GE VERNOVA

Asset Performance Management
On-Premises APM
V5.0.7.0.0

APM Upgrade

Contents

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Overview

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About APM Upgrade

The APM Upgrade document provides information on how to upgrade the existing APM version to a newer latest version. These instructions assume that you upgrade basic APM system architecture first and then complete the steps for upgrading the modules. For information on upgrade instructions for specific component or module, refer to the specific information using the left navigation.

Terms Used in this Documentation

The following table lists the common terms that are used throughout the database upgrade documentation and their definitions.

Term	Definition	Examples
Database content	Items that exist in the APM database are displayed in some form via the APM interface. There are two versions of database content that exist in your database at a given time: • Baseline content: The database content that matches the baselineAPM database. With the exception of rules and Catalog items, you cannot view baseline content in the APM interface. This content is stored in a separate location from the corresponding public version of that content. • Public content: The database content that you interact with in the APM interface. This content may be the same as the baseline content or it may be the baseline content plus your customizations.	Queries Entity families
Customized database content	Baseline database content that has changed in your database.	Added a field to a baseline datasheet. Modified an Entity family description.
Baseline database content	The database content as it is developed and delivered to you in the baseline APM database.	Query in the baseline Catalog folder Equipment family

Term	Definition	Examples
Custom content	Database content that exists only in your database and not in the baseline APM database.	New query New Entity family and fields
Pre-upgrade public version	In the context of the upgrade process, pre-upgrade public version refers to the public version of the database content that exists in your database (prior to upgrading it to the later version).	Query in the Public Catalog folder Datasheet (applies whether or not the query or datasheet has been customized)
Pre-upgrade baseline version	In the context of the upgrade process, pre-upgrade baseline version refers to the baseline version of the database content that exists in your database (prior to upgrading it to the later version).	Query in the Baseline Catalog folder. Datasheet with no customizations
Content protection	The process by which the custom changes that you apply to baseline database content are preserved during the database upgrade process. Note that, after you apply changes to baseline database content, the database content is considered customized database content.	Field added to a baseline datasheet in your pre-upgrade database also appears in your upgraded database.

Chapter
2

APM Upgrade

Topics:

Before You Begin

Update the `sqlnet.ora` File for Oracle Database 19c

About This Task

Note: This update is applicable only to customers using the Oracle Database.

If you want to upgrade Oracle Database 19c hosted on the APM database using APM Database Upgrade Manager, you must update the `sqlnet.ora` file.

Procedure

1. On the Oracle Database 19c machine that hosts the APM database, access the `sqlnet.ora` file. By default, the file is located in the `ORACLE_HOME/network/admin` folder.
2. Add the following line in the `sqlnet.ora` file:

   ```
   SQLNET.ALLOWED_LOGON_VERSION_SERVER=8
   ```

3. Save and close the file.

Next Steps

You may need to change the password of the APM super administrator before the upgrade. After the upgrade, revert the change (that is, remove the line that you have added in the `sqlnet.ora` file). Otherwise, you may be required to change the password for all APM users.

Improve Upgrade Performance

About This Task

If the APM database contains a large number of Policy Execution History records, upgrading APM can take a long time. To improve the performance, only the most recent 3,000,000 Policy Execution History records will be upgraded. However, if these records contain a large number of hyperlinks, the upgrade may still time out. Therefore, you can choose to remove some or all the Policy Execution History records before upgrading the APM database or you can configure the upgrade to process fewer records or skip upgrade of Policy Execution History records entirely.

This topic describes how to determine the number of Policy Execution History records in your database. You can then remove some or all of them or adjust the upgrade configuration.

Procedure

1. Access APM.
2. In the **Applications** menu, select **TOOLS** > **Queries**.
3. Select **Create New**.
   The **Design** workspace appears.
4. Select **SQL**.
   The **SQL** workspace appears.

5. Enter the following query, and then select ⊳.

```
SELECT Count(MI_POLICY_EXEC_LOG.PLOG_KEY) "Count"
FROM MI_POLICY_EXEC_LOG
```

The query results appear, displaying the number of Policy Execution History records.
6. If the number of Policy Execution History records is excessive, you can remove some or all the records or configure the upgrade utility to process fewer records. For instructions, contact GE Vernova Support.

APM

Upgrade or Update APM to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

Note: GE Vernova does not recommend upgrading from V4.6.2.0.0 through V4.6.4.0.0 to V5.0.0.0.0.

