDM read access to the data library and to the QSYS2 library must be allowed on that system).
   - SQL is used for the copy for better handling of modified field types
   - Validation can be performed to ensure the copy will function at run-time
   - Record Conditions can be defined for files so that only a subset of data will be copied
   - Custom field value Transformation, such as to synthesize confidential data, can be performed on specific field columns.

The Data Copy templates can be modified or executed from the MDCMS Setup Menu option 5=Templates -> option 21=Data Copy.

3.7.1 Data Copy Template Maintenance

Data Copy Templates Screen:

```
MDCTMDC                          MD Production 6.1                          28.05.20
SCRN1                          Data Copy Templates                          17:52:41
Filters:
 From Location  From Library  Target Library
 ____________   ____________   ____________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  C=Conditions  P=Placeholders
 S=Status  T=Transformations  V=Validate  X=Execute

    __________
Opt Template   Last Run Libraries
 _  TEST1      28.05.20 PROD:ACCTLIBPA->ACCTLIBTA, PROD:ACCTLIBPB->ACCTLIBTB


                                                                        Bottom
F3=Exit  F4=Browse  F5=Refresh  F6=Add  F8=Desc  F11=View Output  F21=Sys Cmd
```

Filters
The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Position to Template
A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template
C – Set Template-Level Record Conditions that can be applied to a collection of files in the Template libraries (MDTransform License required)
S – View the Status of actively running copy jobs for a template to track progression of the jobs
T – Set Template-Level Field Transformations that can be applied to a collection of files/fields in the Template libraries (MDTransform License required)

V – Validate the ability to perform the copy between the libraries defined for this Template without actually performing the copy. (MDTransform License required)

P – Placeholders – define placeholders that can be used in various condition and transformation SQL strings so that replacement values can be dynamically managed from a single point.

X – Execute the copy of data between the libraries defined for this Template

Function Keys
F3=Exit
F4=Browse – Browse the list of valid values for a filter field.
F5=Refresh
F6=Add – Add a new Template Definition
F8=Desc/Info – toggle the view between the list of libraries and the template description
F11=View Output – view/export report output, including Data Copy Log Reports
F21=Sys Command – access a command line

3.7.2 Data Copy Template Library Mapping

The set of libraries to copy from and to for a template can be managed using option 2=Edit for a Data Copy Template.

Data Copy Template Library Mapping Screen:

```
MDCTMDC                          MD T 8.1 dev                              2.07.18
SCRN2                          Data Copy Template                         16:42:32

Template.: MDBU          Desc: MD Backup data
Dft #Jobs: 9             Dft Job Queue: MDSERVICE
                                 Library:   MDJOBCTL
Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  O=Objects  V=Validate  X=Execute

Opt Seq From Loc   From Library                    Target Library
 _    1 *LOCAL     MDADM      MD Administration O MDADMT712
 _    3 *LOCAL     MDADM      MD Administration O MDADMT72   MD Administration
 _   11 MDDEMO     MDCMST8    MDCMS  product libr MDCMS_BU   MDCMS  Backup libr
 _  211 *LOCAL     MDADMT712                      MDADMT73   MD Administration
                                                                        Bottom
F3=Exit   F4=Browse   F6=Add   F11=View Output   F21=Sys Command
```

Dft #Jobs
The number of parallel jobs to start by default when executing a copy for a template or template library. The default can be overridden for an individual execution. If only running validation or running for a specific object, then only 1 job will be used.

Dft Job Queue
The name and library of the job queue to submit data copy jobs to by default. The default can be overridden for an individual execution.

From Location (MDTransform License required)
The OS/400 Location containing the library to copy from. The DDM settings for the location must be valid and DDM read access to the from library as well as the QSYS2 library must be allowed.

*LOCAL – the from library is on the same partition as the target library, which is always on the local partition where the template is defined.

From Library
A library containing data in physical files or data areas that will be copied. The from library doesn't need to exist at the time of adding it to the template.

Target Library
The name of the library that contains physical files or data areas to be updated with data from the From Library. The Target Library must exist at the time of adding it to the Template.

Sort Sequence
The sequence in the list to process the from/target combination. The Sort can be used, for example, to pull data from production for a primary test environment and then copy from that environment to other environments on the same system.

Omit by Dft
N – Any files that are not explicitly omitted will be included for copy when executing the copy for a template or library mapping, including new files.
Y – Any files are omitted for copying except those that are explicitly included.

Note – if toggling the value of the Omit parameter, you will need to change the explicitly set objects.

Options
2 – Edit an existing entry
3 – Copy the entry to a new entry
4 – Delete the entry
5 – Display the entry details
O – list all handled objects containing data (Data Areas and Physical Files) in the Target Library
V – Validate the ability to perform the copy between the from and target library without actually performing the copy. (MDTransform License required)
X – Execute the copy of data specifically between the from and target library

3.7.3 Data Copy Template Library Objects

The list of all files and data areas currently in a target library for the Data Copy Template can be viewed by using option O=Objects for a Library Mapping entry.

Target Objects Screen:

```
MDCTMDC                          MD T 8.1 dev                              2.07.18
SCRN4                          Target Objects                             16:50:56
Template TESTLOC    From Loc: *LOCAL     Lib: MDADM      Target Lib: MDADMT712
Filters
 Object: __________  Desc: ________________  Omit: _  Cond: _  Transform: _

Type options, press Enter.
 C=Conditions  I=Include O=Omit  Q=Qry S=SQL  T=Transform  V=Validate X=Execute

Opt Object     Type    Description                                 Omit Cond Trns
 _  MDACRD     *FILE   Admin: Credits
 _  MDACST     *FILE   Admin: Customers                               Y    Y
 _  MDACUR     *FILE   Admin: Currencies
 _  MDAINP     *FILE   Admin: Customer Invoice Profit Distributio
 _  MDAINV     *FILE   Admin: Customer Invoices
 _  MDALIC     *FILE   Admin: Customer Licenses
 _  MDALOC     *FILE   Admin: Locations
                                                                      More...
F3=Exit  F5=Refresh  F13=Include all  F14=Omit all  F15=Print F21=Sys
Command
```

Filters
The entry of values into one or more of the filter fields will result in a limited list of records which contain the values of those filters.

Options
C – Conditions (MDTransform License required)– define the SQL record conditions (the WHERE clause) for a specific file to limit the records to be copied to those conditions. See the section Data Copy Template Conditions for detailed instructions on defining a condition.

I – Include the Data Area or Physical File when performing the copy. If the object doesn't exist in the from library, it is automatically omitted and any data in the target object is retained.
By default, all Data Areas and Physical Files are included.
Press F13 to include all objects in the list

O – Omit the Data Area or Physical File when performing the copy so that any data in the target object is retained. If the object doesn't exist in the from library, it is automatically omitted.
Press F14 to omit all objects in the list

Q – Qry – query the current contents of the Data Area or Physical File residing in the target library.

S – SQL (MDTransform License required) - View the SQL syntax for the INSERT statement that will be used for the copy based on the current transformation definitions for the file. This can then be copied to an interactive SQL session for troubleshooting purposes.

T – Transform (MDTransform License required) – define the resulting values for specific columns in the target file based on SQL syntax. See the section Data Copy Template Transformations for detailed instructions on defining a transformation.

V – Validate (MDTransform License required) – validate the ability to perform the copy between the specific from and target object without actually performing the copy. (MDTransform License required)

X – Execute the copy of data for the specific object

Function Keys
F3=Exit
F5=Refresh
F11=View Output – view/export report output, including Data Copy Log Reports or Object Lists
F13=Include all – Include all of the listed objects, based on the currently set filters, in the data copy template
F14=Omit all – Exclude all of the listed objects, based on the currently set filters, in the data copy template
F15=Print – generate a report listing all of the objects based on the currently set filters. The output is then available for viewing/exporting by pressing F11.
F21=Sys Command – access a command line

3.7.4 Data Copy Template Conditions

A Data Copy condition provides the rules for determining which records in a physical file should be copied. A condition can be defined for a specific file from the Objects listing, or it can be defined at the Template level and then applied to any number of files within the libraries defined for the template. Multiple conditions can be used together (bound by the AND operator) for a file.

Conditions can also be used to define a subset of files to be included for copy when the X=Execute option is used for the specific condition number.

MDTransform must be licensed to use Conditions.
If a condition isn't applied to a file, then all records will be copied.

Template Conditions Screen:

```
MDCGCDC                          MD T 8.2 dev                              8.07.19
SCRN1                   Data Copy Template Conditions                     22:38:07
                                                          Used by
Template              Description      Condition          File
TESTLOC      Filters: ________________ ________________ __________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  F=Files  V=Validate  X=Execute

Opt Description                          Condition
 _  1 - just certain customers           F.CSTNBR >= ++MINCST++ AND F.CSTNBR <>




                                                                        Bottom
F3=Exit   F5=Refresh   F6=Add   F11=View Output   F21=Sys Command
```

Filters
The entry of values into one or more of the filter fields will result in a limited list of records which contain the values of those filters.

Options
2 – Edit an existing condition
3 – Copy the entry to a new condition
4 – Delete the condition
5 – Display the condition details
F – Manage the collection of files that should be applied to the defined condition.
V – Validate – validate the ability to perform the copy for all files that are applied to the condition.
X – Execute the copy of data for the specific files that are applied to the condition.

Function Keys
F3=Exit
F5=Refresh
F6=Add – Add a new Template Condition
F11=View Output – view/export report output, including Data Copy Log Reports
F21=Sys Command – access a command line

Condition Detail

```
 MDCGCDC                          MD T 8.2 dev                          9.07.19
 SCRN2                    Data Copy Template Condition                 10:20:26

 Template . . . . . .  MDBU
 Condition Number . .  10
 Condition Desc . . .  certain users
 Records to Replace .  2  1=All Records in File, 2=Records matching Condition
 Always include Cond.  2  1=Yes, 2=Only when run for this Condition Number
 Join File  . . . . .  USERSELR     File ID: U
   Remote Library . .    MMORGAN    Library, *FROM, *TARGET
   Local Library  . .    MMORGAN    Library, *FROM, *TARGET

WHERE  (SQL Syntax for Records to include in Data Copy)
F.U?USER = U.USRPRF
                                                                              
                                                                              
                                                                              
                                                                              
                                                                              

 F3=Exit    F4=Browse    F7=Placeholder
```

Description
A text description of the condition to explain its usage

Records to Replace
1 – All Records in File – all existing records in the target file will be removed before any records matching the condition are copied from the originating location/library
2 – Records matching Condition – only the records in the target file that match the condition will be removed before any records matching the condition are copied from the originating location/library. This provides a way to add certain use cases for testing without removing the other cases in the file(s). If multiple conditions are applied to the same file, then if at least one of the included conditions is set to 2, then option 2 will be used for all of the included conditions for that file.

Always include Condition
1 – Yes – the condition will be appended to the WHERE clause with an AND operator, even when executing the copy for other condition numbers or for no specific condition number.
2 – the condition will only be appended to the WHERE clause if the execution is running for the specific condition number. When adding an object specific condition from the object listing within the library listing for the template, option 2 will mean that the condition will only be appended to the WHERE clause if the execution is not running for a specific condition number.

Join File
A join file can be defined for the condition in order to limit the records to be copied by those matching certain column values in the join file. The join condition is specified as part of the condition string in the Condition parameter which is then included in the WHERE clause. By using the AND predicate, additional conditions beyond the Join conditions can be included in the Condition parameter.

Due to DDM constraints, the Join file must be on the same partition as the file that is being copied from. The library containing the join file is specified in parameter Remote Library.
*FROM special value for the Remote library can be used and will be replaced by the actual from library at runtime.
*TARGET special value for the Remote library can be used and will be replaced by the actual target library at runtime.

If the Records to Replace option is set to 2=Records matching Condition, then the condition is also run as a subquery on the local delete statement. In this case, the join file must also be on the local partition and the Local Library parameter must be defined. If the from library is also on the local partition, then the join file can be the same object, but when the

from library is on a remote partition, then a copy of the join file of the same name must exist in some library on each partition.

File ID
The file ID (prefixed qualifier) of the join file to use in the Condition statement. For example, if the File ID is set to S, then the referenced column in the condition statement must start with S followed by a period.
When multiple conditions are applied to same file and each condition uses a different join file, then each join file should have a distinct File ID to ensure that the final WHERE clause can be interpreted correctly.

Condition
The rules to determine which records should be included. Technically, this is the SQL where clause for a select statement and any syntactically correct and allowed where clauses may be used, including functions.

If the name of a column in the file is used in the condition, the file identifier F should be used to ensure that the column will be properly identified at runtime. For example, use F.CUSTNO instead of CUSTNO.

The name of a column in the join file used in the condition should start with the file identifier defined in parameter File ID.

String constants should be delimited with a single quote '.

Placeholders can be used in the SQL string and will be replaced with the actual value for the placeholder at execution time.
Additionally, the ? symbol can be used as a replacement value for specific characters in a field name. At execution time, MDCMS will replace the complete field name with the first system or SQL long name that matches the field name string containing one or more ? symbols. This is helpful when the field name has a different prefix or suffix, depending on the file, so that the same condition can be applied in spite of the variation.

The condition can be left blank if it is used just to create a subset of files to be updated within the template.

Function Keys
F3=Exit
F4=Browse – Select a field in the file to insert into the condition string
F7=Placeholder – Select a placeholder to insert into the condition string

Files for Data Copy Template Condition

```
MDCFCDC                          MD T 8.2 dev                              9.07.19
SCRN1                Files for Data Copy Template Condition              10:38:32

Template: TESTLOC     Condition: just certain customers
                    Current View: Files Assigned or matching Filter Values
Type options, press Enter.
 1=Apply Condition  Q=Query File
    __________ __________
Opt Library    File       Description
 1  MDADMT72   MDACST     Admin: Customers
 1  MDADMT72   MDAINV     Admin: Customer Invoices
 1  MDADMT72   MDALIC     Admin: Customer Licenses
 1  MDADMT72   MDA013     Admin: Maintenance Overview Workfile



                                                                        Bottom
F3=Exit  F4=Browse  F5=Refresh  F7=Filters  F8=Toggle View  F9=SQL Name
F13=Select All Undefined  F14=Unselect All  F18=Select All including Defined
```

Once a Template Condition has been defined, option F can be used to select which files should use that condition. Files can also be applied to the condition from the Object Listing within the Library Listing for the template using option C=Conditions and then pressing F8 to apply condition numbers.

Option

1=Apply Condition - Select the field to apply the transformation during the copy process. Blank out the 1 to unselect the field.

Q – Query File – bring up the RUNQRY prompt to view the fields and records in the file

If no files currently use the condition, and no filters have been defined to limit the listing of files, then the filter screen will automatically be shown. Otherwise, F7=Filters can be used to view/change the filters at any time.

Filter Fields:

Target Library

Part or all of the system name of the target library containing the files

File System Name

Part or all of the system name of the files

File SQLName

Part or all of the SQL long name of the files

File Description

Part or all of the file text description

Contains Field

Include a file in the list only if it contains a field name (may match part or all of a system or SQL name)

and Contains Field

Include a file in the list only if it also contains a second field name (may match part or all of a system or SQL name)

Function Keys

F3=Exit

F4=Browse – browse the list of Assigned Status codes

F5=Refresh

F7=Filters – view/change the file filters to limit the listing. The listing can be further filtered by entering part or all of library name or file name directly in the fields above the columns.
F8=Toggle View – toggle the listing between:

- only files that use the condition
- only files matching the defined filter criteria
- files that use the condition or match the filter criteria

F9=SQL Name/Description – toggle the view to show either the system name and description of the files or the SQL name of the tables
F13=Select All Undefined – Select to apply the condition to all files in the list that aren't currently using a condition.
F14=Unselect All – Unselect all files in the list that are currently using this specific Template Condition
F18=Select All including Defined – Select to apply the condition to all files in the list, including those that currently use a custom condition or a different template condition.

3.7.5 Data Copy Template Transformations

A Data Copy transformation provides the ability to manipulate the values in table columns as they are copied from one location/library to another. A transformation can be defined for a specific file column from the Objects listing, or it can be defined at the Template level and then applied to any number of file columns within the libraries defined for the template.

MDTransform must be licensed to use Transformations.
If a transformation isn't applied to a file column, then the value for each row in the from library will be copied without alterations.

Template Transformations Screen:

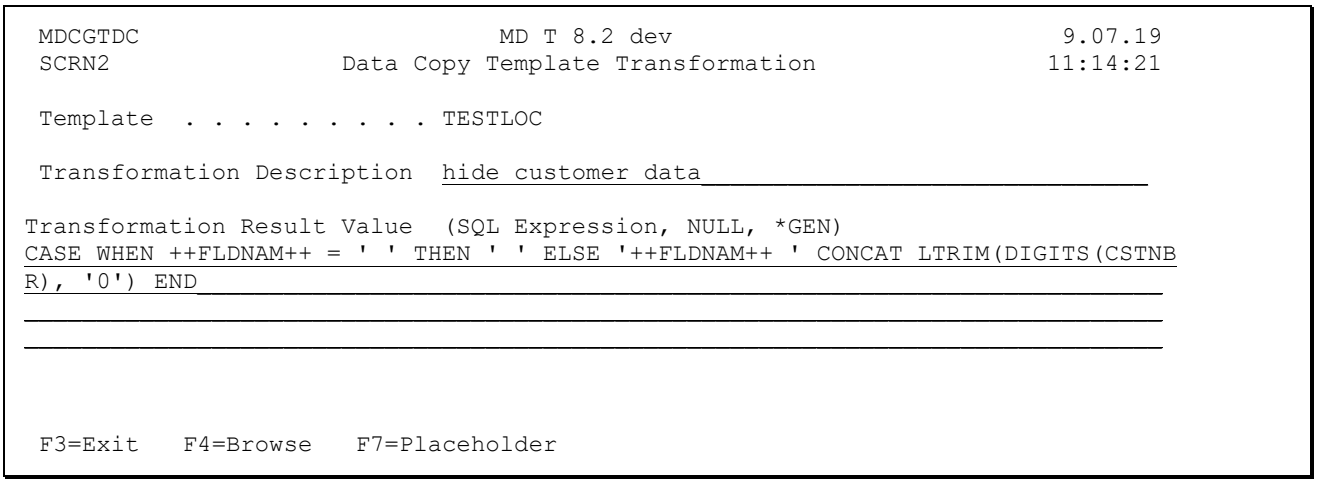
```
MDCGTDC                          MD T 8.2 dev                            9.07.19
SCRN1                 Data Copy Template Transformations                 11:10:33
                                                          Used by
Template               Description      Transformation   File       Field
TESTLOC      Filters: _______________ _______________  __________ __________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  F=Fields

Opt Description                          Transformation
 _  hide customer data                   CASE WHEN ++FLDNAM++ = ' ' THEN ' ' >




                                                                        Bottom
F3=Exit   F6=Add   F11=View Output   F21=Sys Command
```

Filters
The entry of values into one or more of the filter fields will result in a limited list of records which contain the values of those filters.

Options
2 – Edit an existing transformation
3 – Copy the entry to a new transformation
4 – Delete the transformation
5 – Display the transformation details
F – Manage the collection of files that should be applied to the defined transformation.

Function Keys
F3=Exit
F5=Refresh
F6=Add – Add a new Template Transformation
F11=View Output – view/export report output, including Data Copy Log Reports
F21=Sys Command – access a command line

Transformation Detail



Description
A text description of the transformation to explain its usage

Transformation Result Value
The SQL syntax to transform the current value in the from library and then insert that value into the target library. Any syntactically correct SQL expression that is allowed for a column in an SQL statement may be used, including functions.

NULL – set the value to NULL
*GEN – for columns that contain the Generated clause, *GEN can be used to indicate that the system should generate a new value in the target library at copy execution time.

Placeholders can be used in the SQL string and will be replaced with the actual value for the placeholder at execution time.

Additionally, the ? symbol can be used as a replacement value for specific characters in a field name. At execution time, MDCMS will replace the complete field name with the first system or SQL long name that matches the field name string containing one or more ? symbols. This is helpful when the field name has a different prefix or suffix, depending on the file, so that the same transformation can be applied in spite of the variation.

EXAMPLE for Making Customer Identifying Data Anonymous:
CASE WHEN ++FLDNAM++ = ' ' THEN ' '
ELSE '++FLDNAM++ ' CONCAT LTRIM(DIGITS(CSTNBR), '0') END

This is an example showing how a Transformation Template could easily be used to mask customer identifying data when copying from production to test.
If the current value for the field is blank, then the field will remain blank in the target library. However, if it isn't blank, then the value is replaced with the name of the field concatenated by the customer number with leading zeroes stripped off. This is just one example, but the transformation can be as elaborate as necessary, including by using a user-defined function to prepare the value.

Function Keys
F3=Exit
F4=Browse – Select a field in the file to insert into the transformation string
F7=Placeholder – Select a placeholder to insert into the transformation string

Fields for Data Copy Template Transformation

```
MDCFTDC                          MD T 8.2 dev                              9.07.19
SCRN1           Fields for Data Copy Template Transformation              11:27:53

Template: TESTLOC     Transition: hide customer data
                    Current View: Files Assigned to this Condition
Type options, press Enter.
 1=Apply Transformation  5=Field Info  Q=Query File
    __________ __________                __________                        ___
Opt Library    File       Description     Field      Description            Sts
 1  MDADMT72   MDACST     Admin: Customers CONLIC     Licensing Contact      YES
 1  MDADMT72   MDACST     Admin: Customers CONTEC     Technical Contact      YES
 1  MDADMT72   MDACST     Admin: Customers CSTAD1     Address 1              YES
 1  MDADMT72   MDACST     Admin: Customers CSTAD2     Address 2              YES
 1  MDADMT72   MDACST     Admin: Customers CSTAD3     Address 3              YES
 1  MDADMT72   MDACST     Admin: Customers CSTAD4     Address 4              YES
 1  MDADMT72   MDACST     Admin: Customers CSTAD5     Address 5              YES
 1  MDADMT72   MDACST     Admin: Customers CSTNAM     Name                   YES


                                                                        Bottom
F3=Exit  F4=Browse  F5=Refresh  F7=Filters  F8=Toggle View  F9=SQL Name
F13=Select All Undefined  F14=Unselect All  F18=Select All including Defined
```

Once a Template Transformation has been defined, option F can be used to select which file fields should use that transformation.

Option

1=Apply Transformation - Select the field to apply the transformation during the copy process. Blank out the 1 to unselect the field.

5 – Field Info – display additional details about the field.

Q – Query File – bring up the RUNQRY prompt to view the contents of the file

Assigned Sts

Each field displayed in the listing contains a status value and the listing can be filtered by that value.

NO – The field doesn't use the transformation

YES – The field uses the transformation

CST – The field uses a transformation that is specific to that field

OTH – The field uses a different template transformation

If no fields currently use the transformation, and no filters have been defined to limit the listing of fields, then the filter screen will automatically be shown. Otherwise, F7=Filters can be used to view/change the filters at any time.

Filter Fields:

Target Library

Part or all of the system name of the target library containing the files

File System Name

Part or all of the system name of the files

File SQLName

Part or all of the SQL long name of the files

File Description

Part or all of the file text description

Contains Field
Include a file in the list only if it contains a field name (may match part or all of a system or SQL name)

Field System Name
Part or all of the system name of the fields

Field SQLName
Part or all of the SQL long name of the fields

Field Description
Part or all of the field column description

Field Types
Up to 4 different field types to limit the listing to. Press F4 on a field type to select from a list.

Field Length
The minimum and maximum length of fields to include in the list.

Field Decimals
The minimum and maximum number of decimal positions of fields to include in the list.

Function Keys
F3=Exit
F4=Browse – browse the list of Assigned Status codes
F5=Refresh
F7=Filters – view/change the filters to limit the listing. The listing can be further filtered by entering part or all of library name, file name or field name directly in the fields above the columns.
F8=Toggle View – toggle the listing between:

- only fields that use the transformation
- only fields matching the defined filter criteria
- fields that use the transformation or match the filter criteria

F9=SQL Name/Description – toggle the view to show either the system name and description of the files/fields or the SQL name of the tables/columns
F13=Select All Undefined – Select to apply the condition to all fields in the list that aren't currently using a condition.
F14=Unselect All – Unselect all fields in the list that are currently using this specific Template Condition
F18=Select All including Defined – Select to apply the condition to all fields in the list, including those that currently use a custom condition or a different template condition.

3.7.6 MDCPYDATA Command – Copy Library Data

The MDCPYDATA command is provided to run a Data Copy Libraries Template from a command line or scheduler.

Parameter	Description
Data Copy Template	The name of the Data Copy Libraries Template defined in the previous section
Logging Level	A log report can optionally be generated. The report is made available from the MD Reports screen, which is accessible with F11 from most MD screens. 0 – nothing is logged 1 – logs any data areas or files that could not be copied due to errors 2 – log level 1 + any files that had a different record format 3 – log level 2 + all copied objects 4 – log level 3 + all objects not copied because they are on the omit list
Validate Only	*NO – the data is copied *YES – the process is validated but the data itself isn't copied *SQL – the process is validated and the SQL syntax is returned for troubleshooting purposes (if for a specific file), but the data itself isn't copied
Submit Job	*YES – the copy process will be submitted as a new batch job *NO – the copy process will run immediately within the same job
Job queue	The name of the job queue to submit the job to, if requested *DFT – the default job queue defined for the template. If undefined, then *JOBD will be used *JOBD – the job description assigned to the user profile for the job submitting the command
Job queue Library	The location of the job queue to submit the job to, if requested
Specific From Location	The location to copy from *NO – copy from all locations for the template
Specific From Library	The library to copy from *NO – copy from all libraries for the template
Specific Target Library	The library to copy to *NO – copy to all libraries for the template
Specific Object Name	The specific object to copy *NO – copy all included objects for the template
Specific Object Type	The specific object type to copy *NO – copy all types of included objects for the template *DTAARA – copy only data areas *FILE – copy only physical files
Specific Template Condition	Specifies if the list of objects to copy should be limited to the list of files that are applied to a specific Template Condition. 0 – the objects to be copied aren't limited to a Template Condition Otherwise, specify the numeric ID of the condition, which is visible from the detail screen for the condition.
# Parallel Copy Jobs	Specifies the number of jobs to be submitted for parallel copying of the data. If only performing validation or copying a specific object, then this parameter is ignored and 1 job will be used. If 1, then just 1 job is submitted. If more than 1, then 1 control job + n copy jobs are submitted. Ensure that the job queue used allows for the number of jobs selected + 1 (when > 1). A maximum of 9 copy jobs can be used. 0=use the default number defined for the template. If undefined, 1 will be used.
Lock Wait in Seconds	The amount of time, in seconds, that MDCMS will wait to get the necessary lock on an object before timing out. If a time-out occurs, the object will be logged as an error and MDCMS will move on to the next object in the list.

Environment ID	The name of the MDCMS instance (or suffix) - *DFT refers to MDCMS being used in library MDCMS. For a different library suffix, this would be entered for the environment ID.
Email Report to Group	Specifies the ID of the MDCMS user group to receive the Data Copy Log by email. Each user in the group that has an email address defined will receive an email with the Log attached as an xlsx document.
Email Report to User	Specifies the ID of the MDCMS user to receive the Data Copy Log by email. If the user has an email address defined, they will receive an email with the Log attached as an xlsx document.

For each Target object that is not omitted and exists in both the From Library and the Target Library, the following occurs:

1) Automatically increase maximum number of members if less than current number of members in From Library
2) Adds or Removes members as necessary if the From File has <> 1 member
3) Automatically increase maximum number of records if less than current number of records in From Library
4) Automatically handle differing record formats
5) Apply any defined record conditions to limit records copied
6) Perform any defined column transformations during the copy process
7) clear member if from member is empty
8) adjust the next value of an Identity Column in SQL Tables
9) temporarily disable constraints and triggers in a target file during the copy process

3.8 Field Procs to Auto Reapply Templates

When a table containing Field-Level Procedures (Field Procs) is modified, MDCMS can automatically apply the Field Proc definitions to the new version of the file. The Field Procs to Auto Reapply Templates define the criteria to use to select which Field Procs should be auto-reapplied.

When one or more Field Procs meet the selection criteria for a table to be deployed, MDCMS will automatically alter the table to set the field proc definitions prior to copying the existing data from the original version of the table. This ensures that the column's data will continue to be manipulated in the same way that it was before.

When used in conjunction with MDRapid, the manipulation (typically for field encryption) occurs while the application is still live so that the downtime window remains as short as possible.

In order to know where Field Procs are currently used in your database, and which programs that they call, you can use the following SQL statement:

```
SELECT SYSTEM_TABLE_SCHEMA, SYSTEM_TABLE_NAME, SYSTEM_COLUMN_NAME, FIELD_PROC,
CAST(PARMLIST AS CHAR(3000)) AS PARMLIST FROM QSYS2/SYSFIELDS
```

The Field Procs to Auto Reapply templates can be modified from the MDCMS Setup Menu option 5=Templates -> option 22= Field Procs to Auto Reapply.

3.8.1 Field Procs Template Maintenance

Field Procs Templates for Auto Reapply Screen:

```
MDCTMFP                          MD T 8.2 remote                          14.04.20
SCRN1                Field Procs Templates for Auto Reapply                13:11:51
Filters:
 Description      Pgm Lib     Pgm Name    File Lib    File Name   Field Name Dif Err
 _______________  __________  __________  __________  __________  __________  _   _

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename
                                                                      Apply Ign
Opt Template    Pgm Lib     Pgm Name    File Lib    File Name   Field Name Diffs Err
 _  CRYPTO      CRYPTO      CRRP*       *ALL        *ALL        *BY          N    N
 _  CRYPTOALL   CRYPT*      *007        *ALL        *ALL        *ALL         N    Y


                                                                        Bottom
F3=Exit    F5=Refresh    F6=Add    F8=Show Description    F21=Sys Command
```

Filters
The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Position to Template
A value can be entered into the field above the Template column to position the cursor to the first entry in the list greater than or equal to the value.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename the Template

Function Keys
F3=Exit
F6=Add – Add a new Template Definition
F8=Show Description/Show Details – toggle the listing between description and template details
F21=Sys Command – access a command line

Fields
Template
A 10-Character name for the template definition

Description
A 50-Character optional description of the template

Ignore Errors
Y = If the ALTER TABLE statement fails to apply the field procs to the new version of the table, a warning will be placed in the deployment log, but the RFP will continue.
N = If the ALTER TABLE statement fails to apply the field procs to the new version of the table, the RFP will roll back and end.

Automatically Reapply Field Proc when for Program Library
A Field Proc invokes a specific ILE program in a specific library. Use the filter to limit reapplying Field Procs to programs residing in certain libraries.

*ALL – don't filter by program library
generic - use the * symbol at the beginning and/or ending of the value to limit to libraries starting with, ending with, or containing the value.

Automatically Reapply Field Proc when for Program Name
A Field Proc invokes a specific ILE program. Use the filter to limit reapplying Field Procs to programs of a certain name.

*ALL – don't filter by program name
generic - use the * symbol at the beginning and/or ending of the value to limit to program names starting with, ending with, or containing the value.

Automatically Reapply Field Proc when for File Library
Use the filter to limit reapplying Field Procs to files residing in certain libraries.

*ALL – don't filter by file library
generic - use the * symbol at the beginning and/or ending of the value to limit to libraries starting with, ending with, or containing the value.

Automatically Reapply Field Proc when for File Name
Use the filter to limit reapplying Field Procs to files of a certain name.

*ALL – don't filter by file name
generic - use the * symbol at the beginning and/or ending of the value to limit to names starting with, ending with, or containing the value.

Automatically Reapply Field Proc when for Field Name
Use the filter to limit reapplying Field Procs to fields of a certain name.

*ALL – don't filter by field name
generic - use the * symbol at the beginning and/or ending of the value to limit to names starting with, ending with, or containing the value.

Reapply when Field Length or Type is Different in New Version of File

The parameter list for some field procs may be incorrect, if the length, number of decimals or field type changes. Use this flag to decide if a field proc should be reapplied in the case of such a change.

Y = Apply the Field Proc to the new table, even if the length, decimals or type changes.
N = Do not apply the Field Proc to the new table if the length, decimals or type changes.

3.9 Developer Library Naming Templates

By default, the name of the developer library or folder used to make modifications to source code will be the same name as the user profile of the developer and can then be set per user and level.

However, if the library should instead be a shared development library based on a Project, Task, Subtask, RFP or some other entity, then a Developer Library Naming Template can be created and applied to one or more levels to define the naming pattern to be used.

The Developer Library Naming templates can be modified from the MDCMS Setup Menu option 5=Templates -> option 23= Developer Library Naming.

3.9.1 Developer Library Naming Template Maintenance

Developer Library Naming Templates Screen:

```
MDCTMDL                          T84 Demo Dev/QA                          14.04.22
SCRN1                 Developer Library Naming Templates                  22:41:08
Filters
Description: _______________ Pattern: _______________             Appl   Lvl
                                                        Used by: ______ ___
Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View

                                                                 Require at CO
Opt Appl   Lvl  Template Description                             Prj Tsk S RFP
 _  TEST01 *ANY any other TEST01 level with user/spec ifs         N   N  N  N
 _  TEST01  110 branch 1 with proj/lvl/task                       Y   Y  N  N
 _  TEST01  120 branch 2 with level placeholder                   N   N  N  Y


                                                                      Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F21=Sys Command
```

Filters
The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Used by
To see which template, if any, would be applied to a specific application level, enter the value for the application and level and press Enter.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name
4 – Delete a Template definition
5 – Display all details of the Template definition

Function Keys
F3=Exit
F4=Browse list of possible values for the Application and Level
F6=Add – Add a new Template Definition
F21=Sys Command – access a command line

Developer Library Naming Template Fields

Application

The application that will be using this template. Set to *ANY if any application should use the template

Level

The level that will be using this template. Set to 0 if any level should use the template.

When a checkout request is being created, MDCMS will apply a template in the following order:

1) A template exists exactly matching the Application and Level
2) A template exists exactly matching the Application and the Template Level is set to 0
3) A template exists exactly matching the Level and the Template Application is set to *ANY
4) A template exists and the Template Application is set to *ANY and the Template level is set to 0

If none of the 4 combinations exist, the default naming per user and target level will be applied.

Description

A 50-Character optional description of the template

Object Library Naming Pattern

*USER = the default naming per user and target level will be applied
Otherwise, specify any combination of fixed values together with MD, Project, Task, Level or Custom placeholders. Use F7 to select a placeholder from a list and insert it into the pattern at the current cursor position.

Example Library Naming Pattern:
++PROJID(1,4)++++PROLVL(2,2)++++TASKID(TLZ)++

In this example, the library name will be:
the first 4 characters of the Project ID for the object request
+ the 2nd and 3rd digits of the promotion level
+ the Project Task number for the object request with any leading zeroes trimmed from it.

Source Library Naming Pattern

*SAME = use the same value as for the Object Library Naming Pattern
*USER = the default naming per user and target level will be applied
Otherwise, specify any combination of fixed values together with MD, Project, Task, Level or Custom placeholders. Use F7 to select a placeholder from a list and insert it into the pattern at the current cursor position.

Object Folder Naming Pattern

*USER = the default naming per user and target level will be applied
Otherwise, specify any combination of fixed values together with MD, Project, Task, Level or Custom placeholders. Use F7 to select a placeholder from a list and insert it into the pattern at the current cursor position.

Example Folder Naming Pattern:
/home/++APPLIC++/dev/++PROJID++/++TASKID(TLZ)++

In this example, the folder name for IFS objects will be:
Parent directory of /home
+ child directory of the application code
+ child directory of dev
+ child directory of the Project ID for the object request
+ child directory of the Project Task number for the object request with any leading zeroes trimmed from it

Source Folder Naming Pattern
*SAME = use the same value as for the Object Folder Naming Pattern
*USER = the default naming per user and target level will be applied
Otherwise, specify any combination of fixed values together with MD, Project, Task, Level or Custom placeholders. Use F7 to select a placeholder from a list and insert it into the pattern at the current cursor position.

Auto-Delete Libraries
N – Any libraries created to contain the checked-out source and objects will remain on the partition until they are manually deleted.
Y – The MDCLEAN service job will automatically delete a library once there are no longer any active object requests used to migrate from the location and the library/folder was created prior to the current day.

Auto-Delete Folders
N – Any IFS Folders created to contain the checked-out source and objects will remain on the partition until they are manually deleted.
Y – The MDCLEAN service job will automatically delete a folder once there are no longer any active object requests used to migrate from the location and the library/folder was created prior to the current day.

Minimum Install Level
When selecting to auto-delete libraries or folders, MDCLEAN can additionally wait until an installation for the requests has occurred at or above the Promotion Level specified.

Authority Template for new Libraries
MDCMS will automatically create the library if it doesn't exist and can apply ownership and user authority based on an Authority template.

*USER – don't apply a template – the user of the job will be the owner of the library
Otherwise, the name of an OS400 Authority Template. Press F4 to select from a list.

ASP Device for new Libraries
MDCMS will automatically create the library if it doesn't exist into the ASP defined here.

*SYSTEM – create the library in the system ASP
Otherwise, the name of an ASP device.

Authority Template for new Folders
MDCMS will automatically create the folder path if it doesn't exist and can apply ownership and user authority based on an Authority template.

*USER – don't apply a template – the user of the job will be the owner of each new folder in the path
Otherwise, the name of an IFS Authority Template. Press F4 to select from a list.

Require Project at Checkout
If Y, MDCMS won't allow a modification request to proceed unless a Project has been selected for the request.

Require Task at Checkout
If Y, MDCMS won't allow a modification request to proceed unless a Project Task has been selected for the request.

Require Subtask at Checkout
If Y, MDCMS won't allow a modification request to proceed unless a Project Subtask has been selected for the request.

Require RFP at Checkout
If Y, MDCMS won't allow a modification request to proceed unless an RFP has been selected for the request.

3.10 Object Approval Templates

Object Approval Templates provide a means of defining which groups of users must approve an RFP, before the RFP can be installed. Object Approval Template assignments are done at the Object level rather than Attribute level in order to allow for finer granularity.

In order for the templates to be used in the RFP process, the target level and/or target attributes of the RFP must set Auto-Approve to T=Templates.

The Developer Library Naming templates can be modified from the MDCMS Setup Menu option 5=Templates -> option 24=Object Approvals.

To manage the Template Headers and Approval Groups, you must have MDSEC authority to code md/22.

3.10.1 Object Approval Template Header Maintenance

Object Approval Templates Screen:

```
MDCTMRA                          T86 Dev/Test                              8.01.25
SCRN1                     Object Approval Templates                       12:41:27
Filters:
Template   Description   Owner      Approver   Obj Name   Obj Type
__________ ____________ __________ __________ __________ __________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  7=Rename  A=Approvers  O=Objects

Opt Template   Description                        Owner      Approvers Assigned
 _  JUSTDEVS   Just Developer approvals           IBMDEV           1         3
 _  NEEDAPR    Need approval                                     2
 _  TEST1      Test objects 1                     EUROAPP          2         4
 _  TEST2      Test objects 2                     PGMR 1           2         7



                                                                        Bottom
F3=Exit   F5=Refresh   F6=Add   F21=Sys Command
```

Filters
The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Options
2 – Edit an existing Template definition
3 – Copy the definition for a Template to a new Template name. The Approvers will also be copied.
4 – Delete a Template definition
5 – Display all details of the Template definition
7 – Rename a Template definition
A – View/Manage the list of Approval Groups for the Template
O – View/Manage the list of Assigned Objects for the Template

Function Keys
F3=Exit
F5=Refresh the listing
F6=Add – Add a new Template Definition
F21=Sys Command – access a command line

Object Approval Template Header Fields

Template ID
A unique 10-character identifier for the template

Description
A 50-Character description of the template

Business Owner Type
G – The business owner is a user group defined in User Groups
U – The business owner is a specific user defined in MDSEC

Business Owner
The optional User Group or User that is designated as the Owner (from a business perspective) of all objects assigned to the Template. Use F4 to select a value from User Groups or MDSEC Users, depending on the Business Owner Type.

Allow *ANY/*gen* Value
Y – the Object Name, Object Type and/or Target Library Folder values for object assignments may be set to *ANY or have a generic value using *value* in order to assign entire groups of objects to the template based on a naming pattern.
N - the Object Name, Object Type and Target Library Folder values must be for a specific object

Allow no Approvers
Y – Objects can be assigned to the Template if no Approval Groups are defined for the Template. This means that any such objects on an RFP will be automatically approved for installation.
N – Objects can't be assigned to the Template until at least 1 Approval Group is defined for it.

Require Recomp Approval
Y – Objects requested for recompile (or Update) will require approval for installation
N - Objects requested for recompile (or Update) will be automatically approved for installation

Require Delete Approval
Y – Objects requested for deletion will require approval for installation
N - Objects requested for deletion will be automatically approved for installation

3.10.3 Approval Groups for an Object Approval Template

View/Manage the list of Approval Groups registered for a Template by using option A=Approvers from the Object Approval Templates screen. One member of each group will be required to approve the installation of an RFP if one or more objects on the RFP are assigned to the Template.

Filters
The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Options
3 – Add an Approval Group to the Template based on the name of the selected group.
4 – Remove a Group from the Template
G – Group Def – View/Manage the details and users belonging to the User Group

Function Keys
F3=Exit
F5=Refresh the listing
F6=Add – Add an Approval Group to the Template
F21=Sys Command – access a command line

Approval Template Group Fields

Approval Group
The ID of a valid User Group

Application
The application(s) that require that the user group provides approval. A generic value can be used. If multiple specific applications require approval for the template, then add additional group records.
*ANY – any application will require the group

Level
The promotion level(s) that require that the user group provides approval. A generic value can be used. If multiple specific levels require approval for the template, then add additional group records. The format of a level number is 3-digit numeric.
*ANY – any promotion level will require the group

3.10.5 Assigned Objects for an Object Approval Template

View/Manage the list of Objects assigned to a Template by using option O=Objects from the Object Approval Templates screen. When an object is included in an RFP, one member of each Approval Group defined for the template will be required to approve the installation of the RFP.

MDCMS weighs the values for the Object name, Object Type and Application so that specific object values have priority over *generic* values and *generic* values have priority over *ANY values when determining which template the object on an RFP belongs to.

To manage any Object Assignments, you must have MDSEC authority to code md/23.
When you don't have global authority to code 23, you can still add/remove object assignments when you have authority to code 23 for the lowest Promotion Level for a specific Application value.

Filters
The entry of values into one or more of the filter fields will result in a subsetted list of records which contain the values of those filters.

Options
3 – Add an Object to the Template based on the values of the selected object
4 – Remove an Object from the Template
5 – View the full values for the Object Name, Type and Target Library/Folder
8 – Move the object to a different Template

Function Keys
F3=Exit
F5=Refresh the listing
F6=Add – Add an Object to the Template
F21=Sys Command – access a command line

Object Fields

Object Type
The type of Object based on MDCMS attribute types. Press F4 to select from a list.
If the Template allows *ANY/*gen* values, *ANY can be used to indicate any type of object. Generic naming patterns are not allowed for the Object Type.

Object Name
The name of the Object. Press F4 to select from a list.
If the Template allows *ANY/*gen* values, *ANY can be used to indicate any object name and *val* can be used for naming patterns for the object. The values are not case sensitive.

Application
The Application group that the object belongs to.
If the Template allows *ANY/*gen* values, *ANY can be used to indicate any application. Generic naming patterns are not allowed for the application.

3.11 OS/400 Locations

The OS/400 Locations define all locations where MDCMS should connect to for the distribution of settings and promotions, or for data connections to synchronize project, RFP and MDWorkflow information and perform remote retrieval of source or MDXREF information.

MDCMS utilizes the DDM (Distributed Database Management) features of the IBMi system for executing the data connections. MDSEC can be used to manage the security and logging of DDM usage.

For the distribution of promotions, a variety of methods are available.

```
MDCRLOC                          COMPANY NAME                          04.09.15
SCRN1                          OS/400 Locations                        22:37:07
Filters                                                        Dst
Loc ID     Description     Address          Group      Psh Pul St Mtd Snd A W C E
__________ _____________ _____________ __________  _   _  _  ___  _  _ _ _ _

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=Display  7=Rename  C=Src Comp  G=Groups
 S=Sync  U=User Mapping
                                      Sort Push Pull    Dst Snd      Src
Opt Loc ID     Description           Seq  Job  Job Stg Mtd Job A WF Cmp E
 _   *LOCAL     MD Dev                  1  1        N  LCL     Y  Y  N  N
 _   MDDEMO     MD Demo                 2  1        N  FTP  1  Y  N  N  N

                                                                    Bottom
F3=Exit  F4=Browse  F6=Add  F8=Sort by Seq  F9=Pending Data  F14=Clear Errors
```

Screen Definitions:

Opt
2=Edit – Edit the parameters for a location
3=Copy – Copy the parameters of an existing location to a new location
4=Delete – Delete a remote location from the list.
7=Rename – Rename a remote location id.
C=Src Comp – Define the Level residing at the location for source to be compared to when that source is checked out on the local system.
G=Groups – View the Location Groups that the location belongs to. Additionally, manage the Location Groups. Location Groups are used to provide a means of filtering a list of Locations in the Distribution screens by any definition necessary for the organization. Multiple locations can belong to a location group and multiple location groups can contain the same location.
S=Sync – Provide project information from the local system to the target system. If the target system contains the MDWorkflow repository, then additional object and promotion information is provided. If the local system contains the MDWorkflow repository, it should also be synced initially to load the local information into the MDWorkflow tables.
U=User Mapping – Map the User IDs of Sending Users on the local system to the corresponding User IDs on the target system, if the target system uses different naming patterns.

Special Function Keys
F8-Sort by Seq/Sort by ID – toggle the listing between ordering the entries by sort sequence or by the Location ID.
F9-Pending Data – View a count of pending data transactions waiting to be delivered to each target system via DDM. Option 4 can then be used from the Pending Data listing to delete the pending records for a Location.
F14-Clear Errors – Reset all error flags to N. The error flag for a given location will then return to Y only if a new error occurs for the location.

3.11.1 Location DDM Settings

Location settings span up to 3 pages per location. The first page defines the DDM settings for the location.

Location ID
A unique ID for the location. This ID must match the Location ID entered in the system settings on the target system.

Additionally, there is the special value of *LOCAL to maintain MDWorkflow, source comparison and local branch distribution settings for the local system.

Description
A free-format description of the location

Address
The network host name or IP address of the target OS/400 partition

Database Name
The name of the DB/400 database containing MDCMS at the remote location. To easily find the name of the database, enter command STRSQL at a command line on the remote system. The database name will be displayed.

DRDA Port
The port number used on the remote system for handling DDM service requests. *DRDA is the default port number, which is correct in most circumstances.

Loc Active
A flag indicating if connections should be attempted to this location

MDPUSH Job#
If the local system can connect to the location via DDM, a number between 1 and 9 should be specified. This number corresponds to the MDPUSH job to push asynchronous data to the location.

If there are only a couple of locations to push information to, it is recommended to only use 1 push job. However, if there are many locations, then it is recommended to split the locations across several MDPUSH jobs in parallel.

MDPULL Job#
If the local system can connect to the location via DDM, but the location can't connect to the local system, then a queue number between 1 and 9 should be specified. This number corresponds to the MDPULL job to pull asynchronous data from the location.

If there are only a couple of locations to pull information from, it is recommended to only use 1 pull job. However, if there are many locations, then it is recommended to split the locations across several MDPULL jobs in parallel.

In general, it is better to be able to push rather than pull for performance and administration reasons. However, if a firewall only allows one-way DDM connections, then the pull process will enable this to be technically possible.

Stage Data
If the local system can't connect to the location via DDM, but the location can connect to the local system, then the local system can stage the data and the remote location can use an MDPULL job to retrieve the staged data.

MDWorkflow Rep
Set this value to Y if this location contains the repository that the MDWorkflow web application connects to. This indicates to the local system that additional information needs to be distributed to the location so that all necessary data appears in MDWorkflow.

If the local system contains the repository, then set this parameter to Y for location *LOCAL.

MDWorkflow Sort#
If the local system contains the MDWorkflow repository, then set the sort sequence for each location to be viewed from within MDWorkflow.

Remote User
The user id to be used on the remote IBMi in order to process synchronizations or source retrieval. The password for the user on the remote system must also be entered.

This user requires either *ALLOBJ authority, or the user should be granted *CHANGE authority to all *FILE objects in MDCMS, MDSEC and MDXREF on the target location.
If authority is specifically granted to this user on the library objects, it's important to reapply the authority when an upgrade of MDCMS is performed.

UTC Offset
The difference in time between the local time of the location and UTC standard time. The 5-character field has the following format:
shhmm, where s=sign (+/-), hh=hours (00-24) and mm=minutes (00-59)

*LCL – special value for UTC offset to indicate that the target location has the same UTC offset as the local system.

Special Function Keys:
F10=Test DDM Connection – test the DDM connection to the remote location based on the current settings for the location. Pressing this will also refresh the Version, Build Date and Install Date information of MDCMS on the remote location that is shown in the local Location display.
F14=Show/Hide New PW – if adding or modifying the value for the password, press F14 to see the entered value for the field. This will not show the currently stored value of the password for security reasons.

3.11.2 Location Distribution General Settings

Location settings span up to 3 pages per location. The 2nd page defines the general Distribution settings for the location.

Dist. Method
The method to send an RFP or Settings from this partition to another partition

Value	Description	Distribution Address Value
CDR	IBM Connect:Direct	C:D Node
FTP	Native File Transfer Protocol	Hostname/IP
GOA	Linoma GoAnywhere MFT	GA Project ID
LCL	Direct Send to *LOCAL Level For use on the *LOCAL location only. Typically used when sending promotions from the top of a deployment branch to the bottom of the trunk. Direct Save/Restore of Send Package without use of Network Connectivity.	N/A
MDF	MDFTP Client to transfer via FTPS or SFTP. A location entry for a FTPS service (such as OpenSSL) or SFTP service (such as OpenSSH) must be defined in the Remote Server Location Settings using MDOpen. The connection information is then pulled from that entry.	Remote Server Location Address
OBJ	ObjectConnect (SAVRSTOBJ). Transfer using command SAVRSTOBJ, if ObjectConnect is installed and configured on both systems. If DDM is defined for the Location, MDCMS can automatically receive the file on the target. Otherwise, use MDRCVSNA for user *SAVF to listen for new RFPs to receive on the target.	The Control Point name of the remote system. It can be unqualified if for the same Network ID, otherwise use format NNNN.CCCCCCCC where N is the Network ID and C is the Control Point name. This information can be viewed using command DSPNETA on the remote system.
OPT	Optical Device	Device Name
SFF	Save File with Full RFP Information for manual distribution to other systems that use MDCMS. In order to receive the file into a target system, place it in folder /MDCMS/SEND/(instance) on that system and use command MDRCVIFS to process it.	IFS Folder including Path
SFO	Save File with Source/Objects only for manual distribution to other systems that don't use MDCMS	Library Name OR IFS Folder including Path
SNA	IBM Systems Network Architecture	SNA Queue
TAP	Tape Device	Device Name
XCM	CA XCOM Data Transport	XCOM Remote System

Dist. Address
The value of the address based on the method in the table above. Special value *LOCADR can be used if the DDM address is the same as the distribution address.

MDSEND Job#
If the selected distribution method will transfer RFPs to a remote location, a number between 1 and 9 should be specified. This number corresponds to the MDSEND job to transfer the built save file asynchronously to the location. During the RFP Send process, one job runs per RFP that saves the source, objects and metadata to a save file. Then, the transfer of this save file is passed to the MDSEND job defined for the target location. This concurrent processing provides a much lower amount of time to complete the transfer of RFPs to multiple locations.

Set the number of MDSEND jobs to start in the services settings to match the highest job# defined in the location settings.

Target Release
The operating system that is currently installed on the destination system. This value can be overridden for each Distribution Level.
*CURRENT – the default indicating that the OS versions are equal between the 2 systems
*PRV – the destination system runs on the previous OS version
VxRxMx – the exact version number of the destination system (e.g. V6R1M0)

Data Compression
If the data sent to the target location should be compressed before sending.
N – the save file isn't compressed before sending. The preparation of the save file takes a bit less time, but the transfer of the data may take 2-3 times longer.
Y – the save file size is minimized using high data compression. The preparation of the save file takes a bit more time, but the transfer of the data will be 2-3 times faster. Recommended for slow connections.

When to Send

Determines when and whether to send an RFP to the target level. This value can be overridden for each Distribution Level.
A – Automatically send to the target level as soon as the RFP is installed into the distribution level
G – Automatically send to the target level as soon as all quality gates for the installed RFP are open.
Quality Gates: MDWorkflow Acceptance, Task Status Boundary, Code Review or Automated Testing
M – When manually sending an RFP, the target level will be selected by default. The target level will also be selected when a Task Status Trigger to Send RFPs is executed.
N – When manually sending an RFP, the target level will not be selected by default. A trigger will not cause a send to the target level and an RFP will auto-close even if the target level hasn't been sent to.

Object Owner
The Owner of the Temporary Library and Objects that are saved into the Save File

Public Authority
The object authority granted to *PUBLIC for the objects saved into the Save File
- *ALL - All Authority
- *AUTL - Authority defined by Authorization List
- *CHANGE - Change Authority
- *EXCLUDE - No Authority
- *SAME - The authorities are same as in local environment
- *USE - Usage Authority

Send Objects for Attributes containing Source
Y – Source will not be compiled on the target system, so send the object (Option O or B)
N – Source will be compiled on the target system, so only send the source (Option S)

Send Objects for Attributes not containing Source
Y – Objects should be sent to target system (Option O), because a compile will not occur on the target.
If Send Source for Modifications is set to D, database objects will not be sent as a compile is expected.
N – Objects should not be sent – target system intended for source only (Option N)

Send Source for Modifications
Y – Source is permitted on the target system, at least temporarily (Option S or B)
N – Source is not permitted on the target system (Option O)
D – Source should only be sent for Database objects, as only they will be compiled on the target

Send Source for Recompiles
Y – Source will be compiled on the target system, but it is not permanently stored there. MDCMS will then convert the request to modify and send the source for the location. (Option S)
N – Source is not permitted on the target system (Option O)

If not sending Source, Send Request for *SOURCE Objects
Y – *SOURCE types will send only the request records (Option R)
N – *SOURCE types will not be sent (if Send Source is set to N) (Option N)

Send *DATA or *DTAGRP attributes
Y – *DATA and *DTAGRP attributes will be sent to target system (Option O)
N – *DATA and *DTAGRP attributes will not be sent to target system (Option N)

Send *MODULE attributes
Y – *MODULE attributes will be sent to target system (Option O)
N – *MODULE attributes will not be sent to target system (Option N)

The above Send rules can be overridden for the distribution levels and for each attribute in a distribution level.

