



User Manual

MDWorkflow

Web Application
from
Midrange Dynamics

Version 8.0.2
Published July 5, 2017



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1 Introduction

1.1 Product Overview

The Workflow Application is a web application that runs on an application server. The web application connects with a MDCMS database repository on an IBMi system, where the data and business logic for the application resides.

The key features of the Workflow Application:

- Project Management
- Task Management
- Role Management
- Management of Testing Requirements at each step of the Workflow Process
- Time Entry
- Detailed History of Installed Objects and Object Packages
- Object Migration tracking across all systems
- Object Version and Conflict Reporting across all systems
- Application Version tracking and Management
- Graphical Calendar/Scheduler for past and future Installations and Tests



1.2 The MD Elements of Workflow Management

The combination of MDCMS (or MDOpen) and MDWorkflow is used to ensure that punctual and sufficient communication occurs between the technical staff, testing staff and release managers. It additionally assures that testing has been completed and the results accepted, where appropriate, before changes are allowed to continue along the migration path. The combination of the following elements within MDCMS and MDWorkflow are used to define each organization's desired process.

MD Element	Defined in	Description
Application	MDCMS MDOpen	A particular software product across all environments on all systems.
Level	MDCMS MDOpen	A particular environment (development, integration testing, user acceptance testing, production, etc.) on one particular system contained within a collection of libraries.
Project	MDWorkflow MDCMS* MDOpen	A requirement for a modification. This requirement may be anything from a problem ticket to a large-scale new development.
Task/Subtask	MDWorkflow MDCMS* MDOpen	One segment of the project requirement used to allocate work to be performed and tested into smaller pieces. If the Project itself is small enough, a Task is unnecessary.
Group Type	all clients	A particular role, such as tester, programmer, release manager, etc. It is merely a role and not a specific group or user.
Group	all clients	A collection of users that are authorized to carry out the Group Type or Role. There may be many Groups of the same Group Type to differentiate between, for example, geographic regions.
User	MDSEC	An individual person authorized to specific functions within MDCMS and MDWorkflow. The User can be a valid AS/400 User Profile or, if only intended for MDWorkflow, defined directly in MDSEC. A user may belong to many groups
RFP	all clients	A package containing Objects to be deployed into an Application Level
Email Template	MDOpen	A HTML email body template intended for a specific step in the workflow process. The template resides in IFS and contains wildcards that are replaced at runtime and sent to specific Groups or Users
RFP Command	MDCMS MDOpen	A command that runs once per RFP at a specific moment in the process and is typically used to send an email.

* Projects, Tasks and Subtasks can be viewed and managed in MDCMS or MDOpen, but the MDWorkflow Web Application provides far more features and is required for complete Workflow Management.



1.3 Bringing the MD Elements together to ensure Test Acceptance

The following steps explain how to set up a workflow process to ensure appropriate user signoff on changes made in the Test environment before MDCMS can deploy the changes to Production. This is one simple example. Other requirements may include multiple environments requiring acceptance with differing roles for each environment. The steps themselves remain the same.

The detailed instructions for carrying out each step are located in either the MDCMS or MDWorkflow User Manual, depending on the step.

One-Time Administration Steps

- 1) Define the Application
- 2) Define an Application Level for each environment used in the Application.
If Production is on a different system than Test, the parameter Automatic Send of RFP for the Test environment should be set to N for manual sending after MDWorkflow Acceptance, or set to W for automatic sending after MDWorkflow Acceptance. A value of Y immediately sends an RFP automatically without waiting for MDWorkflow Acceptance and can be appropriate if one of the distribution queues is used for mirroring of object changes. However, the queue designated for production must have the Default to Send flag set to M. If Production is on the same system as Test, then the parameter Automatic Receipt of RFP for the Production environment must be set to N for manual submit after MDWorkflow Acceptance or W for automatic submit after MDWorkflow Acceptance.
- 3) Define a Group Type in MDWorkflow for each role that should be represented within the organization. Examples of Group Types are: Programmer, Business Tester, Test Manager, Release Manager, Project Manager
- 4) Define 1 or more Groups for each Group Type and populate each group with the users that should fulfill that role (Group Type) for that group.
- 5) For the Test Environment Application Level in MDWorkflow, set the Group Types (roles) that are required to test and sign off on modifications before they may be prepared for implementation in Production
- 6) Create a *RFP Post-Installation command for the Test level to inform those responsible for testing an RFP that changes have been deployed to the Test environment. Use F9 from the Commands screen in MDCMS and select the "Post-Installation - Info Mail for MDWorkflow Accpt" entry for the levels where test acceptance should occur. The mail notification will be sent to the groups assigned to each Project in the RFP that are of Group Types required for Test Acceptance of the Level.



- 7) Create a *RFP Test Status Accepted and *RFP Test Status Rejected command for the Test level to inform the installer of the RFP when the changes have been tested and accepted/rejected. Use F9 from the Commands screen in MDCMS and select the "RFP Test Status Accepted" entry as well as the "RFP Test Status Rejected" entry for the levels where test acceptance should occur.

If a group of users, rather than the specific installer, should be informed, then edit the generated commands to set a specific user group or use special value *TECGRP to send the mail notification to the technical groups assigned to each Project in the RFP.

- 8) In the MDCMS Email Settings, ensure that the MDWorkflow URL matches the location of the MDWorkflow Host, Port, and Container name and ensure that the address of each potential email recipient is defined.

Steps for each Project

- 1) Within the MDWorkflow Project Detail screen, set the Acceptance and Technical Groups to those that should be involved for the particular Project. If only certain members of a Group rather than the entire Group should be involved, then include a User on each Assigned row for the Group.
- 2) If the Project Manager typically works with the same set of Groups and Users, they can click button Save as Default in the Project screen and then each new Project will automatically load those entities into the Assigned list.

Steps for each Object Request

- 1) The programmer should ensure that they assign the Object Request to the appropriate Project or Projects, Tasks and Subtasks, so that proper tracking of impacted objects per Project can be performed and that the reporting will be accurate.
- 2) The RFP that contains the individual Object Requests will then expect Test Acceptance for each distinctly assigned Project from each Group/User of required Group Type in the Project.



1.4 Logging into the Workflow Application

A web browser is used as the client for the Workflow Application. The URL for the Web App is provided by your application's administrator.

You must first be registered in MDSEC on the partition that the Web Application connects to in order to sign in. If LDAP or MDSEC profiling is used, this is sufficient. If iSeries profiling is used, then your MDSEC user must also exist as a user profile on the IBMi system that the MDCMS Workflow repository resides on. A profile is not necessary on any other partitions or physical IBMi systems in order to use the Workflow Application.

If the Workflow Application is configured to prompt for the user id/password, then a login screen will be displayed. Enter your IBMi user id and password at the prompt.

If the Workflow Application is configured to use your network profile, then your network profile will be mapped to the IBMi user id and you will be automatically logged in, once LDAP authorization is granted.