Upgrading or updating and configuring APM includes completing multiple steps, which are outlined in the tables in this section. This section of the documentation provides all the information that you need to upgrade or update and configure the basic system architecture to V5.0.7.0.0.

After you have completed these steps, you will need to perform additional steps required to upgrade any modules that were deployed on your previous version. If you have purchased additional modules for use with APM, then you will also need to consult the first-time deployment documentation for each of those modules and features.

The person responsible for completing each task may vary within in your organization. We recommend, however, that the steps be performed in relatively the same order in which they are listed in the table.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 6
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 7

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

To apply this maintenance release, complete the following steps:

Procedure

1. On each APM Server, including both dedicated and supporting instances, uninstall the APM Server Components.
2. On each APM Server, including both dedicated and supporting instances, install the APM Server Components.

3. Install this release to mobile devices using an iOS, Android, or Windows operating system by following the standard documentation for installing the GE Digital APM mobile application.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

If your current version is APM V4.6.2.0.0 through V4.6.11.0.0, then updating the basic system architecture to V5.0.7.0.0 requires only that you complete the steps that are outlined in the table in this section.

Step	Task	Notes
1	Create a backup of your database and configuration files (.conf) that exist in the following directories: • `C:\Program Files \Meridium` • `C:\ProgramData \Meridium`	This step is not mandatory, but is recommended by APM. Updates may include changes to configuration files and database elements. If any problems occur during the update, the configuration files and database can be restored to their original states from the backup copies.
2	Update the APM Server and Add Ons software on the APM Server(s).	This step is required. This procedure includes updating your data sources for V5.0.7.0.0.
3	Install Redis on the GE Vernova Redis server (Linux server).	This step is required.
4	Based on your database provider, complete the following steps: • Oracle: Create the Oracle Scheduler Database • SQL Server: Create the SQL Server Scheduler Database	This step is required. To maintain continuity, all the recurring scheduled jobs in current version are migrated to the newer versions. When the Job Monitoring Dashboard logs are migrated, the last 100 logs for all the job types are also migrated.
5	As needed, Based on your database provider, complete the following steps: • Oracle: Create the Localization Oracle Database • SQL Server: Create the SQL Server Localization Database	This step is required only if you are deploying translations for the first time.
6	As needed, If you want to activate non-English translations in APM, then Upgrade Localization Database on page 28	This step is required only if you want to utilize and redeploy updated translations.
7	Upgrade the APM database.	This step is required.
8	As needed, configure one of the virtual machine to execute all the scheduled jobs.	This step is required only if you have deployed APM in a clustered environment and you want to dedicate a virtual machine to run all the scheduled jobs.
9	As needed, deploy the APM mobile application on mobile devices.	This step is required only if you are deploying the APM mobile application on mobile devices.

Upgrade or Update the APM Server to V5.0.7.0.0

About This Task

The following instructions provide details on upgrading or updating the APM Server and Add-ons software on a 64-bit APM Server machine.

Procedure

1. Create a backup of the data contained in the following directories:
   - `C:\Program Files\Meridium`
   - `C:\ProgramData\Meridium`
2. Uninstall the APM Server and Add-ons component.
3. Ensure that WebDAV Publishing is deactivated. To verify this, in the Server Manager, in the **Local Server** workspace, in the **Roles and Features** section, ensure that **WebDAV Publishing** is not present in the list.
4. Install and configure the APM Server software and Add-ons.

Uninstall APM Server Components After the Initial Installation

About This Task

If you need to uninstall APM Server on a machine after the initial installation is complete, you can run the APM Server installer again to uninstall the software.

Note: IIS will be reset automatically by the installer before the installation process begins.

Procedure

1. On the APM Server machine, via the Control Panel, access the **Programs and Features** window.
2. In the grid, select the **APM Server** item, and then select **Uninstall**.
   The APM Server installer appears, displaying the **Preparing Setup** screen, which contains a progress bar. After completion, a message appears, asking if you want to remove the selected application and all of its features.
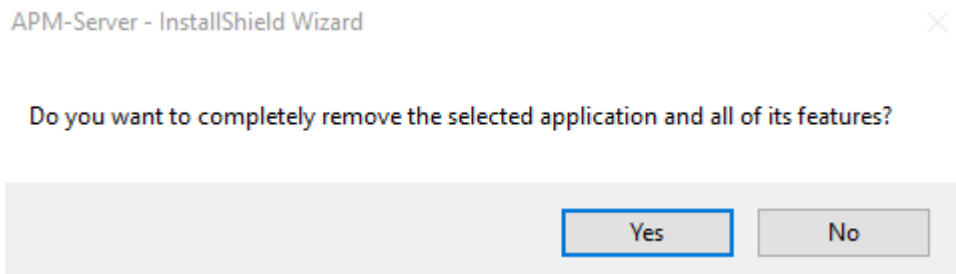
3. Select **Yes**