3.11.3 Additional Distribution Settings for Connect:Direct

Connection User
The optional Connect:Direct local profile that will be used to execute the transfer

Password
The optional Connect:Direct password for the local execution profile (optional)

3.11.4 Additional Distribution Settings for FTP

Connection User
The profile on the remote IBM i partition to use for the FTP connection.
It is recommended to create a user profile specifically for FTP use in MDCMS. The keywords USRCLS(*USER) INLMNU(*SIGNOFF) and PWDEXPITV(*NOMAX) are recommended. The user will need *CHANGE authority to library MDCMS and *ALL authority to file MDCMS/MDDFTPM.

If authority is specifically granted to this user on the library objects, it's important to reapply the authority when an upgrade of MDCMS is performed.

Password
The password for the user on the remote system. Depending on the password settings on the target system, the password may be case-sensitive and up to 40 characters in length.

Remote ASP Device
The ASP device on the remote system containing the MDCMS instance

- *DFT – The device attributed to the connection user on the remote system
- The alphanumeric device ID for the ASP

Server Port
The FTP Port number on the remote system.

- *DFT – Port 21
- *SECURE – Port 990 for FTP using SSL
- 1 - 65535

Secure Connect
The security mechanism to protect the user/password and possibly data information transferred via FTP.

- *DFT - If the PORT parameter specifies *SECURE or 990, *IMPLICIT is used; otherwise, *NONE is used.
- *IMPLICIT – immediately attempt to use SSL when connecting to the server
- *SSL – use a SSL protected session after the connection has been made
- *NONE – no encryption used

Data Protection
The type of data protection used during the FTP transfer

- *DFT – protection is based on the connection type
- *PRIVATE – the data is encrypted
- *CLEAR – the data is not encrypted

Toggle Ext. PASV
Specifies whether or not to toggle the use of Extended Passive mode within the FTP session. Only potentially necessary for OS V6R1M0 or higher.

Toggle PASV
Specifies whether or not to toggle the use of Passive mode within the FTP session

Toggle Ext. PORT
Specifies whether or not to toggle the use of Extended Port mode within the FTP session. Only potentially necessary for OS V6R1M0 or higher.

3.11.5 Additional Distribution Settings for ObjectConnect

Remote ASP Device

The ASP device on the remote system containing the MDCMS instance

- *SYSBAS – MDCMS is installed on the system base ASP
- The alphanumeric device ID for the ASP

3.11.6 Additional Distribution Settings for SFO

Authorization List

- *NONE – Objects in Save File not protected by an Authorization List
- Name of Authorization List existing on local system that would also be required to exist when library is restored on target systems

Prompt for Name

- Y – For each RFP that is sent manually from the Send Promotions list using method SFO, the name of the Library containing the Objects, the name of the Save File, and, if relevant, the name of the IFS File can be optionally provided custom names.
- N – the Library, Save File and IFS File names will be generated by MDCMS and have the format MD0nnnnnnn

3.11.7 Using GoAnywhere™ to Distribute MDCMS Promotions and Settings

GoAnywhere™ is a managed file transfer (MFT) solution from Linoma Software that allows organizations to secure and automate the exchange of data with their trading partners, customers, employees and internal systems.

For MDCMS, GoAnywhere™ can be used to transfer promotions and settings via FTP, FTPS, SFTP or SCP.

Steps necessary to use GoAnywhere™ within MDCMS:

1) Separately purchase and Install GoAnywhere™ from Linoma Software
2) If GoAnywhere™ is installed to a library with a name other than GOANYWHERE, then change the value of Data Area MDCMS(instance)/MDGOALIB
3) Define a FTPS, SFTP, or SCP Server resource for the remote partition that MDCMS must deploy to
4) Define a IBM i Server resource for the remote partition that MDCMS must deploy to
5) Save the following XML code shown below to a file. Replace --your FTPS Resource—by the name of your Transmission resource. If using SFTP or SCP, the task element will need to be renamed from ftps to scp or sftp
6) Import the XML file into the Projects list
7) Define a Distribute Queue where the Distribution Queue name is the name of the GoAnywhere™ project, including the relative path. For example /MDCMS_SEND_1. The Distribution Queue Method must be set to GOA.
8) Repeat steps 3 – 7 for each additional remote partition

Project XML

```
<?xml version="1.0" encoding="UTF-8"?>
<project name="MDCMS_SEND_1" mainModule="Main" version="1.0" logLevel="debug"
         onError="abort">
   <module name="Main" logLevel="debug">
      <ftps label="FTPS" resourceId="--your FTPS Resource--" version="1.0"
            logLevel="debug">
         <put label="Put Savefile" sourceFile="${ifsSavefile}"
destinationFile="”${ifsSavefile}._.${user}._.${sys}._.${agp}._.${lvl}._.${rfp}"
              type="binary" />
      </ftps>
   </module>
   <description>Send MDCMS RFP/Settings to Remote Server 1</description>
</project>
```

3.11.8 Source Comparison Settings

```
MDCSCMP                          COMPANY NAME                          04.09.06
SCRN1                    Source Comparison Settings                    10:37:42

Location: MD71       MD 7.1 Partition

For each Appl Level where a Source Comparison should occur, enter the Level
of the Environment that the checked out source should be compared to.

Appl  Level  Description                                 Compare to Level
HUBI    12    Custom Company Dev 12                            31
TEST    10    Test 10                                          50
CMP     12    Custom Company Dev 12                            __
HUBI    13    Custom Company Dev 12                            __
TEST    11    Test 11                                          __
TEST    12    Test 12                                          __
TEST    25    Emergency for v10                                __




                                                                          Bottom
F3=Exit    F5=Refresh
```

This screen is displayed when a 'C', for Source Comparisons, is requested for the *LOCAL location or a Remote Location within the OS/400 Locations listing.

Appl/Level
Each Application Level that is defined in MDCMS on the local System that allows checkout. If a Compare to Level at another remote location has been defined for an Application's Level, then that Level will not be displayed for the selected remote location. Only levels that are available to the selected remote location will be displayed in the list.

Compare to Level
The level number for the Application at the Remote Location that should be compared to, when checking out source from the selected level on this System.

If the Compare to Level number is higher than 0, then every time that source is checked out on this system for the selected level, the source will be compared to the source residing within the specified level on the Remote System. If the source versions are different, a warning screen will be presented to the programmer.

3.11.9 Location User Mapping

```
MDCDSTU                          COMPANY NAME                           1/22/14
SCRN1                    Distribution User Mapping                      10:37:59

Location: MD71       MD 7.1

Filter by Local User: __________  Desc: ________________  Target User: _________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View

Opt Local User Description                                        Target User
 _   *DFT       Default Target User                              *SAME
 _   MMORGAN    Michael Morgan                                   MMORGANBU



                                                                        Bottom
F3=Exit   F4=Browse   F5=Refresh   F6=Add   F11=View Output   F21=Sys Command
```

This screen sets the mapping of User IDs from the user sending the RFP on the local system to the user receiving the RFP on the target system. This provides the ability to use automated receipt on the target system even when the naming patterns for the users are different compared to the local system or when responsibility of the RFPs should be handed off to a different person on the target system.

Local User
*DFT – the target user mapping to invoke for any profile that is not explicitly defined in this list. If *DFT is not defined and the user is not defined, the target User ID will remain the same

User ID – the name of a valid User ID on the local system

Target User
*SAME – the target user ID is the same as the local user ID

User ID – the name of a valid User ID on the target system

Function Keys:
F3=Exit
F4=Browse – Browse the list of valid values for a field
F5=Refresh – Refresh the list view
F6=Add – Add a new mapping entry to the list
F11=Output – Display the MD Output panel and other spool files
F21=Sys Command – displays the IBMi command entry screen so that IBMi commands may be run without the need to exit MDCMS.

3.11.10 MDLOCPWD – Change Password for MD Locations

MDCMS is delivered with a command-based API that provides for the systematic update of the password stored for the user defined for the MDCMS OS/400 Location DDM Remote user and/or MDCMS OS/400 Location FTP Connection User.

The MDCMS command is named ***MDLOCPWD*** and is located in library MDCMS*.

MDLOCPWD Parameter Table

Name	Type	Length	Description
USER	CHAR	10	The name of the user defined for one or more OS/400 locations in MDCMS on the local partition.
PWD	CHAR	40	The new, mixed-case password to use when connecting to the location. The password is updated for the MDCMS OS/400 entry only – it doesn't change the actual password for the user profile on the remote system.
LOC	CHAR	10	The Location ID of the OS/400 location entry to update. In order for the password to be updated, the location ID value must match (or be *ALL) and the user must match.

3.12 Distribution Levels

The Distribution Level Maintenance function defines the target levels for the distribution of promotions or settings to remote systems. Multiple target levels are permitted for a given combination of Application, Level and Location.

The settings for a Distribution Level are inherited from the Location. The following settings can then be overridden per target level:

- Description of Level
- When to Send
- Target Release
- Data Compression
- Target Attribute Rules

3.12.1 Distribution Level Listing

```
MDCDSTQ                          COMPANY NAME                           1/22/14
SCRN1                        Distribution Levels                        18:35:03
         Appl Lvl  Location    Tgt Lvl  Dft  Release   Method  Group
Filters: ____ __   __________    __      _   ________   ___    __________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=Display  A=Attributes  O=Obj Override  T=Test

                                                        Tgt     Target
Opt Appl Lvl Location   Description                     Lvl Dft Release Method
 _  TEST 10  MD71       MD 7.1                           20  Y  *CURRENT FTP
 _  TEST 10  SFF        Full Save file                   10  N  *CURRENT SFF
 _  TEST 10  SFO        Clean Save file                  10  Y  *CURRENT SFO
 _  TEST 25  *LOCAL     MD 6.1                           50  Y  *CURRENT LCL



                                                                      Bottom
F3=Exit   F4=Browse   F6=Add   F8=Settings
```

Filters

The entry of values into one or more of the filter fields will result in a subsetted list of distribution levels which exactly match those filters. For example, enter '10' in the lvl filter to see only distribution levels for level '10'.

Editable Fields for a Distribution Level

Most of the fields can be set at the location prior to the creation of the Distribution Level and those values will be automatically attributed to the Distribution Level when it's created. If a field value for the Location is changed after the Distribution Level already exists, that value will not be updated in the Distribution Level. Any Distribution Level that has exceptions to the default location values can be edited here.

Ignore Non-Branch

This field is only set for individual Distribution Levels.
N (default) – Send RFPs from the sending level to the target level, regardless if the RFP originated in the same branch as the sending level or not.
Y – Only Send the RFP to the target level if it originated in the same branch (chain of levels) as the sending level. This provides an automated method to avoid looping between levels when replicating objects between the trunk and branches.

Local Dist Reason
This field is only set for individual Distribution Levels and only appears when the Distribution Method is LCL (local).

S=Standard (default) – the target local level is to be treated as a standard level as when distributing to a remote level.

D=DB Sync – Send any database requests to the target level in order to sync the branch of that level with the database objects and to recompile any existing dependencies over the database objects in the branch.

If development or test branches are defined that contain their own persistent Database libraries, it is recommended to create a Distribution Level from the copy of the production level on the local partition to the lowest level for each of those branches. It is also recommended to set Auto-Send to Y for the production copy level and Default to Send should be set to Y for the distribution level.

When the send occurs, MDCMS will only include object requests for *DTAARA, *FILE (PF-DTA or LF) or any of the *SQL types (except *SQLSCR and *SQLPKG). Additionally, a DB object request will be omitted from the send if the same object is currently checked out for modify or delete in the target level.

When the receipt occurs, MDCMS will automatically add recompile requests for any dependencies that exist in any level of the branch of the target level and will then auto-submit the RFP at each level for the branch. This keeps the entire process automated unless an error occurs or manual approval or installation is required.

M=Merge with Trunk – the sending level is the top of a Branch and the target level is the bottom of the Trunk. Once the reason is set to M, the source code in any RFPs sent to the Trunk level with be automatically check for conflicts and the target RFP will require that the conflicts are resolved in the MDOpen Compare with Branch dialog before the target RFP will be allowed to be promoted.

N=Non-Git Requests – the sending level may contain object requests that originated in Git along with object requests that didn't originate Git. The send to the target level should only contain those object requests that didn't originate in Git. Those that did originate in Git will be pushed directly to the target level from Git via a Merge from a Pull-Request.

Opt
2=Edit – Edit the override parameters for a distribution level
3=Copy – Copy the override parameters of an existing distribution level to a new target level
4=Delete – Delete a distribution level
5=Display – Display the override parameters for a distribution level
A=Attributes – State whether or not each type of source or object is to be sent to the target level.
O=Obj Override – Maintain list of objects that should be sent from a different library/folder instead of the library/folder specified on the attribute when sending to the target level.
T=Test – Test if a connection can be made to the specified level on the target system.

3.12.2 Add Distribution Levels to List

Press F6 from the Distribution Levels listing to add one or many levels at once.

Once F6 is pressed, a list of all defined promotion levels is displayed. This list can be filtered by application, level or level description.

By default, the target level on the remote locations will be the same number as the local level. This can be changed for each individual row by entering a different value for that row, or it can be applied to all filtered rows by entering a value in the Default Target Level field.

Place a 1 in front of each Promotion Level that should have a target level added for it and press Enter.

The 2nd listing displays all locations that have a distribution method defined. This list can be filtered by location, description, address, method or locations belonging to a location group.

Place a 1 in front of each location that should have the promotion levels added to it and press Enter.

The result is a Distribution Level for every combination of select Promotion Level and Location. If a particular combination already existed, it is left as is.

3.12.3 Specifying the Source/Object types to send to a Target Level

```
MDCDSTA                          MD T 8 6.1                              4.04.17
SCRN1                Specifications for Target Attributes              23:01:21
FILTERS:
 Appl: TEST  Lvl: 32       Location: *LOCAL____  Target Lvl: 10
  Opt: _     Type: _______ Attribute: __________  Object Lib: __________  *NONE
                                                  Source Lib: __________  *NONE
                                                Source File: __________
Type options, press Enter.
 S=Source   O=Object   B=Both   N=Neither   R=Request Only

Opt Attribute  Type     Object Library                  Source Lib  Source File
 O  CBL        *PGM     TSTOBJ30                        TSTSRC30    QCBLSRC
 O  CBLLE31    *PGM     TSTOBJ31                        TSTOBJ31    QCBLLESRC
 O  CBLMOD     *MODULE  TSTOBJ30                        TSTSRC30    QCBLLESRC
 O  CBLMOD31   *MODULE  TSTOBJ31                        TSTOBJ31    QCBLLESRC
 O  CBL31      *PGM     TSTOBJ31                        TSTOBJ31    QCBLSRC
 O  CLLE31     *PGM     TSTOBJ31                        TSTOBJ31    QCLSRC
 O  CLMOD31    *MODULE  TSTOBJ31                        TSTOBJ31    QCLSRC
 O  CLP        *PGM     TSTOBJ30                        TSTSRC30    QCLSRC
 O  CLP31      *PGM     TSTOBJ31                        TSTOBJ31    QCLSRC
                                                                        More...
Enter=Confirm   F5=Refresh   F12=Previous   F13=Apply to all relevant Rows
```

This screen is displayed when option A for Attributes is requested for a Distribution Level. The screen lists each attribute that is defined within MDCMS (Option 3 –Attributes) and what is to be sent to the target level for that attribute.

Filter Fields

Filter the listing, limiting it to rows with matching values. For the Location, Attribute, Object Lib, Source Lib and Source File filters, all rows containing the filter value will be listed.

Opt

S – Send only the source. The target system will compile the source if an object library is defined.

O – Send only the object. The object does not contain source, or the target system does not permit source.

B – Send both the source and the object. The source and object are expected on the target system, but a compile of the source will not occur.

N – Send nothing for this attribute.

R – Request Only. Only send the request record as no source will be migrated to the target system. This option is only valid for *SOURCE Object types (such as copy books or SQL statements). This option is used when source is not permitted on the target system, but the source will be indirectly migrated to the next level on this system once the Request record returns in an RFP for the next level.

Function Keys:

F3=Exit

F5=Refresh – Refresh the listing

F13=Apply to all relevant Rows – Place the cursor on a row with an option to replicate and press F13 to apply that option to all other rows in the list (based on the filters) that would allow the option. For example, if all attributes in the filtered listing need to change from S to O, then put an O on one of the rows and then press F13 while the cursor is on that option – all attributes with an Object Library would then change to O.

3.12.4 Specifying Object Overrides for Target Levels

```
MDCDSTO                          MD T 8 6.1                              4.04.17
SCRN1                      Distribution Overrides                        10:06:25
FILTERS:
 Appl: ____   Location: __________  Obj Name: __________  Atr Lib: ____________
 Lvl.: __     Tgt Lvl.: __          Obj Type: __________  Ovr Lib: ____________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View

                          Tgt
Opt Appl Lvl Location    Lvl Object       Type    Attribute Lib  Override Lib
 _  TEST  30 MD71         50 server.xml   *IFS    /test8/30/conf /test8/30/cust
 _  TEST  30 MD71         50 BIG TIME     *DTAGRP TEST8O_30      BASOBJ30

                                                                      Bottom
Enter=Confirm    F6=Add    F12=Previous
```

This screen is displayed when option O for Obj Overrides is requested for a Distribution Level. The screen lists each object that is defined to be distributed from a different Library/Folder when sent to a given Target Level.

When an RFP is sent to a target level, each object in the RFP where the attribute is defined to send the Object will be checked against this list.

If the local application, local level, object name, object type and target level match an entry, then MDCMS will check if the object exists in the Override Library/Folder. If it does exist, then that object will be sent instead of the object in the Library/Folder defined for the Attribute. If it doesn't exist, then the standard object will be sent instead.

Examples of when this can be helpful:

- Each location has its own properties file for a web application.
- Each location has its own configuration data for a system application

Filter Fields

Filter the listing, limiting it to rows with matching values. For the Location, Object Name, Attribute Library, and Override Library filters, all rows containing the same prefix as the filter value will be listed.

Object Type

*ALLOBJ – check if object exists for any system object type. The object type defined for the object's attribute will be used.
*SRCIFS – the override pertains to source residing in IFS
*SRCMBR – the override pertains to source residing as a member in a source file
Object Type – the specific object type for the object override. Overrides are not relevant for *REMOTE, *DUMMY, or *MSGD object types. When *SOURCE, use *SRCIFS or *SRCMBR to define the override.

Attribute Library/Folder
The object library or folder defined for attributes where the object is pulled from normally. If the object type is *SRCIFS, then this would be the source folder and if the object type is *SRCMBR, then this would be the source library.

Object Name
*ALL – any object in the RFP that is normally distributed from the Attribute Library/Folder should be overridden, if it exists.
The name of the object (or source) that should be overridden to be distributed from a different location, if it exists.

Distribute from Library/Folder
*NONE – the object request should not be sent to the target level.
The location that should be distributed from instead. If the object (or source) doesn't exist in the location at the time of the send, it will be sent from the normal location instead.

Function Keys:
F6=Add – add a new Object Override entry

3.13 Interface Settings

```
MDLISET                          COMPANY NAME                          12.07.20
SCRN1                      MDCMS Interface Settings                    10:26:43

                    Opt  Description
                     1   Jira
                     2   ServiceNow
                     3   Synon/2E



                     9   HTTP Servers


          Selection: __

F3=Exit    F6=Messages    F8=Submitted Jobs    F11=View Output    F21=Sys Command
```

The ***Interface Settings Menu*** consists of several options that are used to configure the interface between MDCMS and 3rd-Party products as well as to configure the REST service APIs provided by MDCMS for exchanging information with external tools.

Option 1: Jira
Configure the interface between MDCMS and Jira to be able to share task information between the 2 products.
View full instructions in the Wiki

Option 2: ServiceNow
Configure the interface between MDCMS and ServiceNow to be able to share task information between the 2 products.
View full instructions in the Wiki

Option 3: Synon/2E
Configure the interface between MDCMS and Synon/2E to be able to request source and objects for modification and deployment directly out of Synon/2E models.
View full instructions in the Wiki

Option 9: HTTP Servers
Configure the MD http servers for:

- providing REST APIs for use by MDOpen as well as webhooks for DevOps tools and APIs for other external use. An API server must be created on every partition that MDOpen will be connected to.
  View full instructions in the Wiki
- Creating a Server instance of MDOpen for Web, so that MDOpen can be used from within a browser.
  View full instructions in the Wiki

3.14 System Settings

```
MDCSYSI                          System Settings                          04.09.08
SCRN1                                                                     10:37:42

    Location Title  . . . . . .  COMPANY NAME_____________________________
    Location ID . . . . . . . .  COMP1_____   (0-9, A-Z)
    Send Prefix . . . . . . . .  6            0-9, A-Z

    MD Service User Profile . . .  MDCONNECT   *MDOWNER, Profile
    Java Version  . . . . . . . .  jdk71/64bit_
    Sign Objects  . . . . . . . .  Y           Y/N
    Default CCSID . . . . . . . .  1148
    Internal Task Ref Label . . .  Internal Ref___

    Temporary Library Prefixes:                Example
     RFP Backup . . . . . . . .  SAV           SAV123456
     RFP Installation . . . . .  CMS           CMS123456
     RFP Receipt  . . . . . . .  MD0           MD01123456
     RFP Rollback . . . . . . .  MDR           MDRB123456
    Backup Lib Retention in days.  __5         0-999

    MD Build Date . . . . . . .  02.08.20
    MD Installation Date  . . .  02.08.20

F3=Exit    F4=Browse    F8=Patch History
```

Location Title
The title to be displayed at the top of nearly all MD Product screens to help the user identify which system they are currently working on.

Location ID
A 10-Character ID to uniquely identify this system. The ID for this system must match the ID defined in the OS/400 location settings for any partition that will be connecting to this system.

Send Prefix
A 1-Character ID to uniquely identify distributions from this system. This is used to avoid conflicts in case multiple systems send Promotions to the same remote system. The temporary receiving library on the remote system will use this character in the 4th position of the library name.

MD Service User Profile
The technical user profile on this system to be used to run MDCMS service jobs.

*MDOWNER – use the profile that owns the MDCMS product objects. This is typically MDOWNER.

The user must have at least *JOBCTL and *SPLCTL special authorities and the user must have a valid password.
It is recommended to set the Initial program parameter to *NONE to avoid interactive usage.

If the user profile doesn't have the *ALLOBJ special authority, then the following commands should be run once when there are no locks on the product libraries:
CHGAUT OBJ('/QSYS.LIB/MDCMS.LIB/*') USER(<service user id>) DTAAUT(*RWX) OBJAUT(*ALL) SUBTREE(*NONE)
CHGAUT OBJ('/QSYS.LIB/MDREP.LIB/*') USER(<service user id>) DTAAUT(*RWX) OBJAUT(*ALL) SUBTREE(*NONE)
CHGAUT OBJ('/QSYS.LIB/MDSEC.LIB/*') USER(<service user id>) DTAAUT(*RWX) OBJAUT(*ALL) SUBTREE(*NONE)
CHGAUT OBJ('/QSYS.LIB/MDXREF.LIB/*') USER(<service user id>) DTAAUT(*RWX) OBJAUT(*ALL) SUBTREE(*NONE)
CHGAUT OBJ('/QSYS.LIB/MDCMS.LIB/*') USER(<service user id>) DTAAUT(*RWX) OBJAUT(*ALL) SUBTREE(*NONE)
CHGAUT OBJ('/MDCMS') USER(<service user id>) DTAAUT(*RWX) OBJAUT(*ALL) SUBTREE(*ALL)

Replace <service user id> with the ID of the service user. If MDCMS is installed on an ASP device, then prefix the path with the name of the device.

The MDINSSAVF command will automatically run these commands for future updates to the product.

*MDOWNER – use the profile that owns the MDCMS product objects. This is typically MDOWNER.

Java Version
The Java Virtual Machine version to be used by the MDCMS java routines. Press F4 to see the list of installed JVM versions in the QOPENSYS IFS folder. Use option 5 in front of a version and then use option 1 to select either 32bit or 64bit. Minimum allowed is JDK80.

Sign Objects
A hash signature is created for each IFS/Remote file and all source code during the bundle phase of an RFP.

Y – Require Approval to Install if the hash signature differs from what is expected, meaning that manual manipulation has occurred.
N – Do not compare the hash signatures and require approval.

Default CCSID
The Coded Character Set to use by default when communicating with this system using MDOpen or MDWorkflow. This ensures that characters are displayed in the form and order that is expected for the user's locale within those clients. If certain users require a different CCSID, that value can be defined for the user in MDSEC. F4 may be used to browse the list of CCSIDs defined for use in MDCMS.

Internal Task Ref Label
The label to use for the Internal Reference Code field for tasks and subtasks. This label is then used in MDCMS, MDOpen and MDWorkflow.

Temporary Library Prefixes
The prefix string to add to the front of each type of temporary library in MDCMS. The prefix may be changed so that conflicts can be avoided when multiple instances of MDCMS exist on the same system. When temporary libraries are generated by MDCMS, the authority for the library is set based on the Object Authority template applied to the Promotion Level related to the library. See Object Authority templates for more details.

Backup Lib Retention in days
The number of days to retain temporary backup libraries after the deployment of source and objects. Source and objects are archived automatically, but the data in modified tables isn't archived, so it can be helpful in emergency situations to be able to refer back to the prior version of the tables for a period of time.
If days = 0, the temporary libraries will be deleted immediately. Otherwise, the MDCLEAN service will delete them once a minimum age has been reached.

MD Build Date
The date that this version of MDCMS was built by Midrange Dynamics

MD Install Date
The date that this version of MDCMS was installed onto this system

3.14.1 Patch History

Any patches that have been applied to the MDCMS product family since the last full installation of MDCMS can be viewed by pressing F8 from the System Settings screen. Authority to manage the System Settings is required to use this feature.

Status
ERROR – the patch didn't apply successfully – any object changes were automatically rolled back
OK – the patch applied successfully
ROLLBK – the patch has been manually rolled back

Opt
5 – view header details about the patch
O – view the list of objects contained in the patch
R – roll back the objects contained in the patch to the version prior to the patch.

3.15 MD Service Jobs

The MD Service Jobs list provides an overview of all possible persistent batch jobs that run in the background to carry out MDCMS processes.

The job name for a service is the same as the service name + the environment ID.
The job user is the MD Service User defined in the System Settings.

Press F9 to toggle between listing only active services and listing all services

Special Options
S=Start Jobs – Start the default number of jobs for the service
E=End Jobs – End any jobs running for that service
L=Logs – View the IFS logs for the Services that generate logs

Auto-Start Jobs
Y – the jobs will begin the moment they are needed by MDCMS, if within the Runtime Window.
N – the jobs will be started manually or using the starting command for the service from a scheduled job.

The following services cannot auto-start and require the start command for the service to start:
MDKACE
MDPULL
MDSNOW

The following services can only auto-start if the webhook is defined in the server that they connect to:
MDAZUR
MDGIT
MDJIRA

The following RFP receive services can only auto-start if DDM connectivity is allowed from the RFP sending system to the receiving system:
MDRCVIFS
MDRCVRMT
MDRCVSNA

Default Job Queue
The default job queue name and library to submit the jobs to when started. This value can be overridden when using the starting command for the service.

Start of Runtime Window
The time of day that an auto-start job may begin. Not applicable for a job started manually
*ANY – the job is permitted to start whenever needed

Default End Time
The time of day that a running job will end. This value can be overridden when using the starting command for the service.
*NEVER – don’t end automatically. Only end when manually requested.

Default # Parrallel Jobs
MDFTP, MDPULL, MDPUSH and MDSEND can have up to 9 jobs actively running in parallel.

Default Delay Interval
MDRCVIFS and MDRCVSNA allow for setting the number of seconds between RFP checking.

Default SNA User
The default SNADS user id to check for RFPs received via SNA.

F10=More Settings – most services have additional parameters that can be configured. This function is available for those services from the edit screen.

3.15.1 Commands to Start and End MDCMS Services

Some of the services can start automatically. All of the services can be ended automatically at a specified time as well as be started or ended from the MDCMS Services screen.

For those services that must be started manually, or if services should otherwise start or end via a command, the following commands are available that can be used from a command line or from within a job scheduler, etc.:

Service	Start Command	End Command
MDAZUR	MDCMS/MDSTRAZUR	MDCMS/MDENDAZUR
MDCLEAN	MDCMS/MDCLEAN	ends immediately upon completion
MDFTP	MDCMS/MDSTRFTP	MDCMS/MDENDFTP
MDGIT	MDXREF/MDSTRGIT	MDXREF/MDENDGIT
MDJIRA	MDCMS/MDSTRJIRA	MDCMS/MDENDJIRA
MDKACE	MDCMS/MDSTRKACE	MDCMS/MDENDKACE
MDLOG	MDCMS/MDSTRLOG	MDCMS/MDENDLOG
MDMAIL	MDSEC/MDSTRMAIL	MDSEC/MDENDMAIL
MDPULL	MDCMS/MDSTRPULL	MDCMS/MDENDPULL
MDPUSH	MDCMS/MDSTRPUSH	MDCMS/MDENDPUSH
MDRCVIFS	MDCMS/MDRCVIFS	MDCMS/MDENDRIFS
MDRCVRMT	MDCMS/MDRCVRMT	MDCMS/MDENDRRMT
MDRCVSNA	MDCMS/MDRCVSNA	MDCMS/MDENDRSNA
MDSEND	MDCMS/MDSTRSEND	MDCMS/MDENDSEND
MDSFTP	MDCMS/MDSTRSFTP	MDCMS/MDENDSFTP
MDSNOW	MDCMS/MDSTRSNOW	MDCMS/MDENDSNOW
MDXANI	MDXREF/MDSTRXANI	MDXREF/MDENDXANI

For extensive details about each command, enter it at a command line and press F4 to prompt the parameters and then F1 for help information.

3.15.2 MDMAIL Additional Settings

MDCMS provides the ability to send emails via the MDMAIL java service. In order to configure the SMTP client to send emails directly from the partition, Edit the MDMAIL service with option 2 and then press F10 for more settings.

```
MDCSMTP                          COMPANY NAME                          04.09.08
SCRN1                          Email Settings                          10:37:42

SMTP Hostname . .  mail.company.com
SMTP Port . . . .  25

SMTP User . . . .  as400@company.com
Password  . . . .  ___________
Repeat Password .  ___________

email Address . .  as400@company.com

SMTP Auth Reqd  .  Y  Y/N
SMTP Logging  . .  Y  Y/N
Encryption  . . .  T  N=None, Y=SSL, T=TLS

ZIP Attachments .  300___  *ALWAYS, *NEVER, minimum size in KB

MDWorkflow URL  .  http://company.com:8080/mdWorkflow

WF URL in MDOpen.  Y  Y/N

F3=Exit    F8=Addresses    F10=Log
```

SMTP Hostname
The IP address or domain name of the SMTP server which will send emails to recipients

SMTP Port
The SMTP server Port number, which normally is 25 for SMTP and 465 for SMTPS

SMTP User
The ID of the user to connect to the SMTP server

Password
The password for the SMTP user

email Address
The sender address to use for the system

SMTP Auth Reqd
Y – The SMTP Server requires user authorization to occur
N – The SMTP Server does not require user authorization to occur

SMTP Logging
Y – Detailed debug-level SMTP information will be included in the IFS logs for service MDMAIL
N – Only high-level transaction information will be in the IFS logs for service MDMAIL

Encryption
N – Connect to the SMTP Server in unsecured mode
Y – Connect to the SMTP Server using SSL Encryption
T – Connect to the SMTP Server using TLS Encryption

ZIP Attachments
*ALWAYS – attached files will be always be zipped to reduce the size of the emails
*NEVER – attached files will never be zipped
n KB – an attached file will only be zipped if it is larger than the entered number of Kilobytes

MDWorkflow URL
The context path for links to the MDWorkflow application. This must include http or https, the server address, port number if not 80 and the name of the web application.

This URL is used within MDMAILF email bodies to allow the user to navigate directly to a specific RFP and is used when generating Project, Task or Subtask mails out of MDWorkflow.

URL for MDOpen
Y – A column in the MDOpen Project, Task and Subtask list views will provide the URL icon to be clicked to open a browser to show the given element from within MDWorkflow.

N – The MDWorkflow URL column won't be visible in MDOpen

3.15.3 Email Addresses

The email addresses of the recipients can be maintained by pressing F8 from the Email Settings screen. If DDM connections are defined, the updates will be synced to all locations. The addresses can also be entered directly in the MDSEC user details.

User ID
The user profile of the user. If the user does not have a profile on the system, any other ID of up to 10 characters can be used.

Name
The Name to be recipient to be displayed in the mail header

Address
The email address of the recipient

3.15.4 Email Log

Each time the MDMAIL job is used to send an email, a log entry will be written to MDSEC file MDDEMLL with the following information:
Date, Time, Job, Recipients, Subject, Attachments and Error Message

F10 can be pressed from the Email Settings screen to view/search log entries

Additionally, the MDMAIL service logs information to the IFS which can be viewed from the Services listing.

3.15.5 MDMAIL – Send Text Mail command

This command, which resides in the MDSEC(instance) library, can be used to send a plain text mail to one or more recipients.

MDMAIL Parameters

Email Address of Recipient (ADDR)	A specific email address *NONE – the user group or user parameters are used instead
User Group of Recipients (GRPN)	All users belonging to a user group defined in MDSEC that have an email address defined. *NONE – the address or user parameters are used instead *RFP – send the email to all involved groups of the given group type (GRPT) for the projects included in the RFP (RFP).
User ID of Recipient (USER)	The email address defined for the MDSEC user will be used as the recipient. *NONE – the address or user group parameters are used instead
Message Subject (SUBJ)	The text to display in the subject of the email.
Body Text (BODY)	The text string, up to 2000 characters in length, to use as the email body in plain text format.
Attachment 1 (ATT1)	The IFS path, including file name, of a file to attach to the email.
Attachment 2 (ATT2)	The IFS path, including file name, of a 2nd file to attach to the email.
Delete Attachments after Send (DELA)	Whether or not to delete the attachment file(s) once the email is successfully sent. *NO – don't delete the attachment(s) *YES – delete the attachment(s) once sent. If the send fails, the attachment(s) won't be deleted.
MDCMS Instance (INST)	Specifies the MDCMS environment that should be used. The ID correlates to the suffix of the MDCMS library name. *SAME – the environment of the current library list will be used *DFT – the default environment will be used. This correlates to library MDCMS.
Application (APPLIC)	The MDCMS Application Group of the RFP, in the situation that GRPN(*RFP) is used.
Level (PROLVL)	The MDCMS promotion level of the RFP, in the situation that GRPN(*RFP) is used.
RFP Number (RFPNBR)	The MDCMS Request for Promotion number, in the situation that GRPN(*RFP) is used.
Group Type of Recipients (GRPT)	When the value of *RFP is used for the User Group of Recipients (GRPN) this value will specify the type of group to send to. Possible values are: a user defined group type *ACCGRP (default) – all Acceptance Groups for all Projects for the RFP *APRGRP – all users participating in the installation approval of an RFP. For levels using MDSEC roles for approval, all users authorized to approve for the level are included. For levels using Object Approval Templates, all users to participate based on the objects involved are included. *TECGRP – all Technical Groups for all Projects for the RFP *TSKASN – all assigned groups/users for all tasks for the RFP *TSKREQ – all creators for all tasks for the RFP *TSKTST – all test groups/users for all tasks for the RFP

3.15.6 MDMAILF – Send Formatted Mail command

This command, which resides in the MDSEC(instance) library, can be used to send a pre-formatted plain text or HTML mail to one or more users. The mail body to be used must be stored in IFS.
The body may contain placeholder values which are replaced by the actual MDCMS values at runtime. The placeholders within the mail body can be delimited by ## or ++.

HTML body templates for each of the primary RFP exit points are available in IFS folder /MDCMS/MAIL.

MDMAILF Parameters

Email Address of Recipient (ADDR)	A specific email address *NONE – the user group or user parameters are used instead
User Group of Recipients (GRPN)	All users belonging to a user group defined in MDSEC that have an email address defined. *NONE – the address or user parameters are used instead *RFP – send the email to all involved groups of the given group type (GRPT) for the projects included in the RFP (RFP).
User ID of Recipient (USER)	The email address defined for the MDSEC user will be used as the recipient. *NONE – the address or user group parameters are used instead
Message Subject (SUBJ)	The text to display in the subject of the email.
Body File including Path (BODY)	The IFS path, including file name, which contains the body to use in the email.
Body File Type (BTYP)	The format of the body TEXT – the email body has a plain text format HTML – the email body uses html formatting
Attachment 1 (ATT1)	The IFS path, including file name, of a file to attach to the email.
Attachment 2 (ATT2)	The IFS path, including file name, of a 2nd file to attach to the email.
Delete Attachments after Send (DELA)	Whether or not to delete the attachment file(s) once the email is successfully sent. *NO – don't delete the attachment(s) *YES – delete the attachment(s) once sent. If the send fails, the attachment(s) won't be deleted.
MDCMS Instance (INST)	Specifies the MDCMS environment that should be used. The ID correlates to the suffix of the MDCMS library name. *SAME – the environment of the current library list will be used *DFT – the default environment will be used. This correlates to library MDCMS.
Use Placeholders (WCRD)	Whether or not to find and replace any placeholders in the email body. Any of the placeholder parameters in this command that are required as specific values must be present on the command definition. At a minimum, it's recommended that the (APPLIC), (PROLVL) and (RFPNBR) are included on the command definition. The email body can include any placeholder, including placeholders for custom fields. The placeholders will be replaced by the runtime value as long as the necessary key parameter(s) are included in order to find the values in the database.
Send Phase (SEND)	Whether or not the email pertains to an RFP during the send phase. MDCMS will then use replacement values based on the RFP in the send list rather than in the installation database.
Application (APPLIC)	The MDCMS Application Group represented by the placeholder value of ##APPLIC##.
Level (PROLVL)	The MDCMS Application Promotion Level represented by the placeholder value of ##PROLVL##.
RFP Number (RFPNBR)	The RFP number for this promotion represented by the placeholder value of ##RFPNBR##.

Object Request Number (REQNBR)	The MDCMS Object Request number represented by the placeholder value of ##REQNBR##. This is necessary when placeholders for a specific object request are necessary. If not included, the first object in the RFP will be used.
Project (PROJID)	The Project ID represented by the placeholder value of '##PROJID##'.
Task Number (TASKID)	The MDCMS Project Task number represented by the placeholder value of ##TASKID##.
Subtask Number (STSKID)	The MDCMS Project Subtask number represented by the placeholder value of ##STSKID##.
Object Library (OBJLIB)	The Object Library represented by the placeholder value of '##OBJLIB##'.
Source Library (SRCLIB)	The source library name represented by the placeholder value of ##SRCLIB##.
Source File (SRCFIL)	The source file name represented by the placeholder value of ##SRCFIL##.
Error Message (ERRMSG)	The error text explaining why an RFP failed. This is represented by the placeholder value of ##ERRMSG##
Group Type of Recipients (GRPT)	When the value of *RFP is used for the User Group of Recipients (GRPN) this value will specify the type of group to send to. Possible values are: a user defined group type *ACCGRP (default) – all Acceptance Groups for all Projects for the RFP *APRGRP – all users participating in the installation approval of an RFP. For levels using MDSEC roles for approval, all users authorized to approve for the level are included. For levels using Object Approval Templates, all users to participate based on the objects involved are included. *TECGRP – all Technical Groups for all Projects for the RFP *TSKASN – all assigned groups/users for all tasks for the RFP *TSKREQ – all creators for all tasks for the RFP *TSKTST – all test groups/users for all tasks for the RFP

3.15.7 MDUPDEMLA – Update Email Address command

This command, which resides in the MDCMS(instance) library, can be used to systematically add or change the email address for a user. If DDM connections are defined, the updates will be synced to all locations.

MDUPDEMLA Parameters

User ID (USER)	Specifies the user ID under which to store the name and email address. The user ID does not have to be defined in MDSEC and can be any value of up to 10 characters.
User Name (NAME)	Specifies the name of the user that will be used as the recipient name when emails are sent to the user ID.
Email address (MAIL)	Specifies the Email address that will be used for the recipient when emails are sent to the user ID.
Environment ID (ENV)	The name of the MDCMS instance (or suffix) - *DFT refers to MDCMS being used in library MDCMS. For a different library suffix, this would be entered for the environment ID.

3.15.8 MDFTP – MDCMS FTP Client command

The MDCMS FTP Client (MDFTP) command provides the ability to connect to a remote server in order to perform FTP, SFTP or FTPS transactions.

The MDFTP service jobs are used to perform the FTP and FTPS transactions.
The MDSFTP service jobs are used to perform the SFTP transactions.
Ensure that either at least 1 MDFTP or MDSFTP job is set to auto-start or that the MDFTP/MDSFTP jobs have already started prior to invoking this command. This can be reviewed and edited in the MDCMS Services settings.

MDFTP/MDSFTP transactions are logged to the IFS and can be viewed from the MDCMS Services settings.

MDFTP Parameters

Server Address (LADR)	The address of the FTP server to connect to. This address must be defined in the Remote Server Locations settings. MDCMS uses the connection information stored with the address. Be aware that the address is case sensitive and must exactly match the address in the settings.
FTP Action (ACT)	The action to be performed *EXIST – check if a folder or file exists on the remote server *GET – copy a file from the remote server to the local IFS *PUT – copy a file from the local IFS to a remote server *DELETE – delete a folder or file on the remote server *MKDIR – create a folder on the remote server *LIST – list the contents of a folder on the remote server. The result list is written to file QTEMP/MDDFTPF. The format for the file is based on file MDCMS/MDDFTPF. *TESTCONN – test the connection to the remote server
MDCMS Instance (INST)	Specifies the MDCMS environment that should be used. The ID correlates to the suffix of the MDCMS library name. *SAME – the environment of the current library list will be used *DFT – the default environment will be used. This correlates to library MDCMS.
Local Folder (LFLR)	The path of the local IFS folder
Local File (LFIL)	The name of a file in the local IFS folder
Remote Folder (RFLR)	The path of a folder on the remote server *LFLR – the path of the remote folder is the same as the local folder
Remote File (RFIL)	The name of a file on the remote server *LFIL – the name of the remote file is the same as the local file

3.16 Job Settings

```
MDCJOBS                              MD Dev                                25.04.20
SCRN1                          MD Job Settings                             10:39:29

  Default:
    Subsystem . . . . . . . . . .  MDCMS_____
      Library . . . . . . . . . .    MDJOBCTL__

    Job Description Library . . .  MDJOBCTL__
    Job Queue Library . . . . . .  MDJOBCTL__

    MD Report Job Queue . . . . .  MDREPORT__
      Library . . . . . . . . . .    MDJOBCTL__

    MD Service Job Queue  . . . .  MDSERVICE_
      Library . . . . . . . . . .    MDJOBCTL__

    MDOpen/MDWorkflow Job Queue .  MDREP_____
      Library . . . . . . . . . .    MDJOBCTL__

    MDXREF Build Job Queue  . . .  MDXREF____
      Library . . . . . . . . . .    MDJOBCTL__

F3=Exit    F4=Browse    F10=Job Descriptions    F21=Sys Command
```

The Job Settings screen provides the ability to easily define where the different sorts of jobs that are submitted by MD products should be run. This screen is available from option 12=Job Settings of the MDCMS Setup Menu.

In order to create subsystems or job queues from this screen, your user profile requires a minimum of change authority to the CRTSBSD or CRTJOBQ commands to create those elements. When changing/deleting subsystems or job queues, sufficient authority must exist for the specific object.

It is highly recommended to have a separate subsystem with its own set of job queues for MDCMS.

You can also list/manage job descriptions from the Job Settings screen by pressing F10.

Default Subsystem
The name and library of the subsystem that will be used by default for MD jobs. This is used for informational purposes as well as to pre-populate the subsystem parameter when creating a new job queue.

Press F4 to browse existing subsystems or create a new subsystem.

When creating a subsystem from the Job Settings wizard, the subsystem description, class and generic routing entry are each created and bound together for ease of administration.

Recommended number of Maximum Jobs for subsystem: 1000
If using MDCMS on a partition with multiple processors, it is also recommended to assign the subsystem to a Workload Group to limit the number of processors that MDCMS can utilize.

Default Job Description Library
The library where job descriptions by default will be stored. Job Descriptions are used in MDCMS per promotion level for the batch jobs to deploy objects. This is used for informational purposes as well as to pre-populate the job description library parameter when creating a new job description.

Press F4 to browse existing libraries.

Default Job Queue Library
The library where job queues by default will be stored. This is used for informational purposes as well as to pre-populate the job queue library parameter when creating a new job queue.

Press F4 to browse existing libraries.

MD Report Job Queue
The name and library of the job queue that will be used by submitted jobs that create report output in MDCMS, MDSEC and MDXREF.

Press F4 to browse existing job queues or create a new job queue.

When creating a job queue from the Job Settings wizard, the job queue and job queue entry are each created and bound together for ease of administration. You can also use the job queue wizard to switch the job queue to a different subsystem or change the number of maximum jobs.

Recommended number of Maximum Jobs for the MD Report Job Queue: 10

MD Service Job Queue
The name and library of the job queue that will be used by submitted MD Service jobs defined in the Services settings.

Press F4 to browse existing job queues or create a new job queue.

When creating a job queue from the Job Settings wizard, the job queue and job queue entry are each created and bound together for ease of administration. You can also use the job queue wizard to switch the job queue to a different subsystem or change the number of maximum jobs.

Recommended number of Maximum Jobs for the MD Service Job Queue: 100

MDOpen/MDWorkflow Job Queue
The name and library of the job queue that will be used by submitted jobs that are used to communicate with a MDOpen or MDWorkflow client session.

Press F4 to browse existing job queues or create a new job queue.

When creating a job queue from the Job Settings wizard, the job queue and job queue entry are each created and bound together for ease of administration. You can also use the job queue wizard to switch the job queue to a different subsystem or change the number of maximum jobs.

Recommended number of Maximum Jobs for the MDOpen/MDWorkflow Job Queue: 200

MDXREF Build Job Queue
The name and library of the job queue that will be used by submitted jobs that are used to refresh the cross-reference information in MDXREF.

Press F4 to browse existing job queues or create a new job queue.

When creating a job queue from the Job Settings wizard, the job queue and job queue entry are each created and bound together for ease of administration. You can also use the job queue wizard to switch the job queue to a different subsystem or change the number of maximum jobs.

Recommended number of Maximum Jobs for the MDOpen/MDWorkflow Job Queue: 5

3.16.1 MDWRKJOBD – Work with Job Descriptions command

MDCMS is delivered with a command-based API that provides an improved experience for administrators to list and manage job descriptions.

The MDCMS command is named ***MDWRKJOBD*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command.

The first time the command is invoked, the list is unfiltered and may take some time to load. The filter values are saved per user profile for the next use of the command.

In order to create job descriptions from this screen, your user profile requires a minimum of change authority to the CRTJOBD command. When changing/deleting job descriptions, sufficient authority must exist for the specific object.

MDWRKJOBD Parameter Table

KEYWORD	Description	Type	Length
ENV	MDCMS Environment ID	CHAR	4

3.17 Logging

```
MDCLOGM                              MD Dev                              26.08.18
SCRN1                          MDCMS Log Maintenance                     16:00:20

Filter by Description: _____________________

Type options, press Enter.
 2=Edit  P=Purge  Q=Query
                                                                          Age
Opt Log File   Library    Description                              Purge (Days)
 _  MD Output  MDSEC      User Generated Reports                     Y      90
 _  MDDACMD    MDCMS      MDADDCMD API Log                           N
 _  MDDALRL    MDCMS      RFP Send Log Target Problems               Y      45
 _  MDDAREQ    MDCMS      MDADDREQ API Log                           N
 _  MDDCLOG    MDCMS      Object Creation Log                        Y      14
 _  MDDCRTO    MDCMS      MDCRTOBJ API Log                           N
 _  MDDDLOG    MDCMS      Object Request Deletion Log                Y     180
 _  MDDDRFP    MDCMS      MDDELRFP API Log                           N
 _  MDDEMLL    MDSEC      Email Log                                  Y      90
 _  MDDFLOG    MDCMS      RFP Send FTP Log                           Y      45
 _  MDDILOG    MDCMS      Automatic Installation Log                 N
 _  MDDIRFP    MDCMS      MDINSRFP API Log                           N
                                                                       More…
F3=Exit   F10=Purge All   F21=Sys Command
```

The Logging list (Setup Menu option 14) provides an overview of all log files that are written by the MD products.

Options
2=Edit – edit the Purge settings for the Log File
P=Purge – immediately delete all log records for the Log File that are older than the defined number of days
Q=Query – view the current contents of the log

Purge Records
Y – automatically delete all log records that are older than the minimum age for the Log File. The automatic purge occurs during the first RFP to run for a particular day. Purging doesn't occur on days that an RFP doesn't run.

N – retain the log records indefinitely, or until a manual purge occurs from this screen

Minimum Age before Purge
The number of days that must pass since the creation of a log record before it is allowed to be deleted.

3.18 User Groups

```
MDCGRPN                          MD T 74 6.1                          24.04.16
SCRN1                          MD User Groups                         15:13:19
                  Filters
Pos: __________  Desc: ____________________   Type: __________  User: __________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  U=Users

Opt  Group      Type        Description                              Dft Users
 _   MARK-CH    MARKETING   Marketing in Switzerland                        1
 _   MD INTERN  SALES       MD Internal (Michael & Stephan)                 2
 _   NORAM      SALES       Sales North America                             3
 _   PGMR 1     PROGRAMMER  Programmer Group 1                        Y      2
 _   PGMR 2     PROGRAMMER  Programmer Group 2                              6
 _   RMCH       RLSMGR      Release Manager CH                              2
 _   TEST 1     TESTER      Test Group 1                                    3




                                                                       Bottom
F3=Exit  F4=Browse  F5=Refresh  F6=Add  F9=Acceptance Group Types per Level
```

The User Group list (Setup Menu option 15) provides the ability to create and manage collections of users that can be used for sending emails, project assignments and MDWorkflow.

Options
2=Edit – edit the group details
3=Copy – create new group with information for existing group pre-filled in the parameters
4=Delete – delete the group
U=Users – View/Maintain the list of users that belong to the group. A user may belong to a group if the user is defined in MDSEC.

Group Type
The type or category to assign to the group. Press F4 to view/manage the group types.
If MDWorkflow is used, group types can be assigned to promotion levels to indicate which category of groups must accept an RFP before that RFP can continue to the next step in a migration path. Multiple user groups can belong to the same group type, so that project groups can vary based on regional or application requirements.

Dft
Y – when a project is created, or the workflow acceptance dialog is opened for unassigned groups, the group will be involved by default with the project for the given group type, if the group type is required for workflow acceptance.

3.18.1 Acceptance Group Types per Level

If MDWorkflow is licensed, F9 can be pressed from the User Group or User Group Type screens to define the Acceptance Group Types per Level on this partition,

For each MDCMS Promotion Level, between 0 and n types of groups can be designated to be responsible for the acceptance of an installed RFP into that level. This means that each time an RFP, which is a package of objects, is installed into a specific level, 1 person from a group for each required group type must accept the results of the installation before that object package will be allowed to move on to the next step in the Workflow process.

The actual groups containing the users for any given group type are assigned to the project(s) that are impacted by the RFP. So, different projects could use different groups of users for any given group type.

Example:
MDCMS Promotion Level 50 is defined as the User Acceptance Environment level. When objects are installed into this level, business users and IT management must test the environment before those objects are allowed to be installed into the Production Environment level. To ensure that this occurs, group types BUS_USER and IT_MGMT are specified as Required Acceptance Group Types for level 50. Then, whenever an RFP is installed into level 50, a user within a group of type BUS_USER and a user within a group of type IT_MGMT must accept the RFP before it can be sent to Production.

```
CMC264                          MD T 74 6.1                          24.04.16
SCRN1                 Acceptance Group Types per Level               15:31:15

Filter by Appl: ____  Lvl: __  Group Type: __________

Type options, press Enter.
 4=Delete

Opt  Appl  Lvl  Description                              Group Type
 _   TEST   10  Vendor Trunk                            TESTER
 _   TEST   30  Test 30                                  MARKETING
 _   TEST   30  Test 30                                  TESTER




                                                                    Bottom
F3=Exit   F6=Add
```

In order to add or remove an acceptance group type to a promotion level, you must have authority to MDSEC code 73 for that promotion level's application.

When F6 is pressed to add group types, you first select one or many promotion levels and then press Enter. Then, you select one or many group types and press Enter. MDCMS then creates the list of all combinations of the selected levels and group types.

3.19 Project Costs

```
MDCPCST                          MD T 8 6.1                          4.04.17
SCRN1                          Project Costs                         13:24:03

Pos: ___  Filter by Project Type: __________  Task Type: __________
                            Phase: _____            User: __________
Type options, press Enter.                          Cost: __________
 2=Edit  3=Copy  4=Delete  5=Display

Opt Sort  Project Type  Task Type   Phase  User        Cost per Hour
 _   50   *ANY          ADMIN       *ANY   *ANY           120.00
 _  100   *ANY          *ANY        COR    *ANY            25.75
 _  100   *ANY          *ANY        DOC    *ANY            90.00
 _  100   *ANY          *ANY        FUN    *ANY           120.00
 _  100   *ANY          *ANY        REQ    *ANY           130.00
 _  100   *ANY          *ANY        TEC    *ANY           130.00
 _  100   *ANY          *ANY        TST    *ANY           100.00
 _  200   *ANY          *ANY        DEV    MMORGAN        160.00
 _  999   *ANY          *ANY        *ANY   *ANY           150.00
 _

                                                                  Bottom
F3=Exit   F6=Add   F10=Recalculate
```

The Project Costs settings provide the rules in order to apply the correct cost per hour to the time entered for Projects, Tasks and Subtasks.

When time is entered, MDCMS compares the project type, task type, phase and user against the cost rules in the sort sequence. The first matching rule is applied as the cost per hour for the time entry in order to calculate the total cost of that entry and increase the cost sum for the impacted project, task and subtask.

Options
2=Edit – edit the cost rule
3=Copy – copy a cost rule to a new rule
4=Delete – delete the cost rule
5=Display – View the cost rule

Sort Sequence
The sequence of the cost rule in relation to other rules in ascending order.

Project Type
If not *ANY, then limit the cost to projects of entered type.

Task Type
If not *ANY, then limit the cost to project tasks of entered type.

Phase
If not *ANY, then limit the cost to time entry records for the entered project phase.

User
If not *ANY, then limit the cost to time entry records for the entered user ID.

F10 – Recalculate – when pressed, existing Time Entry records can be recalculated based on the current rules. A confirmation screen is shown in order to limit the recalculation to a specific date range and to specify if closed Projects/Tasks should be included in the recalculation.