An unlimited number of concurrent windows may be active for the same browser session, allowing for multiple windows to be open while only logging in once.

It is strongly recommended to use the Logoff link to cleanly end the processes when you are finished using an MDWorkflow session. If there is no activity for the session for 2 hours, the session will automatically end.



1.5 Navigation

The web pages use a consistent look and feel across the entire application. The following concepts are utilized to navigate through the pages:

Navigation Panel

Links	Entries within the Links section at the top left of the screen allow you to navigate to that process described by the link. The Project Listing link appears on every page (except the Project Listing page itself), allowing you to return to the initial screen at any time.
Options	Entries within the Options section at the middle left of the screen list each option available for a row within a list, based on your personal authorization rights. Each row contains a radio button. First click the radio button for the row you wish to process and then click the option to be performed.
Help	The User Guide link may be accessed to launch this User Manual if you need to obtain help about a particular screen.
Change Password	If the login occurs using a password, the password can be changed by clicking on this link
Logoff	Cleanly end the active thread on the IBMi for this browse window. If other threads are still active, the IBMi job MDRPxxxxx remains active and a new thread can be started without the need to provide credentials. If this was the final thread, the IBMi job MDRPxxxxx will cleanly end and login credentials will need to be provided the next time MDWorkflow is accessed.

Screen Body

Buttons	Blue rectangles provided to carry out an action when left clicked
Filter Fields	At the top of most listing screens values may be entered into filter fields to limit the listing to rows matching those values. The Reset button will clear the values from the filter fields. The Search button will refresh the listing using the filter values. The Report button will create an Excel file containing the rows matching the filter values.
Position Field	Directly above one or more columns of most lists, there is a right arrow and an entry field allowing you to reposition the list based on the value for that column. Enter a value into the field and then click the right arrow to reposition the list.
Column Sorting	The column headings of the lists may be clicked to sort the lists by that column. Clicking the column again will toggle the sort sequence between ascending and descending values. Only the currently loaded rows (max. 200) will be resorted.
Clickable Fields	fields displayed in blue may be clicked in order to navigate to a screen relevant to the value of that field. For the primary column in a list, clicking on a field will cause the first available option for that row to be processed.
Magnifying Glass	when available, a magnifying glass icon will be displayed to the right of a field. By clicking on the icon you can select a value for the field from a list of valid values.
Envelope	when available, an envelope icon will be displayed to the right of a user or group field. By clicking on the icon an email will be sent to that user or group of users.
Paginator	If a list contains more than 20 entries, a paginator will be displayed below the list between pages of entries. Click a number to go to a specific page index. Click a narrow arrow to go to the next or prior page. Click a wide arrow to go to the first or last page.



Common Buttons

Add	Add a new entry to the list
Refresh	Refresh the list information based on the current filter values
Report	Create an Excel report containing all rows matching filters for the list. The columns in the report can be customized using the Report Settings link
Reset	Remove all values from the Filter Fields and refresh the listing
Search	Refresh the list information based on the current filter values

Common Options

Add	Add a new entry to the list
Edit	Edit the information for the entry
Copy	Copy entry to a new entry
Delete	Delete the entry
View	View the entry



2 Workflow Settings

The following settings are maintained by clicking on the Settings link from the initial Project Listing screen. These settings are used to configure the Workflow processes and involved entities to match the requirements of your organizational needs.

2.1 Group Types

Group types categorize each kind of user group that will be involved with the Workflow processes.

Fields

Group Type	A 10 character code used to uniquely identify the type
Description	A description of the Group Type. For example: Developer, Business User, Release Manager, Project Manager, etc...

Options

Groups	List and Manage all groups defined for this Group Type
--------	--

2.2 Groups

The list of each distinct user group involved with the Workflow processes.

Fields

Group	A 10 character code used to uniquely identify the group
Group Type	A 10 character code used to uniquely identify the type of group
Description	A description of the Group. For example: Developer Team 1, Developer Team 2, Accounting Users, Release Manager Back Office, etc...
Users	The number of users in the Group. This number may be clicked in order to view/modify the users in the Group.

Options

Users	List and Manage all users defined for this Group
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2.3 Required Acceptance Group Types per Level

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.

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.

Fields

Application	MDCMS Application
Location	The IBMi Location of the Promotion Level
Level	The MDCMS Application Promotion Level
Group Type	The type of group that must accept the results of an installation into the given Level
Description	Description of the Group Type

2.4 Project Types

Project types categorize each kind of project to provide for logical filtering of projects and to set certain rules for that category.

Fields

Project Type	A 10-character code used to uniquely identify the type.
Description	A description of the Project Type. For example: Operations, Enhancements, etc.
Allow Tasks	If true, Tasks may be created, otherwise they aren't allowed for Projects of this type
Require Requests be assigned to Tasks	If true, 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 true when this is true. Otherwise, Object Requests are allowed to be assigned directly to the Project.
Limit Requests to Assigned Users	If true, 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. Otherwise, any developer can assign Object Requests to a Project of this type.

Options

Custom Fields	List and select all Custom Fields permitted to be used by Projects of this Type
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2.5 Task Types

Task types categorize each kind of task to provide for logical filtering of projects and to set certain rules for that category.

Fields

Task Type	A 10-character code used to uniquely identify the type
Description	A description of the Task Type. For example: Issue, Migration Request, Rollback, etc...
Limit Requests to Assigned Users	If true, 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. Otherwise, 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.

Options

Custom Fields	List and select all Custom Fields permitted to be used by Tasks of this Task Type
---------------	---

2.6 Project/Task Status Codes

MDCMS comes packaged with several fixed Status Codes to be used by Projects and Tasks. Additional Custom Status Codes can be created to fulfill the personal requirements for the Organization.

Fields

Status	A 1 Character Code for the Status of a Project or Task
Description	A description of the Status
Sort Sequence	The order in which the Status Code appears in the list. It is recommended to sort the status codes based on when a Project or Task would reach that status. Status Codes that indicate the end of a Project or Task may not be sorted lower than Status Codes indicating an active Project or Task
Ending Status	The Code indicates that the Project or Task has ended
Use in Projects	If true, the Status Code may be used by Projects
Use in Tasks	If true, the Status Code may be used by Tasks
Allow Auto-Update	If true, a project or task can be set to this status automatically via the use of an MDCMS API.
Allow Manual-Update	If true, a project or task can be set to this status from within the MDCMS, MDOpen or MDWorkflow client screen.
Group Type Authorized to Update	Limit the persons who can manually update a project or task to this status to involved groups of the entered Group Type.
Transition From	The current list of status codes that allow for a transition to the selected status code. Use option Status Transitions to modify the list.

Options

Status Transitions	List and select all Status Codes that permit a transition to the selected status. If no codes are selected, then all are permitted.
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2.7 Project/Task Status Boundaries per Level

Boundaries, or barriers, can be put in place so that RFP deployments are blocked until the Status of any Projects or Tasks are within the allowed range for a given action and level.