   The **Setup Status** screen appears, displaying a progress bar. After the application and all of its features are removed, the **Uninstall Complete** screen appears.
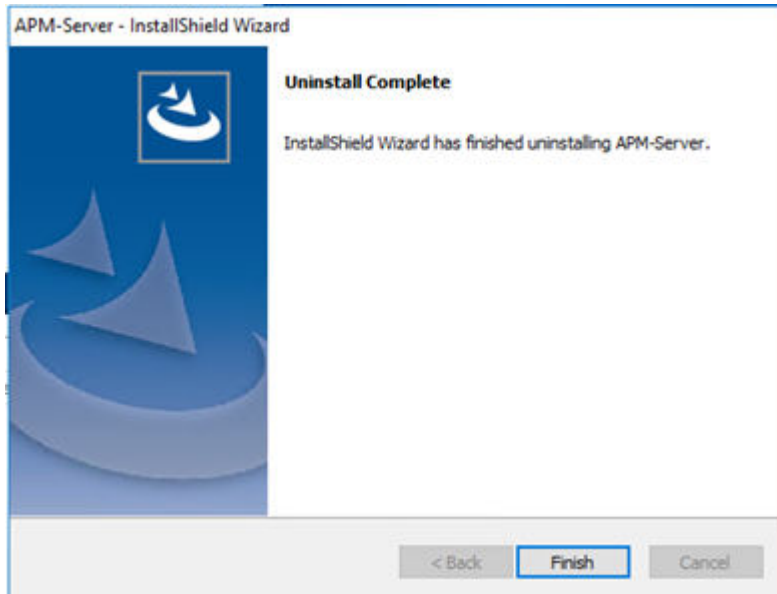
4. Select **Finish**
   The APM Server installer closes.

Upgrade the APM Adapter for SSRS to APM

About This Task

The following instructions assume that you were using the 64-bit APM Adapter for SSRS in your previous version. If you were using the 32-bit APM Adapter for SSRS, you will need to uninstall the older 32-bit version and install the new 64-bit version on a 64-bit SQL Server Report Server.

Procedure

1. On the SQL Server Report Server, in the APM distribution package, navigate to the folder `Setup\SSRS`.
2. Open the file `setup.exe`.

   A message appears, asking if you want to allow the installer to make changes to your machine.
3. Select **Yes**.