3.20 Push Settings Data to Locations

MDCMS and MDXREF settings can be pushed (copied) to any defined Location that allows DDM connectivity. To define and execute the push of settings to another location, select option 17 from the MDCMS Setup Menu.

```
MDCPSET                          MD T 74 6.1                          12.03.16
SCRN1                  Push Settings Data - Definitions               17:19:18

          Appl  Lvl  Attribute  Tgt Lvl  RFP Cmds  Status
Filters:

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  L=Locations
                                                          Last Push
Opt Appl Lvl Attribute  Tgt Lvl  RFP Cmds  Upd Del Env    Date     Time    Stat
 _  *ALL     *ALL                  Y       Y   Y  T74  13.01.16 15:37:22 DONE
 _  *ALL 10  *LF                   Y       Y   Y  T74  13.01.16  3:38:07 DONE
 _  *ALL 10  *RPG*                 Y       Y   Y  T74   5.01.16 14:29:11 DONE
 _  *ALL 10  LF*                   N       Y   Y  T74  13.01.16  3:17:01 DONE
 _  CMP      *ALL                  Y       Y   Y  T74  20.01.16 10:45:01 DONE
 _  CMP      PNLGRP                Y       Y   Y  T74  20.01.16 10:59:30 DONE
 _  TEST 10  *ALL         20       Y       Y   Y  T74   1.02.16 18:01:46 DONE
 _  TEST 10  *LF          33       Y       Y   Y  T74  13.01.16 15:21:22 DONE



                                                                      Bottom
Enter=Continue  F4=Browse  F5=Refresh  F6=Add  F12=Previous
```

The initial screen lists any existing Push definitions. Use F6 to add a new definition or the standard options to maintain an existing definition.

Definition Parameters

Application

- *ALL – all applications
- an application

Level

- 0 – all levels for all applications or one application
- a level for all applications or one application

Attribute

- *ALL – All attributes. When *ALL, any level placeholders will also be pushed
- *NONE – attribute settings should not be sent
- *generic* – use * as a placeholder to filter the attributes by a name pattern
- an attribute

Target Level

- 0 – the same value as the local level
- the level number to apply on the remote system

Include RFP Commands

- Y – any *RFP commands defined for the selected level(s) will be included

Include MDXREF Libraries

- Y – the library list in the MDXREF build screen for the level will be populated

Include Source Libraries

- Y – the source parameters on the pushed attributes will be included
- N – the source library and file values will be removed from the attributes, unless for LF or any of the following MDCMS types: *SQLCST, *SQLFUN, *SQLIDX, *SQLMQT, *SQLPRC, *SQLSCR, *SQLTRG, *SQLUDT, *SQLVAR, *SQLVW

Include Compile Commands

- Y – all compile commands for the pushed attributes will be included
- N – the compile commands for the attributes will not be included, unless for LF or any of the following MDCMS types: *SQLCST, *SQLFUN, *SQLIDX, *SQLMQT, *SQLPRC, *SQLSCR, *SQLTRG, *SQLUDT, *SQLVAR, *SQLVW

Include Scripts

- Y – all pre- and post-install scripts for the pushed attributes will be included
- N – the pre- and post-install scripts for the attributes will not be included

Include Auth Templates

- Y – the definition of each Object Authority Template used by one or more of the pushed attributes will also be pushed
- N – the template definition won't be pushed, but will still be assigned to the attribute, even if it doesn't exist on the target location.

Include Replic Templates

- Y – the definition of each Source and Object Replication Template used by one or more of the pushed attributes will also be pushed
- N – the template definition won't be pushed, but will still be assigned to the attribute, even if it doesn't exist on the target location.

Include Search Templates

- Y – the definition of each Source and Object Search Template used by one or more of the pushed attributes will also be pushed
- N – the template definition won't be pushed, but will still be assigned to the attribute, even if it doesn't exist on the target location.

Include Delete Templates

- Y – the definition of each Source and Object Deletion Template used by one or more of the pushed attributes will also be pushed
- N – the template definition won't be pushed, but will still be assigned to the attribute, even if it doesn't exist on the target location.

Include Rapid Templates

- Y – the definition of each MDRapid Template used by one or more of the pushed attributes will also be pushed
- N – the template definition won't be pushed, but will still be assigned to the attribute, even if it doesn't exist on the target location.

Update Existing Data

- Y – any matching entries already on the remote system will be updated with the new values
- N – only new entries will be added

Delete Undefined Data

- Y – if value *ALL is used for the attribute, then all attributes on the target system that aren't on the local system are deleted.
  If value Y is used for Include RFP Commands, then all RFP commands on the target system that aren't on the local system are deleted.
  Attribute commands that aren't defined locally will be deleted
  If all levels are sent, then remote levels that aren't defined locally will be deleted
- N – unmatched settings will remain on the target system

Target MD Environment

The instance of MDCMS on the target system.

- *DFT – the instance that doesn't include a suffix for the product libraries is the target
- an MDCMS instance

Once a definition is created, use option L to select one or more DDM Locations to push the information to.

After the locations are selected, press Enter to submit the job to batch. The job queue and library can be modified at the top of the location listing screen.

3.21 Send Settings to Remote System

Attributes, including command and authority information, can be sent to Remote Locations using the distribution methods, such as FTP, that are defined for the locations. If *ALL attributes are selected for an Application/Level, then the definitions for the Application and Level, including the Level's Job Description, will also be exported.

Before settings can be sent to a remote system, a Distribution Level for the local Application/Level must be defined (MDCMS Setup Menu Options 6 & 7).

```
MDCEXPS                          COMPANY NAME                          11/23/11
SCRN1                  Send Settings to Remote System                  10:37:35


                       Application: ____
                             Level: __


                         Attribute: *ALL______   *ALL, *RFP, *generic*, Attribute



F3=Exit    F4=Browse    F8=FTP Log
```

Screen Definitions:

Application / Level
The local Application and Level that contains the Attribute(s) to be sent to Remote System(s).

Attribute

- a specific Attribute to send only that Attribute
- a portion of the Attribute name with a wildcard, i.e. R*, to send all matching Attributes that begin with an 'R'
- *ALL to send all defined Attributes for the Application/Level. If *ALL is selected, then the entire definition of the Application and Level, including the Level's Job Description and *RFP commands will be sent.
- *RFP to send only the Application Level's *RFP command types

Function Keys:
F3=Exit
F4=Browse – Browse the list of valid values for a field
F8=FTP Log – If one or more of the selected Distribution Queues use method FTP, the F8 key will be enabled after the attempt to send the settings has finished. If the send failed, the log can be viewed in order to better troubleshoot the connection problem. The log is also available when successful.

Once the selections have been made, press Enter. Then, the list of Distribution Queues for the selected Application and Level are displayed. Select 1 or more Distribution Queues to send the settings to.

3.22 Receive Settings from Remote System

```
MDLIMPS                          COMPANY NAME                          04.09.06
SCRN1                  Receive Settings from Remote System             10:37:22


                     MD Filename: __________


                 Transmitted via: 1      1=SNA
                                         2=FTP/Other
                                         3=Tape
                                         4=Optical Device

                    Netfile User: QPGMR_____



Enter=Confirm    F4=Browse    F12=Cancel
```

Screen Definitions:
MDCMS settings sent from remote systems are received using the above display, which is option 13 from the MDCMS Settings Menu.

Settings may be sent via SNA, FTP, GoAnywhere, XCOM, tape, or optical device. MDCMS remembers which method was used the last time that a promotion or setting was received. It is best to set the Transmitted via parameter (if incorrect) before entering the other information.

MD Filename
Enter the name of the file containing the Settings. MD setting packages are always named 'MDAS' + the 2-digit Host ID of the sending IBMi + a 4-digit sequence number. Press **F4** to browse the list of outstanding setting packages.

Netfile User
If the setting package was sent via SNA, a specific netfile user was entered (default is QPGMR). The same user id must be entered here to receive the settings.

If the setting package is transmitted via tape or optical device, you will also be prompted for the Device Description. It is required for receiving the setting package or for browsing the MD setting packages that exist on the medium.

Function Keys:
Enter=Confirm
F4=Browse – Browse the list of valid values for a field
F12=Cancel

3.22.1 Select Application/Level for Receipt of Attributes

```
MDCIMPS                          COMPANY NAME                          04.09.21
SCRN1                 Receive Settings from Remote System              10:37:05


              Received:
                Application . . . . .  TEST01
                Level . . . . . . . .  100
                Attribute . . . . . .  *ALL


              Copy to:
                Application . . . . .  TEST01
                Level . . . . . . . .  400


              Copy Compile Commands .  Y  Y=All, N=None, D=DB Only


F3=Exit    F4=Browse
```

Copy to Application
Enter the application code or press F4 to select from a list. If all attributes were sent, a new application code may be entered.

Copy to Level
Enter the application level or press F4 to select from a list. If all attributes were sent, a new application level may be entered.

If the attribute(s) already exist in the selected Application and Level, they will be overwritten with the information received from the remote system.

Copy Compile Commands
Y – all compile commands for the sent attributes will be received into the target level
N – none of the compile commands for the sent attributes will be received into the target level
D – only compile commands for Database objects will be copied. These include PF, LF and any *SQLxxx attributes.

Press Enter to continue.

3.22.2 Specify Application/Level Definitions for Received Settings

If the Application or Level on the local system does not yet exist, and all (*ALL) attributes were sent from the remote system, then the user will be prompted for the descriptions of the Application or Level as well as the name and location of the Job Description.

```
MDCIMPS                          COMPANY NAME                          04.09.21
SCRN2                         Copy Level Settings                      10:37:00


       Received:
         Application . . . .  OPER  Operations
         Level . . . . . . .  30    Test environment for Operations
         Attribute . . . . .  *ALL

         Job Description . .  OPER30
           Library . . . . .    QGPL


       Copy to:
         Application . . . .  OPER  Operations
         Level . . . . . . .  90    Test environment for Operations

         Job Description . .  OPER30____   name, *NONE
           Library . . . . .    QGPL______


Enter=Confirm    F3=Exit
```

If the Application is new, the default description may be modified.

The description for the Level may be modified.

The name and library of the job description to be used for the local Application/Level can be modified. If *NONE is specified, the Job Description will not be copied.

Press Enter to copy the definitions, or press F3 to cancel the receipt of the settings.

3.22.3 Specify Library Names for Copied/Received Attributes

```
MDCIMPS                          COMPANY NAME                          9.01.21
SCRN3                      Copy Attribute Settings                     20:00:21

From Appl/Lvl: TEST01 100  Current value: __________
  To Appl/Lvl: TEST01 400   Replace with: __________  F10=Replace values
    Attribute: *ALL
Type changes, press Enter.
 *NONE=Skip Attr using Lib, *NOOBJ=No Obj for Attr, *NOSRC=No Source for Attr
 *REQONLY=No Src/keep Req, *TEMP=Temp Source for any, *TEMPDB=Temp Source DB

Object Libraries           Change to                  Source Libs Change to
/test/JAVA/P               /test/JAVA/P_____          TSTSRC10    TSTSRC10__
TSTOBJ10                   TSTOBJ10__                 TSTSRC11    TSTSRC11__
TSTOBJ11                   TSTOBJ11__

                                                                      Bottom
Enter=Confirm   F2=Full Name   F3=Exit   F4=Browse   F5=Refresh
```

When a level is locally copied or is received from another location, the above screen is displayed to prompt for the library/folder names to be used in the new Level.

The left column for the Object Libraries lists the name of each distinct Object Library specified in the copied Attribute(s).

The Change to column allows the user to modify the name of the Object or Source Library to be saved in the attribute(s) for the target level.

If a find/replace naming pattern is possible to mass update all libraries/folders, the current value and replacement value can be entered at the top and then changed by pressing F10.

Special Object Library values:
*NONE – do not copy the attributes using the object library
*NOOBJ – change the Object Type to *SOURCE for attributes containing a source and object library. Do not copy the attributes containing only the object library.

Special Source Library values:
*NONE – do not copy the attributes using the source library
*NOSRC – remove the Source Library definition for attributes containing a source and object library. Do not copy the attributes containing only the source library.
*REQONLY - remove the Source Library definition for attributes containing a source and object library. Change source file to *REQONLY for *SOURCE attributes.
*TEMP – temporarily migrate source for compiles, but don't keep the source in the target environment. Typically used for production environments where persistent source isn't allowed.
*TEMPDB – remove the source definition for any non-database attributes and set the source library to *TEMP for database attributes.

Function Keys
F2 – display/edit the full name of paths that exceed the length of the prompt field
F3 – cancel the copy of the attributes
F4 – browse the list of Libraries or IFS directories
F5 – reset the library names to their original values
F10 – replace values in list of libraries

3.22.4 Update Attribute Templates for New Level

```
MDCIMPT                        T84 Demo Production                      3.07.22
SCRN1              Update Attribute Templates for New Level             00:06:45

From Appl/Lvl: TEST01 100
  To Appl/Lvl: TEST01 400

Type changes, press Enter.
 *NONE=Remove Template from Attributes

Template Type         Template ID  Change to
Object Authority      *DFTIFS      *DFTIFS
Object Authority      *DFTRMT      *DFTRMT
Object Authority      *DFT400      *DFT400
Object Authority      INTIFS       INTIFS
Object Authority      OSNEW        OSNEW
Object Authority      OSPGP        OSPGP
Object Authority      OSTEST       OSTEST
Object Authority      WEB          WEB
MDRapid Usage         RAPID        RAPID


                                                                      Bottom
Enter=Confirm    F3=Exit    F4=Browse    F5=Refresh    F21=Sys Command
```

When a level is locally copied or is received from another location, the above screen is displayed to prompt for the templates to be used for the attributes in the new Level.

Each currently applied distinct Template Type and Template ID is listed.

The Change to column allows the user to remove the template or to change the assignment to a different template.

Special Object Library values:
*NONE – remove template from Attribute. This value isn't allowed for Object Authority template types

Function Keys
F3 – cancel the update of the attribute templates
F4 – browse/edit the list of templates for the Template Type
F5 – reset the Template IDs to their original values

3.22.5 Specify Level Placeholder Values for Copied/Received Levels

```
MDCIMPW                        T84 Demo Production                      3.07.22
SCRN1                 Copy Level Placeholders for New Level             13:13:52

 From Appl/Lvl: TEST01 100  To Appl/Lvl: TEST01 400

 Type changes, press Enter.
  *NONE=Skip copy of placeholder

 ID               Description
 BBMDJC           Bitbucket Jenkins Credentials for mdcmst8 repo
4859644b-9350-44c2-820f-ef6cc4dc51e1

 CONTXT           Context Path
TPH-Example-Path

 MYTIME           My time in seconds to complete the job
910

 PGMLIB           Program Library
TEST8O_10

                                                                        Bottom
 Enter=Confirm   F3=Exit   F5=Refresh   F21=Sys Command
```

When a level is locally copied or is received from another location, the above screen is displayed to prompt for the placeholders and their values to be copied to the new Level. If the level being copied from didn't contain any placeholders, then this screen will not be displayed.

Special Placeholder values:
*NONE – don't copy the placeholder to the new level

Function Keys
F3 – cancel the copy of the placeholders
F5 – reset the Placeholders to their original values

3.23 Create Config Deployment Settings

Setup Menu option 20 provides command **MDCRTSET** to generate an Application to manage the MDCMS product, including the deployment of new versions, patches, license keys and settings.
The command has the following parameters:

Application Code (APPL)	The Application code to use for MDCMS product administration. Defaults to value MD If the application code already exists, any existing settings will not be updated, but any new attributes will be added. If the code doesn't exist yet, MDCRTSET creates it.
Level (LVL)	The Application level number to use for MDCMS product administration. Defaults to value 90. Typically, only one level is necessary per instance of MDCMS on a specific system. If the level already exists, any existing settings will not be updated, but any new attributes will be added. If the level doesn't exist yet, MDCRTSET creates it and sets the flags to allow checkout and receipt and to automatically process an RFP. The flag values can be modified as necessary afterwards.
Job Description (JOBD)	Specifies the name of the job description to be applied to the level definition, if the level doesn't yet exist. Defaults to value MD90 If the job description doesn't exist, MDCMS will create it automatically and set the parameters to commonly used values.
Job Description Library (JBDL)	Specifies the library of the job description to be applied to the level definition, if the level doesn't yet exist. Defaults to value QGPL The library must already exist on the system.
Job Queue (JOBQ)	Specifies the name of the job queue to be defined in the job description, if the job description doesn't yet exist. Defaults to value QBATCH The job queue must already exist
Job Queue Library (JBQL)	Specifies the library of the job queue to be applied to the job description, if the job description doesn't yet exist. Defaults to value QGPL The library must already exist on the system.

MDCRTSET generates the following attributes:

Type	Attribute	Description
*DTAGRP	APP	Deploy a specific application code. Only the code itself is deployed – use the other attributes to deploy the contents of an application
*DTAGRP	APPLVL	Deploy a specific level by specifying <APPL value>, <Level value> as the object name. The level settings and MDXREF library list are deployed – use the other attributes to deploy the contents of the level
*DTAGRP	ATR	Deploy a specific attribute by specifying <APPL value>, <Level value>, <ATTRIBUTE name> as the object name. The attribute settings, commands and scripts are deployed for that attribute.
*DTAGRP	ATRALL	Deploy all attributes for a level by specifying <APPL value>, <Level value> as the object name. The attribute settings, commands and scripts are deployed for all attributes for the level.
*DTAGRP	CMDRFP	Deploy all *RFP commands for a level by specifying <APPL value>, <Level value> as the object name.
*DTAGRP	LOG	Deploy the Log Cleanup settings for a specific Log File
*DTAGRP	RPTDEF	Deploy a specific report definition
*DTAGRP	SECALL	Deploy all User Roles, Users and user authority defined in MDSEC. Any value can be used for the object name, since all records are included automatically.
*DTAGRP	SECROLE	Deploy the authorities for a specific User Role by specifying the role id as the object name. The users assigned to the role are not deployed.
*DTAGRP	SECUSR	Deploy the authorities for a specific User by specifying the user id as the object name. The roles that the user belongs to are not deployed.
*DTAGRP	SECUSERS	Deploy all users. Only new users are added on the target locations - any existing users aren't overwritten. Role MD_USER will also be applied to all users, if the job description user for the target level has been granted permission to execute command MDUPDUSR in MDSEC.
*DTAGRP	SERVICE	Deploy the Service Runtime settings for a specific service by specifying the service name as the object name.
*DTAGRP	TMPDTACPY	Deploy a Data Copy template by specifying the template ID
*DTAGRP	TMPOBJAUT	Deploy an Object Authority template by specifying the template ID
*DTAGRP	TMPOBJDEL	Deploy an Object Delete template by specifying the template ID
*DTAGRP	TMPOBJREP	Deploy an Object Replication template by specifying the template ID
*DTAGRP	TMPOBJSEA	Deploy an Object Search template by specifying the template ID
*DTAGRP	TMPRAPID	Deploy an MDRapid template by specifying the template ID
*DTAGRP	TMPSRCDEL	Deploy a Source Delete template by specifying the template ID
*DTAGRP	TMPSRCREP	Deploy a Source Replication template by specifying the template ID
*DTAGRP	TMPSRCSEA	Deploy a Source Search template by specifying the template ID
*IFS	INSTALL	Deploy a new build of the MDCMS products and then automatically install that build. Each of the 4 IFS save files (MDCMS.savf, MDREP.savf, MDSEC.savf and MDXREF.savf) should be requested using this attribute. The easiest way to do so is in MDOpen using the Import Local Objects option. If the install (MDINSSAVF) shouldn't be automatic, then disable the post-install command or create a copy of the attribute that doesn't contain the post-install command.
*IFS	LICENSE	Deploy the MDLICENSE.savf to update the license keys and execute the update
*IFS	MAIL	Deploy an email body template file
*IFS	PATCH	Deploy a patch (mdupd_vv.rr_yyyymmddx.savf) and then automatically apply the patch
*IFS	SCRIPT	Deploy a script template file

3.24 MDCMS Configuration Report

Setup Menu option 21 provides the ability to generate an excel file containing one sheet for each MDCMS configuration file. When option 21 is selected, the user is presented with the following parameters:

File Name	The name of the excel file. MDCMS will apply the .xlsx suffix automatically
Export Option	1 – Copy the file to an IFS folder 2 – Email the file to an address and/or user and/or user group 3 – Copy and email the file
Copy to Folder	If option 1 or 3 is selected, the name of the IFS folder to generate the excel file into
Email to Address	If option 2 or 3 is selected, the specific email address to send the file to
Email to User	If option 2 or 3 is selected, the specific user to send the file to. This pertains to the MDSEC user ID and the email address saved in MDSEC for that ID. Press F4 to select from a list
Email to Group	If option 2 or 3 is selected, the user group to send the file to, based on the MDCMS user group definitions. Press F4 to select from a list

NOTE: It is highly recommended to create the MDCMS Configuration Report from MDOpen for VS Code, 8.6+ or MDOpen for RDi 8.7+, as there are many more configuration settings reported on and the report generation is substantially faster.

4 Object Manager

4.1 Overview

The MDCMS menu option 2 is a multi-function display that controls the processes required for making and installing modifications of objects.

```
CMC100                          COMPANY NAME                                  10/18/11
Filters/Defaults                 Object Manager                               7:40:40
  Programmer  : PGMR1_____                          Cmd/Script: _ / _       Y/N
  Appl Group  : ____          RFP Number : ______   Attribute : __________  *gen*
  Project .. .: ____________  Promo Lvl .: 0        Object ...: __________  *gen*
  Task/Subtask: _____ _____   Status ....: __ __ _  Assign RFP: ______

 Opt Object     Attribute  Appl Lvl Project          RFP Sts    CS From Lib
  _  ACCTPGM1   CBL        ACCT 10  VAT     +         37 01C R   Y  MMORGAN
  _  __________ __________ ____ __  ____________   _____
  _  __________ __________ ____ __  ____________   _____
  _  __________ __________ ____ __  ____________   _____
  _  __________ __________ ____ __  ____________   _____
  _  __________ __________ ____ __  ____________   _____
                                                              More...
F2=Full Name      F4=Browse      F5=Refresh     F6=Messages  F7=Promote RFP
F8=Submitted Jobs F9=RFP Control F10=Assign RFP F11=Output   F24=More Keys
```

The Object Manager is used for:
Source/Object request and retrieval.
Reserving Object names for new objects.
Grouping objects for installs.
Identifying modification requests
Requesting the installation of objects into application environments

Filters / Defaults
Programmer
When an object is requested for modification or a new object name is reserved, it is assigned to a user profile. An entry in this field will limit the listing to objects assigned to the user profile.

Appl Group
An entry in this field will filter by the Application Group that has been entered. An entry here is also the default value for new requests so that the programmer does not need to enter it for each object.

Project
A Project defines the reason, responsible parties, and timeline for work to be done. During the Project process, a request is made to assign one or more Projects to the object. This enables MDCMS to filter and track objects by project. An entry in this field will filter the display to only include objects assigned to the selected Project. An entry here is also the default value for new requests so that the programmer does not need to enter it for each object.

Task/Subtask
The Task, or Subtask, associated with the Project value. Tasks and Subtasks enable the user to further define and subset the work being done for the Project. An Object Request may be assigned to one or more Projects, Tasks or Subtasks. This enables MDCMS to filter and track objects by Project, Task and Subtask. Entries in these fields will filter the display to only include objects assigned to the selected Project, Task and Subtask. An entry here will also be used as the default value for any new requests so that the programmer does not need to enter it for each object.

RFP Number
An RFP is a Request for Promotion. When an object or a group of objects are ready to be installed into an application environment, an RFP is required to track and to group an installation. The RFP is Application Group and Promotion Level specific. The system requires a brief explanation of the promotion request. This explanation is stored in the system and a number is assigned. This number is used to group objects to be installed. An entry in this field will filter the display to only include objects assigned to the selected RFP number.

Promo Lvl
An entry in this field will filter the display by the Promotion Level that has been entered. An entry here is also the default value for new requests. If left blank, the lowest level for the application that allows checkouts will be used by default.

Request Status
The first of 3 status filter fields. As each object is processed through the MDCMS system, a status is applied to the object record to track the modification and installation progress. If this field is left blank, the system will include object records with any active status. An entry is in this field will filter the display to only include objects that match the Status selected.

Status values:
RP – The request for the promotion level is pending MDWorkflow acceptance in the prior level.
UL – The request is currently unlocked so that others can work with the same object.
00 - Object has been requested for modification and a RFP has not been assigned.
01 - An RFP number has been assigned to the requested object.
02 - Approval Pending - an RFP approval is required before the installation process can continue.
CP – File waiting for MDRapid to be launched to copy the data to the new format for the file
CR – MDRapid is currently copying the Data
03 - Installation Pending - The object is ready for installation and requires an RFP installation release.
04 - RFP has been submitted to batch for an installation.

Creation/Copy Status
A value, when applicable, is displayed to the right of the Request Status to indicate the Creation or Copy Status of the object. The value is updated with a creation status when option 8 is used to compile the object into the Developer's library or during the compile and installation of the object as part of an RFP. The value is updated with a copy status when MDRapid is used to copy a file's data from the current format to a new format prior to installation.

Status values:
C – The object was successfully created or copied
E – An error occurred during the creation or installation of the object
L – RFP blocked due to lock on the Object or Source member
00-99 – the maximum % of data that has been copied during the MDRapid process

Additionally, value N can be used in the filter to only list objects for which no creation or copy has been attempted.

Conflict Status
A value, when applicable, is displayed to the right of the Creation/Copy Status to indicate status of Conflict Resolution when multiple versions of an application are managed.

Status values:
O – Conflict Resolution open – other versions have not been resolved
L – Conflict ignored for this level, but will be open again when RFP continues to next level
I – Conflict ignored for all levels for this request
R – Conflict has been resolved for all other versions for request

Additionally, value N can be used in the filter to only list objects for which Conflict Resolution is not necessary.

Cmd

Y – Filter the object requests to show only those requests that contain commands defined for the specific object.
N – Filter the object requests to show only those requests that don't contain commands defined for the specific object.

Script

Y – Filter the object requests to show only those requests that contain scripts defined for the specific object.
N – Filter the object requests to show only those requests that don't contain scripts defined for the specific object.

Attribute

An attribute is the identifier for the handling of each type of object. The attribute is defined in Option 3 of the System Settings and specifies source/object locations, compile handling, etc. An entry in this field will filter the display to only include objects assigned to the selected attribute. An entry here is also the default value for new requests. The wildcard character * can be used as a generic prefix or suffix for the value.

Object

An entry in this field will limit the display to requests for matching object names. The wildcard character * can be used as a generic prefix or suffix for the value.

Assign RFP

The RFP number to use when assigning request records to a promotion grouping.
Using option 'A' in front of individual unassigned object requests, will then immediately apply the Assign RFP value to those requests (if for same Application and Level as RFP number).

Using F10 will assign the RFP number to all unassigned requests in the filtered list for the same Application and Level.

4.2 The Request Record fields

Object

For object requests the object value is as follows:

Object Type	Object Value
OS/400 Objects	system object name
*DATA	system name of physical file containing the data
*DTAGRP	record key values
*DUMMY	free text
*IFS	IFS file or directory name
*MSGD	message description ID
*SOURCE	source member name
*SQLxxx	SQL long name

When selecting to perform a library migration, the object value is the name of the library or IFS directory path.

If the name is longer than 10 characters, press F2 to view/modify the complete value.

Attribute
The Attribute is the MDCMS Source or Object code that is used during the Retrieval and Installation processes to define the behaviour of the object. II left blank, MDCMS will use the attribute last used for the object name specified. If left blank and multiple object types exist for the same object name, MDCMS will prompt for the selection of the type before applying an attribute.

Appl
The Application Group is used to retrieve Promotion Level and Environment information required for source retrieval and installing object and source.

Lvl
The Promotion Level is used to define the library that compiled objects are to be installed into and the library of the application's source files. If the promotion level is not entered, or if the object is new, the level will be automatically set to the lowest level that allows checkout for the application environment.

Project
The Project(s) that the object request is assigned to. If the object is assigned to more than one Project, or is assigned to a Projects Task or Subtask, a plus sign(+) will be displayed to denote additional information is available. Enter an option '5' or '6' to see all Projects, Tasks, or Subtasks for an Object.

RFP
The Request for Promotion number is required for installing an object to an application environment. An RFP is Application Group and Promotion Level specific. MDCMS edits the assignment process and will not allow assignments across Application Groups and Levels. When the RFP is submitted for installation, all objects that are assigned to it will be installed.

Sts
The line Status shows the current status of the request record. It is a display only field.

Status values:
RP – The request for the promotion level is pending MDWorkflow acceptance in the prior level.
UL – The request is currently unlocked so that others can work with the same object.
00 – Object has been requested for modification and a RFP has not been assigned.
01 – An RFP number has been assigned to the requested object.
02 – Approval Pending - an RFP approval is required before the installation process can continue.
CP – File waiting for MDRapid to be launched to copy the data to the new format for the file
CR – MDRapid is currently copying the Data
03 – Installation Pending - The object is ready for installation and requires an RFP installation release.
04 – RFP has been submitted to batch for an installation.

The 3rd and 4th positions of the Status shows the Creation, Copy or Lock Status. The possible values are:
C – The object was successfully created or copied
E – An error occurred during the creation, copy or installation of the object
L – RFP blocked due to lock on the Object or Source member
00-99 – the % of data that has been copied during the MDRapid process

C
Y – Commands are attached to this specific object request and will run at install time.

S
Y – Scripts are attached to this specific object request and will run at install time.

From Lib
The library name that corresponds to the From Library associated with the Application level indicated on the Object Request line or the library name of a Library Migration request. This will normally be a named library except when a request is for the recompile, delete or update of an object which will be indicated by the corresponding values of *RECOMPILE, *DELETE and *UPDATE.
Value *REQONLY indicates that a request record exists for a *SOURCE type, but source will not physically be migrated on this system.

Function Keys:
F2=Full Name - Edit or display the full name of an Object, when the name is too long to fit on this screen.
F3=Exit
F4=Browse - Display list of valid values for a field. For fields such as Project, Task, Subtask or RFP, the fields may also be maintained from the F4 screen.
F5=Refresh
F6=Messages – Display message queue of user.
F7=Promote RFP - Prompts the user to submit a RFP for installation.
F8=Submitted Jobs – Work with jobs submitted by user
F9=RFP Control - Used to select and maintain an RFP Assignment number for the **F10** process or the 'A' option.
F10=Assign RFP - Automatically assigns an RFP number to all displayed request records that have a status of '00' and match the application environment and level for the RFP. The RFP number used is retrieved from the RFP Assignment field in the header of the display.
F11=Output – Display the MD Output panel and other spool files
F12=Previous
F15=Print List - Prints a list of every active Project record that matches the current set of filter values.
F17=Top – Position the cursor to the top of the request list.
F18=Bottom – Position the cursor to the bottom of the request list.
F19=Time Entry – Bring up the Project/Task Hours Used listing to view and enter time worked.
F20=Assign Proj - Automatically assigns a selected open Project/Task/Subtask to all displayed requested records not yet assigned to a Project. The Project Selection display is provided in order to select the Project/Task/Subtask or cancel the Assign process before the process is performed.

F21=Sys Command – displays the IBMi command entry screen so that IBMi commands may be run without the need to exit MDCMS.
F22=Create All – MDCMS attempts to create all eligible objects into the developer library, based on, and in the order of, the rows listed. When F22 is pressed, a confirmation screen is shown that displays the total number of object requests that are eligible for creation into the developer library. Press Enter to proceed with the attempt or F12 to cancel. Upon completion, the total number of successful attempts and total number of failed attempts are shown.
F24=More keys – Displays the additional Function Keys that do not appear on initial panel.

4.3 Requesting a change to an Object

4.3.1 M – Modify Object

The 'M' option is a request to modify an existing object. If the request is successful, MDCMS will copy the requested source to a development library and create a Request record in Lock Mode.

The Object Selection Process

1) position cursor to a blank line in the object manager
2) Enter the name of the object or press F4 to select object from list. A portion of the object name may be entered before pressing F4 to position the cursor to that name in the list.
   It is permitted to select multiple objects from the list. If more than 1 object is selected, each additional selection will be placed on its own new row within the Object Manager listing and the option, application and RFP for the initial row will be replicated to the additional rows for rapid check-out of multiple objects.
3) Enter the name of the MDCMS attribute or press F4 to select the attribute from list. If left blank, the default value entered at the top of the screen will be used. If this value is also blank, MDCMS will use the attribute that was used for the object the last time that the object was installed. The attribute specifies the location of the source and object as well as how the source is compiled and which authorities are assigned to the object.
4) Enter the name of the application in which the object exists or press F4 to select the application from list. If left blank, the default value entered at the top of the screen will be used.
5) Enter the Level number for the application or press F4 to select the level from a list. If left blank, the default value entered at the top of the screen will be used. If this is also blank, then the lowest level for the application will be used.
6) Enter the Project ID or press F4 to select the Project, Task or Subtask from the Project Listing panel. If left blank, the default value entered at the top of the screen for Project, Task and Subtask will be used. It is not required that a Project is selected at request time. More than 1 Project may be selected for the same object request.
7) Enter the RFP number or press F4 to select the RFP from list. If left blank, the default value entered at the top of the screen will be used. It is not required that a RFP is selected at request time.
8) Press Enter.

MDCMS checks to see if another user already has the object requested. If so, the newly entered request is declined and a screen is displayed which shows all relevant information pertaining to the existing request. From the screen, the user has the option to press F10 in order to request the object in Unlock Mode.

MDCMS will select the default library/folder to copy the existing source or object from based on the following priority:

1) The primary library/folder for the target level
2) The chain of levels above the target level based on the next level parameter on level definition.
3) The chain of based on levels for the target level, if the target level is based on another level for managing parallel versions of an application.
4) The search template definition for the attribute.

```
CMC180                                T Dev                          29.07.14
SCRN1                     Source Member Copy Options                 22:15:14


Appl Lvl Type    Attribute  Object
TEST 10  *PGM    CLP        ACOBJ1

Copy From
  Location  . . .  *LOCAL_____________________________________
  Source File . .  QCLSRC____
    Library . . .    TSTSRC10__
  Member Name . .  ACSRC1____        Name, *NONE

Copy To
  Dev Source File  QCLSRC____
    Library . . .    MMORGAN___
  Member Name . .  ACSRC1____

Dev Object Library MMORGAN___



Enter=Confirm    F4=Browse    F5=Refresh    F12=Cancel
```

This screen is then displayed where the user chooses where to copy the source from and where to copy the source to. Modifications are then made to the copy of the source, rather than the original source to protect the installed version of the source.

If the source already exists in the programmer's library, the programmer will be prompted as to whether or not the existing source should be overwritten.

If the library or source file does not yet exist in the programmer's library, the programmer will be prompted to create them.

The name of the source can differ from the name of the object and the source library may be different than the object library.

Source Comparison

If Source Comparison Checking is defined for the application level in the OS/400 Location settings (MDCMS Settings Menu Option 8), then the version of the source that is to be copied into the programmer's library will be compared with the version of the source that is residing in the comparison level on the local or a remote system.

If the versions are different, a warning screen will be displayed to the programmer. F8 can be pressed to view the differences in the 2 versions of the source code. If the programmer has authority to request source from a different location (MDSEC Code 33 for the application), the programmer then has the option of copying the remote version of the source rather than the local source.

If the versions are different and the programmer that made the prior change to the source is different than the current programmer, the current programmer can only check out the source if they have authority to change programmer for object request (MDSEC Code 32).

Emergency Checkout Warning
If the Object was most recently checked out for deployment to an Emergency level, and the new request is for a standard level, a warning screen will be displayed to the programmer informing them of the level, user and Project involved in order to help resolve the merging of the changes made for the emergency deployment.

Location Warning
When requesting source or objects, MDCMS can be configured to automatically notify the user if the source or object is found in specific locations. This can be helpful to make the user aware of potential conflicting versions of the object, such as in vendor libraries. To automatically search and notify, apply search templates with the libraries to be checked to the attributes to be monitored.

4.3.2 N – New Object

This option is used to reserve an object name. The steps followed are identical to those for the modification of an object. The new object name may not already exist in the destination library for the attribute. If for new source, the user is then prompted for an existing source to copy from (as a template). The copy is optional.

If an existing source member is copied to a new member, or if the copy from value of *GEN is used to generate a new source member in the programmer library, the programmer is then prompted to provide the source attribute and description of the new member.

If the member to copy from doesn't exist in the default source library, F16 can be pressed to have MDCMS search for the source in the level chain and based on levels.

4.3.3 D – Delete Object

This option is used to delete an object and the source for the object. The steps followed are identical to those for the modification of an object. When the promotion occurs that causes the deletion, the source or object is archived prior to deletion (if archiving is turned on for the level.) Any cross-reference information about the object is also removed at promotion time.

To delete an IFS file or directory, enter the attribute for the IFS entity before pressing F4 to select it from a list. If a directory is selected, and that directory contains files or sub-directories, MDCMS will automatically create deletion reservations for those entities too.

4.3.4 R – Recompile Existing Object

This option is used to recompile an object into a target level. The recompile option can be used for objects that include a source library/folder on the target level's attribute or for ILE programs/service programs to refresh the bindings for modified modules or service programs.

If recompiling from source, the source used to compile from will be determined based on the search priority below. If recompiling ILE from a list of bindings, the program containing the bindings will be determined by the search priority below:

1) The primary library/folder for the target level
2) The chain of levels above the target level based on the next level parameter on level definition.
3) The chain of based on levels for the target level, if the target level is based on another level for managing parallel versions of an application.
4) The search template definition for the attribute.

An object can be requested for recompile even when a locked request already exists for the target level. The steps followed are otherwise identical to those for the modification of an object.

If multiple objects of different names share the same source, the initial object can be checked out as Modify and the other objects can be checked out as Recompile and then placed on the same RFP. The modify request should be set to be sorted first among the group of objects sharing the same source in the RFP.

4.3.5 U – Update Existing Object

This option is used to update an existing object without modifying any source or migrating the Object from a lower level. An Update command must be defined for the object or attribute. Examples of an Update command would be the UPDPGM command for updating existing ILE programs, CHGPF for updating an existing DDS table, or RUNSQLSTM for an ALTER script for an existing SQL table. The Update option may be requested even when work is in progress for the source or object. The steps followed are otherwise identical to those for the modification of an object.

*** NOTE - for ILE/Service Programs, it is recommended to instead use the recompile option for ease of use.

*** Generally, for tables, it is recommended to use the modify option instead of the update option for better rollback capabilities. However, if an update is used in conjunction with MDRapid, the update will occur in a copy of the file and then that will be moved to the live library at installation time to limit application downtime and provide full rollback capabilities. By default, updates don't utilize MDRapid, but this can be enabled by editing the object request and specifying *YES for parameter Use MDRapid.

4.3.6 L – Library Migration

Often, a temporary library will be sent from a vendor (or some other source) with the intent that the objects in this library are to be migrated into your application. The 'L' option can be used to easily request the objects for migration.

To do this, enter the name of the library at the object prompt. Also enter the Application code. Leave the attribute field blank. Press Enter. A list of all objects in the library is then displayed.

```
CMC125                            COMPANY NAME                              10/18/11
SCRN1                        Library Objects Request                        15:44:34
Library.: LIV12121
Appl/Lvl: TEST 10  RFP: _______ Project: SAP001______ Task/Subtask: _____ _____
Filters (* = generic*)
 Object*: __________  Type: _______ *Sys Attr*: __________ *Desc*: ____________
                                      Created from: ________ to: ________
Type options, press Enter.
 M=Migrate  D=Object Description  S=Source Members  5=View Request Details

Opt Object     Type      CMS Attr   Created   Description
 M  COHDRL1    *FILE     LF         10/01/11  XYZ CO HDR file by costs
 _  COHDRL2    *FILE     LF         10/01/11  XYZ CO HDR file by cocst
 _  COHDRL3    *FILE     LF         10/01/11  XYZ CO HDR file by copsts
 M  CO001D     *FILE     DSPF       10/01/11  XYZ Customer Order Maint
 M  CO002D     *FILE     DSPF       10/01/11  XYZ Customer Order Browse
 M  CO002R     *PGM      RPG        10/01/11  XYZ Customer Order Browse
 _  CO006D     *FILE     DSPF       10/01/11  XYZ Customer Order Print
 M  CO007P     *FILE     PRTF       10/01/11  XYZ Customer Order Print

                                                                    More...
F4=Browse   F8=Today   F9=Dft Attribute   F13=Repeat Opt   F14=Repeat Attribute
```

This display lists all objects that exist in the library.

RFP
The RFP number to assign to the selected objects in the library. Press F4 to create a new RFP and/or select an RFP from the list of open RFPs.

Project/Task/Subtask
The Project ID to assign to the selected objects in the library. Press F4 to create a new Project and/or select a Project from the list of open Projects. If the assignment needs to be for a task or subtask within the Project, those values can be entered as well.

Filters
The list of objects may be filtered by Object, Type, System Attribute, Description or range of Creation Dates.

The object name filter value can use the suffix * to filter the objects based on the value preceeding the *. The system attribute and description filters allow the * wildcard before and after the generic value.

The filters are not case sensitive.

Opt

M=Migrate – Migrate the object from the selected library into the lowest application level on the system. A request will then be created for that object. The request can then be handled like all other requests in the Object Manager.

D=Object Description – Display the object description using the IBM Display Object Description command(DSPOBJD) using a Detail parameter value of *FULL. The information on the Display Object Description panel can aid in analysing objects prior to migration.

S=Source Members – View the list of source members in a source file. This option is only valid for source files. The members may then be individually requested.

5=View Request Details – View the details of an already requested object.

Attribute

MDCMS makes a best guess as to what the attribute should be. Enter a different value or press F4 to select from list, if necessary.

Function Keys:

F4=Browse – Display list of valid values for a field.

F8=Today – Creates a filtered view of all objects that were created with today's date.

F9=Dft Attribute – Set default Attribute to be used for new objects with same system attribute.

F13=Repeat Opt – Repeat an option until end of list. For example, if 'M' was entered on the 4th line of the list and F13 was then pressed, lines 5 through the end would also have 'M' entered.

F14=Repeat Attribute – Repeat an attribute. Place cursor on line for attribute to be repeated and press F14. For every object with a matching object type, this attribute will be inserted.

4.3.7 L – IFS Directory Migration

Option L can also be used to migrate files or entire directories that exist in IFS.

To specify a Directory Migration rather than a Library Migration, place a "/" at the beginning of Object field before pressing Enter.

```
CMC126                              COMPANY NAME                              10/18/11
SCRN1                       IFS Object Migration Request                      12:55:23

Directory: /transfer



Type options, press Enter.
 M=Migrate  S=Set Root Directory  5=View

Object Filter: _____________________________

Opt     Object                          Date Modified       Attribute   Req'd By
 _   DIR downloads                      2011-08-25 14.33.24 __________
 _   DIR patch070315                    2011-08-25 14.33.25 __________
 _   DIR patch070326                    2011-08-25 14.33.26 __________
 _   DIR patch070420                    2011-08-25 14.33.27 __________
 _   DIR patch070427                    2011-08-25 14.33.28 __________
 _   DIR patch070620                    2011-08-25 14.33.29 __________
 _   DIR saved070211                    2011-08-25 14.33.30 __________
 _   DIR savem070407                    2011-08-25 14.33.31 __________
                                                                   More...
F2=Full Name   F3=Exit   F4=Browse   F12=Up   F13=Repeat Opt   F14=Repeat Attr
```

This display lists all sub-directories and files that exist in a specified directory.

Object Filter
The list of objects may be filtered by object name. All values are interpreted as generic strings. For example, enter TCH in the object filter to see all objects with tch somewhere in the name. The filter is not case sensitive.

OPT
M – Migrate the object from the specified directory into the lowest application level on the system. A request will then be created for that object. The request can then be handled like all other requests in the Object Manager. If the object is a directory, and the directory contains files or sub-directories, you will be prompted with the choice to automatically migrate all files and/or directories as well. You can also limit the migration to include only directories/files that have been modified since a specific date/time.

S – Set the Root Directory for the Migration. Afterwards, you can use option 5 to drill down into the directory and its sub-directories and select to migrate specific files or directories, while retaining the path starting with the root directory.
For example: an Attribute is defined that specifies that an IFS object is to be installed into directory /tomcat. You could then use option S to set the root directory for the migration as directory webapps, which resides in directory /delivery. Afterwards, option 5 is used to select a file in directory /delivery/webapps. When the file is migrated, it will be moved from directory /delivery/webapps to directory /tomcat/webapps. This way, you only need to create an attribute for the uppermost directory of commonly changed objects in IFS.

5 – If the object is a file, then the contents of the file will be displayed. If the object is a directory, then this display will change to show all objects residing in the directory.

Attribute

MDCMS makes a best guess as to what the attribute should be. Enter a different value or press F4 to select from a list of IFS attributes, if necessary. If a Root Directory has been set, then the Attribute for the Root Directory will be used.

Function Keys:
F2=Full Name – Display the full name of an IFS Object or Directory. Place the cursor on the field before pressing F2.
F12=Up – Go up 1 directory in the path. If the currently displayed path is /, then MDCMS returns to the Object Manager.
F13=Repeat Opt – Repeat an option until end of list. For example, if 'M' was entered on the 4th line of the list and F13 was then pressed, lines 5 through the end would also have 'M' entered.
F14=Repeat Attr – Repeat an attribute. Place cursor on line for attribute to be repeated and press F14. For every object with a matching object type, this attribute will be inserted.

4.3.8 Y – Synon/2E Migration

If MDCMS is configured to migrate objects from Synon/2E models, Option Y will appear that can be used to select the Model objects for migration.
See the PDF document MDCMS_SYNON-2E_Interface_Manual for further information and instructions.

4.3.9 Request Linked Objects for Attribute

If the object just requested was for an attribute that contains Linked Checkout definitions, then MDCMS will automatically present a list of linked objects to be considered for checkout.

```
CMC123                          COMPANY NAME                          20.04.13
SCRN1                Request Linked Objects for Attribute             21:41:56

 Object: RC0300                            Appl: MD     Project: V7
   Type: *PGM          Attr: RMCBL          Lvl: 10     RFP Nr.:

Type options, press Enter.
 D=Delete   M=Modify   N=New   R=Recompile   U=Update   5=View Request

Opt Object                Type    Attribute  Description
 _  C.OBJ.LST____________ *DTAGRP RFUN
 _  RC0300_______________ *DTAGRP RSCREEN
 _  RC0300IO_____________ *SOURCE RLBL       Screen Definition Copybook









                                                                    Bottom
F2=Full Name   F3=Exit   F13=Repeat Opt
```

Opt
D=Delete – Create a Request to delete the Object
M=Modify – Create a Request to modify an existing object
N=New – Create a Request to create a new object
R=Recompile – Create a Request to recompile an existing object
U=Update – Create a Request to update an existing object
5=View Request – View the details of an already requested object.

Object
MDCMS automatically generates the name of the linked object, based on the name of the parent object in combination with the Naming Pattern definition for the linked attribute. The object names can be modified before pressing Enter to request them.

Function Keys:
F2=Full Name – Place cursor on an Object field and press F2 to view/edit the complete value
F13=Repeat Opt – Repeat an option until end of list. Place cursor on line for option to be repeated (including a blank option) and press F13. Every line after the line containing the cursor will receive the same option.

4.4 Process Request Records

4.4.1 2 – Edit Request Details

An entry of '2' for an existing request will allow the user to change the request parameters.

```
CMC100                          COMPANY NAME                              4.09.06
SCRN3                        Edit Request Details                        10:37:02

Appl/Lvl: TEST 10  RFP:          Object: JAVAXREF
Project.:                          Type: *SQLTAB
Reason..: *MODIFY
Attribute  . .  SQLTABIFS_
Programmer . .  MMORGAN___
Sort Sequence.  _____
Source Name  .  JAVAXREF.sql_____________________________________________________
Object Desc  .  Admin - Invoice maintenance_____________________  *SAME,*BLANK
From Lvl . . .  __
From Obj Lib .  MMORGAN___
From Src Lib .  /home/mmorgan____________________________________________________
Data Origin  .  *SAME_____________________________  Name, *SAME, *MIGRATE, *NONE
Data Member  .  __________                          Name, *ALL, *FIRST
Use MDRapid  .  *DEFAULT                           *DEFAULT, *YES, *NO
Automatically Reapply Y/N:
 Journaling: Y  Constraints: Y  Triggers: Y

Enter=Confirm   F2=Full Name   F4=Browse   F8=Edit Projects   F9=Get Object Desc
```

Attribute
The MDCMS attribute may be changed, as long as the new attribute is of the same Object Type as the old attribute, and the target source or object for the attribute isn't already locked by another request.

Programmer
The programmer can be changed to a different user registered in MDSEC.

Sort Sequence
Object Requests are sorted by attribute compile sequence, sort sequence and object name. The sort sequence for the individual object can be entered here in case other objects of the same attribute compile sequence are dependent on this object. For SQL objects see the MD Best Practice – Managing SQL Entities guide for more information on automatic sorting.

Source Name
The source name may differ from the object name and can be modified here

Object Desc
The object description that is either currently on the object or that can be entered to be applied to the object when deployed.
*SAME – keep the same value for the object description when the object is created. If blank, then the object description will be set to the description of the object that it is replacing.
*BLANK – set the object description to be blank.

Press F9 to retrieve the current description for the Object

From Lvl
If more than one level migrates to the request level, a different level to migrate from can be selected

From Obj Lib/Src Lib/Src File
If the request is from the lowest level, the from location for the object (and source when applicable) can be changed.

Data Origin
When the request is for a file, existing data will by default be copied from the old version of the file to the new version of the file.

The origin can be one of the following:
*MIGRATE – the data in the file is migrated with the changed format for the file. This is the equivalent of having a *FILE request and a *DATA request in the same RFP.
*NONE – any existing data will not be retained. *NONE is required when changing the system attribute from PF to LF or from LF to PF.
*SAME (default) – any existing data in the file being replaced will be mapped to the new format for the file.
The system or SQL name of the file containing the data to copy from. The file must exist in the same target library as the file being modified.

Data Member
When the request is for a file, and the Data Origin is a different file, the member in the other file can be defined to copy from. This is particularly helpful when converting an existing multi-member DDS file to several new SQL tables, since SQL only allows for one member per table.

The member can be one of the following:
*ALL – all members in the file will be copied. This is only valid if the requested file is a DDS file.
*FIRST – the first member in the file will be copied.
The name of the member to copy from the Data Origin to the requested file.

Use MDRapid
Whether or not MDRapid, if licensed, should be used to copy data from the prior version of a file to the new version of the file, to significantly reduce the amount of time required during deployment.

*DEFAULT – MDRapid will be used for modify or recompile requests, if the number of records in the file at RFP submission time meet or exceed the minimum defined on the MDRapid Usage template.
*YES – use MDRapid for the copy/syncing of data, even if the current record count is less than the default minimum, or if the file is requested for Update.
*NO – don't use MDRapid for the file deployment, even if the file would otherwise be qualified.

Automatically Reapply Journaling
Whether or not Journaling for a file should be automatically reapplied when the file is modified.

Automatically Reapply Constraints
Whether or not constraints for a file should be automatically reapplied when the file is modified.

Automatically Reapply Triggers
Whether or not system (non-SQL) triggers for a file should be automatically reapplied when the file is modified. Any SQL triggers that should be re-applied should be requested for recompile and placed on same RFP as the file.

Automatically Reapply LF Members
Whether or not existing members for a logical file should be automatically recreated when the file is modified.

4.4.2 4 – Delete Object Request

An entry of '4' will delete the request for an object modification. This is only allowed if the Status of the request record is currently '00 or '01', which means that the installation of the request is not yet in progress. A confirmation screen is displayed before the request is deleted.

If the request is for the lowest level on the system, the user may choose to delete the source and object from the programmer library. This allows for a cleaner developer environment.

4.4.3 5 – Display Request Details

The Option '5' will display all relevant information pertaining to the object request.

4.4.4 6 – Edit Projects for Request

An entry of '6' allows the user to change the list of Projects, Tasks, or Subtasks that the Request is assigned to. If the user has enough authority, they can also edit the details of the projects or add new Projects, Tasks or Subtasks.

4.4.5 7 – Rename Object Request

An entry of '7' will prompt the user for a new name for the requested object. The user may also let MDCMS automatically rename the source and object residing in the programmer's library.
Renaming is permitted for new or existing objects for a level allowing checkout.
The rename only affects the name to be used in the developer's library and when deployed, but will not automatically delete an object with the prior name.

4.4.6 8 – Create Object

An entry of '8' will prompt the user to compile the object into their own library from the checked out source. This is useful for validating the source or for unit testing prior to submitting the RFP. This is only valid for object attributes defined with a source and object location or for ILE programs/service programs. The source must be checked out as New, Modify or Recompile from a level allowing check-out.

The compile process uses the Pre-Compile, Compile and Post-Compile commands defined for the attribute or specific object so that the object is created in exactly the same way as during a deployment.
In the case of SQL Constraints or Triggers, the Post-Installation commands are used instead of the Compile commands.

If compiling a physical file, any logical files over the physical that exist in the developer library will be automatically deleted. However, logical files in other libraries must be handled manually.

Library List
1 – The library list defined for the Job Description assigned to the Application Level is used
2 – The current library list for the job is used

Include Dev Library
Y – The developer object library for the request is added to the top of the library list to reference any objects in that library that may also have changed.
N – The developer object library is not added to the library list. If it is already in the library list, it will remain at the position it is in.

Object Exists
Y – The object already exists in the developer library and will be automatically deleted prior to the create process.
N – The object doesn't yet exist in the developer library

Show Create Log
The Create Log consists of job log entries and compile log entries written during the create process. In order for compile log entries to be written, the CRTxxxx command must include the option *EVENTF, if that option is available for the command.

The following options determine when the create log will be shown directly after processing the pre-compile and compile-commands:
E – if command exceptions occurred or the object didn't get created
Y – always
N - never

When the Create Log is displayed, the minimum severity can be set to filter out lower severity messages than the filter value.

4.4.7 9 – View Spooled File

An entry of '9' will display the most recent spooled file for the object. The spooled file will have been created during the compile of the object into the developer's library using option 8 or during the compile of the object during RFP processing.

4.4.8 A – Assign RFP

An 'A' entry in the option field will assign the RFP number entered in the RFP field to the Object Request record. The Status of the Request record must currently be 00 or UL. If the RFP is blank, the system will transfer the display to the RFP Select Display so that the user may add and/or select an RFP.

4.4.9 B – Bound Objects for Program

An entry of 'B' will allow the programmer to configure the list of Bound Modules and Service Programs for an ILE Program or Service Program.

This information will then be used when the program is created, assuming a compile command is defined for the attribute or object with the placeholders ##MODULE##, ##SRVPGM## and ##ENTMOD## (for programs).