If multiple Projects or Tasks are impacted by an RFP, then each of them must have a status within the allowed range.

If a Project is assigned to an object request within the RFP without a Task number, then the Project Status will be checked. If a Task or Subtask within the Project is assigned to an object request within the RFP, then the Task or Subtask Status will be checked, but the Project status will be ignored.

Fields

Application	MDCMS Application
Location	The IBM i Location of the Promotion Level
Level	The MDCMS Application Promotion Level
RFP Action	The RFP action that will not be permitted to be executed until all Projects or Tasks within the RFP are within the allowed Status Code range. Submit – Submit the RFP for validation/build of the objects Approve – Approve the built RFP for Installation Install – Install the objects into the target Application Promotion Level Send – Send the RFP to target levels on other IBM i locations
Min Project/Task Status	The minimum status that each Project, Task or Subtask on the RFP must have in order for the action to be executed. If blank, then a minimum won't be considered.
Max Project/Task Status	The maximum status that each Project, Task or Subtask on the RFP must have in order for the action to be executed. If blank, then a maximum won't be considered.



2.8 Project/Task Custom Fields

Additional Fields can be added to the Project or Task Detail screens. These fields are then available for list filtering, managing and reporting within MDWorkflow. The Custom Fields may also be managed from MDOpen.

Fields

Field Name	A 10 Character Code for the ID of the custom field
Description	A description of the field – this is then displayed as the label for the field
Sort Sequence	The order in which the field appears in the list
Type	String – alphanumeric Number – numeric Date Time Checkbox DropDownList URL – web link
Length	The total length of a field, including decimal positions for a numeric field The maximum length for a string is 160 and the maximum length for a number is 24
Decimal Positions	The number of decimals for a number field. The maximum is 9.
DropDownList View	What should be displayed to the user for a DDL field DDL Code DDL Value Both
Visible from Status	The minimum status that allows the field to be seen. If blank, then the field is always visible.
Required from Status	The minimum status that requires that a value is entered for the field. If blank, then the field is always optional. Once the status for the Project, Task or Subtask has been reached, the field label will be shown in red and the status for that Project, Task, Subtask will not be allowed to transition forward until a value has been entered for the required field.
Editable from Status	The minimum status that allows a value to be entered or changed. If blank, then the field is editable as soon as it's visible.
Editable until Status	The maximum status that allows a value to be entered or changed. If blank, then the field is editable until the project or task is closed.
Allow Auto-Update	If true, the field can be updated via the MDUPDCFLD API.
Allow Manual-Update	If true, the field can be updated from within the MDOpen or MDWorkflow client screen.
Group Type Authorized to Update	Limit the persons who can manually update the field to involved groups of the entered Group Type.
Wildcard ID	A 6-character ID to use in commands or email templates. When the command or email is prepared, the value ##<wildcard id>## will be replaced by the value of the Custom Field for the applicable Project or Task.

Options

Project Types	List and select all Project Types permitted to use this Custom Field
Task Types	List and select all Task Types permitted to use this Custom Field
DDL Codes	Manage the list of DropDownList elements for the DDL field



2.9 DDL Entries

This view allows for the maintenance of the list of Code Elements for a Custom DropDownList field. Click Button DDL Codes for a DDL field to open this view.

Fields

Code	The unique code value to identify the element. Maximum Length of code is set by the parent field
Description	The description of the code, which can be set to be displayed to the user
Sort Sequence	The order in which the code appears in the list
Selectable from Status	The minimum status that allows this code to be selected. If blank, then the code is selectable as soon as it's visible and editable.
Selectable until Status	The maximum status that allows this code to be selected. If blank, then the code is selectable until the field is no longer editable.

2.10 Project Phases

Project Phases are used during Time Entry to allocate the hours worked to a specific phase of the project. This code also provides the ability to apply different cost amounts to a project for each phase.

Fields

Phase	A 5-character Code for the ID of the Project Phase
Description	A description of the phase, such as Development, Design, Testing, etc.
Sort Sequence	The order in which the Phase appears in the list

2.11 Project Costs

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.

Fields

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 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.

Buttons

Recalculate	When clicked, you are prompted for a range of dates. Once confirmed, the costs for all existing Time Entry records within the date range are recalculated based on the current rules. You also have the option to recalculate time entered for closed Projects and Tasks.
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2.12 Object Group Levels

Object Group Levels define the environments where Object Group versioning should be enabled. Object Groups are collections of objects that reside within a library or across libraries or within an Application or across Applications. Workflow can track and increment the version of those collections as installations occur into the defined Levels.

Fields

Location	The IBMi Location of the Promotion Level
Level	The MDCMS Promotion Level
Description	A description of the level, since the object groups may span applications
Group Required	Flag specifying if an object must belong to at least 1 group before it may be installed

Options

Object Groups	List and Manage all Object Groups defined for this Level
Manually Attached Objects	List and Manage all Manually Attached Objects defined for this Level

2.13 Reports

The fields to be included in each of the Excel reports can be defined here. Personal or Public Field Selection definitions can be saved from here.

Fields

Report	The list of available Reports are: Project Listing Task Listing Subtask Listing RFP Listing Installed RFP Listing RFP Installation Schedule Object Listing Time Entry Listing
My Fields	public – the Default Public Fields definition is used by your profile all – every field for the Report is used and the Public definition will not be used custom – some fields for the Report is used and the Public definition will not be used
Default Public Fields	If My Fields = public, then the Public Definition will be used all – all fields for the Report custom – some fields for the Report is used

Click on the My Fields field for a report to change or remove the personal definition for that report. Click on the Default Public Fields field for a report to change the public definition for that report.



2.14 Email Addresses

The email address table for users involved with the workflow process that may need to be able to receive an email from the tool. The MDMAIL and MDMAILF APIs also use this table for any in-house use of the API, such as within an MDCMS Exit Point.

Fields

User	The user profile of a user that is registered in MDSEC on the Repository partition
Name	Name of user defined in MDSEC
Email Address	The address to be used to send emails to this user

2.15 Email Settings

The connection settings necessary to connect the java SMTP client on each IBMi system to the SMTP server.

Fields

Location	The IBMi location
SMTP Host	The TCP/IP address/hostname of the SMTP server
SMTP Port	The port number to connect to for SMTP requests
SMTP User	The user id for authentication on the SMTP server
SMTP Password	The password for authentication on the SMTP server
SMTP Auth Required	Flag specifying if the SMTP server requires authentication
Email Address	The address to use as the sender
SMTP Logging	Flag specifying if detailed debug-level SMTP information should be included in the IFS logs for service MDMAIL
Use SMTPS	Flag specifying if SMTP Secure (SSL) should be used for the connection to the SMTP server
Minimum Limit in KB to ZIP Attachments	*ALWAYS – always ZIP an attachment before sending, regardless of size *NEVER – never ZIP an attachment, regardless of size 1 – 9999999 – ZIP all attachments larger than the entered size in 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. Example: http://server.com:8080/mdWorkflow 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.