   The Meridium APM SSRS installer appears, displaying the welcome screen.
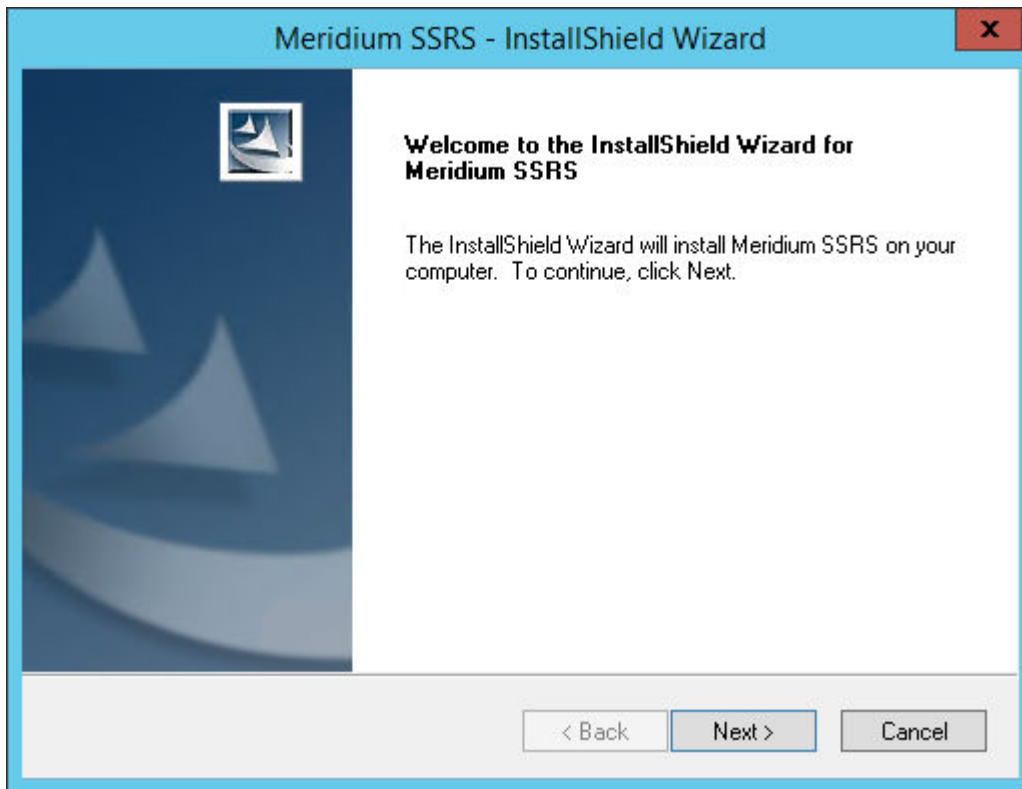
4. Select **Next**.
    The **License Agreement** screen appears.
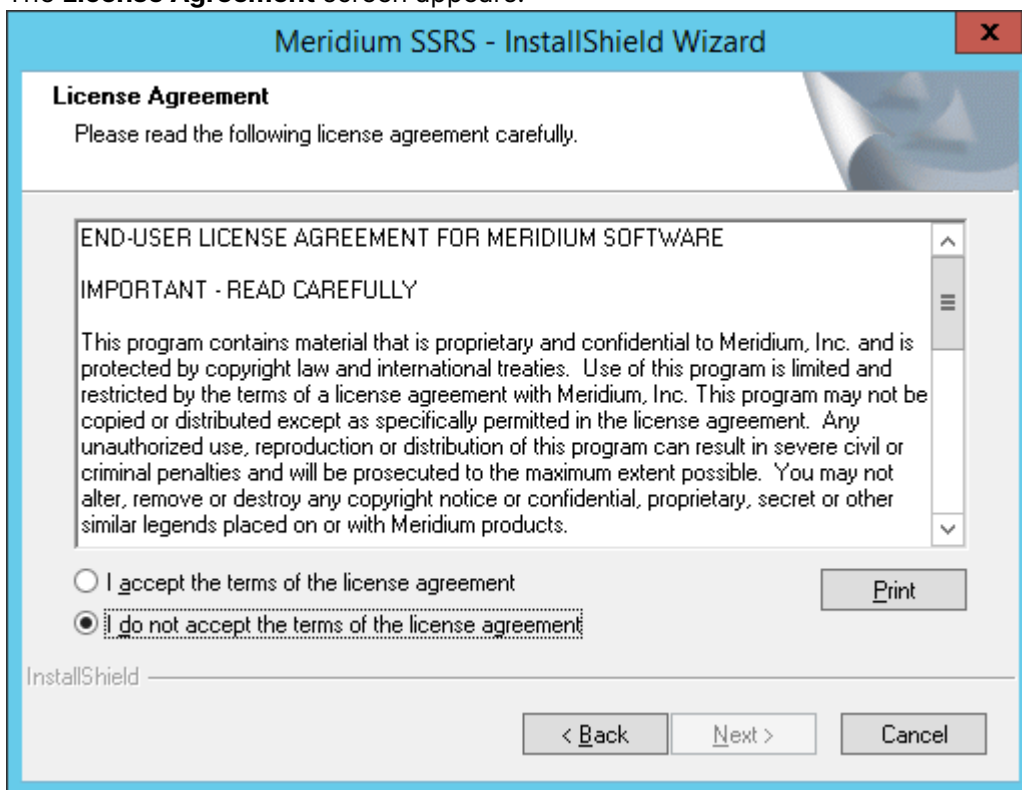
5. Read the License Agreement, and then, if you agree to the terms, select the **I accept the terms of the license agreement** check box. Then, select **Next**.