If this option is not used before a program is created during installation, then MDCMS will use the current definition for the object in the migration library.

```
MDCCMSB                          MD Test Environment                          11.03.08
SCRN1                               Bound Modules                             17:18:30

 Program: ILEXREF     Type: *PGM       Attribute: ILEPGM

Type options, press Enter.
 M=Modify   4=Remove from List   E=Entry Module

Opt Module      Library    PEP Attribute  Description
 _  MDCDATR     TSTLIBMOD      CBLLE      MDXREF: calculate date range
 _  MDCDIRL     TSTLIBMOD   Y  CBLLE      MDCMS - view/select directory contents
 _  MDCIFSE     TSTLIBMOD      CBLLE      MD Check access of IFS object
 _  MDCIFST     TSTLIBMOD      CBLLE      MD Check type of IFS object
    __________  *LIBL
    __________  *LIBL
    __________  *LIBL
                                                                        Bottom
F3=Exit   F4=Browse   F8=Service Programs   F10=Create in Programmer Lib
```

Opt

M=Modify – Request the Module or Service Program for modification. The requested element will automatically be assigned to the same RFP and Project as the Program binding it.

4=Remove from List – Remove a Module or Service Program from the list

E=Entry Module – Designate a specific module to contain the PEP (Program Entry Procedure)

Module [or Service Program]

The name of a Module or Service Program to add to the list

Library

The current location of the Module or Service Program. MDCMS looks first in the developer library and then in the library list for the Level.

Attribute

The MDCMS attribute to use if requesting to modify the Module or Service Program

Function Keys:

F3=Exit

F4=Browse

F8=Service Programs – toggle the listing between Modules and Service Programs

F10=Create in Programmer Lib – create the program in the developer library, based on the currently defined list of bound modules and service programs. MDCMS will use the version of each module or service program based on the found library location. It is not necessary to create a program in the check-out library, but it can be useful for testing purposes.

4.4.10 C – Commands/Scripts for Object

An entry of 'C' activates the MD Detail Command Maintenance function for a specific object. This function is used to define IBMi commands that can be executed during the installation of objects into an application level. This function is also used to override the default compile, data, and update commands defined at the attribute level.

```
CMC192                              COMPANY NAME                              4.09.06
SCRN1                         Commands for this Object                       15:54:04

Appl/Lvl: ACCT 10  Object: ACRPT01

Type options, press Enter.
 2=Edit    3=Copy    4=Delete    5=View

 Opt Type Seq  Command String
  _    1   10   OVRDBF FILE(ACCTPF1) TOFILE(PRODLIB/ACCTPF2)
  _    3   10   RMVM PRODLIB/ACCTPF1 XXXTEST



                                                                        Bottom
 F3=Exit    F6=Add    F12=Previous
```

Type

C – Compile Command. Will be used to compile the object from source code. The C command override uses the compilation command as defined in the System Settings for the attribute as a default model. The command can then be changed for the compile process. This override will then be used to compile the specific object rather than the default compile command for the attribute.

D – Data Copy Command

- *FILE attributes – determines how the existing records in a physical file should be mapped to the new format when a physical file is installed.

  Data Transformation must be disabled for the file in order for MDCMS to consider a Data Copy command. It can be disabled using option F=File Data Transformation from the Object Manager and then pressing F10.

  The data copy command can use CPYF, in which case the parameters FROMMBR, TOMBR and MBROPT are considered. All other keywords in the CPYF command are ignored. Only 1 command may be defined for *FILE mapping.

  Other commands, such as RUNSQLSTM or CALL, may also be used for mapping the data in a changed file from the old format to the new format. If such a command is used, it is critical to use the ##OFF placeholders so that MDCMS can correctly provide the location of the old file format.

- *DATA attributes – determines how and which data records should be copied from one environment to another. All keywords except FROMFILE and TOFILE are then used when the CPYF command is run. Only the CPYF command is permitted for *DATA attributes

U – Update Command. The U command override will be used to update the existing object rather that the U commands defined at the attribute level. An example would be the UPDPGM command to update existing ILE programs. The Update Command may also be used to update an existing object using the modified source. An example for this would be the CHGPF command to update the format of a physical file for a modified DDS source. In this case, the source would be checked out using the M (modify) option and at installation time, the Update command would be used.
1 – Pre-Compile Command runs prior to compiling objects
P – Post-Compile Command runs after compiling objects
2 – Pre-Installation Command runs prior to installing objects into the environment
3 – Post-Installation Command runs after the installation of objects is complete, but prior to releasing the application for usage. Possible to roll back RFP if command fails.
Q – Command that runs during the Archive/Cleanup phase of the RFP after the application is released. Any command error will flag a warning, but not cause a roll back. Typically used post-installation notifications or for additional processing of archived source and objects. For example, command MDCMPPFM can be invoked to generate a comparison report between the prior and new code in source members.
O – Data Copy during Send runs for *DATA requests only during the copy of data to send to a remote location, determining which data records should be sent to a remote location based on the INCCHAR and INCREL parameters of the CPYF command. The command is run separately for each target location. Placeholder ##SVFLOC## could, for example, be used to filter by the location ID, if a column in the table contains that value.

Ignore Errors
Y – Continue with RFP processing even if the command fails. Flag will always be Y for type 3.
N – Cease and Rollback RFP processing if the command fails

Keep MD Libs in Libl
N – The MD Libraries (MDCMS and MDXREF) are removed from the library list before the command is invoked. This assures that any MD Objects with the same name as your objects are not used.
Y – The MD Libraries are left in the library list. This is necessary when MD Objects, such as interface programs, MDMAIL or MDMAILF, are needed to process the command.

Reuse Command
Y – The next time that this same object is checked out, this command will be reapplied to the request
N – This command is intended to be used only once for this object

Placeholders in SQL
N – The SQL member or IFS file used by a RUNSQLSTM command does not contain MDCMS placeholders – no conversion will occur
Y – The SQL member or IFS file used by a RUNSQLSTM command contains MDCMS placeholders – MDCMS will create a temporary copy of the script and convert the placeholders in the copy to the actual runtime values.

This flag is only relevant for RUNSQLSTM commands. The placeholders embedded in the SQL script may be delimited by ++ instead of ## to avoid code page issues.

Sequence
The sort sequence of the command at run time, in case multiple commands for the same type are defined.

Frequency
If the command type is 5 (Pre-Send), 6 (Post-Send) or 7 (Send Error), the Frequency parameter will be displayed and allow one of the following values:
B – Batch – the command will be executed once per batch of locations to be sent to
L – Location – the command will be executed for each target location/level

Location to run Cmd
The location that the command should be run, allowing for commands to be run only for certain environments. Enter a valid Location ID or press F4 to select a location from the list.

Otherwise, select from one of the following special values:

- *ALL – run the command on every level in the migration path
- *LOCAL – run the command on any level on this system
- *LOCLVL – run the command only for this level
- *REMOTE – run the command on any level everywhere but this system

Run as User Profile
By default, commands executed during an RFP run under the profile of the user profile defined on the job description of the application level for the RFP. If a specific command should run under the authorities of a different user, that user ID can be entered here. As a safety precaution, the user placing a value in this field must have authority to use that entered user profile in order to save the command definition.

Command
The IBM i or user-defined command to be performed. Enter the name of the command and then press F4 to fill in the keywords.

Some placeholder parameter values may be used and are substituted by MDCMS at run-time. The placeholder value may be typed directly into the command or the cursor may be positioned in the command and F7 pressed to insert the value from a list. The full list of values are in this manual in the Attribute Command section.

Scripts

If the MDCMS object type for an object is *IFS or *REMOTE, then scripts can be applied to the object to be run before or after the object is deployed to IFS or a remote server.

To manage the scripts for an object, use option C for Commands/Scripts from the object manager and press F10 from the command listing.

```
CMC171                              COMPANY NAME                              4.09.15
SCRN1                          Scripts for this Object                       15:54:04

Appl/Lvl: ACCT 10  Object: webApp.war

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View   S=Script Content

 Opt Type Seq Script
  _   2    1  /ifs-stop-tomcat.sh
  _   3    1  /ifs-start-tomcat.sh


                                                                          Bottom
 F3=Exit   F6=Add   F12=Previous
```

Type
The Type value designates when a script should run

2	Pre-Installation	runs prior to installing objects into the environment
3	Post-Installation	runs after the installation of objects is complete

Sequence
The sort sequence of the script at run time, in case multiple scripts for the same type are defined.

Ignore Errors
Y – Continue with RFP processing even if the script fails.
Flag will always be Y for type 3.
N – Cease and Rollback RFP processing if the script fails

Reuse Script
Y – The next time that this same object is checked out, this script will be reapplied to the request
N – This script is intended to be used only once for this object

Replace Placeholders
N – The script doesn't contain placeholder values to be replaced by runtime values when executed
Y – Replace placeholder values in the script at run time

Loc. to run Script
The location that the command should be run, allowing for commands to be run only for certain environments. Enter a valid Location ID or press F4 to select a location from the list.

Otherwise, select from one of the following special values:
*ALL – run the command on every level in the migration path
*LOCAL – run the command on any level on this system
*LOCLVL – run the command only for this level
*REMOTE – run the command on any level everywhere but this system

Run as User
The user profile that the IFS script will run under within QSHELL

Wait for Response
Y – MDCMS waits until the Remote server confirms completion of the script execution
N – MDCMS continues without waiting for a response from the remote server

Submit Job
Y – Submit the IFS Script execution to a separate job. MDCMS will not wait for a response in this case, but instead continue with RFP processing.
N – the ifs script execution runs within this job

Job Name
The name of the submitted job that will process the IFS script

Job Queue
The name and library of the Job Queue to receive the submitted job

Script Subfolder
The relative path of the script, if it isn't directly located in the script root folder.

Script
The name of the script file located in IFS

4.4.11 D – MDRapid Data Copy Status

A 'D' entry in the option field will result in seeing the copy status of all physical and logical files that require MDRapid processing once copy is pending until such time that the RFP is installed. The status can also be viewed from the RFP after installation to check the amount of time that was required for the copy.

4.4.12 F – File Data Transformation

An 'F' entry in the option field will bring up the Data Transformation screen. This is only relevant for physical files or SQL tables that are checked out for modify or recompile, or for files/tables that are checked out for update and MDRapid has been enabled for that request.

Data Transformation is used, by default, to map the data in a file from the prior format for the file to the new format during the installation of the file.

Data Transformation performs a dynamic SQL insert to populate the new version.
The results for each column, by default, are the contents of the same column name in the prior version, if the prior column type can be cast to the new column type. For new or invalid columns, MDCMS automatically fills with blank, 0 or null, depending on column properties.

In order to view/customize the data transformation values for a file, the new and old version of the file must exist. MDCMS will attempt to create the new version of the file if it doesn't exist in the developer's library when requested for a check-out level. For higher levels, the file must exist in the from level to use the Data Transformation screen.

The following screen lists each column in the new format of the file, it's format and the new value of the column when the transformation occurs.

```
MDCRAPF                          COMPANY NAME                          29.01.22
SCRN1                        Data Transformation                       15:14:50
File...: INVOICE_PARTNERS
Enabled: Y         Filter by Field: __________  Type: _  Desc: _______________

Type options, press Enter.
 2=Edit  4=Remove Custom Result  5=Display  K=Add/Remove Key for MDRapid

Opt  Field Name   Len Typ Dec SQL Name                   S Result Value
 _ K INVNBR         9  B      INVOICE_NUMBER            D INVNBR
 _ K PARNBR         9  B      PARTNER_NUMBER            D PARNBR
 _   INVAMT        11  P   2  INVOICE_AMOUNT             INVAMT
 _   CREATED       26  Z                                C DATETIME_TO_TIMESTAM
 _   CREATED_BY    10  A                                C CRTUSR
 _   CHANGED       26  Z                                C DATETIME_TO_TIMESTAM
 _   CHANGED_BY    10  A                                N NULL



                                                                       Bottom
F3=Exit  F7=View SQL  F8=New/Diff/Custom only  F9=Descriptions  F10=Disable
```

Enabled

Y – When the file is installed, Data Transformation will be used to map the existing records to the new format for the file.

N – A Data Copy Command will be used to map the records. If a Data Copy Command isn't defined, then a CPYF *MAP/*DROP will be performed.

A file is enabled by default, unless it contains temporal or generated expression columns. Use F10 to toggle between disabled and enabled.

Filter by Field

Enter a value to limit the list of fields to field names or SQL names that contain that value

Filter by Type
Enter a field type to limit the list of fields to that type

Filter by Desc
Enter a value to limit the list of fields to field descriptions that contain that value

Opt
2 – Edit – add or change the custom Result value for a field
4 – Remove Custom Result – return the Result value to the default value for the field
5 – Display – view all information about the Data Transformation for the Field
K – Add/Remove Key for MDRapid. If MDRapid will be used to minimize downtime during deployment of the file, K can be used to designate the columns that combined would uniquely identify each record in the file. If the file has a unique key or primary key constraint on it, those fields will automatically be designated and the key fields. If key fields are defined, MDRapid will map the records by relate record number instead, which is a bit slower and takes more overhead during the journal syncing process. If using MDRapid to transition a table from single-membered to partitioned, the designation of key fields is required. Up to 99 fields can be designated a key field. If a field is marked in error, use option K to remove the designation.

Function Keys
F7 – View the SQL syntax for the INSERT statement that will be used for the copy based on the current transformation definitions for the file. This can then be copied to an interactive SQL session for troubleshooting purposes.
F8 – toggle the listing between all fields in the new format of the file and only those fields that are new, have a different format, or have a custom Result Value.
F9 – toggle the listing between showing the Field Description and the SQL Name
F10 – toggle Data Transformation for the file between Enabled and Disabled

Result Value
This is the SQL syntax containing the value for the field in the new version of the file for each record selected from the old version of the file.

When Data Transformation is performed, MDCMS runs an SQL insert into new file select <Result Value> from old file.

The Result Value can be any valid SQL value, containing any combination of constants, functions, expressions and field names.

Basic SQL syntax checking is done immediately when a custom value is entered. Additionally, full validation of the insert statement occurs during the Compile phase of the RFP, in order to catch any issues before the actual installation occurs.

*GEN – this special value can be used on columns containing the Generated By Clause. *GEN for a column will cause a new value to be generated for each row during the copy from the old version to the new version of the file. In the case of Temporal Columns and Generated Expression columns, *GEN is the only value that is permitted. If it is important that the existing values for such columns are retained, then MDTransform should remain disabled for that file.

4.4.13 H – Installation History

An ‘H’ entry in the option field will result in directly navigating to the Installation History listing for the object. This option is available for new or existing request records in the display.

4.4.14 I – Include Related Objects

This option is used to request objects that 1) are dependent upon a requested file, ILE module, Service Program, or copybook or 2) invoke a requested program, command, query, function, procedure or menu. **MDXREF** is used to identify the objects.

Example 1: the length of a field in file COHDRP needs to be changed. The user would first select COHDRP for modification. Then, the user would place an 'I' in front of the request record so that all of the objects that use COHDRP (or other files that use COHDRP, such as logical files) can be selected for modification, deletion, or recompilation.

Example 2: the linkage section of a COBOL program needs to be changed. The user would first select the program for modification. Then, the user would place an 'I' in front of the request record so that all of the objects that invoke the program can be selected for modification, deletion, or recompilation.

```
CMC120                    Source and Object Control                          11/20/11
SCRN1                    Request Objects using File                          07:10:24

Object: COHDRP       Type: *FILE        Appl: ACCT   Project:  VAT             +
                     Attr: PF            Lvl: 10     RFP Nr.:  _22371

Type options, press Enter.
 D=Delete   M=Modify   R=Recompile   U=Update   S=View Source   5=View Request

Opt Object     Type      Attribute  Req'd By  Description
 R  COHDRL1    *FILE     LF                   XYZ CO HDR file by costs
 R  COHDRL2    *FILE     LF                   XYZ CO HDR file by cocst
 R  COHDRL3    *FILE     LF                   XYZ CO HDR file by copsts
 R  CO001D     *FILE     DSPF                 XYZ Customer Order Maint
 R  CO002D     *FILE     DSPF                 XYZ Customer Order Browse
 S  CO002R     *PGM      RPG                  XYZ Customer Order Browse
 R  CO003D     *FILE     DSPF                 XYZ Customer Order Maint
 D  CO006D     *FILE     DSPF                 XYZ Customer Order Print
 R  CO007P     *FILE     PRTF                 XYZ Customer Order Print
                                                                  More...
F3=Exit   F4=Browse   F9=Dft Attribute  F13=Repeat Opt   F14=Repeat Attribute
```

This display lists all objects that somehow reference a selected file or invoke a selected object.

OPT
D=Delete – Delete the object and source for the object. When the promotion occurs that causes the deletion, the source or object is archived prior to deletion (if archiving is turned on for the level.) Any cross-reference information about the object is also removed at promotion time.
M=Modify – Modify the object (and source used to create object).
R=Recompile – Recompile an object from the existing source at the requested level. This can be requested even when work is in progress for the source.
U=Update – Update the existing object
S=View Source – View the source code for the object.
5=View Request – View the details of an already requested object.

Function Keys:
Enter=Confirm – Process the Request selections for the currently listed Application. If other Applications are linked to the Base Application and references to the Object are found, a list references for each Linked Application will be displayed. A separate RFP can be selected for each Application by changing the number at the upper right of the screen.
F3=Exit
F4=Browse
F9=Dft Attribute – Default Attribute will be set to be used for new objects with same system attribute.
F13=Repeat Opt – Repeat an option until end of list. For example, if 'R' was entered on the 4th line of the list and F13 was then pressed, lines 5 through the end would also have 'R' entered.

F14=Repeat Attribute – Repeat an attribute. Place cursor on line for attribute to be repeated and press F14. For every object with a matching object type, this attribute will be inserted.

4.4.15 L – Lock Object Request

The Option 'L' will lock a requested object so that other users are unable to install a different request of the same object. A lock will only be granted to the request if the object is not already locked by another request.

4.4.16 M – Merge Source Updates

The Option 'M' for checked out source provides the ability to compare and merge source code from another member.

Member Selection Fields:

Location
*LOCAL – the other member is located on the same system
Synchronization Location – The location of a remote system containing the other member

Source File
*TGTFIL – the source file name is identical to the name of the source file of the checked out member
Source File – The name of the source file containing the other member

Library
*TGTLIB – the source library name is identical to the name of the source library of the checked out member
Source Library – The name of the source library containing the other member

Member
*TGTMBR – the source member name is identical to the name of the checked out member
Source Member – The name of the other member

Compare/Merge Screen:

If the 2 members are identical, a message is returned stating this and the code is not displayed.
If they are different, the top half of the screen displays the checked out member and the bottom half displays the other member. The code will positioned to the first difference between the 2 members and the difference will be highlighted.
Press F14 to merge all differences from the other member into the checked out member.
Press F15 to merge only the highlighted difference from the other member into the checked out member.
Press F16 to position the source code to the next difference

4.4.17 O – Object Replication Rules

This option is used to override the Add/Update rules for Object Replication for the specific object request.
The overrides travel with the object request to all target levels.
This option is only applicable for system/SQL objects. IFS and Remote objects are limited to template rules.

Any overrides will take effect for the object and given promotion level when an Object Replication Template is defined for the attribute at a level at RFP installation time. Any specific library rules will take effect when the Object Replication Template includes the library.

Usage example 1: by default, a number of template libraries are set to only update objects but not add new objects. However, this specific object should be added to those libraries. The general rule could be set to *ALL or left as *DFT and specific libraries could be added to the specific rules list.

Usage example 2: by default, the object is updated for all replication libraries, but for this object, certain libraries should retain the old version of the object. The rules could be set to generally not update except for certain libraries or to generally update except for certain libraries.

```
MDCTOOR                          MD T 8.2 dev                          3.08.20
SCRN1                    Replication Rules for Object                 12:25:38

Appl/Lvl: TEST 10  RFP:          Type: *FILE    Attribute: PF
Object..: MDAINV

General Rule . .  *NOADD  *DFT, *ALL, *NONE, *NOADD, *NOUPD

Specific Rules .  Library *generic  Incl/Omit
                  TEST8O*___           O
                  TEST8O10R2           I
                  TEST8O10R3           I
                  __________           I
                                                                    More...
F3=Exit   F4=Browse   F5=Refresh   F8=Templates   F10=Qualified Libraries
```

This display lists the general and specific override rules for the object request.

General Rule
*DFT – Library add and update rules are based on the rules defined in the Replication Template
*ALL – object will generally be included for all replication libraries
*NONE – object will generally be omitted for all replication libraries
*NOADD – Library Add rule set to Omit. Library Update rule based on rule defined in the Replication Template
*NOUPD – Library Update rule set to Omit. Library Add rule based on rule defined in the Replication Template

Specific Rule Library
The specific or generic library name to include/omit for replication. This rule will only apply for deployment to a target level if the template for that level's attribute also includes the library.

Hierarchical Logic to Determine if a Library will be included for replication at deployment time:
1) Load the libraries from the Replication Template and set the Add/Update rules based on the template
2) Override the Add/Update rules for the libraries in the work list based on the General Rule
3) Override the Add/Update rules for the libraries in the work list based on generic libraries in the Specific Rules list
4) Override the Add/Update rules for the libraries in the work list based on specific libraries in the Specific Rules list

F10=Qualified Libraries can be pressed to see the list of libraries that would be included for the object request for the current promotion level of the object request.

4.4.18 P – PDM/IFS-links

The Option 'P' will begin the Work with Members[or Objects] Using PDM display for the specific source member or, for the specific object (when source is not applicable).
This option is valid as long as the source/object is requested for modification and has not yet been submitted for installation.

For IFS objects, the Work with Object Links display is presented.

4.4.19 Q – Trace Request

The Option 'Q' will list the route that an object request has taken as it is deployed to various levels across all partitions. The data includes the date/time of the event as well as the RFP number and user.

The steps listed will include:
- all steps up to the request for the selected level
- all steps for the request after the selected level on the same partition
- if the partition is designated as an MDWorkflow location, then all steps taken on other partitions where data syncing back to this partition is defined.

The possible Step values are:
REQ – The object request is created
RCV – The object request is received from another partition or level
INST – The request is installed into the level
DEL – The request is manually deleted
REPL – The object request has been replaced by a newer object request, either through the installation of a follow-up RFP into the prior level, or by the merge of multiple RFPs.

4.4.20 R – Remove Object from RFP

An entry of 'R' will remove the assigned RFP number from the object. This is only allowed if the Status of the request record is currently '01', which means that the request has been assigned a promotion number that is not yet in progress. A confirmation screen is displayed before the RFP number is removed.

4.4.21 S – View/Edit Source

Option 'S' will open the IBM editor for the source based on the type and attribute of the source.

For IFS – The Stream file editor will be opened

For Message Descriptions, S will start a WRKMSGF session for the file that the message description resides in.

For Source Members, the Source Entry Utility (SEU) is invoked for the editor based on the source member attribute.

A user may edit the source if it is requested for modification by that user and if the request is for a level flagged as a Check-out level. Otherwise, the user will only be allowed to view the contents of the source.

4.4.22 U – Unlock Object Request

The Option 'U' will unlock a locked object request, which allows another user to request the same object.

4.4.23 V – Version Conflict Resolution

This option is used to manage resolution of objects belonging to multiple versions of the same Application. Conflict Resolution is automatically prompted for an object when it is checked out for New, Modify or Delete from a level that other levels are based on. In the case of Modify or Delete, the prompt is only given when the object also exists in at least one of the dependant levels.

Since Resolution may not be possible immediately when an object is checked out, or to view/change the status of Resolution, it can be managed at any time by using option V for an object showing a Resolution Status in Object Manager or by using option V for an RFP to see all relevant objects in the RFP in one view.

```
CMC175                            COMPANY NAME                          17.03.15
SCRN1                    Version Conflict Resolution                    20:58:07

Appl: TEST  Lvl: 30  RFP: 2000018 Plex import
                                                 Auto-Gen/Assign RFP: Y  Y/N

Type options, press Enter.
 5=Details  B=Bind  C=Clr  D=Delete  I=Ignore  L=Ignore Lvl  M=Modify  R=Recomp
 U=Update
                                  Ins Obj Src            Request
Opt Object       Type    Rsn Status Lvl Lvl Lvl Attribute Fnd Bnd Rsn     RFP
 _  MDAPAR       *FILE    M  Open    31  31  31 PF          N   N
 _  MDAPAR       *FILE    M  Reslvd  32  32  32 PF          Y   Y   M  2000024









                                                                      Bottom
F3=Exit    F5=Refresh    F13=Repeat Opt
```

This display lists all objects that somehow reference a selected file or invoke a selected object.

OPT

5=Details – View extensive details about this request and the Object in the depending version

B=Bind – Resolve the conflict by binding this request to an existing request for the depending version

C=Clr – Clear the Resolution Status, which returns the status to Open

D=Delete – Request to Delete the Object in the depending version. MDCMS automatically binds the new Delete request to this request and sets the status to Resolved.

I=Ignore – Ignore the Conflict between this Object and the depending version for entire migration path. MDSEC authority to code 36 for application required.

L=Ignore Lvl – Ignore the Conflict between this Object and the depending version for this level only. Status will return to Open for next level in migration path. MDSEC authority to code 36 for application required.

M=Modify – Request to Modify the Object in the depending version. MDCMS automatically binds the new Modify request to this request and sets the status to Resolved.

R=Recomp – Request to Recompile the Object in the depending version. MDCMS automatically binds the new Recompile request to this request and sets the status to Resolved.

U=Update – Request to Update the Object in the depending version. MDCMS automatically binds the new Update request to this request and sets the status to Resolved.

Auto-Gen/Assign RFP

When an object for a depending version is requested for Modify, Delete, Recompile or Update, it can be automatically assigned to an RFP for that level with the same description as the RFP description as this request. If an open RFP for the level and description is not found, it is automatically created. This is only applicable if this request is assigned to an RFP.

Status
Ignore – Conflict ignored between this object and the depending version of the object and will continue to be ignored throughout the migration path.
TmpIgn - Conflict ignored between this object and the depending version of the object, but will be reset to Open status at next level.
Open - Conflict Resolution has not yet occurred for this version. If the Level requires resolution, the RFP cannot be submitted until Resolution occurs.
Reslvd - Conflict Resolution is completed for this version.

Ins Lvl
The level number of the other version

Obj Lvl
The level number where the object for the other version was found. MDCMS first searches in that level, then in the chain for that level, then in the chain of levels it is based on. This helps to indicate if the object already exists for that version when delta levels are used.

Src Lvl
The level number where the source for the other version was found. MDCMS first searches in that level, then in the chain for that level, then in the chain of levels it is based on. This helps to indicate if the object already exists for that version when delta levels are used.

Attribute
The MDCMS attribute for the object

Request Fnd
If an active request for the object in the depending level already exists.

Request Bnd
If an active request for the object is bound to this request

Function Keys:
F3=Exit
F13=Repeat Opt – Repeat an option until end of list. For example, if 'R' was entered on the 4th line of the list and F13 was then pressed, lines 5 through the end would also have 'R' entered.

4.4.24 X – MDXREF Information

The Option 'X' will result in directly navigating to the MDXREF Cross-Reference screen with the search criteria pre-filled with the object name, application and level.

4.4.25 Y – Synon/2E Model List

If MDCMS is configured to migrate objects from Synon/2E models, Option Y will appear that can be used to view/work with checked out objects in the Synon/2E model list for the user.
See the PDF document MDCMS_SYNON-2E_Interface_Manual for further information and instructions.

4.5 MDADDREQ – Generate Object Request Records command

MDCMS is delivered with a command-based API that allows external tools or applications to create Object Requests within MDCMS.

The MDCMS command is named ***MDADDREQ*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your tool, you can also directly call program ***MDADDREQ*** in library MDCMS. In this case, be certain that the parameter order and formats sent to the program exactly match the parameters in command MDADDREQ.

All MDADDREQ API transactions are logged to file MDCMS/MDDAREQ.

4.5.1 MDADDREQ Parameter Table

KEYWORD	Description	Type	Length
APPL	Application	CHAR	6
LVL	Level	INTEGER	3
OBJT	Object Type	CHAR	7
ATTR	MDCMS Attribute	CHAR	10
OBJN	Object Name	CHAR	128
RPTH	Object Relative Path	CHAR	240
SRCN	Source Name	CHAR	128
RSN	Request Reason	CHAR	10
USER	Programmer	CHAR	10
FOLB	From Object Library	CHAR	240
FSLB	From Source Library	CHAR	240
FSFL	From Source File	CHAR	10
COPY	Copy from Env	CHAR	4
PROJ	Project	CHAR	12
TASK	Task	INTEGER	7
STSK	Subtask	INTEGER	7
ARFP	Assign RFP	CHAR	4
RFP	RFP Number	INTEGER	7
RFPD	RFP Description	CHAR	160
CREQ	Create Requests for Next Level	CHAR	4
AREQ	Assign RFP to Next Level Reqs	CHAR	7
SREQ	Place RFP in Send List	CHAR	7
LOCK	Lock Request	CHAR	4
CSQO	Compile Subsequence	INTEGER	5
DATA	Data Origin	CHAR	60
DMBR	Data Member to Copy	CHAR	10
RPGM	Use MDRapid	CHAR	10
RJRN	Reapply Journals	CHAR	4
RCST	Reapply Constraints	CHAR	4
RTRG	Reapply Triggers	CHAR	4
RLFM	Reapply LF Members	CHAR	4
DIR	Is IFS Directory	CHAR	4
ENV	MDCMS Environment ID	CHAR	4
VREF	Vendor Reference ID	CHAR	20
EMSG	Exception Message	CHAR	7

4.5.2 Detailed Description of MDADDREQ Parameters

Application (APPL)

The target MDCMS Application code for the request
This is a required parameter.

Level (LVL)

The target MDCMS Promotion Level for the request that allows check-outs
This is a required parameter.

Object Type (OBJT)

The System or MDCMS Object Type code for the Object. For example: *PGM for a program or *IFS for an IFS file.
This is a required parameter.

MDCMS Attribute (ATTR)

The MDCMS Attribute code that identifies the behaviour and target locations for the requested object.
This is a required parameter.

Object Name (OBJN)

The name of the Object to be requested.
For *SOURCE, this would be the name of the member
For *MSGD, this would be the name of the Message ID
For *DTAGRP, this would be the value of the record key(s)

This is a required parameter.

Relative Path (RPTH)

Specifies the relative portion of an IFS path, starting with /, that will be deployed with the object.
For example, if the *IFS attribute has a target fixed directory defined as /srv/dev and this object should be deployed to /srv/dev/app1/dist, then the value of RPTH should be /app1/dist.

Member/IFS File Name (SRCN)

Specifies the name of the Source Member or IFS Source File to be requested. This parameter is ignored if attribute defined as having no source.

**OBJ* - The name of the source is the same as the name of the object

Request Reason (RSN)

The reason for the object request

*MIGRATE - a source and/or object will be migrated into the selected application level

*DELETE - an existing object will be deleted

*RECOMPILE - an object will be recompiled based on the currently active source for that environment without the source being modified

*UPDATE - this is intended for ILE programs to bind the current modules and service programs to the program. A U command (such as CHGPGM) must be defined for the attribute.

Programmer (USER)

Specifies the user profile to be indicated as the programmer for the request. If this command generates an RFP, the owner of the RFP will also be this user

*USER - the current user profile of the job invoking this command is the user

From Object Library/Path (FOLB)

Specifies the library or IFS path that contains the object to be migrated to the specified level. The library should be a developer or team library that is not managed by MDCMS.
If the attribute contains source only, then enter the library/path containing the source.
If the object resides in IFS, provide the entire directory path starting with /.

*USER - the library name is the same as the user defined for parameter USER

From Source Library/Path (FSLB)

Specifies the library or IFS path that contains the source for the object that is to be migrated to the specified level. The library should be a developer or team library that is not managed by MDCMS. This parameter is ignored if attribute is defined as having no source.

*OBJLIB - the library containing the source is the same library that contains the object

From Source File (FSFL)

Specifies the source file containing the source member to be migrated. This parameter is ignored if attribute defined as having no source.

*ATR - the Source File to migrate from has the same name as the source file defined for the attribute.

Copy Source/Object from Env (COPY)

Specifies if the source or object should be copied from the target environment to the library from which to be migrated from. This parameter is only considered for Reason *MIGRATE.
If the attribute defines a source and object location, only the source will be copied.
If the source or object already exists in the From Library, it will not be replaced by the source or object in the target environment.

*NO - the Source or Object will be manually placed in the From Library prior to migration.

*YES - MDCMS will copy the Source or Object from the Target Environment to the From Library, if it doesn't already exist in the From Library.

Project (PROJ)

Specifies the Project to assign to the Request. The project, if entered, must already exist and be in an open status. If the project is not yet authorized, then the user must have MDSEC authority to authorize the Project and then MDCMS will do so automatically.

Task (TASK)

Specifies the Project Task to attribute to the Request. The task, if entered, must already exist and be in an open status.

Subtask (STSK)

Specifies the Subtask to attribute to the Request. The Subtask, if entered, must already exist and be in an open status.

Assign Request to RFP (ARFP)

Specifies if the request should be immediately assigned to an RFP and the method of determining the RFP.

*NO - The request will be created without being assigned to an RFP

*YES - The request will be assigned to the RFP number based on parameter RFP

*AUTO - MDCMS searches for an open RFP matching the Application, Level, User and Description values entered for this command. If an RFP is found the Request will be assigned to that RFP. If an RFP is not found, a new RFP will be created.

*NEW - A new RFP will be created for the Application, Level, User and Description values entered for this command.

Existing RFP Number (RFP)

Specifies the RFP to assign to the Request. Will only be used if parameter ARFP is set to *YES.

RFP Description (RFPD)

The description to be used for a new RFP or to search for an existing RFP. Will only be used if parameter ARFP is *AUTO or *NEW.

Create Requests for Next Level (CREQ)

If a level exists to migrate after this target level, this parameter specifies if the object requests should be generated for that level once this level's RFP is complete. This parameter will only be applied to the RFP if it is created during the processing of this command.

*YES - Requests for the next level will be generated upon completion of the RFP into this level.

*NO - Requests for the next level will not be generated.

Assign RFP to Next Level Reqs (AREQ)

If a level exists to migrate after this target level, this parameter specifies if the generated object requests should be assigned to an RFP. This parameter will only be applied to the RFP if it is created during the processing of this command.

*YES - Requests for the next level will be assigned to a new RFP number with the same description as this RFP's number.

*NO - No, requests for the next level will not be assigned to a new RFP.

*MANUAL - Requests for the next level will be assigned to a new RFP, but the RFP will not be automatically submitted, even if the next level is set to automatically submit RFPs by default.

Place RFP in Send List (SREQ)

If distribution levels are defined for this level, this parameter specifies if the RFP should be placed in the Send List. This parameter will only be applied to the RFP if it is created during the processing of this command.

*YES - The RFP will be placed in the send list upon completion of the installation.

*NO - The RFP will not be placed in the send list.

*MANUAL - The RFP will be placed in the send list, but the RFP will not be automatically sent, even if the level is set to automatically send RFPs by default.

Lock Request (LOCK)

Specifies whether or not the Request will be placed in Locked status

*YES - The Source/Object will be locked for check-out by this request. The Source or Object may not already be locked by another request for this Request to be created.

*NO - The Request will be created in Unlocked status. Other requests for the same Source or Object may exist.

Compile Subsequence (CSQO)

Specifies the sequence for compiling (lowest first) for objects in same RFP that have the same primary sort sequence in order to handle potential dependency issues. This parameter is not relevant for *IFS Objects.

Data Origin for Physical Files or SQL Tables (DATA)

Specifies the origin of the data that should be copied into a new or modified physical file/SQL Table

**SAME* - The data is mapped from the old format of the modified file to the new format of the file of the same name/target library.

**MIGRATE* - The data is migrated with the file from the check-out location to the target library.

**NONE* - The data is not migrated. The new file format will be empty. *NONE is required for a logical file if it is replacing a physical file.

character-value - Specify the name of the file from which to migrate the data. The data origin file must exist in the same library as the target file at the time of installation.

Data Member to Copy (DMBR)

Specifies the member(s) to copy to the new version of a physical file/SQL Table or to migrate from the prior environment.

**ALL* – All existing members are included for the copy. If the target is an SQL Table, only the first member will be copied.

**FIRST* – The first member in the originating file is copied. Any other members are omitted.

character-value – The name of the specific member to be copied from the originating file. Any other members are omitted.

Use MDRapid (RPGM)

Specifies if MDRapid should be used to map the data from the old version of a file to the new version.

**DFT* - MDRapid will be used for modify and recompile requests if the number of records in the file is at least the number in the MDRapid template for the attribute. Otherwise not.

**YES* - MDRapid will be used for the file, even if it wouldn't qualify for MDRapid processing or is for an update request.

**NO* - MDRapid will not be used for the file, even if it would qualify for MDRapid processing.

Automatically Reapply Journaling (RJRN)

Specifies if the new version of a table or access path should have the journaling attributes applied to it that belonged to the file that it replaced.

**DFT* - The default defined for the Application is used

**YES* - If journaling was used on the prior version of the file, it will be applied to the new version.

**NO* - Journaling will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

Automatically Reapply Constraints (RCST)

Specifies if the new version of a table should have the constraints applied to it that belonged to the table that it replaced.

*DFT - The default defined for the Application is used

*YES - If constraints were used for the prior version of the table, they will be applied to the new version.

*NO - Constraints will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

Automatically Reapply Triggers (RTRG)

Specifies if the new version of a table should have the system (non-SQL) triggers applied to it that belonged to the table that it replaced.

*DFT - The default defined for the Application is used

*YES - If SQL triggers were used for the prior version of the table, they will be applied to the new version. Any SQL triggers that should be re-applied should be requested for recompile and placed on same RFP as the file.

*NO - Triggers will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

Automatically Reapply Logical File Members (RLFM)

Specifies if the new version of a logical file should have the members added to it that belonged to the logical file that it replaced.

*DFT - The default defined for the Application is used

*YES - Any members that existed for the prior version of the logical file will be added to the new version.

*NO - Members will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

IFS Object is a Directory (DIR)

Specifies whether or not the Request of an object of type *IFS is a directory.

*NO - The Requested Object is not an IFS Directory

*YES - The Requested Object is an IFS Directory

Environment ID (ENV)

Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST.

**DFT* - The default environment will be used. This correlates to library MDCMS.
*CUR – The environment currently in the library list will be used

Vendor Reference ID (VREF)

Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDAREQ table. Any value up to 20 characters in length can be used.

Exception Message Returned (EMSG)

Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail.

**DIAG* - A diagnostic message will be placed in the calling program's message queue in the following format:

MDADDREQ Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason>

If the Vendor Reference isn't passed to MDADDREQ, it won't be included in the diagnostic message.

**ESCAPE* - The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor.

**NONE* - An exception message will not be returned to the calling program's message queue.

4.5.3 MDDAREQ EXAMPLE for invoking API and retrieving exception details

This example is a snippet of CL source that tries to create a new request for an SQL Table and add the request to an auto-generated RFP based on the description. The CL then monitors for an exception and retrieves the details of the exception for the diagnostic message.

```
DCL VAR(&KEY) TYPE(*CHAR) LEN(4)
DCL VAR(&MSG) TYPE(*CHAR) LEN(132)

MDADDREQ APPL(TEST) LVL(10) OBJT(*SQLTAB) ATTR(SQLTABIFS)  +
         OBJN('CUSTOMER_TABLE') SRCN('CUSTOMER_TABLE.sql') +
         USER(MMORGAN) FSLB('/home/mmorgan/source') PROJ(MODERNIZE) +
         ARFP(*AUTO) RFPD('modernize customer table') DATA(CUSTTAB) +
         VREF(A123CX) EMSG(*ESCAPE) EMSG(*ESCAPE)
MONMSG MSGID(CPF0001) EXEC(DO)
   RCVMSG MSGTYPE(*LAST) RMV(*NO) KEYVAR(&KEY)
   RCVMSG MSGTYPE(*PRV) MSGKEY(&KEY) RMV(*NO) KEYVAR(&KEY) MSG(&MSG)
ENDDO
```

4.6 MDADDCMD – Add MDCMS Command command

MDCMS is delivered with a command-based API that allows external tools or applications to add commands to the MDCMS configuration for specific object requests, future object requests, attributes, any RFP for a level or for a specific RFP.

If successful, the additional command will be visible in the appropriate location based on the context and will run at the point in the process dictated by the Command Type.

The MDCMS command is named ***MDADDCMD*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command.

All MDADDCMD API transactions are logged to file MDCMS/MDDACMD.

If trying to add a command to an object request, the APPL, LVL, OBJT, ATTR, OBJN and USER values must be identical. The RPTH, RFP, RFPD or REQN parameters can be used to uniquely identify the request in case multiple requests for the same object name and type could exist.

4.6.1 MDADDCMD Parameter Table

KEYWORD	Label	Description
APPL	Application	The application code for the application that the command will be added to
LVL	Level	The MDCMS Promotion Level within the application
CMD	Command	The command string to be added. The string may be up to 640 characters in length. Note - it is recommended to avoid using hardcoded library names in the string. Instead, use placeholder ##OBJLIB##.
CMDC	Command Context	Specifies the context for the command, as in which level in the configuration hierarchy that the command should be added. *OBJECT The command is added to a specific object *ATTRIBUTE The command is for an object attribute, such that it will be executed for any object request of the given attribute, unless overriden by an object-level command. *LVLRFP The command is executed once per RFP for the given level. The command can be viewed/edited from within attribute commands for attribute *RFP. *SPECRFP The command is added to a specific RFP number.
CMDT	Command Type	The Command Type, which specifies at which point in the deployment process that the command is invoked. If not specified, the default of C=Compile is used.
OBJT	Object Type	The object type for the application, level and attribute. For example: *PGM for a program or *IFS for an IFS file. Only relevant for *OBJECT and *ATTRIBUTE command contexts.
ATTR	MDCMS Attribute	An existing Attribute code for the application level. Only relevant for *OBJECT and *ATTRIBUTE command contexts.
OBJN	Object Name	A valid Object name based on the Object Type. For *SOURCE, this would be the name of the member For *MSGD, this would be the name of the Message ID For *DTAGRP, this would be the value of the record key(s)

		Only relevant for *OBJECT and *ATTRIBUTE command contexts.
CMDO	Command Option	The Command Option determines what should happen to any commands that are already defined for the same context and command type. Note - Only one Data Copy command is permitted per Object. All other types allow up to 999 commands. *ADD The command will be appended to the end of the list of commands that will run for the context and command type, so that the command runs after any already defined command. *REPLACE The command will replace any commands already defined for the context and command type. Commands defined for a different command type will not be removed.
IGNE	Ignore Errors	Specifies if the RFP process should continue if an error occurs during the execution of the Object command. Note - certain command errors are automatically ignored because the exit point is outside the scope of an RFP in the process of installation. A warning will be generated, though. *YES any error that occurs will cause a warning condition to occur, but the RFP will continue with the deployment process. *NO MDCMS will end processing and roll back the RFP to the state it was in prior to beginning of the deployment step.
KEEP	Keep MD Libs in Libl	Specifies if the MD libraries (MDCMS, MDXREF, and MDSEC) should remain in the library list during the execution of the command. *NO the libraries will be removed from the library list to avoid allocation of MD objects that are named the same as objects in your application. *YES The libraries will remain in the library list, which is important if the command is an MD command.
REUS	Reuse Command	Specifies if the command should automatically reattach to the object the next time that the object is requested for the same application and level. This parameter is only relevant for context *OBJECT *YES The command should be reused for future versions of the object *NO The command is to be used this time only *DEF The command is only to be applied as a definition for future requests of the object and shouldn't be applied to a current object request. The definition can be viewed/edited from the Object Commands settings.
WCRD	Placeholders in SQL Script	Specifies if MDCMS should inspect the SQL script for placeholders and replace them with the runtime execution values. This flag is relevant when the command RUNSQLSTM is used and the SQL script is stored in either a source member or in an IFS file. *NO

		The script doesn't contain placeholders or the command isn't RUNSQLSTM *YES The RUNSQLSTM command is defined and placeholders need to be replaced in the script.
RLOC	Location to Run Command	Specifies which locations the command should be on, at the time that an RFP containing the command runs at that location. *ALL The command should run at every location that the RFP containing the command deploys to. *LOCAL The command should only run on this system and will not be distributed to other locations. *LOCLVL The command should only run on this system for this level and nowhere else. *REMOTE The command should not run on this system, but should for every system that the RFP is distributed to. location The Location ID of a specific system that the command should run on when the RFP is deployed on that system. Note: this parameter is only relevant for *OBJECT and *SPECRFP contexts
RUSR	Run as User Profile	Specifies the user profile to use when executing the command. *USER the user profile of the job that is running at the time that the command is executed. character-value a valid User Profile name. The profile will be saved with the command definition only if *USE authority is enabled for the invoker of MDADDCMD.
USER	Programmer	Specifies the user profile to whom the object request is assigned *USER the current user profile of the job invoking this command is the user character-value a valid User Profile name. The command will only be attached to the object if the request user is that same value. Note: this parameter is only relevant the *OBJECT context
RPTH	Object Relative Path	Specifies the relative portion of an IFS or REMOTE path for the object. This is in case multiple objects of the same name are in different folders, so that MDCMS can add the command to the appropriate object. This is only relevant for the *OBJECT command context.
RFP	Existing RFP Number	Specifies the RFP that the Object Request is assigned to, in case multiple objects of the same name are currently requested at the same level. Or, the specific RFP for a command to be added directly to an RFP.
RFPD	RFP Description	Specifies the description of the RFP that the Object is currently

		assigned to, in casemultiple objects of the same name are currently requested at the same level. Or, for adding a command directly to an RFP.
REQN	Request Number	The Request Number to uniquely identify the Object to add the command to, if known.
MOD	Run for Modifications	If command is for an attribute, it can be selectively run or not when an object of the given attribute is requested for Modification. This includes when the request reason is for a new object. *YES The command should be run when an object is requested for Modification *NO The command should be skipped when an object is requested for Modification
RCMP	Run for Recompiles	If command is for an attribute, it can be selectively run or not when an object of the given attribute is requested for Recompile. *YES The command should be run when an object is requested for Recompile *NO The command should be skipped when an object is requested for Recompile
DEL	Run for Deletions	If command is for an attribute, it can be selectively run or not when an object of the given attribute is requested for Deletion. *YES The command should be run when an object is requested for Deletion. *NO The command should be skipped when an object is requested for Deletion.
UPD	Run for Updates	If command is for an attribute, it can be selectively run or not when an object of the given attribute is requested for Update. *YES The command should be run when an object is requested for Update. *NO The command should be skipped when an object is requested for Update.
FREQ	Execution Frequency	Depending on the Command Context, options are available for the frequency that a specific command is executed for an RFP. *OBJECT If adding a command to an attribute, *OBJECT indicates that the command should run once for every object in the RFP of the given attribute. This value is ignored for other command contexts. *RFP If adding a command to an attribute, *RFP indicates that the command should run once for an RFP if at least one object is requested in the RFP for the given attribute. If multiple objects of the given attribute are in the RFP, it will only run for the first object, based on the sort sequence of the objects. This value is ignored for other command contexts. *BATCH If adding a command of command type 5 (Pre-Send), 6 (Post-Send) or 7 (Send Error), the value of *BATCH indicates that the command will be executed once per Send of a batch of locations.

		This value is ignored for other command contexts. *LOC If adding a command of command type 5 (Pre-Send), 6 (Post-Send) or 7 (Send Error), the value of *LOC indicates that the command will be executed once for every target location/level in the batch of a Send process. This value is ignored for other command contexts.
ENV	MDCMS Environment ID	Specifies the MDCMS environment that the Object Request exists in. The ID correlates to the suffix of the MDCMS library name. *DFT The default environment will be used. This correlates to library MDCMS. character-value A specific environment for MDCMS. For example, TEST correlates to library MDCMSTEST.
VREF	Vendor Reference ID	Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDACMD table. character-value A string of up to 20 characters used to identify this transaction
EMSG	Exception Message	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the add of the request to fail. *DIAG A diagnostic message will be placed in the calling program's message queue in the following format: MDADDCMD Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason> If not for *OBJECT context, the object won't be in the message If the Vendor Reference isn't passed to MDADDCMD, it won't be included in the diagnostic message. *ESCAPE The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE An exception message will not be returned to the calling program's message queue. .

4.7 MDADDORR – Add Replication Rules to Object Request command

MDCMS is delivered with a command-based API that allows external tools or applications to add object-level replication rules to existing Object Requests within MDCMS.

The MDCMS command is named ***MDADDORR*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command.

All MDADDORR API transactions are logged to file MDCMS/MDDAORR.

To match the rules to the object request, the APPL, LVL, OBJT, ATTR, OBJN and USER values must be identical. The RFP, RFPD or REQN parameters can be used to uniquely identify the request in case multiple requests for the same object name and type could exist. Also, the matched Object Request must be in status '00' or '01' and the Object Type must be for objects residing in libraries.

4.7.1 MDADDORR Parameter Table

KEYWORD	Description	Type	Length
APPL	The MDCMS Application code for the request	CHAR	6
LVL	The MDCMS Promotion Level for the request	INTEGER	3
OBJT	The System or MDCMS Object Type code for the request	CHAR	7
OBJA	The MDCMS Attribute that the existing Object Request is assigned to	CHAR	10
OBJN	The name of the Object that the replication rules should be added to	CHAR	128
USER	Specifies the user profile to whom the object request is assigned. *USER – the job user is the assigned user	CHAR	10
GENR	The general rule to apply to libraries defined in the Object Replication Template that is applied to the object request's attribute for a given application level. Any libraries listed in the specific rules take precedence over the general rules. *DFT - The add and update rules defined on the template will be used *ALL - replicate to every library listed for a template unless omitted by a specific rule *NONE - ignore every library listed for a template unless included by a specific rule *NOADD - ignore every library listed for a template if the object doesn't already exist in the library, unless included by a specific rule *NOUPD - ignore every library listed for a template if the object already exists in the library, unless included by a specific rule	CHAR	6
SPCR	A list of up to 80 specific rules to add or remove from the list for a specific object request. Each rule consists of 2 elements: Library - the name of a specific library, or *generic* name for any libraries matching the name pattern. The rule to apply is prioritized by specific library, then generic library and finally general rule. Option *INCLUDE - Include the library or libraries for replication *OMIT - Exclude the library or libraries for replication *REMOVE - Remove the specific rule for the library or libraries from the list. The general rule will apply instead for the library or libraries.	0 to 80 entries of CHAR(10) + CHAR(8)	2000

RFP	Specifies the RFP that the Object Request is assigned to. This is in case multiple objects of the same name are currently requested at the same level.	INTEGER	7
RFPD	Specifies the description of the RFP that the Object is currently assigned to. This is in case multiple objects of the same name are currently requested at the same level.	CHAR	160
REQN	The Request Number to uniquely identify the Object to add the rules to, if known.	INTEGER	11
ENV	MDCMS Environment ID *CUR – same MDCMS instance as current library list *DFT – the default MDCMS instance (no suffix)	CHAR	4
VREF	Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDAORR table.	CHAR	20
EMSG	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the execution to fail. *DIAG - A diagnostic message will be placed in the calling program's message queue in the following format: MDADDORR Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason> If the Vendor Reference isn't passed to MDADDORR, it won't be included in the diagnostic message. *ESCAPE - The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE - An exception message will not be returned to the calling program's message queue.	CHAR	7

4.8 MDCRTOBJ – Create Object in Dev Library command

MDCMS is delivered with a command-based API that provides external tools or applications the ability to create an object in the Developer Library for currently checked out source.

When invoked, MDCMS uses either the current library list or the library list defined for the job description of the request's Application and Level.
Optionally, the developer library itself can be included at the top of the library list when depending on other checked out objects that have already been created.

The creation process uses the pre-compile and compile commands defined for the Object or Attribute so that the developer is certain that the result mirrors what would occur during the actual submission of the request in an RFP.

In the case of SQL Constraints or SQL Triggers, the pre-compile and post-install commands are used to create the entity, since these types use Post-Install commands rather than Compile commands.

The MDCMS command is named ***MDCRTOBJ*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your tool, you can also directly call program ***MDLCRTO*** in library MDCMS. In this case, be certain that the parameter order and formats sent to the program exactly match the parameters in command MDCRTOBJ.

All MDCRTOBJ API transactions are logged to file MDCMS/MDDCRTO.

To find the object request, the APPL, LVL, OBJT, ATTR, OBJN and USER values must be identical. The RFP, RFPD or REQN parameters can be used to uniquely identify the request in case multiple requests for the same object name and type could exist.

4.8.1 MDCRTOBJ Parameter Table

KEYWORD	Description	Type	Length
APPL	Application	CHAR	6
LVL	Level	INTEGER	3
OBJT	Object Type	CHAR	7
ATTR	MDCMS Attribute	CHAR	10
OBJN	Object Name	CHAR	128
USER	Programmer	CHAR	10
LIBL	Library List	CHAR	8
INCL	Include Dev Lib in LIBL	CHAR	4
REPL	Replace existing Object	CHAR	4
RFP	RFP Number	INTEGER	7
RFPD	RFP Description	CHAR	160
REQN	Object Request Number	INTEGER	11
ENV	MDCMS Environment ID	CHAR	4
VREF	Vendor Reference ID	CHAR	20
EMSG	Exception Message	CHAR	7

4.8.2 Detailed Description of MDCRTOBJ Parameters

Application (APPL)

The target MDCMS Application code for the request
This is a required parameter.

Level (LVL)

The target MDCMS Promotion Level for the request that allows check-outs
This is a required parameter.

Object Type (OBJT)

The System or MDCMS Object Type code for the Object. For example: *PGM for a program or *IFS for an IFS file.
This is a required parameter.

MDCMS Attribute (ATTR)

The MDCMS Attribute code that identifies the behaviour and target locations for the requested object.
This is a required parameter.

Object Name (OBJN)

The name of the requested Object.
This is a required parameter.

Programmer (USER)

Specifies the user profile assigned to the existing request.

**USER* - the current user profile of the job invoking this command is the user

Library List (LIBL)

Specifies the library list to use during the creation process.

**JOBD* - the library list of the job description for the Application Level will be used

**CURRENT* - the current library list for the job will be used

Include Dev Lib in LIBL (INCL)

Specifies if the developer library should be placed at the top of the library list to use any objects it is dependent on that have already been created.

**YES* - the compile-time library list will include the developer library at the top.

**NO* - the developer library won't be added to the top of the list

Replace Existing Object (REPL)

Specifies if the prior version of the object should be replaced, if it already exists.

*YES - an existing object will be replaced

*NO - MDCMS will not replace the object if it exists, and will generate an exception message.