2.16 Drop Down List Settings

The appearance of certain frequently used DDL elements within MDWorkflow can be set here.

Fields

Field	The label of the field often encountered in MDWorkflow
View	Code – only show the unique identifying code for the field Value – show the description of the code for the field Both – show both the code and the description of the code



3 Projects

3.1 Project Listing

The Project Listing is the initial screen shown once the user has logged into the Workflow Application. The listing is filtered by various fields, whose values are remembered from the previous session.

Options

Project Tasks	List and Manage all Tasks defined for this Project. This option is also available by clicking the task count for a row.
Active RFPs	List and Manage all active (not yet installed or cancelled) RFPs that contain at least 1 object assigned to this Project
Installed RFPs	List and Manage all Installed RFPs that contain at least 1 object assigned to this Project
Project Objects	List all Object Requests assigned to this Project

3.2 Project Detail


A project describes a body of work to be performed by one or more users in order to fulfill an IT requirement. The project can contain a number of tasks and subtasks to further describe the work to be performed. If the user has been granted the necessary authority in MDSEC, a Project may be created or edited within the Workflow Application.

Fields

Project	A 12 character identifier for the Project
Project Type	The code to categorize the Project
Project Title	A brief description of the Project
Requester	The creator of the Project. Send project information to the creator by clicking the envelope.
Creation Date	The date/time that the Project was created
Completion Date	The expected completion date, and time, of the Project
Priority	The priority that the Project has in relation to other Projects
Status	1 – Project Opened – work has not yet begun on behalf of the Project 2 – Project Authorized – the Project has been authorized to be performed 3 – Work in Process – the Project is actively being worked upon 4 – Ready for Testing – the coding is complete and testing may commence 5 – Testing Complete – Results of Project testing are positive 6 – Project Complete – the Project is complete 9 – Project Cancelled – the Project has been cancelled, nothing will be installed + any additional custom Status Codes defined
Project Description	A detailed description of the Project
Application	The primary MDCMS Application impacted by the Project. MDCMS allows objects belonging to various applications to be assigned to the same Project.
Hours estimated	The number of hours predicted to complete the project
Hours actual	The number of hours currently entered from Time Entry for the project
Cost estimated	The total cost predicted to complete the project
Cost actual	The accumulated cost based on the hours entered with each entry calculated



	based on Project Cost rules.
Custom Fields	Any Custom Fields that are defined to be used within Projects are displayed under the Project Description, if the Project Status permits visibility of those field(s). Custom Fields that require a value before the status of the Project can transition forward will have the label displayed in red .
Tasks	The number of tasks existing for the project
Hours estimated (Tasks)	A sum of projected hours entered directly within any tasks for the project
Hours actual (Tasks)	The accumulated hours entered directly against all tasks for the project
Cost estimated (Tasks)	The sum of projected costs entered directly within any tasks for the project
Cost actual (Tasks)	The accumulated cost entered directly against all tasks for the project
Subtasks	The number of subtasks existing for the project
Hours estimated (Subtasks)	A sum of projected hours entered directly within any subtasks for the project
Hours actual (Subtasks)	The accumulated hours entered directly against all subtasks for the project
Cost estimated (Subtasks)	The sum of projected costs entered directly within any subtasks for the project
Cost actual (Subtasks)	The accumulated cost entered directly against all subtasks for the project
Involved Users	See detailed description in section 3.2.1 below
Attachments	See detailed description in section 3.2.2 below
Comments	See detailed description in section 3.2.3 below
Status History	Date, Time, Status, User ID and User Name for the past 50 status changes Press the Full History button to see all history, including modifications and email notifications

The  icon to the right of a group or user can be clicked to send an email to the group or user. The email will include pre-defined subject, all visible fields as well as comments.

To send a customized email to any group or user, click the Send Email button – from here, a Group and/or User can be entered, the subject can be modified, additional text can be added and comments are optional.

Time Entry – click this button to switch to the Time Entry listing filtered to hours worked for this Project.



3.2.1 Involved Users for a Project

For each Project, the users that are to be involved with the Project can be defined.

There is no limit to the number of User Groups assigned to a Project. At a minimum, there must be at least 1 User Group defined for each Group Type that is responsible for testing the results of an installation into the MDCMS levels that require testing acceptance.

The user managing the Involved Groups for a Project may click the Save as Default button. This will indicate to MDCMS that the current Group configuration should be automatically used when future Projects are created by the same user.

Fields

Role	Technical – the group is responsible for carrying out the Project tasks Acceptance/Test – the group is responsible for testing and accepting the results of installations.
Group Type	The type of group to be involved. The group types are defined from the settings menu. By default, all group types required for installation acceptance are displayed. Additional group types may be added to the list for a Project.
Required	If the Project requires that a Group of the given Group Type be assigned to the Project in order to accept the results of installations
Group	The Group of the given Group Type involved with the Project. The group id may be clicked to view/maintain the members of the group. The Group is not required for Technical roles.
User	If only a specific member of the Group should be involved, then the ID of the user is defined. Otherwise, any member of the Group may be involved.
Change	Click to change the Group or User for the Group Type
Delete	Click to delete the Group Type entry

3.2.2 Project Attachments

Files may be attached to the project. An attached file is centrally stored in IFS in folder /MDCMS/ProjectDocs for shared use by members of the project.

First click the Choose File button to select a file and then click the Add Attachment button to upload the file to the server.

Attached files can be removed from the Project by clicking the red X.

3.2.3 Project Comments

Comments may be added to the Project by clicking the Add New Comment button.

Existing comments can be viewed in full by clicking the Date of the Comment. If the comment was created by the current user, the comment can also be edited or deleted.

Comments can be navigated by clicking on the Next Comment and Prior Comment buttons.

3.3 Project Task Listing

The Task Listing displays the individual tasks and subtasks that have been defined for a Project. The listing is filtered by various fields, whose values are remembered from the previous session.

The Task Listing can also display tasks across projects by clicking the Task Listing link from the Project Listing.

If a reference to an external Issue Management tool has been configured in the Web Application, the corresponding reference number may be clicked from the list, which will result in a new browser window opening to the URL of the reference number for that tool.

Options

Subtasks	List and Manage all Subtasks defined for this Task
Active RFPs	List and Manage all active (not yet installed or cancelled) RFPs that contain at least 1 object assigned to this Task
Installed RFPs	List and Manage all Installed RFPs that contain at least 1 object assigned to this Task
Task Objects	List all Object Requests assigned to this Task

3.4 Project Subtask Listing

The Subtask Listing displays the individual subtasks that have been defined for a Task. The listing is available from the Task Listing or from Task Detail.