The **Select Installation Location** screen appears, prompting you to select the location where the software will be installed. By default, the software will be installed in the following folder: `C:\Program Files\Meridium`.
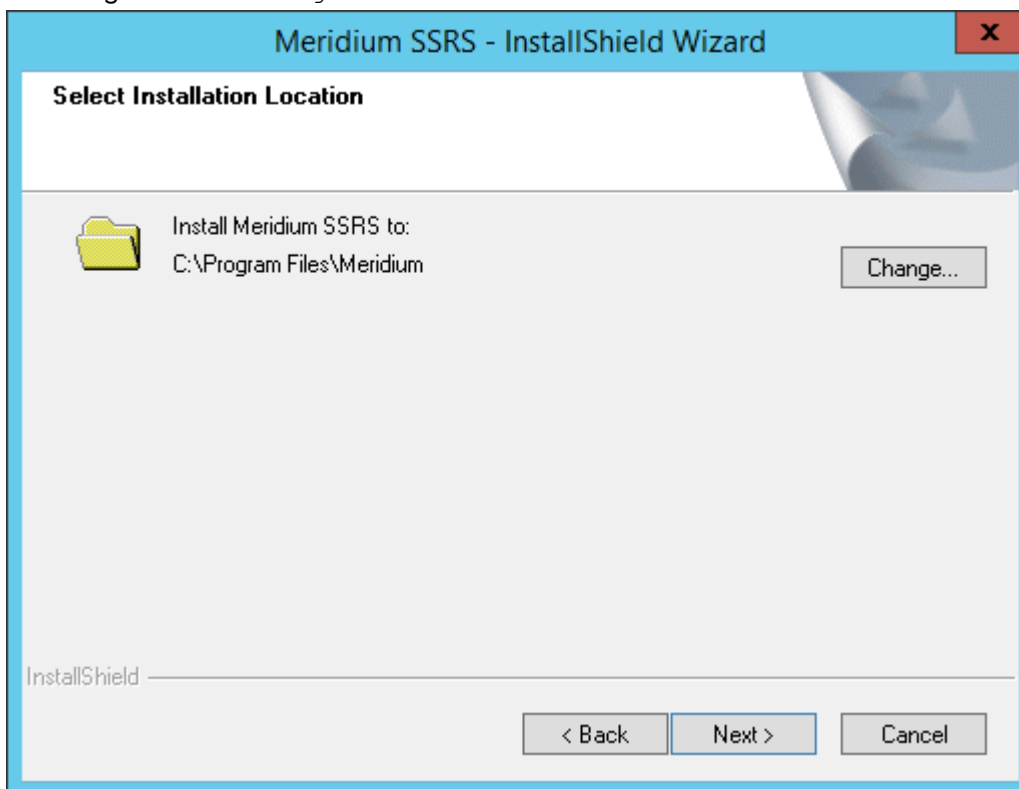
6. If you are satisfied with the default location where the software will be installed, select **Next**.

-or-

If you want to change the location where the software will be installed, select Change, and then navigate to the location where you want to install the software. The folder path that you select will be displayed in place of the default folder path. When you are satisfied with the installation location, select Next.

The **SQL Server Reporting Server Instances** screen appears.
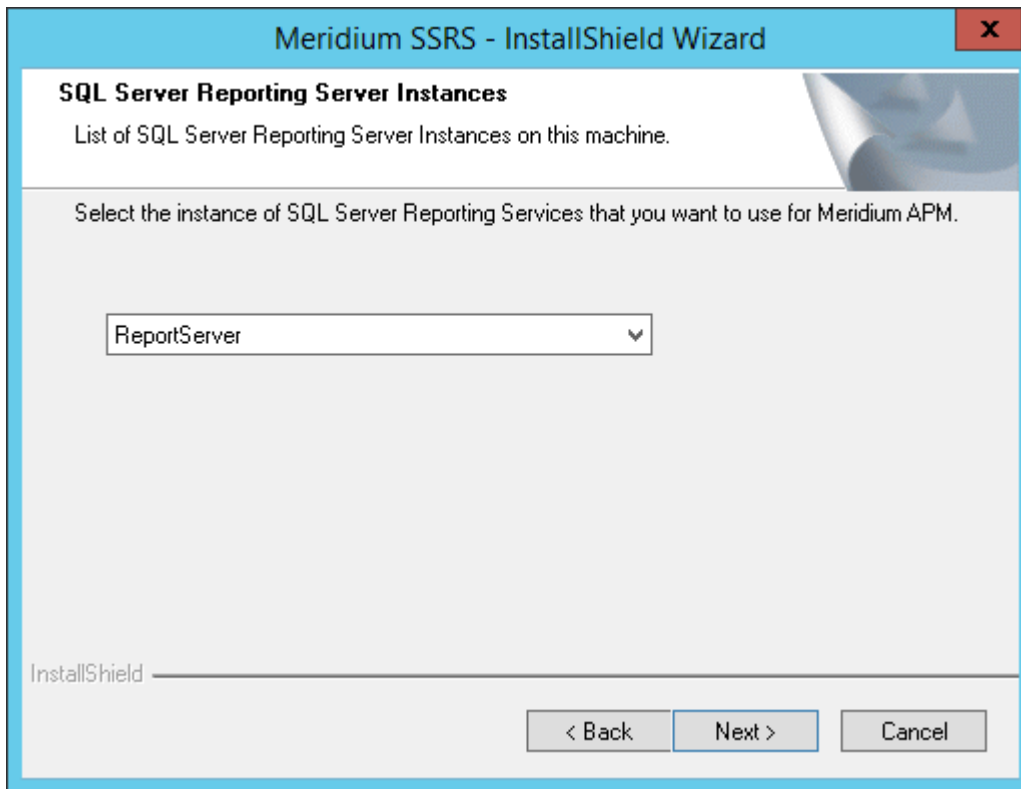
7. Select the instance of SQL Server Reporting Services that you want to use, and then select **Next**.