Existing RFP Number (RFP)

Specifies the RFP assigned to the Request.
This is optional and is only used to help uniquely identify the object request

RFP Description (RFPD)

The description used for the RFP assigned to the object request.
This is optional and is only used to help uniquely identify the object request

Object Request Number (REQN)

The internal request number of the object request, which can be retrieved from the MDDAREQ log, if MDADDREQ was used to add the request.
This is optional and is only used to help uniquely identify the object request

Environment ID (ENV)

Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST.

*DFT - The default environment will be used. This correlates to library MDCMS.
*CUR – The environment currently in the library list will be used

Vendor Reference ID (VREF)

Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDCRTO table. Any value up to 20 characters in length can be used.

Exception Message Returned (EMSG)

Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail.

*DIAG - A diagnostic message will be placed in the calling program's message queue in the following format:

MDCRTOBJ Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason>

If the Vendor Reference isn't passed to MDCRTOBJ, it won't be included in the diagnostic message.

*ESCAPE - The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor.

*NONE - An exception message will not be returned to the calling program's message queue.

4.9 MDOBJRPT – Run MD Object Request Report command

MDCMS is delivered with a command-based API that creates a report of all object requests for specific filters. The report is available in the Report Output screen and can additionally be exported via email or copied to an IFS folder, spooled file or Database file.

The list will be of active object requests, unless an RFP value is provided and the RFP is already installed.

4.9.1 MDOBJRPT Parameter Table

KEYWORD	Description	Type	Length
APPL	Application – will be filtered to a specific application If provided	CHAR	6
LVL	Level – will be filtered to a specific level if provided	INTEGER	3
RFP	RFP Number – will be filtered to a specific RFP if provided	INTEGER	7
PROJ	Project ID – will be filtered to a specific Project if provided	CHAR	12
TASK	Task Number – will be filtered to a specific Task number if provided	INTEGER	7
STSK	Subtask Number – will be filtered to a specific Subtask number if provided	INTEGER	7
USER	Programmer – will be filtered to object requests assigned to a specific user ID if provided	CHAR	10
ENV	MDCMS Environment ID *CUR – same MDCMS instance as current library list *DFT – the default MDCMS instance (no suffix)	CHAR	5
PRINT	Print result to spooled file *NO / *YES	CHAR	4
COPY	Copy result to physical file *NO / *YES	CHAR	4
EXPORT	Export result to IFS file *NO / *YES	CHAR	4
EMAIL	Email result *NO / *YES	CHAR	4
CPYF	Copy to Physical File – the name of the file to copy the results to, when COPY = *YES	CHAR	10
CPYL	Copy to Library – the name of the library to copy the results to, when COPY = *YES	CHAR	10
IFSF	Export to filename – the name of the IFS file when EXPORT = *YES or the name of the file attached to the email when EMAIL = *YES	CHAR	60
APPTS	Append Timestamp to filename *NO / *YES	CHAR	4
IFSD	Export to directory – the path of the folder to place the IFS file in, when EXPORT = *YES	CHAR	80
RPTFMT	Report Format – the format of an exported or emailed report. Either CSV, PDF, TXT or XLSX	CHAR	4
CSVDEL	CSV delimiter when report format is CSV	CHAR	1
EADR	Address to receive Email, when EMAIL = *YES	CHAR	60
EUSR	User ID to receive Email, when EMAIL = *YES. Address stored in MDSEC for user will be used	CHAR	10
EGRP	Group to receive Email, when EMAIL = *YES	CHAR	10

4.10 MDADDIWS – Add Integrated Web Service command

The Add Integrated Web Service (MDADDIWS) command adds a Rest or SOAP service to an existing IWS server, making it possible to manage and deploy IWS services automatically using MDCMS.

It's recommended to run this command as an object-level or attribute-level post-install command on an RFP for the requested *IFS properties file or *IFS pcml file.

It's also highly recommended to keep the configuration for the service in the *IFS properties file, so that changes or rollbacks are audited and easy to perform. Refer to the **Integrated Web Services Server Administration and Programming Guide** for more details.

The MDCMS command is named ***MDADDIWS*** and is located in library MDCMS. The MD libraries must already be in the library list prior to using this command (Keep MD Libs in Libl = 'Y').

Prompt the command and then use the help function (F1 in MDCMS, Help in MDOpen) for detailed instructions about each command parameter.

4.10.1 Example MDADDIWS Parameters for an Attribute Command

The following is an example of the command to define for a *IFS attribute to add/replace a service in an existing Integrated Web Services server:

MDADDIWS SERVICE(##OBJNAM##) SERVER(##SERVER##) PGMNAM(##OBJNAM##) PGMTYP(*SRVPGM) PROP('##OBJLIB##/##OBJNAM##') LIBL(*CURLIBL)

- This example assumes the invoked program has the same name as the service and requested properties file. If different, then generate a reusable object-level command from this command for the specific service.
- The ##SERVER## placeholder is replaced at runtime with the server ID on the *IFS attribute or the object replication server for the attribute.
- LIBL(*CURLIBL) will automatically insert the library list for the target level into the library list for the service so that dependencies are correctly located at service run-time.

4.11 MDRMVIWS – Remove Integrated Web Service command

The Remove Integrated Web Service (MDRMVIWS) command removes a Rest or SOAP service from an IWS server, making it possible to remove IWS services automatically using MDCMS.

It's recommended to run this command as an object-level or attribute-level post-install command on an RFP for the *IFS properties file or *IFS pcml file that is requested to be deleted.

The MDCMS command is named ***MDRMVIWS*** and is located in library MDCMS. The MD libraries must already be in the library list prior to using this command (Keep MD Libs in Libl = 'Y').

Prompt the command and then use the help function (F1 in MDCMS, Help in MDOpen) for detailed instructions about each command parameter.

5 RFP Manager

5.1 RFP Listing

```
CMC228                          COMPANY NAME                              10/18/20
Filters                         RFP Manager                               19:21:41
 Assigned: MMORGAN___
 Appl/Lvl: TEST01 ___     Project....: DEMOUK1_____       Cmd/Script: _ / _
 RFP Nbr.: _______ T: _   Task/Subtsk: ______5 _______
 RFP Sts.: __             Description: _________________
 Problems: _

1=Select, F4 for other options
  Appl       RFP Stat  Lvl Assigned   CS Description
_ TEST01    1021 02    100 MMORGAN       displays for days
_ TEST01    1038 01    300 MMORGAN       branch changes
_ TEST01    1864 00    310 MMORGAN       with varchar into 11 for archive

                                                                    Bottom
F4=Browse  F6=Add  F7=Submit  F8=Approve  F9=Install  F10=Manage   F17/18=T/B
```

The RFP (Request for Promotion) Manager is accessed with option 3 from the Main Menu or by pressing **F9** from the Object Manager panel. It may also be accessed by pressing **F4** while the cursor is positioned on an RFP Number field.

Filters

The Request for Promotion Number Listing can be filtered by any of the following fields at the top of the display.

Assigned – The Programmer assigned to the RFP
Appl –Application
Lvl – Application Level
Project – The Project associated with the RFP
Cmd – Y= only RFPs containing commands are listed, N only RFPs not containing commands are listed
Script – Y= only RFPs containing scripts are listed, N only RFPs not containing scripts are listed
RFP Nbr – Request for Promotion number
T – RFP Type – used in conjunction with the RFP number filter
- C – number of current RFP
- F – number of prior RFP in migration path
- O – number of original RFP in migration path

Task – The Project Task associated with the RFP
Subtask – The Projects Task and Subtask associated with the RFP
RFP Sts – If the Install Status filter is set to blank, only open RFP numbers will be displayed. Enter a Status of 09 to see closed RFPs or press F10=History to see installed RFPs.
Description – The RFP Description. The description filter will list all RFPs that have matching text in the description. For example, enter PRINT to list only RFPs with print somewhere in the short description. The Description filter is not case sensitive.
Problems – if warnings or errors have occurred for an RFP
Send Status – the state of deployments of this RFP to other systems for an installed RFP
Test Status – the state of MDWorkflow acceptance for an installed RFP
Install Date – When in history mode, the minimum and/or maximum install date can be entered.

RFP Status

RP – Request pending – the RFP is waiting for MDWorkflow acceptance of an RFP in the prior level before the new RFP can be used.
00 – Open, no request records assigned to RFP
01 – Open, one or more request records assigned to RFP
SP – RFP has been scheduled for submission and is waiting for the MD Submission service to submit the RFP
YY – RFP Submission currently in Job Queue
XX – RFP Submission in progress
02 – RFP is waiting for approval
CP – MDRapid Data Copy process is pending launch
CJ – MDRapid Data Copy process has been submitted to a job queue
CR – MDRapid Data Copy is in process
03 – RFP is waiting to be installed
IP – Installation Pending - RFP has been scheduled for installation and is waiting for the MD Installation service to install the RFP
04 – Installation in JOBQ
XY – RFP Install in progress
IC – The installation of the objects into the target application is complete
05 – The entire RFP process, included clean-up, is complete
09 – RFP Closed/No Install

Exception Status

E – RFP Error has occurred, causing the processing of the RFP to be rolled back
W – Warnings occurred during the processing of the RFP
B – Special filter value to show only RFPs with errors or warnings
N – Special filter value to show only RFPs without an exception

Option L=Log can be used for extensive details about any warnings or errors that occurred.

Send Status

O – open - the RFP hasn't been sent to any target systems yet
P – partial - the RFP is in the process of being sent and installed on some target systems
C – closed – the RFP is no longer open in the send list
N – not applicable – special filter value to show only RFPs that aren't defined to be sent to targets
U – not closed – special filter value to show any open or partially sent RFPs

Option T=Target Locs can be used for extensive details about the send progress as well as to initiate the send of the RFP to target systems.

Test Status

The state of MDWorkflow acceptance for an installed RFP.
Blank – MDWorkflow not applicable for RFP
0 – MDWorkflow acceptance is ongoing – any further steps are blocked at this time
1 – MDWorkflow provisionally accepted – waiting for confirmation from authorized user
2 – MDWorkflow acceptance complete – next step in process for RFP is freed, as long as all objects in RFP aren't waiting for acceptance in another RFP
8 – MDWorkflow provisionally rejected – waiting for confirmation from authorized user
9 – MDWorkflow rejection complete – next step in process for RFP has been deleted. Corrections must be brought up to this level to allow objects to continue.

Options

1=Select – Select, Enter and return the RFP number back to the requesting process.

2=Edit – Edit the RFP's detail information.

3=Copy – Copy the RFP's detail information to a new RFP. If a completed RFP (status 05) is copied, the user can also choose to re-request some or all of the objects in the RFP.

5=View – View the RFP's detail information.

7=Reset – Reset the RFP. This function causes the following based on the current RFP Status:

- 01 – All requests assigned to the RFP are removed from the RFP and may optionally be deleted.
- 02 – Installation Package waiting for Approval is deleted and the status is returned to 01.
- CP – RFP is returned to status 02 or 01, depending on whether or not Approval is automatic
- CR – MDRapid Data Copy is stopped and the RFP returns to status CP
- 03 – If Approval is required at the RFP's level, the status returns to 02, otherwise the Installation Package waiting for Installation is deleted and the status returns to 01.
- XX/04/XY – MDCMS checks if the submitted RFP job is still active. If the job is no longer active, the status returns to 01 or 03 depending on the last completed installation step.

9=Close – If the current status of the RFP is 00-Empty, the close option will close the RFP (status set to '09') so that it no longer appears in the list. If the current status is IC-Installation Complete, and the RFP job that was performing the clean-up is no longer active, the Close option should be used to finish the post-installation process for the RFP.

A=Accpt Test – View/Manage the MDWorkflow Acceptance of an installed RFP

C=Cmd/Scrp – Define commands or scripts to run for this specific RFP.

D=Rapid Sts – the MDRapid Copy Status of all physical and logical files that require MDRapid processing are displayed. This option is available once the RFP has at least reached Copy Pending status.

L=Log – view all steps that have occurred during the processing of the RFP. For each step, the job log entries can be viewed for additional information. The steps, the job log, or a combination of both can be exported to an excel report. The job log entries are applied to the RFP by the MDLOG service. If the entries are missing, then check that MDLOG is running. Both the log and joblog entries will be retained for only as long as the age parameter in the MDCMS Log Maintenance screen.

M=Merge – Merge 2 or more RFP Packages into 1 RFP. Enter an M for at least 2 RFP packages of the same application and level and then press Enter. A confirmation screen is shown where the target RFP number can be selected and the description of the merged package can be edited. All objects (and commands) of the selected RFPs will be merged into the target RFP. The other specified Packages will be emptied and closed once the merge is complete. Duplicate objects and commands will be eliminated automatically.

O=Objects – Display all objects that are contained within the RFP.

P=Projects – Display all projects that are contained within the RFP.

R=Rollback – Select to rollback some or all objects in a completed RFP.

S=Spools – Display the spooled files for the most recent submission of the RFP

T=Target Locs – view extensive details about the send progress as well as to initiate the send of the RFP to target systems

U=AutUsrs – Display the users in MDSEC that have authority to submit, approve or install depending on the status of the selected RFP.

V=Versions – Display the Conflict Resolution Status for dependent versions of object requests in this RFP. See the section on option V from Object Manager for additional details.

Function Keys:

F3=Exit

F4=Browse – Browse list of valid values for the filter fields.

F5=Refresh

F6=Add – Add a new RFP.

F7=Submit/Manage – Toggle between RFP Submit and RFP Manage modes

F8=Approve/Manage – Toggle between RFP Approve and RFP Manage modes

F9=Install/Manage – Toggle between RFP Install and RFP Manage modes

F10=History/Manage – Toggle between RFP History and RFP Manage modes

F17=Top – Position cursor to the top of the RFP listing.

F18=Bottom – Position cursor to the bottom of the RFP listing.

5.2 RFP Details

```
CMC228                          COMPANY NAME                                  11.03.16
SCRN2              Request For Promotion Number Details                       16:44:31

Application.: TEST                                    User         Date     Time
RFP Level...: 30                        Assigned.: MMORGAN    10.03.16 18:25:15
RFP Number..:    1217                   Submitted: MMORGAN    10.03.16 18:30:06
From RFP....:    1011  Loc: *LOCAL      Approved.: MMORGAN    10.03.16 18:30:09
Original RFP:    2022  Loc: MD71        Installed: MMORGAN    10.03.16 18:30:20
Status......: 05-Installed              RFP Cmds.: Y          Scripts: Y
Send Status.: O-Open  Test: 0-Ongoing
RFP Description
Change to main accounting report_____________________________________________
_____________________________________________________________________________

Upon COMPLETION of RFP
    Delete from Developer Library - Source: Y  Y/N    Object: Y  Y/N
    Delete from Import Library    - Source: N  Y/N    Object: N  Y/N
    Delete Job Log when no Warnings occur.: Y  Y/N
    Generate Requests for the Next Level..: N  Y/N
    Assign new RFP to Next Level Requests.: N  Y=Yes, N=No, M=Manual Submit Only
    Place RFP in Send Promotion List......: N  Y=Yes, N=No, M=Manual Send Only

 F4=Browse    F12=Previous    F15=Print
```

The Request for Promotion Number Details display is where the Promotion number details are entered.

Application
The Application that objects will be promoted into.

RFP Level
The Application level for this RFP.

RFP Number
The assigned number of the RFP.

Merged into RFP
The number of the RFP that the objects for this RFP were merged into for this level when the RFP was merged/cancelled.

From RFP
The number of the RFP that was installed one step prior in the migration path. If the path started at the current level, then this will be blank.

From Loc
The location ID of the RFP that was installed one step prior in the migration path. If the path started at the current level, then this will be blank. Special value *LOCAL will be displayed if the prior level was on the same system as this RFP.

Original RFP
The number of the initial RFP in the migration path. If the path started at the current level, then this will be blank.

Original Loc
The location ID of the initial RFP in the migration path. If the path started at the current level, then this will be blank. Special value *LOCAL will be displayed if the prior level was on the same system as this RFP.

Status
The status of the RFP.

Send Status
O – open - the RFP hasn't been sent to any target systems yet
P – partial - the RFP is in the process of being sent and installed on some target systems
C – closed – the RFP is no longer open in the send list

Test Status
The state of MDWorkflow acceptance for an installed RFP.
Blank – MDWorkflow not applicable for RFP
0 – MDWorkflow acceptance is ongoing – any further steps are blocked at this time
1 – MDWorkflow provisionally accepted – waiting for confirmation from authorized user
2 – MDWorkflow acceptance complete – next step in process for RFP is freed, as long as all objects in RFP aren't waiting for acceptance in another RFP
8 – MDWorkflow provisionally rejected – waiting for confirmation from authorized user
9 – MDWorkflow rejection complete – next step in process for RFP has been deleted. Corrections must be brought up to this level to allow objects to continue.

Assigned
The programmer that the request changes are assigned to. More than one programmer may be included in a request, but only one programmer may be entered on this display (includes the Date and Time of assignment).

Submitted
The user who submitted the RFP (includes the Date and Time of submission).

Approved
The user who approved the RFP (includes the Date and Time of approval).
*AUTO – the RFP was automatically approved
*STSTRG – the RFP was approved by a status trigger after a status transitioned for a Project or Task impacted by the RFP
*TEMPLATE – Object Approval Templates were used for approving the RFP. Press F10 to view the list of all involved Approval groups, as well as the approver, date, time and comment per group. From that approval logging screen, you can also press F10 a 2nd time in order to list the object and template for each object requiring approval on the RFP.

Installed
The user who installed the RFP (includes the Date and Time of installation).
*AUTO – the RFP was automatically installed
*STSTRG – the RFP was installed by a status trigger after a status transitioned for a Project or Task impacted by the RFP

Upon COMPLETION of RFP:

Delete Source from Developer library
Y – Delete the source from the developer library after the successful installation of the RFP. This is only permitted when installing into an Application Level that permits checkout.
N – Leave a copy of the source in the developer library

Delete Object from Developer library
Y – Delete the objects from the developer library after the successful installation of the RFP. This is only permitted when installing into an Application Level that permits checkout.
N – Leave a copy of the objects in the developer library

Delete Source from Import library
Y – Delete the source from an imported library after the successful installation of the RFP. This is only permitted when installing into an Application Level that permits checkout.
N – Leave a copy of the source in the import library

Delete Object from Import library
Y – Delete the objects from the imported library after the successful installation of the RFP. This is only permitted when installing into an Application Level that permits checkout.
N – Leave a copy of the objects in the import library

Delete Job Log when no Warnings occur
Y – Delete the job log for the RFP installation job once it has successfully finished and no warnings occurred.
N – Retain the job log even if there were no errors or warnings

Generate Requests for the Next Level
Y – If a next level on the same system is defined for this level, automatically create request records for all objects in this RFP for migration from this level to the next level.
N – Do not create request records for the next level

Assign new RFP to Next Level Requests
Y – If object requests are to be generated for the next level, then also create a new RFP number to assign to those requests. The description and user will be copied from this RFP.
N – Do not assign object requests to a new RFP
M – Assign to a new RFP for the next level, but don't automatically submit the RFP, even if the next level is defined to automatically submit RFPs by default.

Place RFP in Send Promotion List
Y – If a distribution queue is defined for this level, automatically place the RFP in the send queue.
N – Do not place the RFP in the send queue.
M – Place RFP in the send queue, but don't automatically send the RFP, even if the level is defined to automatically send RFPs by default.

Function Keys:
F4=Browse – Browse the Assigned field.
F12=Previous - Cancel any changes.
F15=Print – Print the details of the RFP to a spooled file.

5.3 RFP Commands

An entry of 'C' for an RFP activates the MD Detail Command Maintenance function for a specific RFP. This function is used to define IBMi commands that can be executed during the processing of the specific RFP.

```
CMC192                              COMPANY NAME                              4.09.06
SCRN1                          Commands for this RFP                         15:54:04

Appl/Lvl: ACCT 10  RFP: 1031 demo 42

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View

 Opt Type Seq  Command String
  _   1   10   OVRDBF FILE(ACCTPF1) TOFILE(PRODLIB/ACCTPF2)
  _   3   10   RMVM PRODLIB/ACCTPF1 XXXTEST


                                                                        Bottom
 F3=Exit   F6=Add   F10=Scripts
```

Type

L	Object Lock	runs during the compile or installation process when a required object or source is locked. Separate field Wait before Usage specifies the amount of time to wait before executing the command. Multiple commands can be defined in order to have a lock escalation process in place.
V	Pre-Submit Validation	runs when user selects to submit an RFP for promotion. Command MDCHKRFP must be used and this provides an organization with the ability to add custom validation rules before an RFP can be submitted. See section MDCHKRFP API for more information.
1	Pre-Compile	runs prior to compiling objects
P	Post-Compile	runs after all object compilations are successfully completed
E	Compile Error	runs when the compile phase of an RFP fails to complete successfully.
A	RFP Approved	runs after an RFP has been approved for installation
J	RFP Rejected	runs after an RFP has been reset from Waiting for Approval status
F	MDRapid Waiting to Launch	runs after an RFP has been approved and MDRapid is required for the RFP
G	MDRapid Started	runs to indicate that MDRapid has begun copying data for changed files
H	MDRapid Completed	runs after all existing records in the changed files has been copied to inform the users that the installation can be started.
I	MDRapid Error	runs when the MDRapid Data Copy phase of an RFP fails to complete successfully.
2	Pre-Installation	runs prior to installing objects into the environment
3	Post-Installation	runs after the installation of objects is complete, but prior to releasing the application for usage. Command errors can trigger an automatic roll back of the RFP.
Q	Installation Archive/Cleanup	Runs after the installation of objects is complete and the application is released for usage to avoid prolonging the downtime window. Typically used for post-installation notifications or other processes that don't require a roll back if they fail.
4	Installation Error	runs when the installation phase of an RFP fails to complete successfully. This type could be used, for example, to send an email or SMS to the installer if a weekend Installation fails.
W	Installation Warning	runs if an RFP Installation completes, but with warnings. Warnings can occur if data cannot be copied or if a Post-Installation Command fails to run successfully.
S	RFP Test Status Accepted	runs if an RFP Test Status is Accepted in MDWorkflow
T	RFP Test Status Rejected	runs if an RFP Test Status is Rejected in MDWorkflow

5	Pre-Send	runs once prior to sending an RFP to one or more remote systems
6	Post-Send	runs once, after an RFP has been successfully sent to one or more remote systems
7	Send Error	runs in case the send of an RFP fails to complete successfully
8	Post-Receive	runs after an RFP has been successfully received from a remote system
9	Receive Error	runs in case the receipt of an RFP fails to complete successfully
R	Receive Warning	runs in case the receipt of an RFP completes, but with warnings

Sequence
The sort sequence of the command at run time, in case multiple commands for the same type are defined.

Ignore Errors
Y – Continue with RFP processing even if the command fails. Flag will always be Y for type 3.
N – Cease and Rollback RFP processing if the command fails

Keep MD Libs in Libl
N – The MD Libraries (MDCMS and MDXREF) are removed from the library list before the command is invoked. This assures that any MD Objects with the same name as your objects are not used.
Y – The MD Libraries are left in the library list. This is necessary when MD Objects, such as interface programs, MDMAIL or MDMAILF, are needed to process the command.

Location to run Cmd
The location that the command should be run, allowing for commands to be run only for certain environments. Enter a valid Location ID or press F4 to select a location from the list.

Otherwise, select from one of the following special values:
*ALL – run the command on every level in the migration path
*LOCAL – run the command on any level on this system
*LOCLVL – run the command only for this level
*REMOTE – run the command on any level everywhere but this system

Run as User Profile
By default, commands executed during an RFP run under the profile of the user profile defined on the job description of the application level for the RFP. If a specific command should run under the authorities of a different user, that user ID can be entered here. As a safety precaution, the user placing a value in this field must have authority to use that entered user profile in order to save the command definition.

Command
The IBM i or user-defined command to be performed. Enter the name of the command and then press F4 to fill in the keywords.

Some placeholder parameter values may be used and are substituted by MDCMS at run-time. The placeholder value may be typed directly into the command or the cursor may be positioned in the command and F7 pressed to insert the value from a list. The full list of values are in this manual in the Attribute Command section.

5.4 RFP Scripts

An entry of 'C' for an RFP activates the MD Detail Command Maintenance function for a specific RFP. Then, F10 can be pressed to access the list of scripts to be executed for this specific RFP.

```
CMC171                          COMPANY NAME                          4.09.15
SCRN1                        Scripts for this RFP                    15:54:04

Appl/Lvl: ACCT 10  RFP: 1031 demo 42

Type options, press Enter.
 2=Edit   3=Copy   4=Delete   5=View   S=Script Content

 Opt Type Seq Script
  _    2    1 /ifs-stop-tomcat.sh
  _    3    1 /ifs-start-tomcat.sh


                                                                    Bottom
 F3=Exit   F6=Add   F12=Previous
```

Type
The Type value designates when a script should run

2	Pre-Installation	runs prior to installing objects into the environment
3	Post-Installation	runs after the installation of objects is complete

Sequence
The sort sequence of the script at run time, in case multiple scripts for the same type are defined.

Ignore Errors
Y – Continue with RFP processing even if the script fails.
Flag will always be Y for type 3.
N – Cease and Rollback RFP processing if the script fails

Attribute for Settings
The name of the MDCMS attribute containing the IFS or server connection settings to be used during the execution of the script.

Replace Placeholders
N – The script doesn't contain placeholder values to be replaced by runtime values when executed
Y – Replace placeholder values in the script at run time

Loc. to run Script
The location that the command should be run, allowing for commands to be run only for certain environments. Enter a valid Location ID or press F4 to select a location from the list.

Otherwise, select from one of the following special values:
*ALL – run the command on every level in the migration path
*LOCAL – run the command on any level on this system
*LOCLVL – run the command only for this level
*REMOTE – run the command on any level everywhere but this system

Wait for Response
Y – MDCMS waits until the Remote server confirms completion of the script execution
N – MDCMS continues without waiting for a response from the remote server

Submit Job
Y – Submit the IFS Script execution to a separate job. MDCMS will not wait for a response in this case, but instead continue with RFP processing.
N – the ifs script execution runs within this job

Job Name
The name of the submitted job that will process the IFS script

Job User
The user profile of the submitted job that will process the IFS script

Job Queue
The name and library of the Job Queue to receive the submitted job

Script Subfolder
The relative path of the script, if it isn't directly located in the script root folder.

Script
The name of the script file located in IFS

5.5 Promoting an RFP

Once 1 or more objects are assigned to an RFP, the Request for Promotion may be submitted. This is done by pressing **F7** from the Object Manager or **F7** from the RFP Manager.

The list of all RFPs in status 01 (Open, one or more request records assigned to RFP) OR SE (Partially Open, prior submit ended in error) is displayed. The filter and command handling of this list is identical to the RFP Control list.

Enter a '1' for one or more RFP numbers to promote them.

If the RFP status is currently 01, MDCMS then immediately runs an extensive series of checks on the contents of the RFP. If any warnings or errors are found, a screen is displayed detailing the exception and providing some options to correct them directly from the screen. Warnings can be ignored, though some warnings require specific MDSEC authority to be able to ignore. Errors must be resolved be the RFP can be submitted.

For automatically submitted RFPs, the RFP is only checked for error exceptions.

Excp. ID	Description
ERROR 1	Source or Object not found for Recompile requests. For any object with an attribute containing source, MDCMS checks in the target source library, migration chain, based-on levels and source search template for the source. For any object with an attribute without source defined, MDCMS checks in the target object library, migration chain, based-on levels and object search template for the Object.
ERROR 2	Unlocked Object Requests. Every object request in an RFP must be in a locked state in order to submit the RFP
ERROR 3	Object not found for Update requests. MDCMS checks in the target object library, migration chain, based-on levels and object search template for the object.
ERROR 4	Uncommitted Object Requests. For *REMOTE and *IFS requests where the file originates from outside the system, the file must first be committed to MDCMS using MDOpen.
ERROR 5	Incomplete Deletion requests for contents of an IFS Directory that has been requested for deletion. Every folder and file within the requested directory must also be requested for deletion. This can be done recursively by re-requesting to delete the directory and selecting to include contents.
ERROR 6	Object Requests not assigned to a Project. Every object request in an RFP must be assigned to at least one project in order to submit the RFP.
ERROR 7	Requests not Assigned to Approval Template. Object Approval Templates are required for the Promotion Level to approve the RFP for installation, but the listed objects aren't assigned to an Object Approval Template to determine which Approval Groups are involved. If you have authority to MDSEC code 23 for the Promotion Level, you can use option 1=Assign to Template in order to select the template to add the object(s) to.
ERROR 8	MDWorkflow acceptance not granted in prior level for objects in RFP. The submission of an RFP into the next level depends on every RFP containing any of the RFP's objects in the prior level to have been accepted, if MDWorkflow Acceptance is enabled for the prior level.
ERROR 9	Project/Task Status outside Boundary for Action. If Status Boundaries are defined for the target level to limit when and RFP can be submitted, each Project, Task or Subtask (depending on the boundary definition) that is assigned to requests in the RFP must be within the defined range.
ERROR 10	Missing Database Relations for Modified Files. For any modified file, along with logical files over that file, each database relation (LF, index, view, materialized query table) that isn't part of the RFP is listed.
ERROR 11	Unresolved Merge Conflicts. When the RFP is for a level designated as the Trunk and the RFP was received locally from a Branch, then any source code in conflict status must be set to Resolved before the RFP can continue. Resolution is performed in MDOpen using the option Compare with Branch on the RFP. A source member/IFS file is considered to be in conflict if it is different than the source currently in the trunk and the source in the trunk has either not yet reached production or it was installed after the source was checked out in the branch.

ERROR 12	Code Review Quality Gate. If any source code in the prior level requires a Code Review and the Code Review template for the attributes has the Quality Gate parameter set to true, then the next step in the migration path is not permitted until the Code Review has completed with a status of SUCCESS. If you have authority to MDSEC code 58 for the prior level, you can use option O to override the Quality Gate and continue with the RFP submission.
WARNING 1	Missing Dependencies for Modified Files. For any modified file, along with the logical and reference files over that file, each dependency that is not part of the RFP is listed. See the MDXREF manual for more information about the usage codes. If the dependency is a program or module, and that dependant has record-level access to the file, this warning will not be permitted to be ignored, unless **MDSEC code 35** is granted to the user for the target level of the RFP.
WARNING 2	Missing Programs for Modified Source Members. For any *SOURCE request, all programs or modules that copy the source (copybook), but aren't requested in the RFP, are listed.
WARNING 3	Missing Programs for Modified Modules. All ILE Programs and Service Programs that bind a requested module, but aren't included in the RFP, are listed.
WARNING 4	Missing Programs for Modified Service Programs. All ILE Programs that require a requested service program, but aren't included in the RFP, are listed.
WARNING 5	Objects to be migrated are older than the existing objects. If a non-compiled object has been requested to be imported, but the source change date on that object is older than the object already in the target application, then the object is listed. This is to help flag when a vendor sends the wrong version of an object.
WARNING 6	Objects already requested for Next Level. The listed objects are already requested for promotion at the next level from the target level of this RFP. The result of continuing with the promotion is that the changes in this RFP will overwrite the changes requested in the prior RFP(s). If the existing requests for the next level are by a different user than the user(s) that requested the objects for this RFP, the user submitting this RFP must be granted **MDSEC code 55** (Merge Other Users into RFP) in order to continue. If the existing requests for the next level are for a different project than the projects for this RFP, the user submitting this RFP must be granted **MDSEC code 56** (Merge Other Projects into RFP) in order to continue. If the existing requests for the next level are for different tasks than the tasks for this RFP, the user submitting this RFP must be granted **MDSEC code 57** (Merge Other Project Tasks into RFP) in order to continue. If authorized, and this RFP is set to create the requests for the next level, the user must choose if the existing RFPs should be automatically merged into this RFP when finished. N=don't auto-merge – the existing RFPs remain active and any objects that were already requested won't be part of this RFP at the next level. Y (recommended)=auto-merge – all existing RFPs that conflict with this RFP will be automatically merged into this RFP for the next level. The existing RFPs will then be automatically closed.
WARNING 7	Objects already requested for next level that won't be overwritten. Lists all object requests that promote from a different level than the target level of this RFP or that are already in the process of being installed. The existing RFPs remain active and any objects that were already requested will be requested in the new RFP for the next level in Unlock Mode.
WARNING 8	Objects already in Send Queue. The listed objects are already requested to be sent to target systems in other RFPs for this target level. The result of continuing with the promotion is that the changes in this RFP will overwrite the changes requested to be sent in the prior RFP(s).

	If the existing requests in the send queue are by a different user than the user(s) that requested the objects for this RFP, the user submitting this RFP must be granted **MDSEC code 55** (Merge Other Users into RFP) in order to continue. If the existing requests in the send queue are for a different project than the projects for this RFP, the user submitting this RFP must be granted **MDSEC code 56** (Merge Other Projects into RFP) in order to continue. If the existing requests in the send queue are for different tasks than the tasks for this RFP, the user submitting this RFP must be granted **MDSEC code 57** (Merge Other Project Tasks into RFP) in order to continue. If authorized, and this RFP is set to send, the user must choose if the existing RFPs should be automatically merged into this RFP when finished. N=don't auto-merge – the existing RFPs remain active. The objects will be in the old and new RFPs in the send queue. Y=auto-merge – all existing RFPs that conflict with this RFP will be automatically merged into this RFP in the send queue. The existing RFPs will then be automatically closed. If your organization prefers that an auto-merge of RFPs in the Send List should ALWAYS or NEVER happen, the choice can be locked down by application by setting parameter Auto-Merge RFP in Send List to Y for ALWAYS or N for NEVER.
WARNING 9	Objects in process of being Installed. Any compiled object that is being installed at the same time in another RFP (due to recompiles) is listed to indicate that an unintended version of the object may end up in the target object library.
WARNING 10	Objects that have been deployed to an Emergency Level. Each object that was deployed to an emergency level since the last time it was deployed to the target level is listed. This is to keep visibility on the emergency deployments, in case those changes need to be retrofitted into the standard version.
WARNING 11	Dependencies in Linked Apps for Modified Files. Objects that exist in linked applications that depend on files in this RFP.
WARNING 12	Programs in Linked Apps for Modified Copybooks. Objects that exist in linked applications that depend on source copybooks in this RFP.
WARNING 13	Programs in Linked Apps for Modified Modules. Objects that exist in linked applications that depend on modules in this RFP.
WARNING 14	Programs in Linked Apps for Modified Service Programs. Objects that exist in linked applications that depend on service programs in this RFP.
WARNING 15	Recompiles based on Uninstalled Requests. This warning indicates when objects are requested for recompile in this RFP, that are based on source in a different level, but that source hasn't been deployed yet to that based-on level. This usually indicates that the RFP for that level should be installed before continuing with this RFP.
WARNING 16	Objects Installed Since Checkout. Objects are listed that have been installed into the target level between the time that the object on this RFP was checked out in the originating level and now. This is to provide awareness that potentially other project work had passed through this level in the meantime.
WARNING 17	Missing External References for Requested System Objects. Files in a Git Repository, SVN Repository or IFS reference a system object that is requested for modify or delete in the RFP, but external File itself isn't included in the RFP. If you should never be warned about a given External Reference in the list, option I=Ignore can be used to permanently skip the warning for that specific file. If it should ever be important in the future, it can be unignored from the MDOpen External Reference view.
WARNING 18	Missing SQL Routines for Programs. Programs or Service Programs are requested in the RFP for modification or recompile and these programs are invoked by SQL Functions or Procedures, but the

	routine isn't included in the RFP. This can lead the routine to be dropped by the system if it isn't included with the RFP.
WARNING 19	Locked Source Members. Source members that are to be deployed are currently locked in the developer library. Close the source editor for each member and press F5 to refresh the list.

If any of the listed conditions are true, a screen will appear for each warning or error allowing for the correction or confirmation of the issue.

Once all errors have been corrected, the following confirmation screen will appear with the default submission parameters, based on the job description for the promotion level.

```
CML400                            COMPANY NAME                              4.09.06
SCRN1                  Submit Confirmation and Override                     07:06:37

                              Parameters    Override
  Jobname  . . . . . . . .  CMS001894
  Job Description  . . . .  MD30
    Library  . . . . . . .    QGPL

  Submission Date  . . . .  *CURRENT       __________     *CURRENT, Date
  Submission Time  . . . .  *CURRENT       __________     *CURRENT, Time
  Installation Date  . . .  *CURRENT       __________     *CURRENT, Date
  Installation Time  . . .  *CURRENT       __________     *CURRENT, Time
  Place in Job Queue . . .  *YES           ____           *YES, *NO
  Job Queue  . . . . . . .  QBATCH         __________
    Library  . . . . . . .    QGPL            __________
  Hold in Job Queue  . . .  *NO            ____           *YES, *NO

Enter=Confirm   F12=Cancel
```

Submission Date
*CURRENT – submit the RFP today
date – schedule the submission for the entered date. If the job is immediately placed in the job queue, be certain that an IPL does not occur between now and the scheduled date

Submission Time
*CURRENT – submit the RFP at this time
time – schedule the submission for the entered time

Installation Date
If the level for the RFP allows for automatic approval and installation, the date and time of the installation can also be controlled when performing the initial submission.
*CURRENT – install the RFP on the same day that the bundling process is complete
date – schedule the installation for the entered date.

Installation Time
*CURRENT – install the RFP as soon as the bundling process is complete
time – schedule the submission for the entered time

Place in Job Queue
*YES – the job will be submitted immediately to the job queue and scheduled for the entered date/time
*NO – the job is intended to be submitted no sooner than the scheduled date/time by the MDSBMRFP process. The status of the RFP is changed to SP for Submission Pending.

Job Queue
The name and library of the job queue to use if placed in a job queue

Hold in Job Queue
*YES – the job will be placed in the job queue in hold status so that something can release the job at a later time
*NO – the job will be placed in the job queue in released status for automatic processing

Delay Delete Prior Obj
*YES – the temporary library holding the prior version of the installed objects will not be deleted until the following day. This allows active jobs to continue using the prior version of programs that were already invoked by those jobs.
*NO – the temporary library will be deleted as soon as the installation is complete

5.6 The RFP Installation Process

Once a request for promotion has been submitted, the actual process of installing the new or modified source and objects takes place. Listed below are the steps that this process goes through and the result of each step.

5.6.1 The Source/Object Preparation Steps

Temporary MDCMS libraries (naming based on system settings for temp libraries + the RFP number) are created to handle the entire process so that no permanent changes take place until MDCMS is certain that all is ready.

Pre-Steps:

1- Process Pre-Compile commands for *RFP attributes
2- Process Pre-Compile commands for this RFP

Object Steps processed in full for each object before continuing to next object:

1- The source or non-compiled object is checked for existence.
2- If new or modified source is to be compiled, the existing source is copied to a backup library and the new version of the source is copied to the target source file/ifs path
3- Process Pre-Compile commands for object or attribute
4- Process Compile commands for object or attribute
5- Process Post-Compile commands for object or attribute
6- Validate that object has been created into temporary packaging library
7- Apply object authority to the object in the temporary packaging library
8- Stamp the object with MDCMS Meta-Data
9- Delete any triggers and disable any referential constraints from new version of a file
10- Validate the Data Transformation for mapping existing records to new version of a file
11- Add Comments to the source in the packaging library, if requested for an attribute assigned to a Source Comment template

Post-Steps:

1- Process Post-Compile commands for this RFP
2- Process Post-Compile commands for *RFP attributes
3- Sign source and objects, if enabled for system, to ensure that manual changes are detected
4- Warn about any level check issues, if enabled for level
5- Warn and stop process if insufficient disk space is available to deploy file changes

If a failure occurs during these steps, a message will be sent to the user that submitted the job describing why the failure occurred and the Compile Error exit point will be triggered. For additional detail, the RFP log and the spooled files for the job should be reviewed. The RFP will remain at status 01 and can be re-requested from the RFP Manager. If the RFP is not in status 01, it will need to be reset using option 7 in the RFP Manager.

5.6.2 Source and Object Signing

MDCMS uses an SHA-1 encryption algorithm with a HMAC key unique to each distinct object migration chain to create a 1-way signature for each source member, IFS source file or IFS/Remote object files that have been prepared to be installed. The initial signature is applied when it is installed into the initial promotion level, and this signature is compared to the newly generated signature at higher levels.

If the System Settings parameter Sign Objects is set to true, and the signature does not match, then MDCMS will require that an authorized user approves the installation before the installation steps will be started.

5.7 Approving a Promotion

An RFP is first submitted for promotion which prepares the source and objects for deployment in a temporary library. If there are no errors, the installation process checks the Promotion Level parameters and if the Automatic RFP Approval flag is set to 'N' or 'T', or the RFP contains attributes that require approval, the RFP status is set to '02' - Approval Pending. An authorized user or users must then approve the promotion before it can be installed. To do this, toggle to the Approve list using F8 in the RFP Manager.

The list of all RFPs in status 02 are displayed.

Enter a '1' for an RFP number to approve it.
Enter a '7' to remove the temporary promotion library and to set the RFP back to status '01'.

If approval could be completed and the auto-install flag is set to 'Y' for the promotion level, then a confirmation screen will be displayed for the submission of the installation of the promotion.

5.7.1 Manual Approval

A single user can approve the RFP.
The user must have authority to MDSEC code 42 for the application if the RFP was submitted by someone else.
The user must have authority to MDSEC code 52 for the application if the RFP was submitted by that same user.

5.7.2 Template Approval

One user per Approval Group required for the RFP will need to approve the RFP for Installation. The required Approval Groups are determined by the Object Approval Templates that the RFP's objects are assigned to. Once the status for each group is set to approved, then the RFP will be transitioned to status 03=Ready for Installation.

```
MDCRIAG                          T86 Dev/Test                              8.01.25
SCRN1                     RFP Installation Approval                       15:38:15
Appl/Lvl: TEST01 100
     RFP: 1797    add parm to simplecl

Type options, press Enter.
 1=Approve  7=Undo  9=Reject

Opt Appr. Grp  Status    User         Date     Time    Comment
 _  EUROTEST   approved MMORGAN    08.01.25 15:38:15
    MEXTESTMGR open
    NORAM      open
 _  PGMR 1     approved MMORGAN    08.01.25 15:38:06 looks good to me



                                                                        Bottom
F3=Exit    F5=Refresh    F10=Templates/Objects
```

You will have a prompt to Approve, Reject or Undo for each Approval Group that you belong to.

Options

1 – set the status to approved for the selected Approval Group. A confirmation screen will be displayed where a comment can also be optionally provided.

7 – undo the approved or rejected status for the selected Approval Group. The undo occurs without a confirmation screen.

9 – set the status to rejected for the selected Approval Group. A confirmation screen will be displayed where a comment can also be optionally provided.

Function Keys

F3=Exit – exit the screen

F5=Refresh – refresh the listing

F10=Templates/Objects – view the list of all Objects and Object Approval Templates that combined to determine the list of required Approval Groups.

5.8 Launching MDRapid

Once approval is granted, and the RFP contains one or more files that should have their data copied prior to installation, the installation process checks the Promotion Level parameters and if the Automatic Launch MDRapid is set to 'N' the RFP status is set to 'CP' - Copy Pending. An authorized user must then launch MDRapid to begin the Copy process. To do this, toggle to the Install list using F9 in the RFP Manager.

The list of all RFPs in status CP or 03 are displayed.

Enter a '1' for a RFP number with status CP to launch it. A confirmation screen with the following fields is displayed:

Auto-Install Objects when Data Copy Complete
Y – Yes, the install steps should begin automatically once all data has been copied
N – No, an authorized user must schedule the installation
W – Yes, auto-install if the data copy finishes within the Time Window

Time Window for Auto-Install
The minimum and maximum Date/Time that the Copy process must finish within in order for the RFP to auto-install. If the RFP finishes outside of the window, then an authorized user must schedule the installation. Exit point commands can be defined for the level to notify the group when the Data Copy is finished.

Once Enter is pressed, the MDRapid jobs are submitted to the job queue defined by the MDRapid template and MDCMS monitors the progress. Once a physical file has completed the copy process, MDCMS builds the dependent logical files. Once all files are prepared for installation, the status of the RFP is switched to 03.

5.9 MDRapid Console

If one or more Files in an RFP are to use MDRapid for copying the data, then option D=Rapid Sts can be used in front of the RFP, or in front of the file request, once the status of the RFP has reached at least CP=Copy Pending. That option brings up the following screen:

```
CMC247                          MD T 8.1 dev                          1.03.18
SCRN1                       MDRapid Copy Status                      19:00:48

Appl: TEST  Lvl: 10  RFP:    1539                     Start: 01.03.18 19:00:11
Status: 03-Waiting for Installation                     End: 01.03.18 19:00:19
Filter by File: __________  Library: __________  Active: _ Y/N
Type options, press Enter.
 5=Details  E=End  H=Hold  I=Init+Restart  J=Job  R=Rec Errors  S=Restart
  Target     Source     F                                Usage   Est/Actual End
O File       Library    T Status      Initial Recs  Pct hh:mm:ss   Date   Time
_ MDALIC     TEST8O_10  P Sync/Idle            724  100          01.03.18 19:00
_ MDALIC     TEST8O10R1 P Sync/Idle            724  100          01.03.18 19:00
_ MDALIC     TEST8O10R2 P Sync/Idle            724  100          01.03.18 19:00
_ MDACSTL1   TEST8O_10  L LF Built                 100          01.03.18 19:00
_ MDACSTL1   TEST8O10R1 L LF Built                 100          01.03.18 19:00
_ MDACSTL1   TEST8O10R2 L LF Built                 100          01.03.18 19:00
_ MDALIC1    TEST8O_10  L LF Built                 100          01.03.18 19:00
_ MDALIC1    TEST8O10R1 L LF Built                 100          01.03.18 19:00
_ MDALIC1    TEST8O10R2 L LF Built                 100          01.03.18 19:00
_ MDALIC2    TEST8O_10  L LF Built                 100          01.03.18 19:00
_ MDALIC2    TEST8O10R1 L LF Built                 100          01.03.18 19:00
                                                                      More...
F3=Exit   F5=Refresh   F13=Repeat Opt   F17=Top   F18=Bottom
```

Option

5 – view additional information about the MDRapid process for the file. This is particularly helpful to see:

- the complete error reason if the status for the job is in error
- the number of synced transactions or
- temp library names where the data copying and syncing is occurring so that any analysis and validation of the file contents can be performed.
- If an idle sync point has been reached, the current number of records in the old and new version of the file for comparison.

E – End the MDRapid job for the file

H – Hold the MDRapid job for the file

I – clear all data in the new version of the file and restart the job from the beginning of the copy process

J – view details of the processing job for a physical file or for the MDRapid Monitor

R – view the list of records in the file that failed to get inserted, updated or deleted and choose to copy those records to another file or to allow the file to be installed with the errors in place.

S – restart the job at the point where it left off when last ended

Target File

The name of the file being prepared, or the value Monitor for the MDRapid monitor job

Source Library

The location of the data origin file that the records are being copied from, which is also the library that the file will then be deployed to during the installation phase.

F T (File Type)
I – SQL Index
L – Logical file
M – Monitor job
P – Physical file
T – SQL Table
V – SQL View

Status

Pending	The file hasn't begun processing yet
Resetting	A reset to Copy Pending has been requested for the RFP
Reset	A reset to Copy Pending has completed for the RFP
Launch Err	Error occurred trying to submit the launch of the file for MDRapid processing
Copying	The current data in the origin file is being copied to the new version of the file
Copying/RE	The current data in the origin file is being copied to the new version of the file, and one or more of the records failed to be copied. Use option R for more details. The errors may potentially be automatically resolved during the sync process.
Copy Held	A user has held the copy job
Copy Ended	The copy job has ended without reaching completion
Copy Error	Error occurred during the copy of data
Copy Resume	A user has requested that a copy job resume processing
LF Building	A logical file is in the process of getting built over its physical file(s)
LF Built	A logical file has finished the build process
LF Error	Error occurred during the logical file build
Syncing	The copy process is complete and outstanding Journal transactions are in the process of being synced to the new version of the file
Syncing/RE	The copy process is complete and outstanding Journal transactions are in the process of being synced to the new version of the file and one or more of the records failed to be copied. Use option R for more details.
Sync/Idle	All copying and transaction syncing is complete, will continue to sync new transactions as they occur
Sync/IdleRE	All copying and transaction syncing is complete, will continue to sync new transactions as they occur and one or more of the records failed to be copied. Use option R for more details.
Sync Held	A user has held the sync job
Sync Ended	The sync job has ended without reaching completion
Sync Error	Error occurred during the sync of journal transactions
Sync Resume	A user has requested that a sync job resume processing
Finish Pending	The RFP install job has requested the sync job to finish any outstanding transactions and then end so that the deployment of the files can occur.
Sync Comp	The job for the file has completed so that the installation can proceed
Running	The monitor job is actively observing the individual file jobs
Monitor Held	A user has held the monitor job
Monitor Ended	The monitor job has ended
Monitor Error	Error occurred
Monitor Resume	A user has requested that the monitor job should resume processing

Initial Recs
The total number of records across all members in the live physical file at the time that the MDRapid job for the file is started

Pct
The percentage of records that have been copied to the new version of the file. 100% will show once all records have been copied and all outstanding journal transactions have been processed.

Usage
The amount of time that has elapsed in order to copy the initial set of records to the new version of the file in hours:minutes:seconds format.

Est/Actual End Date Time
Physical files - If still running, an estimate of when the copy of the initial set of records will complete. Once the copy process is complete, the actual completion date/time is displayed.

Logical Files - The date/time when the logical file was built

Monitor - If still running, and an install window was defined, the start of that window is displayed.
If MDRapid is complete, then the actual date/time when installation began is displayed.

5.10 MDSTRRAP – Restart MDRapid Jobs command

MDCMS is delivered with a command-based API that allows external processes to restart MDRapid jobs for an RFP. An RFP must have status CR (MDRapid Copy Running) or 03 (Ready to Install) in order to be considered by the API.

The MDCMS command is named ***MDSTRRAP*** and is located in library MDCMS*.
All MDSTRRAP API transactions are logged to file MDCMS/MDDARAP.

MDSTRRAP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code (required)
RFP	INTEGER	7	RFP Number. 0=Restart MDRapid for all RFPs in the Application that were previously started and are currently in status CR=Copy Running or 03=Waiting for Installation
MINF	CHAR	10	Minimum File Name Value – the minimum alphabetic value of files in the list to restart *FIRST = Files beginning with the first file in the list
MAXF	CHAR	10	Maximum File Name Value – the maximum alphabetic value of files in the list to restart *LAST = Files ending with the last file in the list
MON	CHAR	4	Restart Monitor Job – if the MDRapid monitor job should be restarted *YES – if the monitor job is not active, it will be restarted *NO – do not restart the monitor job
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDINSRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.11 MDENDRAP – End MDRapid Jobs command

MDCMS is delivered with a command-based API that allows external processes to end MDRapid jobs for an RFP. An RFP must have status CR (MDRapid Copy Running) or 03 (Ready to Install) in order to be considered by the API.

The MDCMS command is named ***MDENDRAP*** and is located in library MDCMS*.
All MDENDRAP API transactions are logged to file MDCMS/MDDARAP.

MDENDRAP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code (required)
RFP	INTEGER	7	RFP Number 0=End MDRapid for all RFPs in the Application that were previously started and are currently in status CR=Copy Running or 03=Waiting for Installation
MINF	CHAR	10	Minimum File Name Value – the minimum alphabetic value of files in the list to end *FIRST = Files beginning with the first file in the list
MAXF	CHAR	10	Maximum File Name Value – the maximum alphabetic value of files in the list to end *LAST = Files ending with the last file in the list
MON	CHAR	4	End Monitor Job – if the MDRapid monitor job should be ended *YES – if the monitor job is active, it will be ended *NO – do not end the monitor job
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDINSRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.12 Installing a Promotion

Once any compile, approval and MDRapid steps are complete, the installation process checks the Promotion Level parameters and if the Auto-Install flag is set to 'N', the RFP status is set to '03' – Waiting to Install. An authorized user must then select the promotion for installation before the objects are actually installed into an application. To do this, toggle to the Install list using F9 in the RFP Manager.

The list of all RFPs in status CP or 03 is displayed.

Enter a '1' for a RFP number with status 03 to install it. A confirmation screen will be displayed for the submission of the installation of the promotion. If the RFP installation job is not placed in the Job Queue, then the status is changed to IP for Installation Pending and will wait until the RFP Installer API (MDINSRFP) submits the RFP.

The user must have authority to MDSEC code 44 for the application if the RFP was approved by someone else.

The user must have authority to MDSEC code 53 for the application if the RFP was approved by that same user.

Enter a '7' to remove the temporary promotion library and to reset the RFP back to status '01'.

5.12.1 The Installation Steps

Pre-Steps:
1. Process Pre-Installation commands for *RFP attributes
2. Process Pre-Installation commands and scripts for this RFP
3. Process Pre-Installation commands and scripts for objects and object attributes
4. Lock all target files to be replaced with new versions of those files
5. If MDRapid is running, finish any outstanding journal syncing and then end MDRapid processing

Object Steps processed in full for each object before continuing to next object:
1. Move current version of source and object to a backup library/folder
2. Move new version of source and object to target locations
3. Set object authorities for each target library, if replicated to multiple libraries and MDRapid not used to prepare the object.
4. Stamp object with MDCMS metadata information, if the object was re-compiled during the install phase.

Post-Steps
1. All prior members for modified physical files are copied to the new file using Data Transformation, if enabled. If disabled, CPYF with option *map/*drop will be used unless an overriding data copy command is specified.
   If MDRapid was used for a file, then this step already occurred prior to installation, so only a simple move is required.
2. All constraints, journals and system (non-SQL) triggers are reapplied (if the file flags indicate to do so). If a logical file is being replaced, all prior members of the file are created for the new file (if the file flag indicates to do so).
   If MDRapid was used for a file, then the constraints will have already been applied prior to installation.
3. Unlock all files
4. Process Post-Installation commands and scripts for objects and object attributes
5. Process Post-Installation commands and scripts for this RFP
6. Process Post-Installation commands for *RFP attributes
7. Set status of RFP and objects to IC=Installation Complete, indicating the application can be used again.

If an exception occurs during the Installation Steps, any completed portion of the installation is automatically rolled back and the RFP will return to status 03=Ready for Installation, unless the exception is for a command or replication location that has the Ignore Errors flag set to Y. In the case of ignoring a specific error, the warning will be logged and the RFP warning exit point will be triggered at the conclusion of the RFP process.