The functionality for Subtasks is the same as for tasks. Subtasks are recommended when portions of a task are to be carried out by multiple people or when multiple RFPs should be linked to a task. Details of linked RFPs can be viewed by clicking on the RFP number from the Subtask listing.

Options

Active RFPs	List and Manage all active (not yet installed or cancelled) RFPs that contain at least 1 object assigned to this Subtask
Installed RFPs	List and Manage all Installed RFPs that contain at least 1 object assigned to this Subtask
Task Objects	List all Object Requests assigned to this Subtask




3.5 Project Task/Subtask Detail

Fields

Project	The identifier of the Project that the task belongs to
Project Title	The title of the Project
Task	An automatically generated task number
Description	Task Description
Subtask	An automatically generated subtask number
Task Type	The type or category of the task. The task types can be defined in the settings menu
Reference	The reference number for an external Issue Management tool belonging to the customer
Requester	The User that created the task. Task information can be sent to the user by clicking the envelope.
Priority	The relative priority, from 1 (critical) to 5 (optional)
Status	<p>Created – Task Created Modified – Task Modified Sent – An email has been sent using the MDMAIL API on the IBMi system Work In Progress – Work on behalf of the task is in progress Ready to Test – Programming for the task is complete and ready for testing Testing in Progress – Testing of changes is in progress Testing Complete – Testing of changes is complete Closed – The task is complete, finished or done Cancelled – The task will not be performed</p> <p>+ any additional Status Codes defined for the Organization in MDWorkflow</p>
Due Date	The intended date by which the task should be complete
Due Time	The intended time by which the task should be complete
Description	A detailed description of the task. This can include programmer and testing notes
Application	The MDCMS Application impacted by the task
Location	The IBMi system impacted by the task
Level	The MDCMS Application Promotion level impacted by the task
Assign to Group	The group responsible for carrying out the task. Send task information to all users in the group by clicking the envelope.
Assign to User	A specific user in the group responsible for carrying out the task. If blank, then any user in the group may be involved. Send task information to the user by clicking the envelope.
Test Group	The group responsible for testing the results of the task. Send task information to all users in the group by clicking the envelope.
Test User	A specific user in the group responsible for testing the results of the task. If blank, then any user in the group may be involved. Send task information to the user by clicking the envelope.
Hours estimated	The number of hours predicted to complete the task
Hours actual	The number of hours currently entered from Time Entry for the task
Cost estimated	The total cost predicted to complete the project
Cost actual	The accumulated cost based on the hours entered with each entry calculated based on Project Cost rules.
Custom Fields	Any Custom Fields that are defined to be used within Tasks of the selected task type are displayed, if the status of the task permits visibility of the field(s). Custom Fields that require a value before the status of the Task can transition forward will have the label displayed in red .
Subtasks	The number of subtasks existing for the task



Hours estimated (Subtasks)	A sum of projected hours entered directly within any subtasks for the task
Hours actual (Subtasks)	The accumulated hours entered directly against all subtasks for the task
Cost estimated (Subtasks)	The sum of projected costs entered directly within any subtasks for the task
Cost actual (Subtasks)	The accumulated cost entered directly against all subtasks for the task
Attachments	See detailed description in section 3.2.2
Comments	See detailed description in section 3.2.3
Status History	Date, Time, Status, User ID and User Name for the past 50 status changes Press the Full History button to see all history, including modifications and email notifications

The  icon to the right of a group or user can be clicked to send an email to the group or user. The email will include pre-defined subject, all visible fields as well as comments.

To send a customized email to any group or user, click the Send Email button – from here, a Group and/or User can be entered, the subject can be modified, additional text can be added and comments are optional.

Time Entry – click this button to switch to the Time Entry listing filtered to hours worked for this Task or Subtask.

3.6 RFPs for a Project or Task

The list of all RFPs (Installation Packages) that contain at least one object assigned to the Project, Task or Subtask.

The list may be filtered to display RFPs for any of the following status codes:

- blank – All RFP's
- *A – Any active status
- RP – Request Pending
- 00 – No Requests assigned
- 01 – Requests assigned
- SP – Submission Pending
- YY – Submission in JOBQ
- XX – Submission in Progress
- 02 – Waiting for Approval
- 03 – Waiting for Installation
- IP – Installation Pending
- 04 – Installation in JOBQ
- XY – Installation in Progress
- 05 – Installed
- 09 – RFP Closed without Install

Within the list the RFP number (or Created date) can be clicked for more information about the RFP.

The Test Status value, if available, can be clicked for information and management of the workflow for the testing of the RFP.

More information about the RFP can be found in section 4.2 titled RFP Detail.



3.7 Objects for a Project or Task

The list of all Objects assigned to the Project, Task, or Subtask that have been installed or are waiting to be installed.

The list can be filtered to display Object Requests for any of the following status codes:

- *A – Any Active Status
- RP – Request pending
- 00 – Object requested
- 01 – Assigned to RFP
- 02 – Waiting for approval
- 03 – Ready to be installed
- 04 – Installation in progress
- 05 – Installation complete

Within the list, the Object name can be clicked for more information about the Object and the RFP number can be clicked for more information about the RFP.

More information about the Object information can be found in section 5.2 titled Object Detail.



4 RFPs

4.1 RFP Listing

The RFP Listing displays MDCMS installation packages across IBMi systems. The listing is filtered by various fields, whose values are remembered from the previous session.

Options

RFP Objects	List all Objects assigned to the RFP
Object Groups	List the object groups impacted by the Installed RFP along with the version for each group as a result of the installation
Test Status	View and update the Test Status for the RFP

4.2 RFP Detail

An RFP identifies a collection of objects that are to be installed together into the same application environment level. If the user has been granted the necessary authority in MDSEC, an RFP may be created, edited, approved or rejected within the Workflow Application.

Fields

Application	The MDCMS Application code
Location	The IBMi MDCMS Repository Location
Level	The MDCMS Promotion Level at the given location correlating to a specific environment for the application (such as Development, Test, or Production)
RFP	The automatically generated RFP number. The RFP is used only once for the migration of objects into the specified environment.
User	The user assigned to the RFP
Status	<p>RP – Request Pending – The RFP is waiting to be activated. The installation into the prior level has not yet been accepted.</p> <p>00- No Requests Assigned – no objects have been assigned to the RFP</p> <p>01 – Requests Assigned – 1 or more objects are assigned to be migrated when the RFP is installed</p> <p>SP – Submission Pending – The RFP has been requested to be submitted, but has not yet been placed in the job queue</p> <p>YY – Submission in job queue – once the queue is freed, the RFP submission process will begin</p> <p>XX – Submission in progress – the submission job is active. The submission job compiles the source code, if necessary, and places the objects in a temporary library pending installation.</p> <p>02 – Waiting for Approval - Submission is complete and approval of the RFP is necessary before the RFP can be installed. If the user is authorized, the user may press the Approve button within the Workflow application to approve the RFP</p> <p>CP – MDRapid Copy Pending – RFP waiting for launch of MDRapid to copy the contents of modified tables prior to installation.</p> <p>CJ – MDRapid Copy in job queue – once the queue is freed, the MDRapid process will begin</p> <p>CR – MDRapid Copy Running – existing data is being copied to new table formats</p> <p>03 – Waiting for Installation – Approval is complete and the RFP is waiting to be requested to be installed</p>