   The **Complete the Installation** screen appears.
8. Select **Install**.
   The **Setup Status** screen appears, which displays a progress bar that shows the progress of the installation process. After the progress bar reaches the end, a message appears, indicating that your server is being configured. After your server is configured, the **Installation is Complete** screen appears.
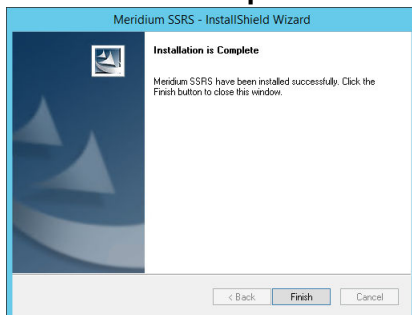
9. Select **Finish**.

   The installer closes.

Next Steps

- Upgrade or update APM.

Upgrade the APM Database to V5.0.7.0.0

To upgrade your APM database, you will use the APM Database Upgrade Manager application, which guides you step-by-step through the database upgrade process. The application is installed automatically when you install the APM Server.

During the database upgrade process, the APM Database Upgrade Manager will:

1. Replace all the baseline database content in your database with the updated baseline APM database content.
2. Compare your public database content to the baseline APM database content, and then:
   - Retain any customized database content.
   - Replace any database content that you have not customized in your database with the updated baseline database content.
3. Record every event in the database upgrade log and display a status on the interface.
4. Report errors as they occur.
5. Compile the database when the upgrade is complete.
6. Display a confirmation message when the database upgrade process is complete.

The progress of this process will be displayed while it is running. When it is finished, a message will appear, displaying a summary that includes the number of failures, if any, that occurred during the upgrade process.

Note: The information in this note applies only to SQL Server. Altering the database recovery mode to SIMPLE for the duration of the upgrade will limit disk space consumption on the APM Database Server and may be necessary to successfully upgrade larger databases. The database upgrade executes many transactions, all of which are logged by SQL Server. If the database is in FULL recovery mode, SQL Server must retain all of these transactions, causing the transaction log file to become very large. This could potentially cause the upgrade to fail by consuming all available disk space or exceeding the size limit for the file.

Upgrade failure of this kind can be safely avoided by temporarily modifying the database recovery mode to SIMPLE before running the upgrade and then resetting it to FULL after the upgrade. Your database administrator can use the following commands to modify the database recovery mode:

To put the database in SIMPLE recovery mode:

```
 USE [master]

 GO

 ALTER DATABASE [mydb] SET RECOVERY SIMPLE WITH NO_WAIT
 GO
```

To put the database in FULL recovery mode:

```
 USE [master]
 GO

 ALTER DATABASE [mydb] SET RECOVERY FULL WITH NO_WAIT

 GO
```

For more information about SQL Server database recovery modes, consult the Microsoft documentation.