5.12.2 The Archiving/Cleanup Steps

1. Update MDXREF information for the installed source and objects
2. If the Application Level is tied to X-Analysis libraries in MDXREF, the deployed objects will be passed to the MDXANI service for the asynchronous update of object information in X-Analysis for those libraries.
3. Process Installation Archive/Cleanup commands for this RFP
4. Process Installation Archive/Cleanup commands for *RFP attributes
5. All replaced source is archived. Replaced objects will be zip compressed and archived to the MDCMS IFS path, if they are not compiled from source.
   During the archiving process for each object, any Installation Archive/Cleanup command for the specific object or for the MDCMS attribute used by the object will be invoked to be able to perform additional processing on the archived source and objects.
6. If the installation occurred at a checkout level and the RFP is defined to remove the source or objects from the developer's library and/or from an import library, the removal is performed at this time.
7. Delta Source and Objects are removed from other levels based on the templates assigned to the object attributes in this RFP. They are left in place if the version in the delta level is different than the version in the target level, unless the delta level is also flagged as an emergency level.
8. Installation History records are created for each object.
9. The finished Request detail records are removed.
10. If any of the object requests require Code Review, they will be added to the pending batch for each impacted Code Review Template. If the number of pending items meets the criteria to run the review, the batch will be executed.
11. The temporary libraries and spool files are deleted unless the parameters specify to keep them.

5.12.3 The Next Level Preparation Steps

1. If a Distribution Level is defined for the RFP's promotion level, the RFP is placed in the send list. If Auto-Send is set to Y for this Level, the RFP will immediately be sent to all Target Levels where the Default flag is set to Y.
   If other RFPs containing one or more of the same objects are open in the send list, and this RFP was flagged to auto-merge, then the other RFPs will be merged into this new RFP.
2. New Request records are created for the next level on the same system, if direct migration is defined and the object attribute exists further up the chain.
3. A new RFP number is generated and automatically assigned to the new Request records.
4. If an object is already requested for the next level, and auto-merge was set to No during the RFP submission, a Request record will not be created and a warning condition will be generated. If auto-merge was set to Yes, the other RFPs will be merged into this new RFP and a warning isn't flagged.
5. If Auto-Submit is set to Y for the next level, and no errors exist at the next level, and Workflow acceptance of this RFP is not required, the new RFP is submitted to batch.

5.13 MDWorkflow Acceptance of Installed Promotion

If MDWorkflow Acceptance Group Types are defined for the RFPs promotion level, then the groups assigned for acceptance for the Projects contained in the RFP must sign off on the installed changes before the RFP may continue to the next step. A next step would be submission to the next level on this system and/or sending to target levels on other systems.

To perform MDWorkflow acceptance, either use the MDWorkflow web application or use option A=Accpt Test from the RFP listing for the installed RFP.

```
CMC263                          MD T 74 6.1                          24.04.16
SCRN1                        RFP Test Status                         18:14:47

Appl/Lvl: TEST 30 Test Status: 0-Ongoing
     RFP:    1061 data areas

Type options, press Enter.
 A=Accept  C=Comments  G=Group Info  I=In Progress  R=Reject  U=Undo

Opt Project      Group Type Group      User       Status     Date     Time  Cmt
 _  LIBRARYPROJ  MARKETING  MARK-CH
 _  LIBRARYPROJ  TESTER     TEST 1     MMORGAN    Accepted 23.04.16 18:03:15 Y




                                                                      Bottom
F3=Exit   F5=Refresh
```

Options
A=Accept – accept the RFP for the project entry. You must belong to the defined group for the project to perform acceptance or rejection. Every entry must be accepted before acceptance confirmation can be granted.
C=Comments – view/edit comments for the project entry
Group Info – If a group isn't yet defined for the project, and you have authority to edit projects, the group (and optionally user) can be selected. If a group is already defined, the information about the group is displayed.
I=In Progress – specify that you are testing the results for the project entry. The entry is then reserved for you.
R=Reject – reject the RFP for the project entry. If any entry is rejected, the entire RFP can be confirmed for rejection.
U=Undo – Undo the provisional acceptance or rejection of a project entry. This also frees the entry to be worked on by another member of the group, if not for a specific user for the project.

Confirm Acceptance/Rejection
Once all entries are accepted, or any entry is rejected, F10 must then be pressed by an authorized user (MDSEC code 46 for the RFPs Application). This then confirms the status for the RFP, which will either of the following:

2 - MDWorkflow acceptance complete – next step in process for RFP is freed, as long as all objects in RFP aren't waiting for acceptance in another RFP
9 – MDWorkflow rejection complete – next step in process for RFP has been deleted. Corrections must be brought up to this level to allow objects to continue.

5.14 MDSBMRFP – RFP Submission command

MDCMS is delivered with a command-based API similar to the Installer API. The difference with the Submitter API is that RFPs will be submitted when they have status 01 (Objects assigned to RFP) and/or status SP (Submission Pending). This API allows external processes, such as End-of-Day, to submit some or all RFPs for promotion.

The Object Checking and Compilation portion of a Promotion will be performed for the selected RFP(s). If no problems are encountered, the Auto-Approve and Auto-Install flags for the Promotion Level will be checked. If one of the flags is set to N, the process stops, otherwise the RFP will be installed. The API does not fail if no RFPs are currently waiting to be submitted.

This allows a business to embed the MDCMS Submission process into its remote systems for clean, hands free processing.

The MDCMS command is named ***MDSBMRFP*** and is located in library MDCMS*.

If the submission of an RFP is not successful, its status returns to 01 and the objects in the environment remain the same as they were prior to the submission.

All MDSBMRFP API transactions are logged to file MDCMS/MDDSRFP.

MDSBMRFP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code or *ALL for any application
FROMLVL	INTEGER	3	Minimum Application Level to consider
TOLVL	INTEGER	3	Maximum Application Level to consider
FROMRFP	INTEGER	7	Minimum RFP Number to consider
TORFP	INTEGER	7	Maximum RFP Number to consider
PEND	CHAR	4	Include Pending RFPs *YES = RFPs with status SP are also considered *NO = only RFPs with status 01 are considered *ONLY = only RFPs with status SP are considered
SCHDT	CHAR	8	Pending until Scheduled Date *CURRENT = include RFPs with a scheduled date that is not greater than the current date Or, enter a date in YMD format to designate the maximum allowed scheduled date
PROJ	CHAR	12	Project Filter – only submit RFP if one or more Objects in the RFP are requested for the Project
TASK	INTEGER	7	Task Filter – only submit RFP if one or more Objects in the RFP are requested for the Project Task
STSK	INTEGER	7	Subtask Filter – only submit RFP if one or more Objects in the RFP are requested for the Project Subtask
PIPE	CHAR	10	Pipeline Filter - Specifies the Pipeline Server ID of a Pipeline TraceKey request. This value is required if a value for TRCKEY is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
TRCKEY	CHAR	128	Pipeline TraceKey Filter - Specifies the Pipeline TraceKey of a Pipeline TraceKey request. This value is required if a value for PIPE is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.

USER	CHAR	10	The User Profile ID to be displayed in Installation History. *CREATOR = same user that created the RFP number *USER = same user that called the API A specific User Profile
CONT	CHAR	4	Continue Submitting RFPs if a RFP Fails *YES = any further RFPs will be submitted *NO = this API stops submitting RFPs
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDSBMRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.15 MDAPRRFP – RFP Approver command

MDCMS is delivered with a command-based API that allows external processes to approve some or all RFPs. An RFP must have status 02 (Waiting for Approval) in order to be considered by the API.

By default, users are not authorized to use this command. Authority can be granted from the MDSEC Command Security feature.

The MDCMS command is named ***MDAPRRFP*** and is located in library MDCMS*.
All MDAPRRFP API transactions are logged to file MDCMS/MDDARFP.

MDAPRRFP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code or *ALL for any application
RFP	INTEGER	7	Specific RFP Number – if left blank, then the range of RFP numbers will be considered
RFPT	CHAR	8	Specific RFP Type - the type of specific RFP number passed in parameter RFP. *CURRENT = the current number for an RFP *FROM = The RFP number refers to the RFP installed into the prior level, which then automatically generated the RFP with a different number to be deleted. *ORIG = Each RFP to be deleted originated from the specified RFP number, which was installed into the initial level for a chain of migrations across systems.
FROMLVL	INTEGER	3	Minimum Application Level to consider
TOLVL	INTEGER	3	Maximum Application Level to consider
FROMRFP	INTEGER	7	Minimum RFP Number to consider
TORFP	INTEGER	7	Maximum RFP Number to consider
PROJ	CHAR	12	Project Filter – only install RFP if one or more Objects in the RFP are requested for the Project
TASK	INTEGER	7	Task Filter – only install RFP if one or more Objects in the RFP are requested for the Project Task
STSK	INTEGER	7	Subtask Filter – only install RFP if one or more Objects in the RFP are requested for the Project Subtask
PIPE	CHAR	10	Pipeline Filter - Specifies the Pipeline Server ID of a Pipeline TraceKey request. This value is required if a value for TRCKEY is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
TRCKEY	CHAR	128	Pipeline TraceKey Filter - Specifies the Pipeline TraceKey of a Pipeline TraceKey request. This value is required if a value for PIPE is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format:

			MDINSRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.16 MDINSRFP – RFP Installer command

MDCMS is delivered with a command-based API that allows external processes, such as End-of-Day, to install some or all RFPs. An RFP must have status 03 (Ready for Installation) and/or status IP (Installation Pending) in order to be considered by the API. The API does not fail if no RFPs are currently waiting to be installed. This allows a business to cleanly embed the MDCMS Installation process into its nightly or weekend batch processing so that conflicts are avoided.

The MDCMS command is named ***MDINSRFP*** and is located in library MDCMS*.

If the installation of an RFP is not successful, its status returns to 03 and the objects in the environment remain the same as they were prior to the installation. This API allows the option of automatically rolling back all RFPs that were installed prior to the RFP which failed.

All MDINSRFP API transactions are logged to file MDCMS/MDDIRFP.

MDINSRFP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code or *ALL for any application
FROMLVL	INTEGER	3	Minimum Application Level to consider
TOLVL	INTEGER	3	Maximum Application Level to consider
FROMRFP	INTEGER	7	Minimum RFP Number to consider
TORFP	INTEGER	7	Maximum RFP Number to consider
PEND	CHAR	4	Include Pending Installs *YES = RFPs with status IP are also considered *NO = only RFPs with status 03 are considered *ONLY = only RFPs with status IP are considered
SCHDT	CHAR	8	Pending until Scheduled Date *CURRENT = include RFPs with a scheduled date that is not greater than the current date Or, enter a date in YMD format to designate the maximum allowed scheduled date
PROJ	CHAR	12	Project Filter – only install RFP if one or more Objects in the RFP are requested for the Project
TASK	INTEGER	7	Task Filter – only install RFP if one or more Objects in the RFP are requested for the Project Task
STSK	INTEGER	7	Subtask Filter – only install RFP if one or more Objects in the RFP are requested for the Project Subtask
PIPE	CHAR	10	Pipeline Filter - Specifies the Pipeline Server ID of a Pipeline TraceKey request. This value is required if a value for TRCKEY is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
TRCKEY	CHAR	128	Pipeline TraceKey Filter - Specifies the Pipeline TraceKey of a Pipeline TraceKey request. This value is required if a value for PIPE is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
USER	CHAR	10	The User Profile ID to be displayed in Installation History. *APPROVER = same user that approved RFP for Installation *USER = same user that called the API A specific User Profile
CONT	CHAR	4	Continue Installing RFPs if an Installation Fails *YES = any further RFPs will be installed *NO = this API stops Installing RFPs

ROLLBACK	CHAR	4	Rollback any RFPs that were already installed by the API prior to the RFP that has failed. *YES = The prior RFPs will be rolled back (only valid if CONT=*NO) *NO = The prior RFPs remain installed
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDINSRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.17 MDRBRFP – RFP Rollback command

MDCMS is delivered with a command-based API that allows an external CL program, such as a program within End-of-Day, to rollback a specific RFP. An RFP must have already been installed in order to be considered by the API.

The MDCMS command is named ***MDRBRFP*** and is located in library MDCMS*.

MDRBRFP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code
RFP	INTEGER	7	RFP Number
USER	CHAR	10	The User Profile ID to be displayed in Installation History. *INSTALLER = same user that installed the RFP *USER = same user that called the API A specific User Profile
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDRBRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.18 MDDELRFP – RFP Deletion command

MDCMS is delivered with a command-based API that allows an external CL program, such as a program within End-of-Day, to delete (reset) RFPs. If the RFP has already been installed, or a job is currently compiling or installing the RFP, it will not be considered by the API.

The MDCMS command is named ***MDDELRFP*** and is located in library MDCMS*.

All MDDELRFP API transactions are logged to file MDCMS/MDDDRFP.

MDDELRFP Parameter Table

Name	Type	Length	Description
APPL	CHAR	6	Application Code *ALL = The RFPs to delete can belong to any application
RFP	INTEGER	7	Specific RFP Number – if left blank, then the range of RFP numbers will be considered
RFPT	CHAR	8	Specific RFP Type - the type of specific RFP number passed in parameter RFP. *CURRENT = the current number for an RFP *FROM = The RFP number refers to the RFP installed into the prior level, which then automatically generated the RFP with a different number to be deleted. *ORIG = Each RFP to be deleted originated from the specified RFP number, which was installed into the initial level for a chain of migrations across systems.
FLVL	INTEGER	3	From Level - the lower limit for the level number to delete from
TLVL	INTEGER	3	To Level - the upper limit for the level number to delete from
FRFP	INTEGER	7	From RFP – the minimum RFP number to be deleted
TRFP	INTEGER	7	To RFP – the maximum RFP number to be deleted
PROJ	CHAR	12	Project - specifies the Project that must be assigned to one or more of the objects in an RFP for that RFP to be considered.
TASK	INTEGER	7	Task - Specifies the Project Task that must be assigned to one or more of the objects in an RFP for that RFP to be considered. If TASK > 0, then the Project ID must also be passed.
STSK	INTEGER	7	Subtask - Specifies the Project Subtask that must be assigned to one or more of the objects in an RFP for that RFP to be considered. If STSK > 0, then the Project ID and Project Task must also be passed.
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDDELRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor.

			*NONE = An exception message will not be returned to the calling program's message queue.

5.19 MDWFARFP – MDWorkflow Acceptance for RFP command

MDCMS is delivered with a command-based API that provides for automated updates to the MDWorkflow Test Status for RFPs.
An RFP will be considered if already installed with an “ongoing” test status.

The MDCMS command is named ***MDWFARFP*** and is located in library MDCMS*.

All MDWFARFP API transactions are logged to file MDCMS/MDDWFAR.

MDWFARFP Parameter Table

Name	Type	Length	Description
GRP	CHAR	10	The User Group ID of the user to update the Workflow test status for RFPs. This is a required parameter
USER	CHAR	10	The specific user in the Group to attribute the acceptance status to. The user must belong to the group that is involved with testing project(s) impacted by the RFPs to accept/reject. *USER = The user id of the job that invokes this command will be used.
ACT	CHAR	7	The action to carry out for each qualified project in each qualified RFP, based on the passed parameter values. *ACCEPT = Set the test status to accepted *REJECT = Set the test status to rejected *INPROG = Set the test status to In Progress *UNDO = Reset the provisional test status
CMNT	CHAR	120	A comment to apply to the status update for informational purposes
CONF	CHAR	4	Whether or not to set the RFP test status to confirmed, if all impacted projects for the RFP have been provisionally accepted or if at least one of the impacted projects for the RFP has been provisionally rejected. *NO = This command will only set the provisional status. Final confirmation will occur later. *YES = Set the RFP test status to confirmed and carry out any post-confirmation steps.
APPL	CHAR	6	Application Code *ALL = The RFPs to accept/reject can belong to any application
RFP	INTEGER	7	Specific RFP Number – if left blank, then the range of RFP numbers will be considered
RFPT	CHAR	8	Specific RFP Type - the type of specific RFP number passed in parameter RFP. *CURRENT = the current number for an RFP *FROM = The RFP number refers to the RFP installed into the prior level, which then automatically generated the RFP with a different number to be accepted. *ORIG = Each RFP to be accepted originated from the specified RFP number, which was installed into the initial level for a chain of migrations across systems.
FLVL	INTEGER	3	From Level - the lower limit for the level number to accept/reject
TLVL	INTEGER	3	To Level - the upper limit for the level number to accept/reject
FRFP	INTEGER	7	From RFP – the minimum RFP number to accept/reject
TRFP	INTEGER	7	To RFP – the maximum RFP number to accept/reject

PROJ	CHAR	12	Project - specifies the Project that must be assigned to one or more of the objects in an RFP for that RFP to be considered. If blank, then the RFPs won't be filtered by a project and the test status for all projects in the RFP will be updated. If not blank, the RFP must impact the Project and the test status will only be applied to that project.
TASK	INTEGER	7	Task - Specifies the Project Task that must be assigned to one or more of the objects in an RFP for that RFP to be considered. If TASK > 0, then the Project ID must also be passed.
STSK	INTEGER	7	Subtask - Specifies the Project Subtask that must be assigned to one or more of the objects in an RFP for that RFP to be considered. If STSK > 0, then the Project ID and Project Task must also be passed.
PIPE	CHAR	10	Pipeline Filter - Specifies the Pipeline Server ID of a Pipeline TraceKey request. This value is required if a value for TRCKEY is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
TRCKEY	CHAR	128	Pipeline TraceKey Filter - Specifies the Pipeline TraceKey of a Pipeline TraceKey request. This value is required if a value for PIPE is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
ENV	CHAR	5	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS. *SAME = the current instance, in case the library list is already set
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDWFARFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

5.20 MDCMPPFM – MD Member Comparison Report

MDCMS is delivered with a command-based API that provides for the reporting of code differences between 2 source members.

This command can be used for any member comparisons, but is particularly useful for automatic reporting of differences for any source deployed by an RFP. To configure MDCMS to do this, do the following:
Create a command entry either for specific objects or for specific MDCMS attributes with the following properties:
Type = Q=Installation Archive/Cleanup
Run for Modifications = Y
Run for Recompiles, Deletes and Updates = N
Keep MD Libs in Libl = Y
Command

```
MDCMPPFM NEWFILE(##SRCLIB##/##SRCFIL##) NEWMBR(##SRCNAM##)
OLDFILE(##PRISLB##/##PRISFL##) OLDMBR(##PRISNM##)
IFSF(CodeCompare_##SRCNAM##_##ATTRIB##)
TITLE('MDCMS Code Comparison for Level ##APPLIC##/##PROLVL## RFP ##RFPNBR##')
IFSD('/Reports/CodeCompare/RFP##RFPNBR##')
```

MDCMPPFM Parameter Table

Name	Type	Length	Description
NEWFILE	QUAL	10-21	The qualified name of the source file containing the new version of the source. Use *LIBL for library when the file should be found in the library list.
NEWMBR	CHAR	10	The name of the new version of the source member
OLDFILE	QUAL	10-21	The qualified name of the source file containing the old version of the source. Use *LIBL for library when the file should be found in the library list.
OLDMBR	CHAR	10	The name of the old version of the source member
IFSF	CHAR	60	The name of the IFS file to contain the result
APPTS	CHAR	4	Append Timestamp to filename *YES – the date and time of the comparison will be appended to the file name *NO – the file name won't contain the date/time
TITLE	CHAR	100	The title to include in the PDF report, if the PDF is used
IFSD	CHAR	80	The folder path of the IFS file to contain the result
RPTFMT	CHAR	4	PDF – a PDF will be created for the result TXT – a plain text file will be created for the result

6 RFP History

The RFP History screen lists all RFPs that have completed installation in descending order. The screen is identical to the RFP Manager screen. The RFPs can be toggled on this screen between historical and active using **F10**.

6.1 Rolling back a Promotion from within RFP History

To rollback part or all of an RFP from Object History, enter option R in front of any installed RFP.

A list of all objects assigned to the RFP will be displayed. Each object which still has the prior version of the source or object, or each object that is new, will have the ability of being rolled back. Enter a *1=Select for Rollback* in front of each object to rollback or press *F13=Select all available* to select all available objects.

A new RFP will be automatically generated and all selected objects will be assigned to it. The Submit Confirmation and Override panel will then appear for the promotion or scheduling of the Rollback RFP. The promotion will delete new objects, recreate deleted objects, bring modified objects back to the prior version, and recompile objects that were originally set as *RECOMPILE. As with a normal RFP, a rollback RFP will also archive the source/objects it replaces.

6.2 Target Locations for Installed RFP

Option T can be used from RFP History to view the send status for each of the defined target levels based on the promotion level of the installed RFP. If the RFP in the Send List is still open, the RFP can also be sent directly from this screen.

7 Object History / Archive

Historical information is kept in MDCMS for every object that is promoted. The Installation History / Archive process is used to view the history of installed or deleted objects and to retrieve or rollback prior versions of objects.

```
CMC540                          COMPANY NAME                              10/19/20
Filters                Installation History/Archive Retrieval             19:35:48
Appl:______
Lvl.:___      Attribute.: __________ Project..: ___________       Install Date
RFP.: _______ Programmer: __________ Task/STsk: _______ _______  Min: ________
                                     Reason...: _               Max: ________
Type options, press Enter.
 5=Details  C=Compare Src  R=RFP  T=Trace  7=Prior Src  8=Prior Obj  9=Rollback
                                                                        Pri
   Object    Installed Appl/Lvl Attribute  Programmer   RFP Project    R SO
_ ACCTPG01   8/21/96  MD2K 10  RPG        MMUCKLEY   20028 VAT        R
_ ACCTPG02   9/28/96  MD2K 10  CBL        MMORGAN    20017 VAT     +  M Y
_ ACCTPG02   9/03/96  MD2K 10  CBL        MMUCKLEY   20058 P288394    M Y
_ ACDRHDL    9/03/96  MD2K 90  CLP        MMUCKLEY   20059 P293823    D Y Y
_ PKT1037    8/17/96  ACCT 10  PRTF_WIDE  MMUCKLEY   20010 VAT        M Y
_ MTU553     6/06/96  MD2K 10  DSPFSE     MMORGAN    20008 A382KS9    M Y
_ SENTPGM    8/11/96  MD2K 10  CMD        MMORGAN    20007 VAT        M Y
_                                                                   More...
 F2=Full Name   F4=Browse   F8=Audit Reports   F11=View Output   F15=Print
```

All of the previously installed objects are displayed and subsetted using the filters at the top of the display.

If the promotion of an object results in the change or deletion of previously existing source, the previous version of the source will be archived. Installation History stores between 1 and an infinite number of generations of the source for each object at each promotion level. If an object is not compiled from source code, then the object itself is compressed and archived in the IFS directory MDCMS/ARCHIVE. The number of generations to store is set within the promotion level maintenance function.

Options

5=Details – Display the Installation History Detail.
C=Compare – Place this option in front of 1 entry containing archived source to compare that source to the source that currently exists in the source file for the attribute.
Place this option in front of 2 entries containing archived source to compare those 2 versions to each another.
R=RFP – Toggle to the RFP History, filtered to the selected RFP, in order to view additional information about the RFP or the objects in that RFP.
T=Trace – list the route that an object request has taken as it is deployed to various levels across all partitions. The data includes the date/time of the event as well as the RFP number and user. See the section on Trace Request under Object Manager/Process Request Records for more information.
7=Prior Src – Prompt the user for a location for the archived source to be copied to. The source can be copied to any library that is not managed by MDCMS or to a spooled file.
8=Prior Obj – Prompt the user for a location for the archived object to be copied to. The object can be copied to any library (or folder for IFS objects) that is not managed by MDCMS.
9=Rollback – Rollback selected object and/or other objects for same RFP as selected object.

Filters:
Entering a value into one of the filters fields will cause the list to be re-displayed and subsetted to show only archive records that match the entered filter field values.

Appl –Application.
Lvl – Application Level.
RFP – Request for Promotion number.
Attribute – The object Attribute used for the promotion.
Programmer – The Programmer assigned to the Object Request.
Project – The Project associated with the Object Request.
Task/STsk – The Project Task and/or subtask associated with the Object Request.
Reason – The Reason for the Object Request. Possible values are M=Modify, R=Recompile, U=Update and D=Delete
Installed – the minimum and/or maximum date that the promotion was installed

Position to:
The Position to field appears as above the Object column. Entering a value into the Position to field will position the contents of the subfile to the first record in the current list of archived records that is greater than, or equal to, the entered value.

Function Keys:
F2=Full Name – Displays full name of object when F2 is pressed when cursor is within the Object name field. This can be useful for IFS object names that exceed the length of the Object field within the display.
F3=Exit
F4=Browse – Browse a list of available filter entries depending upon which filter the cursor is positioned to. For example, to browse the RFP list, place cursor on RFP filter field and press **F4**.
F8=Audit Reports – MDCMS Audit Reports menu. Generate customizable audit reports for what has been installed either within, or outside of, MDCMS.
F11=View Output – Display the MD Output panel and other spool files.
F15=Print – Print a list of promotion records to a spooled file based on filters in current display.

7.1 Rolling back a Promotion from within Object History

To rollback part or all of an RFP from Object History, enter option 9 in front of any installed object that is part of the RFP.

A list of all objects assigned to the RFP will be displayed. Each object which still has the prior version of the source or object, or each object that is new, will have the ability of being rolled back. Enter a *1=Select for Rollback* in front of each object to rollback or press *F13=Select all available* to select all available objects.

A new RFP will be automatically generated and all selected objects will be assigned to it. The Submit Confirmation and Override panel will then appear for the promotion or scheduling of the Rollback RFP. The promotion will delete new objects, recreate deleted objects, bring modified objects back to the prior version, and recompile objects that were originally set as *RECOMPILE. As with a normal RFP, a rollback RFP will also archive the source/objects it replaces.

7.2 Installation History Audit Report

To generate a report over promoted objects from within MDCMS, press **F8** from the Installation History screen and select **option 1 MDCMS Installation History** from the MDCMS Audit reports menu. The following prompt screen is then displayed:

```
CMC541                          COMPANY NAME                              10/19/11
SCRN3                     Installation History Report                      6:02:01

Select and sequence fields and record filters, press Enter.
Use F7 to load a definition, F9 to save a definition
                                                                          Sort
Seq Field           Minimum    Maximum                                    A/D
_10 Install Date    *PM        __________ YYYYMMDD,*PY,*PM,*Pn,*CY,*CM,*CD  A
_20 Application     __________ __________                                  A
_30 Level           80         90                                         A
___ Programmer      __________ __________ *gen*eric*                       A
___ Approver        __________ __________ *gen*eric*                       A
___ Approval Date   __________ __________ YYYYMMDD,*PY,*PM,*Pn,*CY,*CM,*CD A
___ Installer       __________ __________ *gen*eric*                       A
___ Install Time    __________ __________ HHMMSS                          A
___ RFP Number      __________ __________                                  A
___ Project         __________ __________ *gen*eric*                       A
___ Task            __________ __________                                  A
___ Subtask         __________ __________                                  A
___ Object Name     __________ __________ *gen*eric*                       A
___ Object Type     __________ __________                                  A
                                                                   More ...
F3=Exit    F4=Browse    F5=Refresh    F7=Load Def    F9=Save Def    F11=View Output
```

This screen allows you to define your own report. The report may consist of any or all of the listed fields and any or all promotion records may be selected and sorted as you choose. The report definitions may then be saved and used again in the future from this screen or from a command line.

Seq
Each field with a sequence number > 0 will be included in the report. The columns of the report are ordered by the sequence number. The sorting of the records is also based on the order of the sequence fields.

Minimum
The smallest value that the corresponding field may contain, unless the value is a special value or a generic value.

Special Values:

- *PY – the date must fall within the previous year (only valid for date fields)
- *PM – the date must fall within the previous month (only valid for date fields)
- *Pn – all object changes occurring during the previous n (1-9) days (only valid for date fields)
- *CY – the date must fall within the current year (only valid for date fields)
- *CM – the date must fall within the current month (only valid for date fields)
- *CD – only report on object changes occurring on the current date (only valid for date fields)
- M – the object must have been selected for a modification request (only valid for reason)
- D – the object must have been selected for a deletion request (only valid for reason)
- R – the object must have been selected for a recompile request (only valid for reason)
- U – the object must have been selected for an update request (only valid for reason)

Generic Values:

The wildcard value * may be used multiple times anywhere within a string to limit records to occurrences where the field contains the string. For example, *3XJ* will select all records where the value 3XJ is contained somewhere within the field string. *XJ will select all records where the value XJ is contained at the end of the field string. Wildcards may be used for all alphanumeric fields, except Object Type and Reason.

Maximum

The largest value that the corresponding field may contain. This field must be left blank if a special or generic value was entered in the Minimum field.

Sort

A – Sort this field in ascending (A->Z) order.
D – Sort this field in descending (Z->A) order.

NOTE: Only the first 10 columns will be considered for sorting. The system attribute and text for an object can be included in the report, but the filtering and sorting features aren't applicable for these 2 columns.

Function Keys:

F3=Exit – Exit the prompt screen.
F4=Browse – Browse the list of available entries depending upon which field the cursor is positioned.
F5=Refresh – Reset the definition back to the initial settings
F7=Load Def – Load a definition from the list of saved definitions
F9=Save Def – Save the entered configuration as a report definition. The saved definition may then be reused anytime in the future from within MDCMS or from a command line. See the chapter on MDRUNRPT for more information about running reports from a command line.
F11=View Output – Display the MD Output panel and other spool files.

When the report runs, optimized SQL routines are used against the MDCMS tables so that the report is created very quickly, even if several years of data are to be inspected.

7.3 Audit Report of Object Changes outside of MDCMS

7.3.1 Designing/Running Audit Report from Online Generator

To generate an audit report of object changes that have occurred outside of MDCMS, press **F8** from the Installation History screen and select option 2 from the report menu. The following prompt screen is then displayed:

```
CMC542                              COMPANY NAME                              09/04/05
SCRN1                  Modifications outside of MDCMS Report                  10:37:52

Select and sequence fields and record filters, press Enter.
Use F7 to load a definition, F9 to save a definition

                                                                              Sort
Seq Field            Minimum    Maximum                                       A/D
 10 Date             __________ __________  YYYYMMDD, *PM, *Pn D, *CM, *CD     A
 20 Time             __________ __________  HHMMSS                            A
 30 User             __________ __________  *gen*eric*                        A
 40 Object Library   __________ __________  *gen*eric*                        A
 50 Object Name      __________ __________  *gen*eric*                        A
 60 Object Type      __________ __________                                    A
 70 Object Attrib
 80 Object Text
 90 Program          __________ __________  *gen*eric*                        A
100 Job              __________ __________  *gen*eric*                        A
110 Reason           __________ __________  CREATE, DELETE                    A
120 Sequence Number  __________ __________                                    A
    Application      __________ __________
    Level            __________ __________



                                                                          Bottom
F3=Exit    F4=Browse    F5=Refresh    F7=Load Def    F9=Save Def    F11=View Output
```

This screen allows you to define your own report. The report may consist of any or all of the listed fields and any or all object changes may be selected and sorted as you choose. The only exceptions are the application and level fields. These fields may not appear in the report, as they are only used as selection criteria. If records are limited to a specific application or level, then only object libraries used by attributes in the application/level are evaluated.

The report configurations may then be saved as definitions and used again in the future from this screen or from a command line.

Seq
Each field with a sequence number > 0 will be included in the report. The columns of the report are ordered by the sequence number. The sorting of the records is also based on the order of the fields.

Minimum
The smallest value that the corresponding field may contain, unless the value is a special value or a generic value.

Special Values:

- *PM – all object changes occurring during the previous month (only valid for date fields)
- *Pn – all object changes occurring during the previous n (1-9) days (only valid for date fields)
- *CM – all object changes occurring during the current month (only valid for date fields)
- *CD – all object changes occurring during the current day (only valid for date fields)
- CREATE – report only created objects (only valid for reason)
- DELETE – report only deleted objects (only valid for reason)

Generic Values:

The wildcard value * may be used multiple times anywhere within a string to limit records to occurrences where the field contains the string. For example, *3XJ* will select all records where the value 3XJ is contained somewhere within the field string. *XJ will select all records where the value XJ is contained at the end of the field string. Wildcards may be used for all alphanumeric fields, except Object Type and Reason.

Maximum

The largest value that the corresponding field may contain. This field must be left blank if a special or generic value was entered in the Minimum field.

Sort

A – Sort this field in ascending (A->Z) order.
D – Sort this field in descending (Z->A) order.

Note: The system attribute and text for an object can be included in the report, but the filtering and sorting features aren't applicable for these 2 columns.

Function Keys:

F3=Exit
F4=Browse – Browse the list of available entries depending upon which field the cursor is positioned.
F5=Refresh – Reset the definition back to the initial settings
F7=Load Def – Load a definition from the list of saved definitions
F9=Save Def – Save the entered configuration as a report definition. The saved definition may then be reused anytime in the future from within MDCMS or from a command line. See the chapter on MDRUNRPT for more information about running reports from a command line.
F11=View Output – Display the MD Output panel and other spool files.

7.3.2 Troubleshooting the Audit Report

In order for the audit report of object changes to be accurate, it is important that the following system settings are in place:

1) The system value for Auditing control (WRKSYSVAL QAUDCTL) must be set to at least *AUDLVL. It is also recommended that the value *OBJAUD is included.
2) The system values for Security auditing level (WRKSYSVAL QAUDLVL) must be set to at least *CREATE and *DELETE.
3) The journal object QAUDJRN must exist and a journal receiver must be attached.
4) The current chain of journal receivers that exist on the system need to cover the time frame for the desired reporting range.
5) Objects will only be considered for the report if they reside in libraries or IFS-directories that are designated as Object Libraries in the MDCMS Attributes settings. If a desired library/directory is not reported, then create at least one attribute for that library/directory in the MDCMS Setup Menu option 3. This requirement exists to avoid excessive reporting of temporary libraries and directories.

8 Project Manager

8.1 Project Listing

```
CMC227                          COMPANY NAME                              10/18/11
SCRN1                         Project Listing                             12:22:20
FILTERS
Appl: ____          Requester.: _________    Description.....: _____________
Pri.: _   Sts: _    Assn User:  _________    Project Type....: _______
                                             Pos to Project..: _________
Type options, press Enter.
 1=Select 2=Edit  3=Copy  7=Rename  8=Chg Status  G=Groups  H=Hours  O=Objects...
                                                     Create  Exp Comp
Opt Project      Appl  Requester   Assign to Pr St Proj Type   Date     Date    T
 _  VAT          ACCT  MMORGAN     MMORGAN   2  3  *DFT     28.01.07  14.02.07 Y
     Version 6.0
 _  SAVERESTORE  OPER  MMORGAN     MMORGAN   3  5  *DFT     11.02.07  31.03.07 Y
     Save and Restore functions



                                                                        Bottom
 F3=Exit    F4=Browse    F5=Refresh    F6=Add    F8=Reports    F9=Closed Projects
 F10=Sort by Comp. Date    F13=Exit Points    F17=Top    F18=Bottom  F23=More Opts
```

The Project Listing display is accessed from main menu option 6 or by pressing **F4** from the Object Manager when the cursor is on a Project field.

NOTE: Not all functions of the Project Management system are available within the 5250 UI. Refer to the MDWorkflow web application documentation for those features available within MDWorkflow or MDOpen.

Filters

The Project Listing is filtered by the fields at the top of the display. If the Status (Sts) filter is left blank, only Projects with an open status will be displayed. Press F9 to display closed Projects.

The description filter will list all Projects that have matching text in the title. For example, enter PRINT to list only Projects with print somewhere in the title. The description filter is not case sensitive.

Options

1=Select – Return the selected Project back to the requesting process. This option will only appear when using F4=Browse in the Project field of the Object Manager panel.
2=Edit – Edit the Project's detail information.
3=Copy – Copy the details of a Project to a new Project ID.
5=Display – View the Project's detail information.
7=Rename – Rename the Project to a new value. When renamed, the Project ID in all related tables for configuration, activity and history are also renamed. The original value is only retained in API logs for audit reasons.
8=Chg Status – Select a new status for the Project from a list of possible status codes, based on authority and current status. **NOTE:** If the new status closes the Project, a warning will be given if the Project still has open Tasks or Subtasks. The user can bypass the warning by pressing Enter and all Tasks and Subtasks will also be closed.
G=Groups – Acceptance and Technical Groups assigned to project. Option only available when MDWorkflow is licensed.
H=Hours – View and enter hours worked on behalf of the project.
O=Objects – View a list of objects that are or were modified for the selected Project.
T=Tasks – View and manage the tasks for a Project.

Function Keys:

F3=Exit
F4=Browse – Browse list of valid values for the Filter fields.
F5=Refresh
F6=Add – Add a new Project.
F8=Reports – Define or run a Project or Task Report.
F9 – Toggles display between **Active Projects** and **Closed Projects**.
F10 – Toggles display between **Sort by Comp. Date** and **Sort by Project**.
F11=View Output – Display the MD Output panel and other spool files
F13=Exit Points – View/Manage the Exit Point definitions for when commands should be executed when a project, task or subtask transitions to a new status.
F17=Top – Position cursor to top of list.
F18=Bottom – Position cursor to bottom of list.
F23=More Opts – View additional options available for a Project

8.2 Project Details

```
CMC281                          COMPANY NAME                                10/18/11
SCRN1                           Edit Project                                12:37:15
                                                                              Date
Project.....: SAVERESTORE              Requested by.: MMORGAN      11.02.07
Project Type...: *DFT_____ Appl OPER   Authorized by: MMORGAN      11.02.07
Assign to Group: NORAMTEST User MMORGAN Work Started.: MMORGAN     11.02.07
Priority.....: 3  Medium               Test Ready...: MMORGAN      15.02.07
Exp. Completion: 31.03.07              Approved by..: MMORGAN      15.02.07
Status.....: 5  Changes Approved       Closed by....:
Hours Expected.: _____18.0_            Hours Used...:        12.00
Project Title
Save and Restore functions_____________________________________________________

Project Description
for internal use_______________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

                                                                          More...
F3=Exit    F4=Browse    F11=View Output
```

All Project information available within the 5250 client can be displayed or edited from this screen.

The Project Listing display is accessed by pressing **F4** from the Object Manager when the cursor is on a Project field or via option 6 from the MDCMS Main Menu.

NOTE: Not all functions of the Project Management system are available within the 5250 UI. Refer to the MDWorkflow web application documentation for those features only available within MDWorkflow or MDOpen.

Project
A 12-character field to uniquely identify the project

Project Type
The type of project, in order to categorize it and to apply pre-defined rules, custom fields and status codes for the project (if MDWorkflow is used). Press F4 on the Project Type field to manage the Project Types.

Appl
The primary application that the project will be used for. This is an optional field and if an application code is entered, requests for objects in other applications may still be assigned to this application.

Assigned to Group
The primary MDWorkflow Group that has been assigned to perform the work for this project. This screen only displays the primary value for this field. Use option G=Groups to view/manage all groups for the project.

User
The primary programmer to perform the work for this project. This is an optional field and other programmers may also perform work for the project, if the project type allows for it.

Priority
- 1 - Critical
- 2 - High
- 3 - Medium
- 4 - Low
- 5 - Optional

Exp. Completion
The date the project is expected to be complete

Status
- 1 - Project Opened
- 2 - Project Authorized
- 3 - Work in Process
- 4 - Ready for Testing
- 5 - Changes Approved
- 6 - Project Complete
- 9 - Project Cancelled

If the MDWorkflow license is active, additional status codes may be created and used.

Requested by
Authorized by
Work Started
Test Ready
Approved by
Closed by
For all these fields it will list the User that set each status and the date that the status was set.

Hours Expected
The number of hours that are expected to be needed to complete the project.

Hours Used
The sum of all hours entered to date for the project.

Project Title
A brief description of the Project.

Project Description
A full description of the Project.

Function Keys:
F3=Exit
F4=Browse – Browse list of valid values for available fields.
F11=View Output – Display the MD Output panel and other spool files

8.2.1 Project Types

```
MDCPRJT                          MD T 8 6.1                            4.04.17
SCRN1                          Project Types                           22:18:50
                                                      Tasks
Pos: _________  Filter by Desc: _____________          Allow: _   Limit Requests: _
                                                     Require: _
Type options, press Enter.
 1=Select  2=Edit  3=Copy  4=Delete  5=View  S=Sts Transitions  T=Task Types
                                                        Tasks   Limit
Opt Proj Type  Description                             Alw Req   Req   Dft
 _  *DFT       Default                                  Y   N      N     N
 _  NOTASKS    no tasks allowed                         N   N      Y     N
 _  ONLYTASKS  Require request for task                 Y   Y      Y     Y
 _  Z-TYPE     Z-Type                                   Y   N      N     N


                                                                    Bottom
F3=Exit   F6=Add
```

Project Types are means to categorize projects and to set certain rules for projects of a given type. Every project must have a Project Type defined for it.

The listing to view and manage project types is reached by pressing F4 on the Project Type field in the Project screen.

Project Type
A 10-character identifier for a type of project

Description
Description of the Project Type

Allow Tasks
If Tasks are allowed to exist for this Project Type
Y – Tasks may be created
N – Tasks are not allowed. All work must be performed at the Project level

Require Requests be assigned to Tasks
If objects can be deployed directly for a Project, or if a Task must exist and applied to any checkouts before the RFP can be processed.
Y – Tasks must be created and assigned to every Object Request assigned to a project of this type prior to submission. Allow Tasks must also be set to Y if this flag is set to Y.
N – Object Requests are allowed to be assigned directly to the Project.

Limit Object Requests to Assigned Users
If developers are limited from assigning Object Requests to a Project of this type.
Y – Only developers that have been assigned to the Project, either directly or as a member of an assigned group, are allowed to assign Object Requests to the Project.
N – Any developer can assign Object Requests to a Project of this type.

Default Project Type
If the project type should be used as the default value when the user selects to create a new project.
Y – The Project Type should be used as the default for new projects. Only one Project Type can be the default. The user can overwrite the value with a different project type.
N – Not the default project type

Options
2=Edit – change the type properties

3=Copy – copy to a new type
4=Delete – remove the type
S=Sts Transitions – specify the allowed Project Status Transitions permitted for the Project Type
T=Task Types – specify the Task Types that can be used by Tasks or Subtasks by a Project of the Project Type

8.2.2 Project Groups

```
CMC261                              MD T 74 6.1                          24.04.16
SCRN1                         Project Group Listing                      17:45:51

Project: DEMO       Demo project

Type options, press Enter.
 2=Edit  4=Delete  G=Group Info

Opt  Role         Type        Req  Group       User
 _   Acceptance   MARKETING    Y   MARK-CH
 _   Acceptance   RLSMGR       Y
 _   Acceptance   TESTER       Y   TEST 1      MMORGAN
 _   Technical    PROGRAMMER       PGMR 1
 _   Technical    PROGRAMMER       PGMR 2      MMORGAN




                                                                       Bottom
F3=Exit    F5=Refresh    F6=Add    F9=Save as Default
```

If a valid MDWorkflow license exists for the partition, option G can be used from Project Listing to view/manage all acceptance and technical groups for a project.

Role
A - Acceptance/Test – The role is used to perform acceptance testing on RFPs that impact the project once the RFP is installed for a level requiring MDWorkflow acceptance before the RFP can continue to the next step in the migration path.

T – Technical – The role is used to carry out work on behalf of the project.

Type
The User Group Type assigned to the role

Req
Whether or not the Group Type is required for the Project in order to be able to deploy an RFP all the way to production.

Group
A user group of the given group type. A group is mandatory for an Acceptance role entry, but is optional for technical roles.
Multiple user groups can be added to a project for the same group type. During RFP acceptance, members of any included group for same project can accept or reject an RFP.

User
If the group is blank, any user registered in MDSEC can be added to a project for a technical role.
If the group is entered, the user field can be blank to mean that any member of the group can be involved with the project. Otherwise, the user must belong to the group and then the project is intended for that specific user.
Multiple entries of specific users can be added for the same user group to a project.

Options
2=Edit – change the group or user for a group type entry
4=Delete – remove a group or user from the project
G=Group Info – Display the User Group listing positioned to the entry selected

Function Keys:
F3=Exit
F5=Refresh
F6=Add – Add a group and/or user to the project
F9=Save as Default – Save the current list of groups and users to your profile. When you create a new project, the list will automatically be applied to that project.

8.2.3 Project/Task Status Codes

The list of valid Status codes for Projects and Tasks can be viewed by pressing F4 on the Status filter in the Project and Task list views or by pressing F4 on the Status field in the Project and Task detail views.

If a valid MDWorkflow license exists for the partition, additional Status codes can be created and status behaviour can be modified.

Status Code
A one-character unique code for the status

Sort Sequence
The order of the code in the list. Any active status must have a sort sequence < 800 and any closed status must have a sort sequence >= 800.
The sort sequence is also important when defining status ranges for custom fields or status boundaries.

Description
A description of the status code

Use in Projects
Y – the status can be applied to a project
N – the status can't be applied to a project

Use in Tasks
Y – the status can be applied to a task or subtask
N – the status can't be applied to a task or subtask

Ending Status
Y – the status indicates that the project or task is closed. No further work is allowed when ended.
N – the status indicates that the project or task is still ongoing.

Allow Auto-Update
Y – Automated commands are permitted to update a project or task to this status. The commands that apply are:
MDUPDPROJ
MDUPDSTS
MDUPDTASK

N – this status can't be automatically applied to a project or task

Allow Man.-Update
Y – Authorized users are permitted to update a project or task to this status via the MDCMS, MDOpen or MDWorkflow views.

N – this status can't be manually applied to a project or task

Manual Group Type
If entered, limit the users that can manually set this status to members of a group of the given type that is involved with the project or task.

Options
2=Edit – change the status properties
3=Copy – copy the properties of an existing status to a new status code
4=Delete – delete a status code – only allowed for custom status codes
T=Transitions – manage the list of status codes from which the project or task can transition to this status. See Section Project/Task Status Transitions for more information.

Function Keys:
F3=Exit
F5=Refresh
F6=Add – Add a new status code
F8=Sort by Code/Seq – Toggle the listing to be ordered by Code or Sort Sequence
F9=Boundaries – Limit when an RFP can be processed based on the status of the Projects or Tasks that are impacted by the RFP. See Section Project/Task Status Boundaries per Level for more information.
F10=Triggers – Automatically initiate the submit, approve, install or send of RFPs for a Project or Task when the status of the Project or Task changes. See Section Project/Task Status Triggers per Level for more information.

8.2.4 Project/Task Status Transitions

By default, every status can transition to every other status for any given Project or Task Type, assuming authority, activity and mandatory field entry is otherwise in a permissible state.

However, for each Project Type and Task Type, the workflow of the projects, tasks and subtasks can be controlled by limiting which status codes can transition to other status codes.

For example, you may wish to have all tasks of type ABC limited to the following flow:
1-Opened
-> 2-Authorized
-> 3-Work in Progress ->
4->Ready to Test
-> Testing Complete or E-Errors found during Testing or 3-Work in Progress
-> 7-Closed

This can be done from the Status Transitions screen, which is accessible with option T from the Project Type or Task Type listings.

NOTE: a valid MDWorkflow license must exist for the partition to define Status Transitions.

Options
F=Codes to Transition from – specify which status codes can transition to the selected status
T=Codes to Transition to – specify the list of valid status codes values to change to from the selected status

8.2.5 Project/Task Status Boundaries per Level

Barriers can be put in place to limit when an RFP can be processed based on the status of the Projects or Tasks that are impacted by the RFP. The list of defined Boundaries can be viewed/managed by pressing F9 in the Project/Task Status Codes list.

NOTE: a valid MDWorkflow license must exist for the partition to define Status Boundaries.

Boundaries are checked when a submit, approve, install or send action is requested for an RFP. MDCMS then checks if a Boundary definition exists for that action for the level of the RFP.
If found, MDCMS verifies if the status of each Project or Task or Subtask impacted by the RFP is within the permitted range defined by the Boundary.

The status is checked for the lowest element assigned to each object in the RFP.
For example, if object ABC is assigned directly to a Project, then the Project Status is checked. If object XYZ is assigned to a Project Task, then the Task Status is checked, but the Project Status is ignored.

If at least one of the impacted projects or tasks have a status outside the allowed range, then the requested action will be denied.

Application
The target application of the RFP

Level
The application level of the RFP

RFP Action
1 – when an RFP is submitted for validation and building of the deployment package
2 – when an RFP is approved
3 – when an RFP is installed
4 – when an RFP is sent to a target location

Minimum Status
A valid status code that marks the minimum boundary of the range based on the sort sequence of the code. If blank, then any status below the maximum is allowed.

Maximum Status
A valid status code that marks the maximum boundary of the range based on the sort sequence of the code. If blank, then any status above the minimum is allowed.

Options
2=Edit – change the boundary
3=Copy – copy the properties of an existing boundary to a new boundary
4=Delete – delete a boundary

Function Keys:
F3=Exit
F6=Add – Add a boundary

8.2.6 Project/Task Status Triggers per Level

Triggers can be put in place to automatically initiate the submit, approve, install or send of RFPs for a Project or Task when the status of the Project or Task changes. The list of defined Triggers can be viewed/managed by pressing F10 in the Project/Task Status Codes list.

NOTE: a valid MDWorkflow license must exist for the partition to define Status Triggers.

Triggers are checked whenever a status changes for a Project, Task or Subtask.

Application
The target application of the RFP

Level
The application level of the RFP

RFP Action
1 – when an RFP is submitted for validation and building of the deployment package
2 – when an RFP is approved
3 – when an RFP is installed
4 – when an RFP is sent to a target location

New Status
The new status value that has just been transitioned to

From Status
The prior value of the status. Leave blank to trigger the action when transitioning from any status to the new status. Otherwise, enter a value to limit the transitions causing the trigger. A Trigger record can be created for each transition if multiple from values, but not all from values, are necessary.

Project Trigger
Y – trigger the action when the status was changed on a project
N – not applicable at the project level

Task Trigger
Y – trigger the action when the status was changed on a task
N – not applicable at the task level

Subtask Trigger
Y – trigger the action when the status was changed on a subtask
N – not applicable at the subtask level

Merge RFPs
This parameter is considered for the RFP Submit and Send actions

Y – if multiple RFPs containing the Project, Task or Subtask are ready to be submitted or sent, merge them into a single RFP prior to triggering the action.
N – submit or send each RFP separately

Submit Immed
This parameter is considered for the RFP Submit and Install actions

Y – submit the RFP to the job queue immediately for processing
N – place the RFP in pending status, to be picked up at the appropriate time by the MDSBMRFP or MDINSRFP commands.

Options
2=Edit – change the trigger
3=Copy – copy the properties of an existing trigger to a new trigger
4=Delete – delete a trigger
5=View – view the parameters of a trigger

Function Keys:
F3=Exit
F6=Add – Add a boundary

8.3 Project Task/Subtask Listing

```
CMC224                          COMPANY NAME                                  10/18/11
SCRN1                           Task Listing                                  12:37:15
FILTERS
Proj: PROJNAME          Requester.: MMORGAN     Description: ___________________
Pri : _    Sts: _       Assn User.: ROGERS_     Task Type  : __________
                                                Pos to Task: _____
Type options, press Enter.
 2=Edit  3=Copy  5=Display  8=Chg Status  H=Hours  O=Objects  S=Subtasks
                                                        Create
Opt  Task  Type        Requester    Assign to    Pri  Sts    Date    Due Date   STsks
 _      1  INT_FIX     MMORGAN      ROGERS         3    1    8/18/11  10/01/11     12
     Fix accounting program ACT001.
 _      2  DEL_FIX     MMORGAN      ROGERS         3    1    9/22/11                5
     Delete obsolete program ACT009.
 _      3  DOC CHANGE  MMORGAN      ROGERS         3    1    9/22/11
     Change documentation for tasks 1 and 2.



                                                                          Bottom
F3=Exit    F4=Browse    F5=Refresh    F6=Add    F8=Ref Code  F9=Closed Tasks
F10=Sort by Due Date  F11=View Output    F17=Top    F18=Bottom
```

If necessary, projects can be granulated by tasks, which can be further granulated by subtasks.

The Project Task Listing display is accessed with option T from the Project Listing. Subtasks are then accessed with option S from the Task Listing.

The fields and handling for tasks and subtasks are largely the same as for projects. The only key difference is that the project can have any number of involved groups, but the task/subtask are limited to one assigned group (or user) and one test group (or user). The task-level groups and users do not have to be part of the groups at the project level.

FILTERS

Requester

Filter the listing by the Tasks Requester or leave blank to see all tasks for all Requesters.

Description

Filter the listing by a Tasks Description.

Pri - Priority

Filter listing by available Priority values.

1 - Critical
2 - High
3 - Medium
4 - Low
5 - Optional

Sts - Status
Filter listing by available Status values.

1 - Created
2 - Modified
3 – Email Sent
4 – Work in Progress
5 – Ready to Test
6 – Testing in Progress
7 – Testing Complete
8 – Closed
9 - Cancelled

If the MDWorkflow license is active, additional status codes may be created and used.

Assn User
Filter the listing by the user assigned to the task.

Task Type
Filter the listing by the Task Type. Press F4 on the Task Type to manage the Task Type definitions and/or select a valid Task Type from the list.

Pos to Task
Position the listing to the selected Task.

Options
1=Select – Return the selected Task (and Project) back to the requesting process. This option will only appear when using F4=Browse in the Project field of the Object Manager panel.
2=Edit – Edit the Tasks detail information.
3=Copy – Copy the details of a Task to a new Task.
5=Display – View the Tasks detail information.
8=Chg Status – Select a new status for the Task from a list of possible status codes, based on authority and current status. **NOTE:** If the new status closes the Task, a warning will be given if the Task still has open Subtasks. The user can bypass the warning by pressing Enter and all Subtasks will also be closed.
H=Hours – View and enter hours worked on behalf of the Task.
O=Objects – Display requested objects for Task.
S=Subtasks – Display a list of Subtasks for the selected Task.

Function Keys:
F3=Exit
F4=Browse – Browse list of valid values for available fields.
F5=Refresh
F6=Add – Add a Task to the selected Project.
F8=Ref Code/Description – Toggle between the Reference Code and Task Summary/Description for the filter field and information on the 2nd row of each task entry.
F9=Closed Tasks – Display a listing of closed Tasks for selected Project.
F10=Sort by Due Date – Sort the Task listing by the value of Due Date.
F11=View Output – Display the MD Output panel and other spool files
F17=Top – Position the display to the Top.
F18=Bottom – Position the display to the Bottom.

8.3.1 Task Types

```
MDCTSKT                          MD T 8 6.1                            5.04.17
SCRN1                            Task Types                           15:58:36
                Filters:
Pos: __________  Desc: ____________________ Limit: _  Project Type: __________

Type options, press Enter.
 1=Select  2=Edit  3=Copy  4=Delete  5=Display  T=Transitions
                                                                        Limit
Opt  Task Type   Description                                          Requests
 _   ADMIN       Administration                                          N
 _   CHG_FUN     Change existing Function                                N
 _   COSMETIC    Cosmetic Fix                                            N
 _   DEMO        Product Demonstration                                   N
 _   FUN_ERROR   Functional error                                        N
 _   INSTALL     Installation                                            N
 _   LICENSE     Product License                                         N
 _   NEW_FUN     New Function                                            N
                                                                       More...
F3=Exit   F6=Add
```

Task Types are a means to categorize tasks and to set certain rules for tasks of a given type. Every task must have a Task Type defined for it.