	<p>IP – Installation Pending – The RFP has been requested to be installed, but has not yet been placed in the job queue</p> <p>04 – Installation in job queue. When the job queue is freed, the RFP installation process will begin</p> <p>XY – Installation in progress – the installation process is active</p> <p>05 – Installed – Installation Complete</p> <p>09 – RFP Closed without any Installation occurring</p>
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From RFP	The previous RFP that this RFP was created from
Test Status	<p>Ongoing – Testing in progress and results are not yet complete</p> <p>Accepted (Provisional) – Test Users have accepted the results of the test but confirmation has not yet occurred</p> <p>Accepted – Test acceptance has been confirmed. The next step in the Workflow process may occur.</p> <p>Accepted (Provisional) – Test Users have accepted the results of the test but confirmation has not yet occurred</p> <p>Accepted – Test acceptance has been confirmed. The next step in the Workflow process may occur.</p> <p>Rejected (Provisional) – Test Users have rejected the results of the test but confirmation has not yet occurred</p> <p>Rejected – Test rejection has been confirmed. The next step in the Workflow process will not occur.</p>
Description	A description of the RFP
Delete Source from Programmer Library	Flag specifying if the source should be deleted from the programmer library once it installed into the specified environment level. This flag is only applicable for the development environment
Delete Object from Programmer Library	Flag specifying if the objects should be deleted from the programmer library once they are installed into the specified environment level. This flag is only applicable for the development environment
Delete Job Log when no Warnings occur	Flag specifying if the job log that is generating during the installation of an RFP should be deleted, if no errors or warnings occurred during the installation process.
Create Requests for next level	Flag specifying if the objects for this RFP should be automatically requested for the next level at the same location, once the installation is complete for this level
Assign new RFP to next level Requests	Flag specifying if a new RFP should be automatically generated and assigned to the objects for the next level
Place RFP in Send List	Flag specifying if the RFP should be placed in the send list when distribution queues are defined for the specified level
Date Created	The date that the RFP was created
Time Created	The time that the RFP was created on the date
Submission Date	For Open RFPs: The date the RFP should be submitted For Submitted RFPs: The date the RFP was submitted
Submission Time	For Open RFPs: The time the RFP should be submitted For Submitted RFPs: The time the RFP was submitted
Installation Date	For Open RFPs: The date the RFP should be installed For Submitted RFPs: The date the RFP was installed
Installation Time	For Open RFPs: The time the RFP should be installed For Submitted RFPs: The time the RFP was installed
Reserved until	The date until which the environment should be reserved for testing of the RFP.



Date	The block of time between the Installation Date and the Reserved until Date is displayed on the Installation Calendar as time reserved for testing. This field is merely informational and does not block further work from being performed.
Reserved until Time	The time until which the environment should be reserved for testing of the RFP.

RFP Detail Buttons

Approve	Approve the installation of the RFP. If the current status of the RFP is 02-Waiting for Approval, and the user is authorized to approve RFPs for the particular Application, this button will be enabled. Upon approval, the status of the RFP will be set to 03-Waiting for Installation. If Auto-Install is set to true for the level, the RFP will be submitted for installation with the scheduled date/time based on the Date of Installation and Time of Installation fields. If the date/time fields are blank, installation will commence immediately.
Reject	Reject the RFP for installation. If the current status of the RFP is 02-Waiting for Approval or 03-Waiting for Installation, this button will be enabled. Upon rejection, the status of the RFP will be returned to 01-Requests assigned.
Install	Install an RFP. If the current status of the RFP is 03-Waiting for Installation, and the user is authorized to install RFPs for the particular Application, this button will be enabled. When clicked, the RFP will be submitted for installation with the scheduled date/time based on the Date of Installation and Time of Installation fields. If the date/time fields are blank, installation will commence immediately.
Objects	List the object requests assigned to the RFP
Projects	List the projects impacted by the object requests in the RFP
Tasks	List the tasks impacted by the object requests in the RFP

4.3 RFP Objects

The list of all Objects packaged within the RFP.

Options

Object Locations	List all locations where the object is found
Object Groups	List the object groups impacted by the Installed object along with the version for each group as a result of the installation
RFP Details	View details of the RFP that the object is assigned to

More information about the object information can be found in the section titled Object Detail.



4.4 RFP Test Status

If at least 1 Group Type is defined to perform acceptance testing for a Promotion Level, then each RFP that is installed must be accepted before that RFP can continue to the next step in the migration process.

The current Test Status for an RFP is displayed in the RFP listing and in the RFP detail. The user may click on this status to view or enter the results of the testing performed for the RFP.

If the Test Status is blank, then either the RFP is not yet installed, or the RFP is for a level that does not require testing.

The Test Status view lists each Project that is impacted by the RFP and the status of the testing by the Acceptance Groups assigned to the Project for the RFP's Level.

Header Fields

Application	The MDCMS Application code
Location	The IBMi MDCMS Repository Location
Level	The MDCMS Application Level at the given location correlating to a specific environment for the application (such as Development, Test, or Production)
Test Status	Ongoing – Testing in progress and results are not yet complete Accepted (Provisional) – Test Users have accepted the results of the test but confirmation has not yet occurred Accepted – Test acceptance has been confirmed. The next step in the Workflow process may occur. Accepted (Provisional) – Test Users have accepted the results of the test but confirmation has not yet occurred Accepted – Test acceptance has been confirmed. The next step in the Workflow process may occur. Rejected (Provisional) – Test Users have rejected the results of the test but confirmation has not yet occurred Rejected – Test rejection has been confirmed. The next step in the Workflow process will not occur.
RFP	The automatically generated RFP number. The RFP is used for precisely 1 migration of objects into the given environment. Note: The RFP Description will appear to the right of the RFP number.