Upgrade workflow

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The table in this section lists the prerequisite tasks that must be completed before you initiate the database upgrade process. These instructions assume that yourAPM Server and APM Database Server machines meet the APM hardware and software requirements. You can use the Database Upgrade Manager to upgrade a database from any version V3.4.0 SP3 or later to your target version. Details on upgrading from a starting version that is earlier than V3.4.0 SP3 are not provided in this documentation. For more information on upgrading your database from a version earlier than V3.4.0 SP3, contact the APM Professional Services department.

Step	Task	Notes
1	Complete all steps before Upgrade the Meridium Enterprise APM Database Server in the upgrade APM to APM workflow.	This step is required. For example, if you are upgrading your system to APM, you should upgrade your dedicated APM Server to APM before attempting to upgrade your database to the APM database version. Doing so ensures that your machine contains the latest database content file, which is a compressed folder containing the content of the baseline APM database for the target database version.
2	Read and understand how your customizations will be protected during the upgrade process.	You will need to understand how your content is protected to determine what, if any, content you should export from your pre-upgrade database before initiating the database upgrade process.
3	Create a backup of your database.	You should always back up the database before beginning any upgrade process. If any problems occur during the upgrade, the database can then be restored to its original state from the backup copy.

Step	Task	Notes
4	Log in to Oracle Server 12.2 as a privileged user, and then run the following command: SQL> GRANT SELECT ANY DICTIONARY TO <user>; ...where <user> is the name of the user that you created when you created the APM Oracle Schema on the APM Database Server.	
5	Using a backup copy of your database, perform the upgrade in a test environment.	We recommend that you perform the upgrade in a test environment so that you can assess any issues that you may encounter and correct them before upgrading your database in a production environment.
6	Log in to SQL*Plus (or equivalent) as the schema owner, and then run the following command: SQL> EXEC MI_DDL.CRT_SIDX_SI_MI_GEOD_GD	This step is required only if both of the following are true: • You plan to use an Oracle Database Server. -and- • You are upgrading from a version of APM version V4.2.0.0 or later.
7	Perform the upgrade in the production environment.	This step is required. **Note:** Before you upgrade your database in a production environment, all the issues that were discovered during the test upgrade must be resolved. Otherwise, the resulting state of your database could be unstable.
8	Log in to Oracle Server 12.2 as a privileged user, and then run the following command: SQL> REVOKE SELECT ANY DICTIONARY FROM <user>; ...where <user> is the name of the user that you created when you created the APM Oracle Schema on the APM Database Server.	

| Step	Task	Notes
9	If your pre-upgrade database employed Enterprise Data Filtering and you want to convert your Enterprise Data Filtering values to Site Reference Keys, consult a member of the APM Professional Services department for more information.	This step is optional. If your pre-upgrade database did not employ Enterprise Data Filtering or you do not want to convert your existing Enterprise Data Filtering values to Site Reference Keys, then skip this step.
10	Modify each custom family that you do not want to be enabled for site filtering.	During the upgrade, custom families are set to be enabled for site filtering. For each custom family that you do not want to be enabled for site filtering, you must modify the family by clearing the **Enable Site Filtering** check box in the **Information** section of the workspace for the family.

Step	Task	Notes
11	Confirm that Site Reference Keys were populated correctly during the upgrade. Modify the site assignments for records as needed.	This step is required. To support site filtering, a APM Default site was added to the Site Reference family during the database upgrade. If the APM Default site is the only site in your Site Reference family, then records of families that are enabled for site filtering are assigned to it. If there are two sites in your Site Reference family (i.e., the APM Default site and one other site), then records of families that are enabled for site filtering are assigned to the site that is not APM Default site. During the upgrade, additional logic is used, based on a record's specific relationships with other records, to assign a site for each record belonging to a family that is enabled for site filtering. **Note:** The manner in which Site Reference Keys are spread across families to assign sites to records can vary from module to module. If you have questions about how Site Reference Keys were populated during the upgrade, contact the APM Professional Services department. If a record's site assignment could not be populated automatically during the upgrade, then the record is designated as a global record (i.e., it is not assigned to any specific site). For some records, the site assignment may need to be modified by a Super User.