Only Task Types that are enabled for a Project Type can be used for Tasks and Subtasks within a Project of the given Project Type.

The listing to view and manage task types is reached by pressing F4 on the Task Type field in the Task screen.

Task Type
A 10-character identifier for a type of task

Description
Description of the Task Type

Limit Object Requests to Assigned Users
If developers are limited from assigning Object Requests to a Task of this type.
Y – Only developers that have been assigned to the Task, either directly or as a member of an assigned group, are allowed to assign Object Requests to the Task.

N – Any developer can assign Object Requests to a Task of this type, unless they aren't involved with the Project and the Project Type has limited Object Requests.

Allow Manual Task Creation
Y - users are permitted to create tasks for the given type from within the standard MDCMS, MDOpen and MDWorkflow screens.
N – tasks of the given type must be created via an external process such as Jira, ServiceNow or via the MDUPDTASK interface.

Allow Task Creation via API
Y – tasks for the given Task Type are permitted to be created via the MDUPDTASK command or the /mdcms/task REST API.
N – tasks of the given Task Type may not be created using the MDUPDTASK command or the /mdcms/task REST API.

Import Tasks from Jira
Y – if the Task Type is mapped to a Jira Issue Type, allow issues that are created in Jira to be imported into MDCMS.
N – Jira Issues are not permitted to be imported into MDCMS as tasks of the given Type.

Export Tasks into Jira
Y – if the Task Type is mapped to a Jira Issue Type, allow tasks that are not created in Jira to be exported to Jira as new issues within Jira.
N – Jira Issues shouldn't be created as a result of Tasks of the given Type.

Import Tasks from ServiceNow
Y – if the Task Type is mapped to a ServiceNow Incident Type, allow incidents that are created in ServiceNow to be imported into MDCMS.
N – ServiceNow incidents are not permitted to be imported into MDCMS as tasks of the given Type.

Export Tasks into ServiceNow
Y – if the Task Type is mapped to a ServiceNow Incident Type, allow tasks that are not created in ServiceNow to be exported to ServiceNow as new incidents within ServiceNow.
N – ServiceNow Incidents shouldn't be created as a result of Tasks of the given Type.

Options
2=Edit – change the type properties
3=Copy – copy to a new type
4=Delete – remove the type
T=Transitions – specify the allowed Task/Subtask Status Transitions permitted for the Task Type

8.4 Project/Task Hours Used

```
CMC268                              MD T 8 6.1                              6.04.17
SCRN1                        Project/Task Hours Used                        09:39:19
Filter by
Project: DEMO033_____ Task/STask: _____ _____  Date Range: ________ - ________
                             Phase: _____              User: __________
Type options, press Enter.                          Comment: ____________________
 2=Edit  3=Copy  4=Delete  5=View                Total Hours:         28.00

Opt    Date    Project       Task STask User       Phase Hours  Comments
 _   30.03.17 DEMO033                  MMORGAN    DOC     3.00  info
 _   28.03.17 DEMO033                  MMORGAN    FUN     3.00  initial draft
 _   28.03.17 DEMO033                  MMORGAN    TEC    20.00  Customer DOCS
 _   24.03.17 DEMO033                  REN        REQ     2.00

                                                                        Bottom
F4=Browse  F6=Add  F7=Today  F8=This Week  F9=This Month  F10=Prior Month
```

The Project/Task Hours Used listing provides an overview of hours worked based on a variety of filters and provides the means to enter hours worked. This display is accessed is 2 ways:

1) Using the H=Hours option for a Project, Task or Subtask. This listing then filters the entries by default to show the hours worked for that Project, Task or Subtaski.
2) Pressing **F19** from the Object Manager. This listing then filters the entries by default based on the filters used the last time this screen was entered from the Object Manager.

Filters

The Hours Used Listing is filtered by the fields at the top of the display.

The comment filter will list all entries that have matching text in the comment. For example, enter PRINT to list only entries with print somewhere in the title. The comment filter is not case sensitive.

Total Hours

The sum of all records listed based on the filter criteria

Options

2=Edit – Edit the number of hours or Comments for an entry
3=Copy – Copy an existing entry to a new entry
4=Delete – Delete an entry
5=View – View the details of the entry

Function Keys:

F3=Exit
F4=Browse – Browse list of valid values for the Filter fields.
F5=Refresh
F6=Add – Add a new entry
F7=Today – change the date range filters to show only today
F8=This Week – change the date range filters to show only the current week
F9=This Month – change the date range filters to show only the current month
F10=Prior Month – change the date range filters to show only the prior month

8.4.1 Time Entry

```
CMC268                              MD T 8 6.1                          6.04.17
SCRN2                               Time Entry                          09:56:40


Date  . . . . . .  06.04.17

Project . . . . .  DEMO03         Demo project 03
Task  . . . . . .      1          implement changes
Subtask . . . . .      1          test to see if the subtasks are getting talli
Phase . . . . . .  FUN            Functional Design

User  . . . . . .  MMORGAN        Michael Morgan

Hours Worked  . .  7.5___

Comments  . . . . _____________________________________________________________
_____________________________________________________


F4=Browse   F11=View Output   F12=Previous   F21=Sys Command
```

A new time entry can be added or modified from this screen.

Date
The date the work occurred. Required Field.

Project
The project for which the work was performed. Required Field. Enter value or press F4 to select from list of Projects that you are authorized to see.

Task
If work was performed for a task within the project, enter that number here or press F4 to select from a list.

Subtask
If work was performed for a subtask within the project task, enter that number here or press F4 to select from a list.

Phase
The project phase used to categorize the type of work performed. Required Field. Enter value or press F4 to select from the list of Project phases. Also Press F4 on this field in order to create or modify the list of Project Phases.

User
The MDSEC ID of the user that performed the work. Required Field. Enter value or press F4 to select from list of users.

Hours Worked
The number of hours for that day that were worked for the combination of project, task, subtask, phase and user. The number to the left of the decimal point are the number of hours and the number to the right of the decimal point is the percentage of an hour. Required Field.

Comments
Free text to further describe the work performed.

8.5 Project Report Generator

To generate a report over Projects from within MDCMS, press **F8** from the Project Listing screen select option 1 for Project Reports. The following prompt screen is then displayed:

```
CMC285                          COMPANY NAME                              10/18/11
SCRN1                         Project Report                              17:01:13

Select and sequence fields and record filters, press Enter.
Use F7 to load a definition, F9 to save a definition

                                                                          Sort
Seq Field           Minimum      Maximum                                  A/D
___ Project         ____________ ____________ *gen*eric*                    A
___ Title           ____________ ____________ *gen*eric*                    A
___ Exp. Completion ____________ ____________ YYYYMMDD, *PY, *PM, *CY, *CM  A
___ Priority        ____________ ____________                               A
___ Status          ____________ ____________                               A
___ Application     ____________ ____________ *gen*eric*                    A
___ Requester       ____________ ____________ *gen*eric*                    A
___ Date Created    ____________ ____________ YYYYMMDD, *PY, *PM, *CY, *CM  A
___ Assigned Group  ____________ ____________ *gen*eric*                    A
___ Assigned User   ____________ ____________ *gen*eric*                    A
___ Test Group      ____________ ____________ *gen*eric*                    A
___ Test User       ____________ ____________ *gen*eric*                    A
___ Closed by User  ____________ ____________ *gen*eric*                    A
___ Date Closed     ____________ ____________ YYYYMMDD, *PY, *PM, *CY, *CM  A
                                                                        Bottom
F3=Exit   F4=Browse   F5=Refresh   F7=Load Def   F9=Save Def   F11=View Output
```

This screen allows you to define your own Project Report. The report may consist of any or all of the listed fields and any or all Projects may be selected and sorted as you choose. The report definitions may then be saved and used again in the future from this screen or from a command line.

Seq

Each field with a sequence number > 0 will be included in the report. The columns of the report are ordered by the sequence number. The sorting of the records is also based on the order of the sequence fields.

Minimum

The smallest value that the corresponding field may contain, unless the value is a special value or a generic value

Special Values:

- *PY – the date must fall within the previous year (only valid for date fields)
- *PM – the date must fall within the previous month (only valid for date fields)
- *CY – the date must fall within the current year (only valid for date fields)
- *CM – the date must fall within the current month (only valid for date fields)

Generic Values:

The wildcard value * may be used multiple times anywhere within a string to limit records to occurrences where the field contains the string. For example, *3XJ* will select all records where the value 3XJ is contained somewhere within the field string. *XJ will select all records where the value XJ is contained at the end of the field string.

Maximum
The largest value that the corresponding field may contain. This field must be left blank if a special or generic value was entered in the Minimum field.

Sort
A – Sort this field in ascending (A->Z) order.
D – Sort this field in descending (Z->A) order.

Function Keys:
F3=Exit
F4=Browse – Browse the list of available entries depending upon which field the cursor is positioned.
F5=Refresh – Reset the definition back to the initial settings
F7=Load Def – Load a definition from the list of saved definitions
F9=Save Def – Save the entered configuration as a report definition. The saved definition may then be reused at anytime in the future from within MDCMS or from a command line. See the chapter on MDRUNRPT for more information about running reports from a command line.
F11=View Output – Display the MD Output panel and other spool files.

8.6 Task Report Generator

To generate a report over Project Tasks from within MDCMS, press **F8** from the Project Listing screen select option 2 for Task Reports. The following prompt screen is then displayed:

```
CMC285                          COMPANY NAME                              10/18/11
SCRN1                         Project Report                              17:01:13

Select and sequence fields and record filters, press Enter.
Use F7 to load a definition, F9 to save a definition

                                                                          Sort
Seq Field           Minimum      Maximum                                  A/D
___ Project         ____________ ____________ *gen*eric*                    A
___ Task            ____________ ____________ 1-99999                      A
___ Subtask         ____________ ____________ 1-99999                      A
___ Due Date        ____________ ____________ YYYYMMDD, *PY, *PM, *CY, *CM A
___ Due Time        ____________ ____________ HHMMSS                       A
___ Priority        ____________ ____________                              A
___ Status          ____________ ____________                              A
___ Task Type       ____________ ____________ *gen*eric*                   A
___ Internal Ref    ____________ ____________ *gen*eric*                   A
___ Date Created    ____________ ____________ YYYYMMDD, *PY, *PM, *CY, *CM A
___ Time Created    ____________ ____________ HHMMSS                       A
___ Requester       ____________ ____________ *gen*eric*                   A
___ Assigned Group  ____________ ____________ *gen*eric*                   A
___ Assigned User   ____________ ____________ *gen*eric*                   A
                                                                   More...
```

This screen allows you to define your own Task Report. The report may consist of any or all of the listed fields and any or all Tasks may be selected and sorted as you choose. The report definitions may then be saved and used again in the future from this screen or from a command line.

Seq
Each field with a sequence number > 0 will be included in the report. The columns of the report are ordered by the sequence number. The sorting of the records is also based on the order of the sequence fields. The only exception is the Description field, which is not part of the sort.

Minimum
The smallest value that the corresponding field may contain, unless the value is a special value or a generic value

Special Values:

- *PY – the date must fall within the previous year (only valid for date fields)
- *PM – the date must fall within the previous month (only valid for date fields)
- *CY – the date must fall within the current year (only valid for date fields)
- *CM – the date must fall within the current month (only valid for date fields)

Generic Values:

The wildcard value * may be used multiple times anywhere within a string to limit records to occurrences where the field contains the string. For example, *3XJ* will select all records where the value 3XJ is contained somewhere within the field string. *XJ will select all records where the value XJ is contained at the end of the field string.

Maximum
The largest value that the corresponding field may contain. This field must be left blank if a special or generic value was entered in the Minimum field.

Sort
A – Sort this field in ascending (A->Z) order.
D – Sort this field in descending (Z->A) order.

Function Keys:
F3=Exit
F4=Browse – Browse the list of available entries depending upon which field the cursor is positioned.
F5=Refresh – Reset the definition back to the initial settings
F7=Load Def – Load a definition from the list of saved definitions
F9=Save Def – Save the entered configuration as a report definition. The saved definition may then be reused at anytime in the future from within MDCMS or from a command line. See the chapter on MDRUNRPT for more information about running reports from a command line.
F11=View Output – Display the MD Output panel and other spool files.

8.7 Time Report Generator

To generate a report over Project Time Entries from within MDCMS, press **F8** from the Project Listing screen select option 3 for Time Reports. The following prompt screen is then displayed:

```
CMC258                          COMPANY NAME                          10/18/16
SCRN1                         Project Report                          17:01:13

Select and sequence fields and record filters, press Enter.
Use F7 to load a definition, F9 to save a definition

                                                                        Sort
Seq Field           Minimum      Maximum                                A/D
___ Date            ___________  ___________ YYYYMMDD, *PM, *PW, *CM, *CW  A
___ Project         ___________  ___________ *gen*eric*                    A
___ Project Title   ___________  ___________ *gen*eric*                    A
___ Task            ___________  ___________ 1-99999                      A
___ Subtask         ___________  ___________ 1-99999                      A
___ Task Desc.      ___________  160________ Min=*gen*eric* / Max=Length
___ User            ___________  ___________ *gen*eric*                    A
___ User Desc.      ___________  ___________ *gen*eric*                    A
___ Phase           ___________  ___________ *gen*eric*                    A
___ Phase Desc.     ___________  ___________ *gen*eric*                    A
___ Hours Reported  ___________  ___________ 1 - 99                       A
___ Comments        ___________  ___________ *gen*eric*                    A
___ Cost per Hour   ___________  ___________ 1 - 99999                    A
___ Total Cost      ___________  ___________ 1 - 9999999                  A
                                                                      Bottom
F3=Exit   F4=Browse   F5=Refresh   F7=Load Def   F9=Save Def   F11=View Output
```

This screen allows you to define your own Time Entry Report. The report may consist of any or all of the listed fields and any or all entries may be selected and sorted as you choose. The report definitions may then be saved and used again in the future from this screen or from a command line.

Seq
Each field with a sequence number > 0 will be included in the report. The columns of the report are ordered by the sequence number. The sorting of the records is also based on the order of the sequence fields. The only exception is the Description field, which is not part of the sort.

Minimum
The smallest value that the corresponding field may contain, unless the value is a special value or a generic value

Special Values:

- *PM – the date must fall within the previous month (only valid for date fields)
- *PW – the date must fall within the previous week (only valid for date fields)
- *CM – the date must fall within the current month (only valid for date fields)
- *CW – the date must fall within the current week (only valid for date fields)

Generic Values:

The wildcard value * may be used multiple times anywhere within a string to limit records to occurrences where the field contains the string. For example, *3XJ* will select all records where the value 3XJ is contained somewhere within the field string. *XJ will select all records where the value XJ is contained at the end of the field string.

Maximum
The largest value that the corresponding field may contain. This field must be left blank if a special or generic value was entered in the Minimum field.

Task Description Field
Minimum – Tasks can be filtered by a generic value entered in the minimum field
Maximum – The maximum length of the description that will be in the report. The default length is 160 characters and a length of up to 600 characters is permitted.

Sort
A – Sort this field in ascending (A->Z) order.
D – Sort this field in descending (Z->A) order.

Function Keys:
F3=Exit
F4=Browse – Browse the list of available entries depending upon which field the cursor is positioned.
F5=Refresh – Reset the definition back to the initial settings
F7=Load Def – Load a definition from the list of saved definitions
F9=Save Def – Save the entered configuration as a report definition. The saved definition may then be reused at anytime in the future from within MDCMS or from a command line. See the chapter on MDRUNRPT for more information about running reports from a command line.
F11=View Output – Display the MD Output panel and other spool files.

8.8 Project/Task Exit Points

```
MDCPTEX                          T84 Demo Dev/QA                          28.10.21
SCRN1                      Project/Task Exit Points                       18:35:55

          Description  Proj Type  Task Type  Sts Command
Filters: _____________ __________ __________  _  ________________________

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  C=Commands

Opt Description                                          Job Desc
 _  new interfaced task                                  TEST8_10
 _  new non-interfaced project                           TEST8_10
 _  new non-interfaced task                              TEST8_10
 _  task is authorized                                   TEST8_10









                                                                        Bottom
F3=Exit  F5=Refresh  F6=Add  F8=Log  F11=Output  F21=Sys Command
```

If a valid MDWorkflow Base license exists for the partition, F13 can be used from Project Listing to view/manage all exit points for a projects and tasks. A potential exit point is any time a Project, Task or Subtask is created or when the status transitions to a new status.

Description
A description of the exit point

Project Types
The list of Project Types to be considered for the exit point. Any project of the allowed type will then be a candidate if the status conditions are also met.
*NONE – the exit point is not relevant for any project types
*ANY – the exit point is relevant for all project types

Otherwise, you may enter a single value in the prompt when editable or press F4 to select 0-n project types to be included. If multiple project types are defined for the Exit Point, the field will be protected and F4 should be used while the cursor is positioned on the field to add/remove types.

Task Types
The list of Task Types to be considered for the exit point. Any task or subtask of the allowed type will then be a candidate if the status conditions are also met.
*NONE – the exit point is not relevant for any task types
*ANY – the exit point is relevant for all task types

Otherwise, you may enter a single value in the prompt when editable or press F4 to select 0-n task types to be included. If multiple task types are defined for the Exit Point, the field will be protected and F4 should be used while the cursor is positioned on the field to add/remove types.

Transition From
The list of Status Codes that are transitioned from to be considered for the exit point.
*NEW – the project, task or subtask has been created
*ANY – the exit point is relevant for when transitioning from any status

Otherwise, you may enter a single value in the prompt when editable or press F4 to select 0-n status codes to be included. If multiple status codes are defined for the Exit Point, the field will be protected and F4 should be used while the cursor is positioned on the field to add/remove codes.

Transition To
The list of Status Codes that are transitioned to to be considered for the exit point.
*ANY – the exit point is relevant for when transitioning to any status

Otherwise, you may enter a single value in the prompt when editable or press F4 to select 0-n status codes to be included. If multiple status codes are defined for the Exit Point, the field will be protected and F4 should be used while the cursor is positioned on the field to add/remove codes.

Job Desc/Library
The name and library of the job description to use to determine the default user, library list, job queue and other job run attributes when the exit point is submitted to batch. Press F4 while the cursor is on the field to select/manage a job queue.

Options
2=Edit – change the exit point conditions or job description
3=Copy – make a copy of the exit point definition
4=Delete – delete the exit point definition
5=View – view the exit point conditions or job description
C=Commands – View/Edit the commands to be executed when the exit point is triggered for a project, task or subtask

Function Keys:
F3=Exit
F5=Refresh
F6=Add – Add a new exit point definition
F8=Log – View the log of all triggered exit points for auditing or troubleshooting purposes. The log is stored in file MDCMS/MDDPTEL and is accessible from the Log Manager or using any file tool such as SQL.
F11=View Output – Display the MD Output panel or spool files.
F21=Sys Command – Save the current list of groups and users to your profile. When you create a new project, the list will automatically be applied to that project.

8.8.1 Project/Task Exit Point Commands

For each exit point an unlimited number of commands can be defined to be executed in a specific sort sequence.

```
 MDCPTCM                          T84 Demo Dev/QA                          28.10.21
 SCRN2                  Project/Task Exit Point Command                    18:58:00

 Sort Sequence  . . . .  __1
 Keep MD Libs in Libl .  Y            Y/N
 Run as User Profile  .  *JOBD_____   *JOBD, user

Command
MDMAILF USER(##TSKREQ##) SUBJ('Task ##PROJID##-##TASKID## is now authorized') BO
DY('/MDCMS/MAIL/taskAuthorized.htm') BTYP(HTML) PROJID('##PROJID##') TASKID('##T
ASKID##')_____________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________


 Enter=Confirm  F4=Browse  F7=Insert Placeholder  F12=Cancel  F21=Sys Command
```

Screen Definitions:

Sort Sequence
The sort sequence of the command at run time, in case multiple commands are defined.

Keep MD Libs in Libl
N – The MD Libraries (MDCMS and MDXREF) are removed from the library list before the command is invoked. This assures that any MD Objects with the same name as your objects are not used.
Y – The MD Libraries are left in the library list. This is necessary when MD Objects, such as interface programs, MDMAIL or MDMAILF, are needed to process the command.

Run as User Profile
By default, commands executed during an RFP run under the profile of the user profile defined on the job description of the exit point. If a specific command should run under the authorities of a different user, that user ID can be entered here. As a safety precaution, the user placing a value in this field must have authority to use that entered user profile in order to save the command definition.

Command
The IBM i or user-defined command to be performed. Enter the name of the command and then press F4 to fill in the keywords.

Some placeholder parameter values may be used and are substituted by MDCMS at run-time. The placeholder value may be typed directly into the command or the cursor may be positioned in the command and F7 pressed to insert the value from a list.

Function Keys:
F4=Browse – Browse for values.
F7=Insert Placeholder – Insert placeholder value into command string at the location of the cursor. A list of all fixed placeholder values followed by all placeholders for custom fields will displayed to select from.

8.9 MDUPDPROJ – Create/Update Project command

MDCMS is delivered with a command-based API that allows external tools or applications to create and update Projects within MDCMS. This allows a business to continue using its existing Project Management tool, while being able to synchronize the data in the tool with the Project Manager that is embedded in MDCMS.

The MDCMS command is named ***MDUPDPROJ*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your Project Management tool, you can also directly call program ***MDUPDPROJ*** in library MDCMS. In this case, be certain that the parameters sent to the program exactly match the parameters in command MDUPDPROJ.

All MDUPDPROJ API transactions are logged to file MDCMS/MDDUPRJ.

NOTE: If Location Synchronization is used (MDCMS Settings option 6), the API will only need to be invoked for 1 system. The other partitions or physical systems will automatically be synchronized.

If a parameter value is not provided and the Project already exists, the existing value for the parameter will remain in place.

MDUPDPROJ Parameter Table

Name	Type	Length	Valid Values and Format
Project ID	CHAR	12	unique ID
Project Type	CHAR	10	The Project Type to categorize the Project
Primary Appl	CHAR	6	The primary Application referenced by this Project
Assigned to Group	CHAR	10	Valid User Group
Assigned to User	CHAR	10	Specific User in Group or Valid user in MDSEC when group left blank
Priority	INTEGER	1	1 – 5
Expected Completion	INTEGER	8	YYYYMMDD
Status	CHAR	1	Unique ID
Project Title	CHAR	80	free format
Expected Hours	DEC	9,2	Number of hours expected to complete project
Expected Cost	DEC	11,2	Cost expected to complete project
Modification User	CHAR	10	IBMi USRPRF
MDCMS Instance	CHAR	5	Specifies the MDCMS environment that should be used for the API. The ID correlates to the suffix of the MDCMS library name. Special values: *DFT – default instance (no suffix) *SAME – the current instance based on the library list
Extended Description	CHAR	4000	

8.10 MDUPDPRJG – Update Project Group command

MDCMS is delivered with a command-based API that allows external tools or applications to add or remove an involved User Group from an existing Project in MDCMS.

The MDCMS command is named ***MDUPDPRJG*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your Project Management tool, you can also directly call program ***MDUPDPRJG*** in library MDCMS. In this case, be certain that the parameters sent to the program exactly match the parameters in command MDUPDPRJG.

Successful MDUPDPRJG transactions are logged in file MDCMS(ENV)/MDDTHST and visible from the Full History listing in the MDWorkflow web application.

NOTE: If Location Synchronization is used (MDCMS Settings option 6), the API will only need to be invoked for 1 system. The other partitions or physical systems will automatically be synchronized.

If the target Project is closed or if the Group or User aren't defined in MDCMS, the entry will not be processed.

MDUPDPRJG Parameter Table

Name	Type	Length	Valid Values and Format
Project ID	CHAR	12	unique ID - Required
Group ID	CHAR	10	Valid User Group – Required
User ID	CHAR	10	A specific user that is a member of the group that will be involved with this project. Leave this parameter blank if any user that is a member of the group may be involved.
Role	CHAR	1	A - The role of Acceptance/Test will be applied. This indicates that the group/user will be responsible for accepting RFPs that have been installed in a level requiring acceptance before being allowed to migrate to the next level. T - The role of Technical will be applied. This indicates that the group/user will be responsible for carrying out work on behalf of the project.
Option	CHAR	7	*ADD - Add the provided Group/User combination for the given Role to the Project. If the combination already exists, execution will be ignored. *REMOVE - Remove the provided Group/User combination for the given Role from the Project. If the combination doesn't exist, execution will be ignored.
MDCMS Instance	CHAR	5	Specifies the MDCMS environment that should be used for the API. The ID correlates to the suffix of the MDCMS library name. Special values: *DFT – default instance (no suffix) *SAME – the current instance based on the library list

8.11 MDUPDTASK – Create/Update Task command

MDCMS is delivered with a command-based API that allows external tools or applications to create and update Tasks within MDCMS. This allows a business to continue using its existing Project Management tool, while being able to synchronize the data in the tool with the Project Manager that is embedded in MDCMS.

The MDCMS command is named ***MDUPDTASK*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your Project Management tool, you can also directly call program ***MDUPDTASK*** in library MDCMS. In this case, be certain that the parameters sent to the program exactly match the parameters in command MDUPDTASK.

All MDUPDTASK API transactions are logged to file MDCMS/MDDUTSK.

NOTE: If Project Synchronization is used (MDCMS Settings option 8), the API will only need to be invoked for 1 system. The other partitions or physical systems will automatically be synchronized.

If a parameter value is not provided and the Task or Subtask already exists, the existing value for the parameter will remain in place.

MDUPDTASK Parameter Table

Name	Type	Length	Valid Values and Format
Project ID (PROJ)	CHAR	12	A valid, active Project ID
Task Number (TASK)	INTEGER	7	Specifies an existing Task number, or 0 if information is for a new Task Number or the task number will be retrieved based on the IREF value.
Subtask Number (STSK)	INTEGER	7	Specifies an existing Subtask number. Or, if TASK > 0 and NSTS = *YES, a new Subtask will be created.
New Subtask (NSTS)	CHAR	4	Specifies if the values should be saved to a new Task or Subtask. *NO – If parameter TASK = 0, then a new task will be created. If TASK > 0 and STSK = 0, then the existing task will be updated. If TASK > 0 and STSK > 0, then the existing subtask will be updated. *YES – If parameter TASK = 0, then a new task will be created. If TASK > 0, then a new subtask will be created. *REF - If the value of IREF is found in the database for the given project, then the referenced task or subtask will be updated. If parameter task = 0, and the value of IREF isn't found in the database for the given project, then a new task will be created. If parameter task > 0, and the value of IREF isn't found in the database for the given project, then a new subtask will be created for the task. *NOREF - If the value of IREF is found in the database for the given project, then the referenced task or subtask will be updated. If the value of IREF isn't found in the database for the given project, then nothing will occur.

Task Type (TSKT)	CHAR	10	The Task Type to categorize the Task/Subtask. If blank for a new task/subtask, the default task type for the project's Project Type will be used.
Task Summary (SUM)	CHAR	240	A brief description of the task
Primary Appl (AGP)	CHAR	6	MDCMS Appl used only for informational and filtering purposes.
Internal Ref Code (IREF)	CHAR	20	Internal Reference Code
Priority (PRI)	INTEGER	1	1 – 5
Status (STS)	CHAR	1	Valid Task Status
Due Date (DUED)	INTEGER	8	YYYYMMDD
Due Time (DUET)	INTEGER	6	HHMMSS
Assigned to Group (AGRP)	CHAR	10	Valid User Group
Assigned to User (AUSR)	CHAR	10	Specific User in Group or Valid user in MDSEC when group left blank
Test Group (TSTG)	CHAR	10	Valid User Group
Test User (TSTU)	CHAR	10	Specific User in Group or Valid user in MDSEC when group left blank
Estimated Hours (HRSE)	DEC	9,2	Number of hours expected to complete task
Estimated Cost (CSTE)	DEC	11,2	Cost expected to complete task
Modification User (MUSR)	CHAR	10	A valid user profile defined in MDSEC to be attributed to the creation or update of the Task or Subtask.
MDCMS Instance (ENV)	CHAR	5	Unique ID *DFT – default instance (no suffix) *SAME – the current instance based on the library list
Extended Description (EDSC)	CHAR	4000	Extended description of the task/subtask

8.12 MDUPDCFLD – Update Project/Task Custom Field command

MDCMS is delivered with a command-based API that allows external tools or applications to add, update or remove a Custom Field value from an existing Project, Task or Subtask in MDCMS.

The MDCMS command is named ***MDUPDCFLD*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your Project Management tool, you can also directly call program ***MDUPDCFLD*** in library MDCMS. In this case, be certain that the parameters sent to the program exactly match the parameters in command MDUPDCFLD.

Successful MDUPDCFLD transactions are logged in file MDCMS(ENV)/MDDTHST and visible from the Full History listing in the MDWorkflow web application.

NOTE: If Location Synchronization is used (MDCMS Settings option 6), the API will only need to be invoked for 1 system. The other partitions or physical systems will automatically be synchronized.

If the target Project is closed or if the custom field isn't defined in MDCMS, the entry will not be processed.

MDUPDCFLD Parameter Table

Name	Type	Length	Valid Values and Format
Project	CHAR	12	*RFP – the custom field value for all projects, tasks and/or subtasks impacted by the Application Code/RFP number defined in parameters AGP and RFP should be updated, as long as the project type of the project or task type of the task/subtask allow use of that field. unique ID – update only for a specific project, task or subtask
Task	DEC	7	Task Number – Leave as 0 if Custom Field is to be applied directly to the Project.
Subtask	DEC	7	Subtask Number – Leave as 0 if Custom Field is to be applied directly to the Project or Task.
Field Name	CHAR	10	The Name of the Field to add, update or remove for this Project/Task
Option	CHAR	7	*UPDADD - If a value already exists for the given field, it will be updated with the field provided. Otherwise, the value will be added for the field. *ADD - If a value is already defined for the field, the existing value will be retained. *REMOVE - Remove any exiting value from the Field for the given Project/Task. If a field value doesn't exist, execution will be ignored.
Alphanumeric Value	CHAR	160	The value to apply for the given field in character format. The maximum length of an alphanumeric field is 160 characters or the defined length of the field, whichever is shorter. Use this for fields of type: String Checkbox (Y or N) DropDownList (the code value, not the description) URL
Numeric Value	DEC	26,9	The value to apply for the given field in decimal format.

			The maximum length of a numeric field before the decimal point is 15 digits. The maximum length after the decimal point is 9 digits. The actual maximum depends on the definition of the field. Use this for fields of type: Number Date (format YYYYMMDD) Time (format HHMMSS)
Application of RFP	CHAR	6	The application of the RFP that contains the Projects, Tasks and Subtasks that require an update to the field value. If PROJ = *RFP, this parameter is required.
RFP Number	DEC	7	The RFP (Request for Promotion) number that contains the Projects, Tasks and Subtasks that require an update to the field value. If PROJ = *RFP, this parameter is required.
Apply to RFP Projects	CHAR	4	*YES – MDCMS will attempt to update the value for the field for each project impacted by the RFP, even if development work is done against a task or subtask within the Project. *NO – Any Project level field will be ignored
Apply to RFP Tasks	CHAR	4	*YES - MDCMS will attempt to update the value for the field for each task impacted by the RFP, even if development work is done against a subtask within the Task. *NO - Any Task level field will be ignored
Apply to RFP Subtasks	CHAR	4	*YES - MDCMS will attempt to update the value for the field for each subtask impacted by the RFP. *NO - Any Subtask level field will be ignored
MDCMS Instance	CHAR	5	Specifies the MDCMS environment that should be used for the API. The ID correlates to the suffix of the MDCMS library name. Special values: *DFT – default instance (no suffix) *SAME – the current instance based on the library list

8.13 MDUPDATT – Update Project/Task Attachment command

MDCMS is delivered with a command-based API that allows external tools or applications to add, update or remove an attachment from an existing Project, Task or Subtask in MDCMS.

The MDCMS command is named ***MDUPDATT*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your Project Management tool, you can also directly call program ***MDUPDATT*** in library MDCMS. In this case, be certain that the parameters sent to the program exactly match the parameters in command MDUPDATT.

Every MDUPDATT transaction is logged in file MDCMS(ENV)/MDDUATT and visible from the Logging settings in the MDCMS Setup Menu.

MDUPDATT Parameter Table

Name	Type	Length	Valid Values and Format
Project	CHAR	12	unique ID - Required
Task	DEC	7	Task Number – Leave as 0 if the attachment is to be applied directly to the Project.
Subtask	DEC	7	Subtask Number – Leave as 0 if the attachment is to be applied directly to the Project or Task.
IFS File Name	CHAR	80	The Name of the File to add, update or remove for this Project/Task
Option	CHAR	7	*UPDADD - If an attachment already exists for the given file name, it will be replaced with the file provided. Otherwise, the file will be added as a new attachment. *ADD - If an attachment already exists for the given file name, the existing file will be retained. *REMOVE - Remove the attachment of the entered name from the Project/Task.
IFS Folder containing File	CHAR	240	The full path name in the IFS where the file is located. This parameter is ignored if removing an attachment.
MDCMS Instance	CHAR	5	Specifies the MDCMS environment that should be used for the API. The ID correlates to the suffix of the MDCMS library name. Special values: *DFT – default instance (no suffix) *SAME – the current instance based on the library list

8.14 MDUPDSTS – Update Status for RFP Projects/Tasks command

It is often useful, that the status for a Project or Task automatically updates to a new value when an RFP reaches a certain point in the migration path. To facilitate this, command MDUPDSTS is provided to use as an exit point (such as a Post-Installation command) to update any Projects or tasks that were impacted by the RFP.

All MDUPDSTS transactions are logged to file MDCMS/MDDUSTS.

MDUPDSTS Parameter Table

Application (AGP)	The Application targeted by the RFP
RFP Number (RFP)	The RFP Number whose activity requires a status change to projects and tasks assigned to object requests in the RFP.
New Status Code (STS)	The new project/task status code to be applied The status code must be defined and be allowed for automatic updates. If the status code is marked as a closing status, no open object requests may remain in the Object Manager for a given Project or Task.
Apply to Projects (PROJ)	Specifies if projects in the RFP should be updated with the new status. *YES – the status will be updated for Projects *NO – the status will not be updated for Projects
Apply to Tasks (TASK)	Specifies if Tasks in the RFP should be updated with the new status. *YES – the status will be updated for Tasks *NO – the status will not be updated for Tasks
Apply to Subtasks (STSK)	Specifies if Subtasks in the RFP should be updated with the new status. *YES – the status will be updated for Subtasks *NO – the status will not be updated for Subtasks
Include for Current Status (CSTI)	Specifies a list of status codes to compare to the current status of a project, task or subtask. If the current status matches one of the codes in the list, the status for the project, task or subtask will be updated to the new status. If the list is empty, then any current status is permitted. You can specify 50 values for this parameter.
Exclude for Current Status (CSTE)	Specifies a list of status codes to compare to the current status of a project, task or subtask. If the current status matches one of the codes in the list, the status for the project, task or subtask will NOT be updated to the new status. If the list is empty, then any current status is permitted. You can specify 50 values for this parameter.
Environment ID (ENV)	Specifies the MDCMS environment that should be used for the API. The ID correlates to the suffix of the MDCMS library name. *DFT – the default environment will be used. This correlates to library MDCMS. *SAME – the environment of the current library list will be used

9 MDXREF

MDXREF is a tool used to view the inter-relationship between objects. This includes what and how programs use files, what and how files relate to one another, the complete process flow of applications, etc. See the MDXREF User Manual for instructions and more information.

10 Send Promotion to Remote System

```
MDRLWSD                          COMPANY NAME                              11/20/11
SCRN1                  Send Promotion to Remote System                     10:37:41
Filters:
 Appl: TEST   Rcvd: _   Project: _____________   Object: ____________________
 Lvl.: 10     Inst: _   Task...: _____          User..: __________
 Stat: __     Prob: _   Subtask: _____          Loc ID: ________
 RFP.: _______          Cmd/Scr: _ / _          Desc..: ____________________
Type options, press Enter.
 1=Send  2=Edit  3=Copy   7=Reset    9=Close       C=Cmd/Scrp  H=History
         L=Log   M=Merge  O=Objects  P=Proj/Tasks  S=Spools    T=Target Locs
   Appl    RFP  Lvl User      Installed St R I P Description
_  ACCT  20368  90  MMORGAN     3/14/97 01       Fix to receivables process
_  ACCT  20594  90  MMORGAN     3/16/97 02 P   W Euro Currency preparation
_  ACCT  20643  90  BTERRELL    3/16/97 01       Decimal data problem
_  ACCT  20653  90  MMORGAN     4/09/06 03       Load workfiles with info



                                                                        Bottom
 F3=Exit   F4=Browse   F5=Refresh   F6=Add   F8=Sort by Date   F10=History
```

It is possible to control applications across IBMi systems or logical partitions via MDCMS, as long as a licensed copy of MDCMS exists on each of the systems involved.

The first step for specifying what is to be sent where is to define the distribution levels (see the sections for OS/400 Locations and Distribution Levels for instructions).

If a promotion is installed into an Application/level, the RFP with all of its installed objects and commands will appear in the list as long as:

1) the application/level has at least 1 defined distribution level
2) the flag, Place RFP in Send Promotion List, is set to Y for the RFP

For each entry, the application, RFP number, application level, RFP Manager, date installed, and description of promotion are listed.

The following additional columns are shown:

St

The send status of the RFP across all target levels.

RP – The installed RFP is pending MDWorkflow acceptance. Until acceptance occurs, none of the objects in the RFP can be sent to other locations.
00 – The RFP is empty – no objects assigned to RFP
01 – The RFP is ready, but not yet sent to any locations
02 – The RFP has been sent to some of the defined locations
03 – The RFP has been sent to all defined locations that normally expect to be sent to
04 – The send process is currently running for the RFP
05 – The RFP is closed in the Send List

R
If the receipt of the sent RFP has occurred for some or all of the locations. There must be a defined DDM push or pull connection defined between this location and a target location for this information to be available.
Blank – Receipt of RFP hasn't occurred or isn't known
P – the RFP has been received on a portion of the locations that it has been sent to
C – the RFP has been received on every location that it has been sent to

I
If the installation of the sent RFP has occurred for some or all of the locations. There must be a defined DDM push or pull connection defined between this location and a target location for this information to be available.
Blank – Installation of RFP hasn't occurred or isn't known
P – the RFP has been installed on a portion of the locations that it has been sent to
C – the RFP has been installed on every location that it has been sent to

P
If warnings or errors occurs during processing of the RFP on the target systems. There must be a defined DDM push or pull connection defined between this location and a target location for this information to be available.
Blank – problems haven't occurred or isn't known
W – warnings have occurred
E – errors have occurred

The entries may be filtered by a large number of criteria. For most of the filters, F4 can be used to list and select a filter value.

The following options are available for each entry in the list:

1=Send – send the promotion package to remote systems. Any default send locations that haven't been ignored or already sent to will be pre-selected to send
2=Edit – edit the description or user of the promotion package
3=Copy – copy the RFP, including its object requests, to a new RFP
7=Reset – reset the status from 04=running back to 01 or 02. This can only be used if a send job ended abnormally or hasn't been processed in the send queue yet.
9=Close – remove RFP from list.
A confirmation screen will be displayed before the promotion would actually be removed.
Closed RFPs can be reopened in the Send History screen.
If default target levels haven't been processed yet for the RFP, the user must be authorized to MDSEC function code 54 in order to be able to close the RFP.
C=Cmd/Scrp – add or edit RFP-Level commands and scripts for the promotion package.
H=History – View the Send History for the RFP
L=Log – view all steps that have occurred during the most recent Send Batch for the RFP. For each step, the job log entries can be viewed for additional information. The steps, the job log, or a combination of both can be exported to an excel report. To view the log entries for older batches, use the Log option from Send History (F10 from Send Listing). The job log entries are applied to the RFP using the MDLOG service. If the entries are missing, ensure that the MDLOG service is running.
M=Merge – Merge 2 or more RFP Packages into 1 RFP. Enter an M for at least 2 RFP packages of the same application and level and then press Enter. A confirmation screen is shown where the target RFP number can be selected and the description of the merged package can be edited. All objects (and commands) of the selected RFPs will be merged into the target RFP. The other specified Packages will be emptied and closed once the merge is complete. Duplicate objects and commands will be eliminated automatically.
O=Objects – View/edit the objects contained in the promotion package. Specific objects (and commands) may be added or removed.
P=Proj/Tasks – view list of all Projects, Tasks and Subtasks impacted by object requests on the Send RFP
S=Spools – View any spool files from the most recent attempt to send the RFP.
T=Target Locs – view the send status for the target locations and individually send the promotion package if the status allows it.

Function Keys:
F3=Exit
F4=Browse – Browse list of valid values for a field (place cursor on appropriate field)
F5=Refresh – Refresh listing display
F6=Add – Manually add a promotion package to send
F8=Sort by Date/Appl – toggle the sort sequence for the listing between Appl/RFP ascending and Install Date descending
F10=History – View the Send History for all promotions

10.1 Promotion Objects Display

```
MDRLWSO                          COMPANY NAME                              10/19/11
SCRN1                         Promotion Objects                            10:37:03

Appl: TEST Lvl: 30 RFP:       4  Desc: Load workfiles with info

Type options, press Enter.
 2=Edit  3=Copy  4=Delete  5=View  C=Cmd/Scrp  P=Projects

Opt Object           Attribute  Type    C/S  Project        User       Rsn
 _  CALCAC1          CBL        *PGM         VAT          + MMORGAN     M
 _  CALCAC2          CBL        *PGM    Y    VAT            MMORGAN     D

                                                                    Bottom
 F3=Exit    F5=Refresh    F6=Add    F17=Top    F18=Bottom
```

This display, which is accessed by taking option O=Objects against an RFP on Send Promotion to Remote System panel, lists all source or objects within a promotion package that would be sent to a remote system. The reason for the promotion is listed with each entry. The reason may be M for a modification, R for a recompile, U for an Update or D for a deletion.

The following options are available for each entry in the list:
2=Edit – Edit the request parameters for the object. The parameters are equivalent to those that can be changed in the Object Manager – see Section 2 - Edit Request Details in the Object Manager chapter for more information.
3=Copy – add an object request to the RFP using the parameters for selected object as initial values
4=Delete – Remove the object from the promotion package
5=View – View the details of the object
C=Cmd/Scrp – Display and edit the commands and scripts to be sent with the object
P=Projects – Display and edit the projects that the object is assigned to

F3=Exit
F5=Refresh – refresh the list
F6=Add – add an additional object to the promotion package
F17=Top – position cursor to the top of the list
F18=Bottom – position cursor to the bottom of the list

10.2 Send Promotion Display

```
MDCLWSD                            COMPANY NAME                              10/19/15
SCRN3                  Send Promotion to Remote System                       10:37:38

Appl: ACCT  RFP: 20653  Lvl: 30  Desc: Load workfiles with info

Install Date: *CURRENT TimeZone  Loc.: __________  Lvl: __   Desc:  __________
Install Time: *IMMED     T       User: __________  Fmt: ___  Addr:  __________
                                 Stat: ____        Prb: _    Group: __________
Type options, press Enter.
 1=Send  F=FTP Log  H=History  I=Ignore  L=Log  P=Problems  T=Target RFP
                                                      Send / Ignore
Opt Location   Description                Lvl Stat Prb   Date   User       Fmt
 1  MD71       MD 7.1                     20  SERR  Y                       FTP
 1  SFO        Clean Save file            10  NONE                        SFO
 _  SFF        Full Save file             10  INST     10/18/15 MMORGAN    GOA


                                                                        Bottom
F3=Exit  F4=Browse  F5=Refresh  F8=Settings  F9=View Addr  F13=Unselect All
```

This is the confirmation screen for sending a promotion to one or more remote systems. This panel appears when option 1=Send or T=Target Locs is selected for an RFP on the Send Promotion to Remote System panel or from RFP History.

Install Date
The date that the install should take place on the target systems.
Set this value prior to using option 1 to process the send to the systems that should be installed at that time.

If the target level is set to automatic, it will be received, submitted and approved for installation immediately on the target system. Then a 2nd batch job will be submitted to batch that will be scheduled for the date/time provided.

If the target level is set to manual, then a user will need to carry out the manual steps, but the install date/time will default to the value provided in this screen.

*CURRENT - the installation will be scheduled for the same day that the submission completes on the target system.

Install Time
The time that the install should take place on the target systems.

*IMMED – the installation will begin as soon as installation approval is complete on the target system.

TimeZone
Indication of which location the entered Install Date/Time refers to.

L – schedule the date/time based on the time zone of the local (sending) system. If the target system is in a different time zone, the scheduled date/time will be adjusted accordingly. So, if the RFP is scheduled to install at 9pm EST because the local system is in New York, it will be installed at 6pm PST if the target system is in Los Angeles.

T – schedule the date/time based on the time zone of the target system. The scheduled date/time used on the SBMJOB command will match the value entered exactly. So, if the RFP is sent to 3 different locations and scheduled for 9pm, it will install at 9pm of the time zone of each of those systems.

Loc
Filter by the Location ID of the target system. Press F4 to select from a list.

User
Filter by the User ID that sent the RFP or Ignored a Location. Press F4 to select from a list.

Stat
Filter by the Status of the distribution for a Location. Press F4 to select from a list. The full description of possible status codes is available in section Send Status Values.

Lvl
Filter by the Level on the target system

Fmt
Filter by the Distribution Method. Press F4 to select from a list.

Prb
Whether or not problems have occurred during the send, receive or install of the RFP for the target level. Use Y to filter to only targets where problems occurred. Use N to filter to only targets where problems haven't occurred.

Desc
Filter by the Location Description. Any row will be displayed that contains the value anywhere within the description for its location.

Addr
Filter by the Location Address. Any row will be displayed that contains the value anywhere within the target address for its location.

Group
Filter by a Location Group. Press F4 when cursor is on the Group field to select and manage the Location Groups. Location Groups are used to provide a means of filtering a list of Locations by any definition necessary for the organization. Multiple locations can belong to a location group and multiple location groups can contain the same location.

Options
1 – Send the RFP to one or more target locations
F – View the FTP Log for the most recent attempt of sending by FTP to the selected location
H – View the Send History for the selected location
I – Ignore the target level for this RFP. If ignored, the auto-close function won't consider this level and will proceed with closing the RFP once the other default levels have been processed or ignored. The authority to ignore a target level is based on MDSEC function code 54.
L – view all steps that have occurred during the most recent Send Batch for the RFP and specific target level. For each step, the job log entries can be viewed for additional information. The steps, the job log, or a combination of both can be exported to an excel report. To view the log entries for older batches, use the Log option from Send History (F10 from Send Listing). The job log entries are applied to the RFP using the MDLOG service. If the entries are missing, ensure that the MDLOG service is running.
P – View a list of any problems that have occurred during the send, receive or install of the RFP
T – Once the RFP has been received on the target system, option T can be used to view details about the target RFP. If authorized on the target system, the target RFP can also be approved for installation or installed from this screen. A pre-requisite to use this option is that a DDM connection is defined in MDCMS and MDPUSH or MDPULL is used to sync data between locations. In order to approve or install remotely, the sending location must be defined as a MDWorkflow Repository both locally and on the target location.

Special Funtion Keys
F8 – View/Manage the Distribution Level settings
F9 – toggle the listing between viewing the location description and the target address
F13 – select or unselect all rows with option 1=Send

10.3 Create Send Package

10.3.1 Manually Create Empty Send Package for Specific Object Requests

```
MDRLWS3                          COMPANY NAME                          10/15/20
SCRN1                       Create Send Package                        10:37:03

Application/Level . .  ____ __
Description . . . . .  ________________________________________________________
_______________________________________________________________________________

Empty RFP . . . . . .  _  Y=Yes, N=Fill with Install History based on Filters

Filters:
 Install Date Range .  ________  to  ________
 RFP Number Range . .  _______   to  _______
 Project  . . . . . .  ___________  *generic*
 Task / Subtask . . .  _______ _______
 Object Requester . .  __________   *generic*
 Object Library . . .  __________   *generic*
 MDCMS Attribute  . .  __________   *generic*

Include RFP Cmd/Scr .  N  N=No, Y=Yes
Split DB and Non-DB .  N  N=No, Y=DB Objects on diff RFP than non-DB Objects
Non-DB Objs per RFP .  _____         0=all non-DB Objects on same RFP

Enter=Confirm   F4=Browse   F12=Cancel
```

One or more objects may be manually added to a new send package without the prerequisite that the objects are first promoted. This panel is accessed by pressing **F6=Add** from the Send Promotion to Remote System display.

Application
The local application code of the application to send from

Level
The local application level of the promotion level to send from

Description
The description to apply to the new RFP.

Empty RFP
Y – A new send RFP will be created without any objects in it.

Ignore the remaining parameters on the screen for the use case of a new, empty Send RFP, which will then have specific, individual objects added to it.

10.3.2 Manually Create Send Package from Installed Object Requests

```
MDRLWS3                          COMPANY NAME                          10/15/20
SCRN1                      Create Send Package                         10:37:03

Application/Level . .  ____ __
Description . . . . .  ______________________________________________________
_______________________________________________________________________________

Empty RFP . . . . . .  _  Y=Yes, N=Fill with Install History based on Filters

Filters:
 Install Date Range .  ________  to  ________
 RFP Number Range . .  _______   to  _______
 Project  . . . . . .  ___________  *generic*
 Task / Subtask . . .  _______ _______
 Object Requester . .  __________   *generic*
 Object Library . . .  __________   *generic*
 MDCMS Attribute  . .  __________   *generic*

Include RFP Cmd/Scr .  N  N=No, Y=Yes
Split DB and Non-DB .  N  N=No, Y=DB Objects on diff RFP than non-DB Objects
Non-DB Objs per RFP .  _____       0=all non-DB Objects on same RFP

Enter=Confirm   F4=Browse   F12=Cancel
```

Any amount of installation activity can be combined into a new send package. This panel is accessed by pressing **F6=Add** from the Send Promotion to Remote System display.

Application
The local application code of the application to send from

Level
The local application level of the promotion level to send from

Description
The description to apply to the new RFP.
If filtering to a specific RFP number, the description can be left blank to automatically use the description from the installed RFP. If splitting into multiple RFPs, the description will be applied + a suffix appended stating the part of the RFP, such as DB or non-DB Part 3.

Empty RFP
N – The new send RFP will be populated with all objects in installation history that match the values of the filter fields.

Install Date Range
The range of dates for installation history to include in the RFP. A blank minimum means no minimum. A blank maximum means no maximum.

RFP Number Range
The range of installed RFP numbers to include in the RFP. A blank minimum means no minimum. A blank maximum means no maximum.

Project
Only include objects that were installed for project matching the name pattern in the filter.

Task
Filter the object requests to those that were installed for a specific task number

Subtask
Filter the object requests to those that were installed for a specific subtask number

Object Requester
Only include objects that were requested by a user matching the name pattern in the filter.

Object Library
Only include objects that installed into a library matching the name pattern in the filter.

MDCMS Attribute
Only include objects that were requested for an attribute matching the name pattern in the filter.

Include RFP Cmd/Scr
Y – any commands that were defined for specific installed RFPs, that contain objects included in the send RFP, will be included in the send RFP.
N- no commands defined for specific RFPs will be added to the send RFP

Split DB and Non-DB
If multiple send RFPs should be created. 1 containing any database objects (Physical files, Logical files, data areas and SQL elements) and at least 1 containing non-database objects.

Non-DB Objs per RFP
The maximum number of non-database objects per send RFP.
For example, if the filtered values would mean there are 500 programs, and the number of non-DB Objects per RFP is 100, then there would be 5 RFPs created to contain them (plus 1 for DB objects, if there are any).
Leave this field blank to place all non-DB objects on a single RFP.

Press **Enter** once the information is entered.

10.3.3 Systematically Create Send Package from Installed Object Requests using MDCRTSND

Command **MDCRTSND**, which exists in library MDCMS, can be used to systematically generate a Send RFP from Installed Objects. All of the parameters in the MDCRTSND command are identical to the parameters described in the prior section for manually creating a Send RFP. You can also use F1 on the command or individual parameters in the command for detailed instructions.

10.4 Add Object to Promotion

```
MDRLWSD                          COMPANY NAME                          10/19/11
SCRN6                      Add Object to Promotion                     10:37:03


 Appl: CSL   RFP:   1299  Lvl: 30  Desc: ACPRPT 501000 -> 500001


Reason . . .  _   D=Delete, M=Modify, R=Recompile, U=Update

Object . . .  ____________________________________________________________________


Attribute  .  __________
Project  . .  ____________
Task/Subtask  _____ _____
Sort Seq . .  _____


Rel. Path  .  ____________________________________________________________________


Enter=Confirm    F4=Browse    F12=Cancel
```

An object may be selected to be sent to a remote system without the prerequisite that the object is first promoted. Press **F6=Add** from the Promotion Objects display to add an object to an existing promotion package. This display will also be shown after a promotion is manually added.

Enter the reason, object name, object (or source) attribute and Project ID. Press **F4=Browse** to browse the list of objects, attributes, or projects. If the attribute is left blank, MDCMS will assign the last used attribute for the object.

Press **Enter** once the information is entered

10.5 Send History

```
MDCLWSL                          COMPANY NAME                                10/19/20
Filters:                         Send History                                19:57:57
 Appl: ______
  Lvl: ___        Object: __________    Location: __________  User: __________
  RFP: _______  Project: ___________    Tgt Lvl: ___          Stat: ____
                                          Format: ___          Prob: _
Type options, press Enter.
 5=Details  C=Cmd/Scr  D=Dist Lvls  F=FTP Log  L=Logs  P=Problems  R=Reopen RFP

    Date     Time    Appl Lvl   RFP Distribution Queue   Lvl Trn User       Stat
_ 5.12.07 20:24:12 ACCT 30    351 chmdyn01              50  FTP MMORGAN    OK
_ 5.12.07 20:22:58 OPER 10  40036                           MMORGAN    NONE
_ 5.12.07 20:22:58 OPER 10  40035 chmdyn01                  SNA MMORGAN    FAIL
_ 5.12.07 20:22:58 OPER 10  40034 chmdyn01                  FTP MMORGAN    OK
_ 5.12.07 20:22:58 OPER 10  40033 chmdyn01                  FTP MMORGAN    OK
_ 5.12.07 20:22:58 OPER 10  40031 chmdyn01                  FTP MMORGAN    FAIL
_ 5.12.07 20:22:58 ACCT 10    335 chmdyn01                  FTP MMORGAN    OK
_ 5.12.07 20:22:58 ACCT 10    332                               MMORGAN    NONE


                                                                        Bottom
F4=Browse  F5=Refresh  F9=Toggle Desc  F11=View Output  F15=Print
```

This display will list the promotion send history for all promotions that have been attempted (since the installation of MDCMS version 6.2.4 or higher) plus all promotions that have been removed from the Send List without having been sent.