Project List Fields

Check Box	The check box will be displayed for a row if: a) the RFP Test Status has not yet been confirmed and b) the current user is a member of the defined Group and c) either the defined user is blank so that anyone in the Group can edit the Status for the Project, or, the defined user is the current user
Project	The Project ID that is impacted by the RFP. The ID may be clicked to view more details about the Project
Group Type	The Group Type that is responsible for the acceptance of an installed RFP into the specified level.
Group	The Group that is assigned to the Group Type for this Project in order to test the results of the RFP. The Group may be clicked to view more information about the Group
User	If a value exists, then only this user may edit the status. If blank, then any user in the group can edit the status.
Status	The status for that Project. The status for all projects must be Accepted before the RFP Test Status of Accepted can be confirmed. Only the status for 1 project must be Rejected before the RFP Test Status of Rejected can be confirmed.
Date	The date that the current status was set by the user
Time	The time that the current status was set by the user
Comment	A comment that will be applied to every checked row when a button is clicked. A comment is mandatory for rejected rows

Buttons

In Progress	Set every checked Project to status In Progress, signifying that you are in the process of testing for those Projects.
Accept	Set every checked Project to status Accepted, signifying that you have accepted the testing results for those Projects.
Reject	Set every checked Project to status Rejected, signifying that you have rejected the testing results for those Projects.
Undo	Undo the current status for the checked Projects.
Confirm Acceptance	Once all project rows have been accepted, the Confirm Acceptance button can be clicked by an authorized user to permanently set the RFP to accepted and to allow the next step in the Workflow process to occur for the RFP.
Confirm Rejection	Once 1 or more project rows have been rejected, the Confirm Rejection button can be clicked by an authorized user to permanently set the RFP to rejected and to remove any pending next steps from the Workflow process for the RFP.
Create Task	Once confirmed, the Task view can be requested for a Project with the RFP information automatically filled in.



5 Objects

5.1 Object Listing

The Object Listing displays MDCMS Object Requests that are either currently active or have already been installed. The listing is filtered by various fields. The initial values for the filters will vary, depending on the source of the navigation to the Object listing (RFP, Project, Object Group, etc.)

Options

Object Locations	List all locations where the object is found
Object Groups	List the object groups impacted by the Installed object along with the version for each group as a result of the installation
RFP Details	View details of the RFP that the object is assigned to

5.2 Object Details

An RFP identifies a collection of objects that are to be installed together into the same application environment. If the user has been granted the necessary authority in MDSEC, an RFP may be created or edited within the Workflow Application.

Header Fields

Object	The name of the object
Description	The description, if it is an IBMi object
Library/Path	The installation location for the Object. For an IBMi object, this would be the library, and for an IFS or remote object, this would be the folder path.
Source Library	The installation library for the IBMi source member
Source File	The installation source file for the IBMi source member
Object Type	The type of object
MDCMS Attribute	The attribute assigned to the request to dictate its handling (location, authority, exit points, etc...)
Application	The MDCMS Application code
Location	The IBMi MDCMS Repository Location
Level	The MDCMS Promotion Level at the given location correlating to a specific environment for the application (such as Development, Test, or Production)
From Level	The MDCMS Promotion Level that the object is migrated from. This will be blank if for the initial level or if received from another system.
RFP	The automatically generated RFP number used to install this object. The number may be clicked to view further information about the RFP. A description of the RFP appears to the right.
Request Date	The date that the object was checked out
Status	The status of the object (see RFP Status for all possible values)
Installation Date	The date that the object was installed
Installation Time	The time that the object was installed
Action	Modify – the object is new or will be changed Delete – the object will be deleted Recompile – the object will be recompiled due to file or copybook changes Update – the existing object (such as an ILE program or Physical File) will be updated in place
User	The user who checked out the object. The full User description appears to the right.

Object List Fields

Project	The list of Projects that this object request is assigned to. The Project ID may be clicked to view more information about the Project.
Task	The Project Task that was used for the Object Request. The Task may be clicked to view more information about the Task.
Subtask	The Project Task's Subtask that was used for the Object Request The Subtask maybe be clicked to view more information about the Subtask.
Description	The Description of either the Project, Task or Subtask.

5.3 Object Locations

This list allows you to view all libraries across all systems where an object of the same name and type are located.

NOTE: This list is only complete and accurate if the libraries are cross-referenced within MDXREF. This list is only applicable for OS/400 objects.

This list gives a good overview of where a particular object is located and how far it has migrated along the Workflow path.

Fields

Location	The IBMi MDCMS Repository Location
Library	The library where the object resides
Attribute	The MDCMS Attribute assigned to the object
Create Date	The actual creation date according to the object description
Create Time	The actual creation time according to the object description
Source Date	The actual source change date according to the object description
Source Time	The actual source change time according to the object description
Source Library	The library containing the source at the time the object was compiled
Installation Date	The date of the most recent installation of the object. This date may be clicked to see the full details of the installation.
Installation Time	The time of the most recent installation of the object.

6 Time Entry

6.1 Time Entry Listing

The Time Entry Listing displays all hours entered for Projects, Tasks or Subtasks based on the filter values. The Total Hours field displays the sum of all hours based on the current filter values.

If the listing is started from the link in the navigation pane, then the filters are set to the last used values for your user profile. If the listing is started from a Project, Task or Subtask, then the filters are set to show all hours for that Project, Task or Subtask.

The date range filters can be easily set to the most common values using the buttons shown representing different spans of time.

6.2 Time Entry Details

Fields

Date	The date that the work was performed
Project	The project for which the work was performed
Task	The task within the project, if applicable, for which the work was performed
Subtask	The subtask within the task, if applicable, for which the work was performed
Phase	The project phase during which the work was performed
User	The user that carried out the work
Hours	The number of hours worked. Any amount after the decimal point is interpreted as a fraction of an hour.
Comment	Any further comments or descriptions of the work performed

Any time entered is then summarized in the Project, Task and Subtask detail views and can also be reported on using the Report button in the Time Entry Listing view or by defining a report using the MDCMS Time Reports configurator.



7 Installation Calendar

The Installation Calendar allows you to view all past and future RFP installations across all systems.

The view is filtered by the following fields, whose values are remembered from the previous session:

- RFP Status – The status of the RFP
- Location – The MDCMS repository location
- Application – The MDCMS Application code
- Level – The MDCMS Application Level code
- Object Name – The name of the Object
- Project – The Project value
- Task – The Project Task
- Subtask – The Project Task's Subtask
- Month
- Year

The primary view shows the days of the current month.

A list view, titled **RFP Installation Schedule**, can be viewed for RFP installations for a specific date and time by clicking on the link for Month (*Month yyyy*), Week (*Week nn*) or Day (*Day, mm/dd/yyyy*).

For each day, all RFPs that match the filter values and are part of the span of time between installation and the end of the *Reserved Until* value for the RFP are displayed. For RFPs that are not yet installed, the *Installation Date* and the *Reserved Until Date* can be scheduled in advance and then displayed in this view.

MDCMS uses varying colors for the RFPs to help optically separate the individual RFPs from one another.

The RFP may be clicked to view more information about the RFP.

8 Conflict List

The Conflict List is a function that allows for the listing of all objects in an MDXREF level. Additionally, where found, comparisons will be made with the objects in a second MDXREF level.

This function was created primarily for the following purpose:

Many companies receive updates to their business applications from a 3rd party vendor. The updates might typically be sent as a Save File containing a unique library known as a Delivery Library. If significant or frequent updates are being made to an application, there will often be several delivery libraries present on the development system. It can then be difficult to manage the status of the various deliveries and to ensure that the correct version of a duplicated object will be installed. The conflict list can be used to significantly help with the management of this situation.