Filters
Enter a value into a filter field to limit the listing to items matching the filter(s). Possible values may be selected by pressing F4=Browse while the cursor is positioned on the filter field.

Options
5=Details – View complete details of the send, including object and project information
C=Cmd/Scr – display the RFP-Level commands and scripts that were defined for the promotion
D=Dist Lvls – view/manage the settings for the Distribution Levels
F=FTP Log – If the Send was processed using FTP, the FTP log can be displayed in order to analyse and correct any connection problems.
L=Log – view all steps that have occurred during the most recent Send Batch for the RFP. For each step, the job log entries can be viewed for additional information. The steps, the job log, or a combination of both can be exported to an excel report.
P=Problems – display the list of any warnings or errors that occurred during the send or, if available, during the receipt and installation on the target system
R=Reopen RFP – Reopen the RFP so that it can be sent again

Function Keys:
F4=Browse – Browse possible values for a filter field
F5=Refresh
F9=Toggle Desc – Toggle the display between showing/hiding the RFP description
F11=View Output – Display the MD Output panel and other spool files
F15=Print – create a report in MD Output based on the currently entered filters

10.6 Send Status Values

The following status values are possible for a distribution of an RFP to a specific target level and is visible from the Target Location screen or from Send History.

Status Values generated on Local System prior to, or during, Send Process:

NONE	Send not attempted
IGN	Target Ignored by user
SPND	Send has been submitted for processing and is waiting to begin
SNDB	Send Package being built. This is performed by a batch job that runs specifically for the RFP Send Batch. The build consists of packaging all necessary source, objects and metadata into a save file.
SNDQ	The save file is completely build and has is sitting on the queue for the MDSEND job assigned to the target location.
SPRG	Send in progress - the MDSEND job is transferring the save file to the target location using the method defined for the location.
SENT	RFP has been successfully sent
SERR	An error occurred while trying to send the RFP

Status Values generated for distributed RFP on Target System and logged locally using DDM:

RCVD	RFP has been successfully received
RWRN	RFP has been received, but warnings occurred
RERR	An error occurred while trying to receive the RFP
CLOS	RFP has been manually closed without installing
MERG	Object Requests on RFP have been merged into a different RFP
SBMP	RFP has been submitted for the compile/bundle steps and is waiting to begin
SBM	RFP submission (compile/bundle steps) in progress
SBME	An error occurred while trying to bundle the RFP
APND	RFP is waiting for installation approval
APRV	RFP has been approved for installation
RAP	MDRapid data mapping in progress
IPND	RFP has been submitted for installation and is waiting to begin
IPRG	RFP Installation in progress
INST	RFP has been successfully installed
IWRN	RFP has been installed, but warnings occurred
IERR	An error occurred while trying to install the RFP

Special Filter Status Values for limiting the listings:

*ACT	Any active status – not IGN, INST or IWRN
*SND	Any send status
*RCV	Any receive status
*SBM	Any submit status
*APR	Any approve status
*INS	Any install status

10.7 MDSNDRFP – Send RFPs command

Command **MDSNDRFP** in library MDCMS(env) provides the ability to schedule or programmatically send open RFPs to levels on target systems.

Restrictions:

- The RFP must be open in the send list and none of the objects in the RFP may be waiting for MDWorkflow acceptance or be blocked by a Status Boundary. The RFP will only be sent to unignored target levels where the installation hasn't completed yet.
- As a safety precaution, at least one of the following parameters must be passed with a value other than the default: APPL, FLVL, TLVL, FRFP, TRFP, LOC, LOCGRP, FTLVL, TTLVL or PROJ.

MDSNDRFP Parameters

Name	Type	Length	Description
APPL	CHAR	6	Application Code or *ALL for any application
FLVL	INTEGER	3	Minimum Application Level to consider
TLVL	INTEGER	3	Maximum Application Level to consider
FRFP	INTEGER	7	Minimum RFP Number to consider
TRFP	INTEGER	7	Maximum RFP Number to consider
LOC	CHAR	10	The Location to send the RFP to *ALLDFT = All target locations defined for the RFP's level that have the Default to Send property set to Y=Yes or M=Yes for Manual Send. *ALL = All target locations defined for the RFP's level
LOCGRP	CHAR	10	The Location Group to send the RFP to. MDCMS will only send to locations that meet the value for parameter LOC and LOCGRP. *ALL = the locations to send to aren't limited to a specific group
FTLVL	INTEGER	3	The minimum application level on the target system to send to
TTLVL	INTEGER	3	The maximum application level on the target system to send to
MERGE	CHAR	4	Specifies if, in the case of multiple RFPs for the same local level, they should be merged into a single RFP before sending. The merge will occur for each level and result in the lowest RFP number for the level being the container for all of the impacted objects. *NO = each RFP will be sent separately *YES = All RFPs for the same application level will be merged into the lowest RFP so that a single RFP is sent to the target locations for that level.
RESEND	CHAR	4	Specifies if an RFP should be sent to a target level, if it has already been sent to that level. If the installation completed for the target level, then the RFP won't be resent. *NO = a target level will be omitted, if the RFP has already been sent to it *YES = the RFP will be resent to a target level, even if it had been sent before, as long as the installation hasn't completed on the target level.
INSDT	CHAR	8	Specifies the date that the RFP should be scheduled to be installed on the target level. It will be sent immediately, and then, if the validation, compile and approval phase is ok, will be installed at the given date and time, if the target level is set to install automatically.

			*CURRENT = the installation of the RFP will occur on the same date as the approval is given. If the installation time is set to *IMMED, the installation will occur immediately. Otherwise, specify a date in format YYYYMMDD
INSTM	CHAR	6	Specifies the time of day that the RFP should be scheduled to be installed on the target level. It will be sent immediately, and then, if the validation, compile and approval phase is ok, will be installed at the given date and time, if the target level is set to install automatically. *IMMED = the installation of the RFP will occur as soon as approval is given for the RFP on the target. Otherwise, specify a time in format HHMMSS
TZONE	CHAR	7	Specifies if the scheduled install date/time is based on the time zone of the sending system or the time zone of the target system. *TARGET = the installation date/time is based on the time zone of the target system. *LOCAL = the installation date/time is based on the time zone of the local sending system.
PROJ	CHAR	12	Project Filter – only send RFP if one or more Objects in the RFP are requested for the Project
TASK	INTEGER	7	Task Filter – only send RFP if one or more Objects in the RFP are requested for the Project Task
STSK	INTEGER	7	Subtask Filter – only send RFP if one or more Objects in the RFP are requested for the Project Subtask
PIPE	CHAR	10	Pipeline Filter - Specifies the Pipeline Server ID of a Pipeline TraceKey request. This value is required if a value for TRCKEY is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
TRCKEY	CHAR	128	Pipeline TraceKey Filter - Specifies the Pipeline TraceKey of a Pipeline TraceKey request. This value is required if a value for PIPE is provided. If values for PIPE/TRCKEY are provided, an RFP will only be included if it contains an object request of type *PIPE with the Pipeline server ID and TraceKey in the object name.
BATCH	CHAR	6	Specifies if the target levels are part of a batch send, so that a single process will send to several different targets at the same time rather than each one individually. This provides a way to avoid conflicts when trying to send to multiple targets for the same RFP using multiple calls to this command. *ONLY - The send should be invoked immediately without batching multiple calls to this command together. *FIRST - Any selected targets in this call to MDSNDRFP are to be placed in an initialized batch list per RFP. This should be the value used for the first MDSNDRFP call for a batch. *ADD - Any selected targets in this call to MDSNDRFP will be appended to an existing list per RFP. If the list for a specific RFP doesn't exist yet, it will be started. *LAST - Any selected targets in this call to MDSNDRFP will be appended to an existing list per RFP. If the list for a specific RFP doesn't exist yet, it will be started. The send for the entire batch list per RFP will then be immediately processed. This must be the value used for the last MDSNDRFP call for a batch.

ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDSBMRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

10.8 MDADDSOG – Add MDCMS Send Object Group command

Command **MDADDSOG** in library MDCMS(env) provides the ability to create an RFP in the Send list containing all objects associated with an MDWorkflow Object Group based on that group's object inclusion and exclusion rules.

If successful, the RFP will be available in the Send listing ready to be sent.

Each MDADDSOG transaction is logged in MDCMS/MDDASOG. In addition to displaying the input parameters, the log also shows the generated RFP Number, and, if an exception occurs, a short description of the error.

Restrictions:

- The user entered for parameter USER must have MDSEC authority to Edit RFPs in Send List (code 48) for the entered Application Level as well as authority to use the Project (and Task/Subtask, if entered). .
- The user performing MDADDSOG must have at least *USE authority for the USER parameter profile.
- The user performing MDCRTSCO must have been granted authority to execute the command in the MDSEC Command Security listing.

MDADDSOG Parameters

Name	Type	Length	Description
APPL	CHAR	6	Application to send from
LVL	INTEGER	3	Application Level to send from
OGRP	CHAR	10	The MDWorkflow Object Group
RFPD	CHAR	160	The description to be placed on the RFP in the Send List
PROJ	CHAR	12	A valid Project ID to be applied to each object
TASK	INTEGER	7	The optional Task Number within the Project to be applied to each object
STSK	INTEGER	7	The optional Subtask Number within the Project Task to be applied to each object
USER	CHAR	10	The User ID to apply to the Send RFP and its objects *USER – the user of the job invoking the command
LOC	CHAR	10	The Location to send the RFP to by default when the send occurs *ALL = All target locations defined for the RFP's level that have the Default to Send property set to Y=Yes or M=Yes for Manual Send.
TLVL	INTEGER	3	The target level of remote locations to send to by default. 0 = all defined target levels for all default locations or the specific location in parameter LOC.
ENV	CHAR	4	Specifies the MDCMS environment that should be used when running the command. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
VREF	CHAR	20	Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDASOG table. Any value up to 20 characters in length can be used.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDSBMRFP Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason>

			*ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

10.9 MDADDSRQ – Generate Object Request Records for Send RFP command

MDCMS is delivered with a command-based API that allows external tools or applications to create Object Requests within an RFP in the send list in MDCMS.

The MDCMS command is named ***MDADDSRQ*** and is located in library MDCMS. It is not necessary to have the MD libraries in the library list prior to using this command. If you are unable to invoke a command from your tool, you can also directly call program ***MDADDSRQ*** in library MDCMS. In this case, be certain that the parameter order and formats sent to the program exactly match the parameters in command MDADDSRQ.

All MDADDSRQ API transactions are logged to file MDCMS/MDDASRQ.

10.9.1 MDADDREQ Parameter Table

KEYWORD	Description	Type	Length
APPL	Application	CHAR	6
LVL	Level	INTEGER	3
OBJT	Object Type	CHAR	7
ATTR	MDCMS Attribute	CHAR	10
OBJN	Object Name	CHAR	128
RPTH	Object Relative Path	CHAR	240
SRCN	Source Name	CHAR	128
RSN	Request Reason	CHAR	10
USER	Programmer	CHAR	10
PROJ	Project	CHAR	12
TASK	Task	INTEGER	7
STSK	Subtask	INTEGER	7
ARFP	Assign RFP	CHAR	4
RFP	RFP Number	INTEGER	7
RFPD	RFP Description	CHAR	160
CREQ	Create Requests for Next Level	CHAR	4
AREQ	Assign RFP to Next Level Reqs	CHAR	7
SREQ	Place RFP in Send List	CHAR	7
CSQO	Compile Subsequence	INTEGER	5
DATA	Data Origin	CHAR	60
DMBR	Data Member to Copy	CHAR	10
RPGM	Use MDRapid	CHAR	10
RJRN	Reapply Journals	CHAR	4
RCST	Reapply Constraints	CHAR	4
RTRG	Reapply Triggers	CHAR	4
RLFM	Reapply LF Members	CHAR	4
DIR	Is IFS Directory	CHAR	4
ENV	MDCMS Environment ID	CHAR	4
VREF	Vendor Reference ID	CHAR	20
EMSG	Exception Message	CHAR	7

10.9.2 Detailed Description of MDADDREQ Parameters

Application (APPL)

The target MDCMS Application code for the request
This is a required parameter.

Level (LVL)

The local MDCMS Promotion Level for the request to be sent from.
This is a required parameter.

Object Type (OBJT)

The System or MDCMS Object Type code for the Object. For example: *PGM for a program or *IFS for an IFS file.
This is a required parameter.

MDCMS Attribute (ATTR)

The MDCMS Attribute code that identifies the behaviour and target locations for the requested object.
This is a required parameter.

Object Name (OBJN)

The name of the Object to be requested.
For *SOURCE, this would be the name of the member
For *MSGD, this would be the name of the Message ID
For *DTAGRP, this would be the value of the record key(s)

This is a required parameter.

Relative Path (RPTH)

Specifies the relative portion of an IFS path, starting with /, that will be deployed with the object.
For example, if the *IFS attribute has a target fixed directory defined as /srv/dev and this object should be deployed to /srv/dev/app1/dist, then the value of RPTH should be /app1/dist.

Member/IFS File Name (SRCN)

Specifies the name of the Source Member or IFS Source File to be requested. This parameter is ignored if attribute defined as having no source.

**OBJ* - The name of the source is the same as the name of the object

Request Reason (RSN)

The reason for the object request

*MIGRATE - a source and/or object will be migrated into the selected application level

*DELETE - an existing object will be deleted

*RECOMPILE - an object will be recompiled based on the currently active source for that environment without the source being modified

*UPDATE - this is intended for ILE programs to bind the current modules and service programs to the program. A U command (such as CHGPGM) must be defined for the attribute.

Programmer (USER)

Specifies the user profile to be indicated as the programmer for the request. If this command generates an RFP, the owner of the RFP will also be this user

*USER - the current user profile of the job invoking this command is the user

Project (PROJ)

Specifies the Project to assign to the Request. The project, if entered, must already exist and be in an open status. If the project is not yet authorized, then the user must have MDSEC authority to authorize the Project and then MDCMS will do so automatically.

Task (TASK)

Specifies the Project Task to attribute to the Request. The task, if entered, must already exist and be in an open status.

Subtask (STSK)

Specifies the Subtask to attribute to the Request. The Subtask, if entered, must already exist and be in an open status.

Assign Request to RFP (ARFP)

Specifies if the request should be immediately assigned to an RFP and the method of determining the RFP.

*AUTO - MDCMS searches for an open RFP matching the Application, Level, User and Description values entered for this command. If an RFP is found the Request will be assigned to that RFP. If an RFP is not found, a new RFP will be created.

*YES - The request will be assigned to the RFP number based on parameter RFP

*NEW - A new RFP will be created for the Application, Level, User and Description values entered for this command.

Existing RFP Number (RFP)

Specifies the RFP to assign to the Request. Will only be used if parameter ARFP is set to *YES.

RFP Description (RFPD)

The description to be used for a new RFP or to search for an existing RFP. Will only be used if parameter ARFP is *AUTO or *NEW.

Compile Subsequence (CSQO)

Specifies the sequence for compiling (lowest first) for objects in same RFP that have the same primary sort sequence in order to handle potential dependency issues. This parameter is not relevant for *IFS Objects.

Data Origin for Physical Files or SQL Tables (DATA)

Specifies the origin of the data that should be copied into a new or modified physical file/SQL Table

**SAME* - The data is mapped from the old format of the modified file to the new format of the file of the same name/target library.

**MIGRATE* - The data is migrated with the file from the check-out location to the target library.

**NONE* - The data is not migrated. The new file format will be empty. *NONE is required for a logical file if it is replacing a physical file.

character-value - Specify the name of the file from which to migrate the data. The data origin file must exist in the same library as the target file at the time of installation.

Data Member to Copy (DMBR)

Specifies the member(s) to copy to the new version of a physical file/SQL Table or to migrate from the prior environment.

**ALL* – All existing members are included for the copy. If the target is an SQL Table, only the first member will be copied.

**FIRST* – The first member in the originating file is copied. Any other members are omitted.

character-value – The name of the specific member to be copied from the originating file. Any other members are omitted.

Use MDRapid (RPGM)

Specifies if MDRapid should be used to map the data from the old version of a file to the new version.

**DFT* - MDRapid will be used if the number of records in the file is at least the number in the MDRapid template for the attribute. Otherwise not.

**YES* - MDRapid will be used for the file, even if it wouldn't qualify for MDRapid processing.

**NO* - MDRapid will not be used for the file, even if it would qualify for MDRapid processing.

Automatically Reapply Journaling (RJRN)

Specifies if the new version of a table or access path should have the journaling attributes applied to it that belonged to the file that it replaced.

**DFT* - The default defined for the Application is used

**YES* - If journaling was used on the prior version of the file, it will be applied to the new version.

**NO* - Journaling will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

Automatically Reapply Constraints (RCST)

Specifies if the new version of a table should have the constraints applied to it that belonged to the table that it replaced.

**DFT* - The default defined for the Application is used

**YES* - If constraints were used for the prior version of the table, they will be applied to the new version.

**NO* - Constraints will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

Automatically Reapply Triggers (RTRG)

Specifies if the new version of a table should have the system (non-SQL) triggers applied to it that belonged to the table that it replaced.

**DFT* - The default defined for the Application is used

**YES* - If SQL triggers were used for the prior version of the table, they will be applied to the new version. Any SQL triggers that should be re-applied should be requested for recompile and placed on same RFP as the file.

**NO* - Triggers will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

Automatically Reapply Logical File Members (RLFM)

Specifies if the new version of a logical file should have the members added to it that belonged to the logical file that it replaced.

**DFT* - The default defined for the Application is used

**YES* - Any members that existed for the prior version of the logical file will be added to the new version.

**NO* - Members will not be automatically reapplied. Commands run during the installation, or external processes, will determine the definition.

IFS Object is a Directory (DIR)

Specifies whether or not the Request of an object of type *IFS is a directory.

*NO - The Requested Object is not an IFS Directory

*YES - The Requested Object is an IFS Directory

Environment ID (ENV)

Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST.

*DFT - The default environment will be used. This correlates to library MDCMS.

Vendor Reference ID (VREF)

Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDAREQ table. Any value up to 20 characters in length can be used.

Exception Message Returned (EMSG)

Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail.

*DIAG - A diagnostic message will be placed in the calling program's message queue in the following format:

MDADDREQ Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason>

If the Vendor Reference isn't passed to MDADDREQ, it won't be included in the diagnostic message.

*ESCAPE - The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor.

*NONE - An exception message will not be returned to the calling program's message queue.

10.10 MDCRTSCO – Create MDCMS Send RFP for Changed Objects command

Command **MDCRTSCO** in library MDCMS(env) provides the ability to create an RFP in the Send list containing all objects in a specific library that have been created or changed since a specified minimum date. If the date is unspecified, all objects in the library will be considered for sending. In order for an send request to be created for an object, an attribute must exist for the given level with the named library defined as the target object library for the attribute.

If successful, the RFP will be available in the Send listing ready to be sent.

Each MDCRTSCO transaction is logged in MDCMS/MDDCSCO. In addition to displaying the input parameters, the log also shows the generated RFP Number, number of requested objects and, if an exception occurs, a short description of the error.

Restrictions:

- The user entered for parameter USER must have MDSEC authority to Edit RFPs in Send List (code 48) for the entered Application Level as well as authority to use the Project (and Task/Subtask, if entered). .
- The user performing MDCRTSCO must have at least *USE authority for the USER parameter profile.
- The user performing MDCRTSCO must have been granted authority to execute the command in the MDSEC Command Security listing.

MDCRTSCO Parameters

Name	Type	Length	Description
APPL	CHAR	6	Application to send from
LVL	INTEGER	3	Application Level to send from
OLIB	CHAR	10	An Object Library defined for at least 1 attribute for the given application and level.
RFPD	CHAR	160	The description to be placed on the RFP in the Send List
PROJ	CHAR	12	A valid Project ID to be applied to each object
TASK	INTEGER	7	The optional Task Number within the Project to be applied to each object
STSK	INTEGER	7	The optional Subtask Number within the Project Task to be applied to each object
DATE	INTEGER	8	The minimum date that an object was created or changed (based on parameter DATT). Leave 0 if no minimum. If entered, the value must be in format YYYYMMDD.
DATT	CHAR	7	The types of object dates to compare to the minimum date provided in parameter DATE. *CREATE only the creation date for the object is considered *CHANGE The last change date for the object is considered. If unchanged, the create date is considered.
USER	CHAR	10	The User ID to apply to the Send RFP and its objects *USER – the user of the job invoking the command
ENV	CHAR	4	Specifies the MDCMS environment that should be used when running the command. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *DFT = The default environment will be used. This correlates to library MDCMS.
VREF	CHAR	20	Specifies the Vendor Generated Identifier in order for an external process to easily identify the transaction record in the MDDASOG table. Any value up to 20 characters in length can be used.

EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDSBMRFP Exception. Object=<OBJN>, Vendor Reference=<VREF>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

10.11 MDTGTSUM – MD RFP Target Location Summary command

Command **MDTGTSUM** in library MDCMS(env) provides the ability to summarize the status of some or all target locations for the send of an RFP.

Each MDTGTSUM execution and result is logged in MDCMS/MDDTSUM.

Each result can also be passed to a routine of type command, java or program in JSON format for further processing.

MDTGTSUM Parameters

Name	Type	Length	Description
APPL	CHAR	6	Application Code – required value
RFP	INTEGER	7	RFP Number – required value
LOC	CHAR	10	The Target Location to include in the summary *ALLDFT = All target locations defined for the RFP's level that have the Default to Send property set to Y=Yes or M=Yes for Manual Send. *ALL = All target locations defined for the RFP's level
LOCGRP	CHAR	10	The Location Group to include in the Summary. MDCMS will only send to locations that meet the value for parameter LOC and LOCGRP. *ALL = the locations to send to aren't limited to a specific group
RTNTYP	CHAR	5	The type of routine to invoke and pass the summary result to. *NONE = A routine won't be invoked with the result. The result will only be written to a record in table MDDTSUM. *CMD = Invoke a command with the JSON result. The command must consist of 1 character parameter of length 5800 with the keyword of RESULT. *JAVA = Invoke a Java class or JAR file. The parameter type (PRMTYP) must be *FILE when using java. The file path is passed as a single argument to the java class. *PGM = Call a program. 1 character parameter of length 5800 will be passed that contains the result in JSON format.
RTNPTH	CHAR	160	The path to the routine, if the routine type isn't *NONE. When type = *CMD, the path should be the command name or library name/command name and nothing else When type = *JAVA, the path should be the full IFS path of the java class or JAR file, including the file name. When type = *PGM, the path should be the program name or library name/program name and nothing else
PRMTYP	CHAR	7	The type of parameter that is passed to the command, java class or program. *STRING = The JSON structure is passed as a string. If the routine type (RTNTYP) is java, *STRING is invalid and *FILE will be used automatically. *FILE = The JSON structure will be written to an IFS file in the directory defined in parameter File Directory (FILDIR). The file name is generated automatically with naming pattern: mdtgtsum_<appl>_<rfp>_<timestamp>.txt the path of the file, including the directory and name, are passed to the routine instead of JSON string itself. The routine

			can then work with the file directly.
FILDIR	CHAR	160	If the Parameter Type (PRMTYP) is set to *FILE, the IFS directory where the file should be written is to be provided here. The directory must already exist when the command is invoked.
ENV	CHAR	4	Specifies the MDCMS environment that should be used to place the Request. The ID correlates to the suffix of the MDCMS library name. For example, TEST correlates to library MDCMSTEST. *CUR = the current environment – recommended when invoking this command from an MDCMS exit point. *DFT = The default environment will be used. This correlates to library MDCMS.
EMSG	CHAR	7	Specifies if and to what extent an exception message should be returned to the calling program. An exception message occurs when an input parameter value is invalid, causing the addition of the request to fail. *DIAG = A diagnostic message will be placed in the calling program's message queue in the following format: MDSBMRFP Exception. Object=<OBJN>, Reason=<the error reason> *ESCAPE = The full diagnostic message as described above will be placed in the calling program's message queue and then followed by escape message CPF0001 for which the calling program can monitor. *NONE = An exception message will not be returned to the calling program's message queue.

Example of the JSON Format of the MDTGTSUM result


```
{
 "application": "EXAM",
 "level": 50,
 "RFP": 1234567,
 "RFPDescription": "Example RFP sent to 2 locations",
 "locations": [
  {
   "id": "LOC1",
   "targetLevel": 60,
   "targetRFP": 5959,
   "severity": 10,
   "status": "INST"
  },
  {
   "id": "LOC2",
   "targetLevel": 65,
   "targetRFP": 6162,
   "severity": 20,
   "status": "IWRN"
  }
 ],
 "maximumSeverity": 20,
 "projects": [
  {
   "id": "PROJ1",
   "task": 1565,
   "subtask": 0
  },
  {
   "id": "PROJ3",
   "task": 0,
   "subtask": 0
  }
 ]
}
```


Severity values:
10=Ignored or Installed without Warnings
20=Installed with Warnings
25=Still Ongoing
30=Terminated due to Error

11 Receive Promotion from Remote System

```
MDLLWR1                          Company Name                          11/19/11
SCRN1                 Receive Promotion from Remote System             10:37:31


                    MD Filename: __________

                      Job Queue: *JOBD_____
                        Library:   __________

                Transmitted via: 1      1=SNA
                                        2=FTP/Other
                                        3=Tape
                                        4=Optical Device

                   Netfile User: QPGMR_____


 Enter=Confirm  F4=Browse  F10=Log  F11=Output  F12=Cancel  F21=Sys Command
```

If the automatic receipt of Promotions is not used (see Promotion Level settings and API's MDRCVIFS or MDRCVSNA), then MDCMS promotions sent from remote systems are received using the above display, which is option 9 from the MDCMS Main Menu.

Promotion packages may be received here via SNA, FTP, GoAnywhere, XCOM, tape, or optical device. MDCMS remembers which method was used the last time that a promotion was received. It is best to set the Transmitted via parameter (if incorrect) before entering the other information

MD Filename
Enter the name of the file containing the promotion. MD promotion packages are always named 'MD' and the 1-character Host ID of the sending system and the 6-digit RFP number. Press **F4=Browse** to browse the list of outstanding promotion packages.

Job Queue/Library
The actual receive job is submitted to batch. The subsystem job queue/library may be specified for the receive job.

Netfile User
If the promotion package was sent via SNA, and a specific Netfile user was entered (default is QPGMR) then that same user id must be entered here to receive the promotion.

If the promotion is transmitted via tape or optical device, an additional parameter for Tape Device and Optical Device will prior to confirmation. These parameters are required for receiving the promotion or for browsing the MD promotion packages that exist on each media.

Press **Enter** to submit the receive job.

The submitted job creates a temporary library with the same name as the file. All source and objects related to the promotion are placed in this temporary library. After the objects are installed, the temporary library is deleted.

New MDCMS request records are written for the source/objects and a new RFP number is generated for the received items. The Promotion will then be ready to be installed into the lowest level for the application, unless a higher target level was specified when the Promotion was sent.

If Auto-Submit for the Promotion Level is set to Y, then the compilation portion of the installation will begin as soon as the receipt has completed.

Common Receive Exceptions

1) Promotion Level not defined for the sent application and target level. The Promotion Level will need to be defined (or the settings sent from another system).
2) The job description assigned to the level is corrupt (missing library, job queue, user, authority, etc.). Verify the parameters of the job description.
3) If a sent object is already requested on this system, and the object is in the process of being installed (Status 02 or higher), then a new request record will not be written for the object and report MDRCVERR is generated. Receive Error Commands, if defined for the Promotion Level, will be processed.
4) If the attribute for a sent object is not defined on this system, then a new request record will not be written for the object and report MDRCVERR is generated. Receive Error Commands, if defined for the Promotion Level, will be processed.
5) If a sent object is already requested on this system from a different RFP, and the object is only in reserved status (Status 00 or 01), then the existing request will be modified to migrate the source/object from the temporary library of this promotion at installation time and a warning will be generated. Receive Warning Commands, if defined for the Promotion Level, will be processed.
6) If the same RFP is resent to this location and objects from the prior send are already requested in reserved status (Status 00 or 01), then the existing RFP will be deleted entirely and replaced by the resent RFP. A warning will be generated. Receive Warning Commands, if defined for the Promotion Level, will be processed.

11.1 RFP Receive Log

F10 can be pressed from the Receive Promotion screen to view a log of all attempts to automatically or manually receive an RFP onto this system.

For each attempt, any warnings or exceptions can be viewed.

If an RFP was successfully sent, and should have been automatically received, but doesn't appear in the receive log, then perform DSPMSG QSYSOPR to see the reason why the receive job couldn't be submitted.

11.2 MDRCVIFS – Receive RFP/Settings from IFS command

When RFPs or settings are received via MDFTP (MDF), GoAnywhere™ (GOA) or a manual Save File (SFF) deployment from another system, they must be staged in IFS Folder /MDCMS/SEND/(instance).

If a DDM connection is defined in MDCMS between the sending system and the receiving system, and MDPUSH or MDPULL is also defined to run, then MDRCVIFS isn't necessary unless for SFF.

When for SFF or DDM isn't available, then Service ***MDRCVIFS - MDCMS Receive RFPs in IFS*** is used to check for, and process, those RFP files. MDRCVIFS can be started from the Service List in the MDCMS Setup Menu, but is recommended to be started from a scheduled job using command MDRCVIFS.

MDRCVIFS Parameters

Environment ID	The name of the MDCMS instance (or suffix) - *DFT refers to MDCMS being used in library MDCMS. For a different library suffix, this would be entered for the environment ID.
Submit Job	*YES – a job named MDRIFS(env) will be submitted to the entered Job Queue *NO – the MDRCVIFS process will run within the current job
Job Queue	*DFT – submit to the queue defined for the MDRCVIFS service *JOBD – submit to the default queue for the running job profile The name of the job queue to submit MDRCVIFS to
Job Queue Library	The library of the job queue to submit MDRCVIFS to or *LIBL if the job queue is located in the current library list
Delay between Checks	*DFT – the default number of seconds between checking the IFS folder for candidates that is defined for the MDRCVIFS service The number of seconds to wait between checks (1-9999)
Time of Day to auto-end Job	*DFT – end at the time defined for the MDRCVIFS service *NEVER – the MDRCVIFS job shouldn't end automatically – it should run until the job is forcibly ended. A specific time to end in format HH:MM:SS

11.3 MDRCVRMT – Receive RFP/Settings from a Remote Location

If firewall rules are in place that don't allow in-bound communication for the transfer of files, but out-bound communication is allowed, then MDRCVRMT can be used to receive RFPs or settings that are staged on another partition.

The sending system needs to be configured so that distribution method SFF (save-file containing full MDCMS information) is used for this Location ID to place the RFP or settings in a specified IFS folder.

This partition (the receiving location) needs to be configured to listen for save files in the remote IFS folder using distribution method FTP (IBM Native FTP) or MDF (MDCMS FTP client). To do this, configure the remote location in the OS/400 Locations settings and take the following steps:

1) MDCMS
2) 1=MDCMS Setup Menu
3) 13=Services
4) Option 2=Edit for Service MDRCVRMT
5) F10=More Settings
6) F6=Add and then enter the Location ID of the location to pull from as well as the full path of the remote IFS folder where the save-files are staged on the location to pull from.

Service ***MDRCVRMT - MDCMS Receive RFPs from Remote Locs*** is then used to check for, and process, staged RFP or settings files for each location defined in the MDRCVRMT settings list.

MDRCVRMT can be started from the Service List in the MDCMS Setup Menu, but it is recommended to be started from a scheduled job using command MDRCVRMT.

MDRCVRMT Parameters

Environment ID	The name of the MDCMS instance (or suffix) - *DFT refers to MDCMS being used in library MDCMS. For a different library suffix, this would be entered for the environment ID.
Submit Job	*YES – a job named MDRRMT(env) will be submitted to the entered Job Queue *NO – the MDRCVRMT process will run within the current job
Job Queue	*DFT – submit to the queue defined for the MDRCVRMT service *JOBD – submit to the default queue for the running job profile The name of the job queue to submit MDRCVRMT to
Job Queue Library	The library of the job queue to submit MDRCVRMT to or *LIBL if the job queue is located in the current library list
Delay between Checks	*DFT – the default number of seconds between checking the IFS folder for candidates that is defined for the MDRCVRMT service The number of seconds to wait between checks (1-9999)
Time of Day to auto-end Job	*DFT – end at the time defined for the MDRCVRMT service *NEVER – the MDRCVRMT job shouldn't end automatically – it should run until the job is forcibly ended. A specific time to end in format HH:MM:SS

11.4 MDRCVSNA – Receive RFP/Settings from SNA command

If promotions are sent via SNA, or if they are sent via ObjectConnect and a DDM connection isn't defined on the sending system for use on the target system, then an external process needs to be invoked, if hands-free automatic receipt of Promotions is desired.

Service ***MDRCVSNA - MDCMS Receive RFPs via SNA*** is then used to check for, and process, those RFP files. MDRCVSNA can be started from the Service List in the MDCMS Setup Menu, but is recommended to be started from a scheduled job using command MDRCVSNA.

MDRCVSNA Parameters

SNA Netfile User	*DFT – the default SNADS user queue that the RFPs were sent to that is defined for the MDRCVSNA service *SAVF – if the RFP was transferred using ObjectConnect (SAVRSTOBJ), then the save file will already be in the MDCMS library, but not known to MDCMS. User *SAVF to periodically check for save files in MDCMS. A valid SNADS user profile
Environment ID	The name of the MDCMS instance (or suffix) - *DFT refers to MDCMS being used in library MDCMS. For a different library suffix, this would be entered for the environment ID.
Submit Job	*YES – a job named MDRSNA(env) will be submitted to the entered Job Queue *NO – the MDRCVSNA process will run within the current job
Job Queue	*DFT – submit to the queue defined for the MDRCVSNA service *JOBD – submit to the default queue for the running job profile The name of the job queue to submit MDRCVSNA to
Job Queue Library	The library of the job queue to submit MDRCVSNA to or *LIBL if the job queue is located in the current library list
Delay between Checks	*DFT – the default number of seconds between checking the SNADS queue for candidates that is defined for the MDRCVSNA service The number of seconds to wait between checks (1-9999)
Time of Day to auto-end Job	*DFT – end at the time defined for the MDRCVSNA service *NEVER – the MDRCVSNA job shouldn't end automatically – it should run until the job is forcibly ended. A specific time to end in format HH:MM:SS

12 Reporting

Reports (MD Output) generated within MDSEC, MDXREF and MDCMS can be viewed, printed, exported or emailed by pressing **F11** from most screens.

```
MDCOUTF                          MD Production 6.1                        10.03.12
SCRN1                                MD Output                            17:47:05
           User      Report    Object
Filter by: MMORGAN   ________  __________

Type options, press Enter.
 3=Copy to PF  4=Delete   5=Display   6=Print   E=Export

Opt User         Date     Time    Report  Object     Library         Length Width
 _  MMORGAN    24.02.11 17:36:18 PGMSRCH MDDCLWD    MDCMST             107    80
 _  MMORGAN    31.03.11  9:10:05 RFPHIST                               142    92
 _  MMORGAN    14.04.11 21:34:18 LIBCOMP MDCMS      MDCMST              28   120
 _  MMORGAN    23.05.11 20:50:20 COMPARE MDDCMSE    MDCMST             121   315
 _  MMORGAN    23.05.11 20:53:01 JOURNAL MDACST     MDADM               15   643
 _  MMORGAN    23.05.11 21:01:39 PGMSRCH MDDCMSD    MDCMST             200    80
 _  MMORGAN    29.09.11  9:23:16 PROJECT                               25    92
 _  MMORGAN    15.11.11 22:27:49 FLDLIST MDDTASK    MDCMST              56   112
 _  MMORGAN    22.02.12 13:42:05 JOURNAL MDAINV     MDADM               41   130
 _  MMORGAN     5.03.12 16:03:41 RFPHIST                               27    92


                                                                        Bottom
 F3=Exit   F4=Browse   F5=Refresh   F7=Spooled Output   F17=Top   F18=Bottom
```

Filters
Enter a value into a filter field to limit the listing to items matching the filter(s). Possible values may be selected by pressing **F4=Browse** while the cursor is positioned on the filter field.

Options
3=Copy to PF – Copy the detail contents of the report into a formatted table (DDS Physical File). This provides a simple means to extract information out of the MD database for use in SQL, Queries or programs.
4=Delete – permanently delete the report
5=Display – view the report contents directly in the screen
6=Print – print the report contents to a spooled file
E=Export – Export the report to a CSV, PDF, TXT or XLSX formatted file. The file can be placed in IFS or emailed to one or more recipients. See the parameters for command MDRUNRPT for more information.

Function Keys:
F4=Browse – Browse possible values for a filter field
F5=Refresh
F7=Spooled Output – Display and manage spooled files
F17=Top – Position Cursor to the first entry in the list
F18=Bottom – Position Cursor to the last entry in the list

12.1 MDRUNRPT – Run MD Report command

Certain reports within MDSEC, MDXREF and MDCMS allow for saved report definitions to be run directly from a command line. This gives the users the ability to schedule reports to be run on a periodic basis and to have the output automatically printed or exported. This is also helpful during Project testing to allow the same parameters to be quickly used after each phase of a test.

The following screen is displayed to get the report run parameters.

```
                        Run MD Report (MDRUNRPT)

 Type choices, press Enter.

 Report Name  . . . . . .  _______      COMPARE, JOURNAL, MDSEC...
 User Profile . . . . . .  _____ _____  User Profile
 Report Definition  . . . . . .  ____________________________________________
_____
 MDCMS Instance . . . . . .  *DFT       *DFT, *SAME, Instance
 Print result to spooled file . .  *NO  *YES, *NO
 Copy result to physical file . .  *NO  *YES, *NO
 Export result to IFS file  . . .  *NO  *YES, *NO
 Email result . . . . . .  *NO          *YES, *NO
 Filename . . . . . .  ____________________________________________________
_____________________________________
 Append Timestamp to filename . .  *YES *YES, *NO
 Directory  . . . . . .  ____________________________________________________
 ____________________________________

 Report Format  . . . . . .  XLSX       CSV, PDF, TXT, XLSX
 csv Field Delimiter  . . . . . .  ','  Field Delimiter
 Address to receive Email . . . .  *NONE____________________________________
 ____________________________________
 User to receive Email  . . . . .  *NONE  User ID
 Group to receive Email . . . . .  *NONE  Group ID

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Report Name
COMPARE – the MDXREF Data Comparison Report
JOURNAL – the MD Journal Analysis Report
MDSEC – the MDSEC Authorization Report
NOTCMS – the MDCMS Audit Report listing object changes made outside of MDCMS
PROJECT – the MDCMS Project Report
PRJTASK – the MDCMS Project Task Report
PRJTIME – the MDCMS Project Time Entry Report
RFPHIST – the MDCMS Audit Report listing object changes made within MDCMS

User Profile
The name of the user profile that defined the report definition

Report Definition
The name of the report definition

Print result to spooled file
*NO – the resulting report will not be automatically printed to a spooled file
*YES – the resulting report will be automatically printed to a spooled file
Copy result to physical file
*NO – the resulting report will not be automatically exported to a physical file

*YES – the resulting report will be automatically exported to a physical file (table)

Export result to IFS file
*NO – the resulting report will not be automatically exported to an IFS file
*YES – the resulting report will be automatically exported to an IFS file

Email result
*NO – the resulting report will not be automatically emailed to recipients
*YES – the resulting report will be automatically emailed to recipients

Copy to Physical file
The name of the physical file (table) to contain the detail contents of the report. Each column in the report will be placed in a separate formatted field. If the file already exists, it will be replaced.

Copy to Library
The IBM i library that is to contain the Physical file

Filename
If the results are to be exported or emailed, this is the name of the IFS file to receive the results. The file type (.CSV, .PDF, .TXT or .XLSX) will be automatically appended to the end of the name.

Timestamp
*NO – a timestamp will not be appended to the file name
*YES – a timestamp in the format of YYYMMDD_HHMMSS will be appended to the file name

Directory
If the results are to be exported, this is the name of the IFS directory to receive the results. The directory path should begin with the root character "/".

Report Format
CSV – the exported report will be placed in a comma separated value file which can then be opened in Microsoft excel or similar spreadsheet programs.
PDF - the exported report will be converted to PDF. JVM 1.5 or higher is required
TXT – the exported report will be placed in a text file with the same layout as the on-line report.
XLSX – the exported report will be converted to the excel format. JVM 1.5 or higher is required

csv Field Delimiter
The character to be used to separate fields in a csv file

Address to receive Email
A specific email address to receive the report

User to receive Email
A user id to receive the report - the address for the user will be retrieved from the MDCMS email address table.

Group to receive Email
All users for the entered group id to receive the report – this parameter requires MDWorkflow groups to be present.

12.2 MDEXPFILE – Export Data command

The MDEXPFILE command provides the functionality to export the contents of any physical file to an Excel file.

The following screen is displayed to get the parameters.

```
                          MD Export File (MDEXPFILE)

 Type choices, press Enter.

 File Name  . . . . . .  __________    File
 Library  . . . . . .  . *LIBL        *LIBL, Library
 File Member  . . . . . . *FIRST       *FIRST, Member
 Report Header  . . . . . *FILETEXT
 ____________________________________

 Reorganize File  . . . . . *YES       *YES, *NO
 MDCMS Instance . . . . . . *DFT       *DFT, Instance
 Export result to IFS file  . . *NO    *YES, *NO
 Email result . . . . . . . . *NO      *YES, *NO
 Filename . . . . . . . . . . .
 ____________________________________
 Append Timestamp to filename . . *YES *YES, *NO
 Directory  . . . . . . . . . .
 ____________________________________

 Format . . . . . . . . . . . . XLSX   CSV, XLSX
 csv Field Delimiter  . . . . . ','    Field Delimiter
 Address to receive Email . . . *NONE
 ____________________________________
 User to receive Email  . . . . *NONE  User ID
 Group to receive Email . . . . *NONE  Group ID

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=Hot to use this display
F24=More keys
```

Use **F9=All parameters** to see all available parameters for command.

File Name
The name of a physical file

Library
The location of the file or *LIBL to search the library list for the file

File Member
The name of the file member or *FIRST to use the first member in the file

Report Header
The title to place in the header of the excel file and in the subject line of the email. *FILETEXT will use the object description for the file.

MDCMS Instance
A 1-4 character string of the suffix for an existing instance of MDCMS or *DFT to use MDCMS

Export result to IFS file
*NO – the resulting report will not be automatically exported to an IFS file

*YES – the resulting report will be automatically exported to an IFS file

Email result
*NO – the resulting report will not be automatically emailed to recipients
*YES – the resulting report will be automatically emailed to recipients

Filename
If the results are to be exported or emailed, this is the name of the IFS file to receive the results. The file type (.csv or .xlsx) will be automatically appended to the end of the name.

Timestamp
*NO – a timestamp will not be appended to the file name
*YES – a timestamp in the format of YYYMMDD_HHMMSS will be appended to the file name

Directory
If the results are to be exported, this is the name of the IFS directory to receive the results. The directory path should begin with the root character "/".

Report Format
CSV – the exported report will be placed in a comma separated value file which can then be opened in Microsoft Excel or similar spreadsheet programs.
XLSX – the exported report will be converted to the excel format. JVM 1.5 or higher is required

csv Field Delimiter
The character to be used to separate fields in a csv file

Address to receive Email
A specific email address to receive the report

User to receive Email
A user id to receive the report - the address for the user will be retrieved from the MDCMS email address table.

Group to receive Email
All users for the entered group id to receive the report – this parameter requires MDWorkflow groups to be present.

12.3 MDEXPSPLF – Export Spooled File command

The MDEXPSPLF command provides the functionality to export any spooled file to a text or PDF file.

The following screen is displayed to get the parameters.

```
                    MD Export Spool File (MDEXPSPLF)

 Type choices, press Enter.

 Spool Name . . . . . .          _________     Spool Name
 Job Name . . . . . .            *CURRENT      *CURRENT, Job Name
 Job Number . . . . . .          ______        Job Number
 Job User . . . . . .            __________    Job User
 Spooled file number . . . . .   *LAST         *LAST, *USRD, 1-999999
 User Data . . . . . .           __________    User Data
 MDCMS Instance . . . . . .      *DFT          *DFT, Instance
 Format . . . . . .              PDF           PDF, TXT
 File Name . . . . . .           ____________________________________________
_____________________________

 Append Timestamp to filename . .  *YES        *YES, *NO
 Report Title . . . . . .          ____________________________________________
 ____________________________________________________________________________
 _______
 Page Layout . . . . . .           *DFT        *DFT, AUTOMATIC, LANDSCAPE...
 Page Size . . . . . .             *DFT        *DFT, A3, A4, A5, B5...
 Add Page Number to each Page . .  *NO         *YES, *NO
 Export result to IFS file . . .   *NO         *YES, *NO
 Email result . . . . . .          *NO         *YES, *NO
 Directory . . . . . .             ____________________________________________
 ____________________________________
 Address to receive Email . . . .  *NONE_______________________________________
 ____________________________________
 User to receive Email . . . . .   *NONE        User ID
 Group to receive Email . . . . .  *NONE        Group ID

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
```

Use **F9=All parameters** to see all available parameters for command.

Spool Name
The name of a spooled file

Job Name
The name of the job that generated the spooled file or *CURRENT to look for the spooled file in the current job

Job Number
The number of the job that generated the spooled file

Job User
The user profile of the job that generated the spooled file Report Header

Spooled File Number
The number of the spooled file within the job
*LAST - use the most recently generated spooled file of the given name for the given job
*USRD – use the spooled file that has the same User Data value as the value in parameter USRD

User Data
The specific User Data value for the spooled file to select. Only applicable if parameter SPLNBR = *USRD

MDCMS Instance
A 1-4 character string of the suffix for an existing instance of MDCMS or *DFT to use MDCMS

Format
PDF – the spooled file will be converted to the PDF format. JVM 1.5 or higher is required
TXT – the spooled file will be converted to a text file

File Name
If the results are to be exported or emailed, this is the name of the IFS file to receive the results. The file type (.pdf or .txt) will be automatically appended to the end of the name.

Append Timestamp
*NO – a timestamp will not be appended to the file name
*YES – a timestamp in the format of YYYMMDD_HHMMSS will be appended to the file name

Report Title
The title to place in the header of the PDF file and in the subject line of the email

Page Layout
Values for PDF format:
*DFT – the layout defined in data area MDSEC(instance)/MDPDFLOUT
*SPLF – the layout based on the dimensions of the spooled file
AUTOMATIC – the layout is determined automatically based on the width of the spooled file
LANDSCAPE – the paper is rotated so that the wide edge is horizontal
PORTRAIT – the paper is rotated so that the wide edge is vertical

Page Size
Values for PDF format:
*DFT – the size defined in data area MDSEC(instance)/MDPDFSIZE
A3, A4, A5, B5, LEGAL, LETTER

Add Page Number to each Page
*NO – a page number will not be added to each page
*YES – a page number will be added to each page in the bottom right corner

Export result to IFS file
*NO – the resulting report will not be automatically exported to an IFS file
*YES – the resulting report will be automatically exported to an IFS file

Email result
*NO – the resulting report will not be automatically emailed to recipients
*YES – the resulting report will be automatically emailed to recipients

Directory
If the results are to be exported, this is the name of the IFS directory to receive the results. The directory path should begin with the root character "/".

Address to receive Email
A specific email address to receive the report

User to receive Email
A user id to receive the report - the address for the user will be retrieved from the MDCMS email address table.

Group to receive Email
All users for the entered group id to receive the report – this parameter requires MDWorkflow groups to be present.

13 MDCMS Miscellaneous Product Tools

13.1 MDCLEAR – Clear all MDCMS Activity

Command MDCLEAR can be used to clear all activity (object requests, installation history, project information, etc…) for an instance while leaving all settings intact. This can be useful in testing a version of MDCMS and then clearing the test results before using the version in Production.

In order to run this command, the user must have MDSEC authority to application md/code 3.

After entering the command, the following confirmation screen is displayed:

```
MDCCLRA                          Company Name                          11/19/11
SCRN1                       Clear ALL MDCMS Activity                   21:39:44

     WARNING!!! Pressing F10 will cause all of the following Files to be
                Cleared. The included files contain all information relating
                to Projects, RFPs, Object Requests and History.
                Settings are not cleared.

   Library      File         Description
   MDCMS        MDDCLWD      MDCMS - Send objects
   MDCMS        MDDCLWDM     MDCMS - Send Projects per Request
   MDCMS        MDDCLWH      MDCMS - Request for Promotion header
   MDCMS        MDDCLWM      MDCMS - Send Project description
   MDCMS        MDDCLWO      MDCMS - Send Object commands
   MDCMS        MDDCLWP      MDCMS - Manual Send Promotion number
   MDCMS        MDDCMSB      MDCMS Install Bound Objects - Reqn
   MDCMS        MDDCMSD      MDCMS Install Detail - Reqn
   MDCMS        MDDCMSDM     MDCMS - Projects per Request
   MDCMS        MDDCMSDP     MDCMS Pending Object Requests
   MDCMS        MDDCMSH      MDCMS - Request for Promotion
   MDCMS        MDDCMSM      MDCMS - Request for Modification
                                                                      More...
 F3=Exit    F10=Clear Activity
```

Function Keys:
F3=Exit – Leave screen without clearing the activity
F10=Clear Activity – Clear the contents of all listed files

13.2 MDMIGMD – Merge MDCMS Configuration and Activity Data

The MDCMS Merge Data (MDMIGMD) command copies configuration and activity data from one instance of MDCMS to another instance. This provides a quick way to merge work that was previously done across several instances into one instance.

MDCMS ensures that RFP numbers are unique. If the RFP number already exists in the target instance, a new number will be applied to the RFP details and objects in the RFP.

If active checkouts are to be copied, MDCMS verifies for locked modifications or deletes that the object isn't already locked in the target instance. If already locked, the object request is omitted.

The command should be run from a command line within the instance that is the target for the data to be copied to.

If configuration data will be copied, the application group must already be defined in the target and the level(s) to copy must NOT already be defined. Additionally, distribution levels will only be copied for OS/400 locations that are already defined in the target instance.

During the Merge process, configuration data is copied first, followed by activity data. Activity will only be copied if the level exists in the target instance, which occurs during the copy of the configuration data or if the level was already there.

It is recommended to back up the target MDCMS and MDXREF libraries prior to running this command, in case you aren't happy with the results.

Restrictions:

- You must have MDSEC authority for Application Group maintenance (md/3)
- The version of the from instance and target instance must be the same

MDMIGMD Parameter Table

Title	Type	Description
From Product Instance	CHAR	the suffix of the MDCMS and MDXREF libraries containing the data to be copied from
Application	CHAR	the application to be included in the copy *ALL – all applications that are defined in both the from instance and the target instance.
Minimum Level	DEC	The lower limit of the range of levels to be copied
Maximum Level	DEC	The upper limit of the range of levels to be copied
Migrate Configuration	CHAR	*YES – for each qualifying APP that already exists in the target and each qualifying level that doesn't already exist, the following information will be copied: Levels, Attributes, Commands, Scripts, Templates used by copied attributes (if not already defined), Distribution Levels (for pre-defined OS/400 locations), Workflow Acceptance settings, MDXREF library list. *NO – Configuration Data isn't copied
Migrate Active Checkouts	CHAR	*YES - For each Application and Level in the range that exists in the from and to instances, the active checkouts will be copied. If an object is already locked on the target, it won't be copied for modifications and deletions. The copied information includes: RFP (will get a new number if prior RFP number already exists in target instance), Object information, commands for RFP or Object, scripts for RFP or Object, Project information (if doesn't already exist).

		*NO - Active Checkouts aren't copied
Migrate Install History	CHAR	*YES - For each Application and Level in the range that exists in the from and to instances, the installation history will be copied. This includes: RFP (will get a new number if prior RFP number already exists in target instance), Object information, commands for RFP or Object, scripts for RFP or Object, archived source, Project information (if doesn't already exist), Deployment log. Archived Objects, which are zipped and stored in the IFS, aren't migrated to the target instance. Refer to the original instance if an archived object needs to be restored. *NO - Installation History isn't copied
Migrate Active Send Info	CHAR	*YES - For each Application and Level in the range that exists in the from and to instances, the open RFPs to be sent will be copied. The copied information includes: RFP (will get a new number if prior RFP number already exists in target instance), Object information, commands for RFP or Object, scripts for RFP or Object, Project information (if doesn't already exist), Send History for targets attempted by open RFP. *NO - Open RFPs to Send aren't copied
Migrate Send History	CHAR	*YES - For each Application and Level in the range that exists in the from and to instances, the RFP Send History will be copied. The copied information includes: RFP (will get a new number if prior RFP number already exists in target instance), Object information, commands for RFP or Object, scripts for RFP or Object, Project information (if doesn't already exist), Send Log and Problem list. *NO – Send History isn’t copied

13.3 MDSRC2IFS – Convert Source Members to IFS Files

The Convert Source Members to IFS (MDSRC2IFS) command provides the ability to copy some or all members in a source file to various IFS folders depending on the source type.

When the command is executed, you will be shown a list of each distinct source type in the source file and given the option to select or omit each type for copying as well as to specify the preferred IFS file type and a subfolder for each type.

Restrictions:

- The command must be run interactively from a command shell within MDCMS
- The user performing the command must have authority to edit promotion levels (MDSEC code md/4)

MDSRC2IFS Parameter Table

Title	Type	Description
Source Library	CHAR	The library containing the source file
Source File	CHAR	The source file containing members to copy to the IFS
Parent Path	CHAR	The full path name from the IFS root for the parent folder that the members will either be directly copied to or that will hold subfolders for the source.
CCSID of IFS file	CHAR	1208 (default) – the CCSID of the IFS file will be UTF-8. This is recommended if the source will then be imported into a Git repository. *CCSID - A CCSID in the Microsoft Windows encoding scheme character-value - any CCSID value that is accepted on the CPYTOSTMF STMFCCSID parameter
IFS Authority Template	CHAR	Specifies the MDCMS Object Authority template of type *IFS that contains the authority definitions to apply to each generated IFS file and each created folder. *DFTIFS (default) – The template of name *DFTIFS will be applied character-value - an existing Object Authority Template of type *IFS
Replace Existing	CHAR	Specifies if an existing IFS file should be overridden. *NO (default) - If the IFS file already exists, it won't be replaced by a new copy of the source member. *YES - the member will be copied to the IFS file, even if it already exists