The optimal way to make use of the conflict list is to create a level on the development system, such as 99, to be used to cross reference the objects that reside in the delivery libraries. This way MDXREF is aware of the contents of all of the deliveries and can list them as well as compare the objects to one another or to the Production level.

The Conflict List function is not limited to 3rd party deliveries and could be used for other purposes.

8.1 XREFBLDLIB API to Add Delivery Library to MDXREF

The XREFBLDLIB API can be used to automatically add a new delivery library to the MDXREF database. This command can then be built directly into the process used to restore the delivery library onto the system.

8.2 XREFRMVLIB API to Remove Delivery Library from MDXREF

The XREFRMVLIB API can be used to automatically remove a delivery library from the MDXREF database, once the library is no longer required. This command can then be built directly into the process used to delete the delivery library from the system.

8.3 Conflict List Settings

The settings for the Conflict List must be defined before the function can be used. The settings are available as a link from the Conflict List view.

Fields

Application	The MDXREF application to contain the cross-reference information
Location of Delivery Libraries	The IBMi location containing the Delivery Libraries
MDXREF Level for Delivery Libraries	The MDXREF level number to contain the cross-reference information for the Delivery libraries
Location of Production Libraries	The IBMi location containing the Production Libraries
MDXREF Level for Production Libraries	The MDXREF level number to contain the cross-reference information for the production libraries



8.4 Conflict List Listing

This view lists all objects located in the designated MDXREF Application and Level for deliveries (see Conflict List Settings).

The list can be filtered by a Library, Object, RFP, or differences in respect to Production.

If a value is entered for library filter, or if a library in the listing itself is clicked, the listing will be changed to show only objects in that library. Additionally, all matching objects in other delivery libraries will be shown as well. This allows for the user to very easily see the duplicate objects among the various delivery libraries.

The same is true for the Object or RFP filter.

Fields

Object	The name of the object
Attribute	The IBMi attribute for the object
Library	The name of the delivery library containing the object
Source Date Delivery	The source change date of the object in the delivery library
Source Time Delivery	The source change time of the object in the delivery library
Source Lib Delivery	The library containing the source at the time the object was compiled
Source Date Production	The source change date of the object in Production
Source Time Production	The source change time of the object in Production
Source Lib Production	The library containing the source at the time the object was compiled
Application/Level/RFP	The most recent MDCMS Application / Level / RFP used to migrate the object from the delivery library



9 Object Group Versioning

9.1 Object Groups

An Object Group is an entity in MDCMS that allows for the logical grouping of objects within or across applications and libraries for the purpose of version tracking for that group of objects.

Per object group, a version number can be maintained and/or viewed. The version number may be set manually or automatically depending on object installation counts. Each group can have its own version incrementing scheme.

The MDCMS system locations and levels intended for the versioning of Object Groups is defined from the settings menu (Object Group Levels). Typically, the level(s) containing the production environment are used for versioning.

Fields

Location	The location of the Object Group
Level	The MDCMS level of the Object Group
Object Group	The name of the Object Group
Description	A brief description
Current Version	The current version of the group. This may range from V0R0M0 to V999R999M999
Automatic Versioning	If checked, the version will increment automatically based on the increment counters. Otherwise, the version will only change manually.
Version Number	The Version (primary) portion of the version. This is only editable if automatic versioning is turned off.
Release Number	The Release (secondary) portion of the version. This is only editable if automatic versioning is turned off.
Modification Number	The Modification (tertiary) portion of the version. This is only editable if automatic versioning is turned off.
Increment V every n Object Installations	The number of objects that must be installed for the group, before the Version number will be incremented by 1. Only applicable when automatic versioning is enabled.
Increment R every n Object Installations	The number of objects that must be installed for the group, before the Release number will be incremented by 1. Only applicable when automatic versioning is enabled.
Increment M every n Object Installations	The number of objects that must be installed for the group, before the Modification number will be incremented by 1. Only applicable when automatic versioning is enabled.
Object Installations since last V Increment	The number of objects installed since the last time the version number was automatically incremented. The Reset button may be used to return this value to 0.
Object Installations since last R Increment	The number of objects installed since the last time the release number was automatically incremented. The Reset button may be used to return this value to 0.
Object Installations since last M Increment	The number of objects installed since the last time the modification number was automatically incremented. The Reset button may be used to return this value to 0.



9.2 Object Group Inclusion Rules

A set of rules can be defined to determine which group (or groups) each object belongs to as it is installed. The rules for each group would be searched to match against the object definition. Multiple rules may be defined per group.

Each rule consists of a number of inclusion filter fields. If a value is entered for an inclusion filter, then only objects matching that value will be marked as belonging to the Object Group. The object must match all entered inclusion values. Blank inclusion values will be ignored.

Each rule also consists of the same number of exclusion filter fields. If a value is entered for an exclusion filter, then only objects NOT matching that value will be marked as belonging to the Object Group. The object may NOT match any entered exclusion values. Blank exclusion values will be ignored.

Fields

Rule	An automatically generated number to identify the rule
Application	The MDCMS Application
Library/Folder	The library or folder name where the object will be installed (*generic*)
Object Name	The name of the object (*generic*)
Object Type	The type of object
MDCMS Attribute	The MDCMS attribute used to install the object (*generic*)

9.3 Manually Attached Objects

For each level where Object Groups are defined, the objects to be installed will be checked against the inclusion rules to see which Groups that the Object belongs to. If the object does not match any of the rules for any of the groups, and the installation level requires that each object must belong to a group, a pre-submission checking screen will notify the installer and the installation will not continue until each object belongs to at least 1 group.

Either the rules are updated so that the object will belong to a group, or the object can be manually attached to a group directly from the checking screen. The specific object will then automatically be attached to that same group for future installations.

In order to list the objects that are manually attached to an Object Group, a link is provided from the Object Group Levels settings view. If an object should no longer be manually attached in future installations, the Reuse Group flag can be disabled. Click the Save button once the flags have been set as needed.



9.4 Object Group Installation History

A listing of each RFP that has been installed which contains at least 1 object belonging to the Object Group.

Fields

Install Date	Date of Installation
Install Time	Time of Installation
Application	MDCMS Application code
RFP	The RFP number – may be clicked to view more information about the RFP
Description	The RFP description
Version	The version number of the Object Group after all objects in the RFP had been installed
Object Count	The number of objects in the RFP belonging to the Object Group. Recompiled objects are not counted. The number may be clicked to see the list of objects.

9.5 Objects in Object Group

All objects that have been installed which belonged to the Object Group at the time of the Installation.

More information about the object information can be found in the section Object Detail.

9.6 Object Groups for Object

When viewing the object detail for an installed object, the Object Groups link can be clicked to list all Object Groups that that Object was attached to for that installation.