Step	Task	Notes
12	Verify that users' site assignments and default sites are correct . Assign default sites to any users who do not have one.	This step is required. To support site filtering, a APM Default site was added to the Site Reference family. If the APM Default site is the only site in your Site Reference family, then all users are assigned to it, and it is set as their default site. If there are two sites in your Site Reference family (i.e., the APM Default site and one other site), then all users are assigned to the site that is not APM Default site, and the site that is not APM Default site is set as each user's default site. If there are three or more sites in your Site Reference family (i.e., the APM Default site and two or more other sites), then no default site is set for users. If there are three or more sites in your Site Reference family, then you must verify site assignments and assign a default site for each user.
13	If the system from which you upgraded utilized an Oracle Database Server, then configure the APM Server for Oracle components.	This step is required only if the system from which you upgraded utilized an Oracle Database Server.
14	Remove database notification elements from the database.	This step is not mandatory, but is recommended by APM.
15	In APM, build the search index.	This step is not mandatory, but is recommended by APM.

About Customized Database Content Protection

Illustration of content protection

Consider a scenario where Datasheet A exists in the baseline APM database and you want to upgrade a database in which Datasheet A has been customized (e.g., you added a new field). The following diagram illustrates what the two databases would contain in this case, where the squares represent the unchanged baseline datasheet and the hexagon indicates the same baseline datasheet with your customizations.
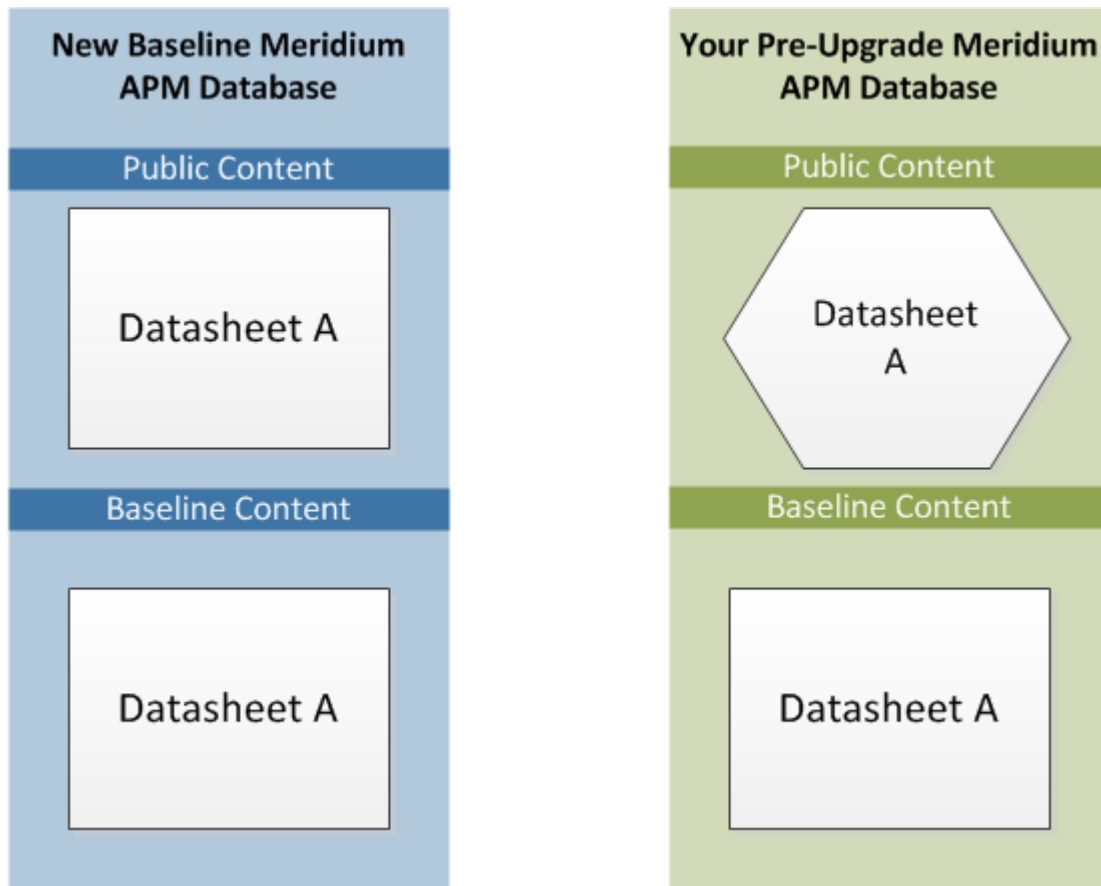
Note: Note: As indicated by this illustration, in the baseline APM database, the public and baseline versions of an item are always identical.

When this database is upgraded to the new database version, only the baseline version of Datasheet A will be replaced in your database, as illustrated in the following diagram.
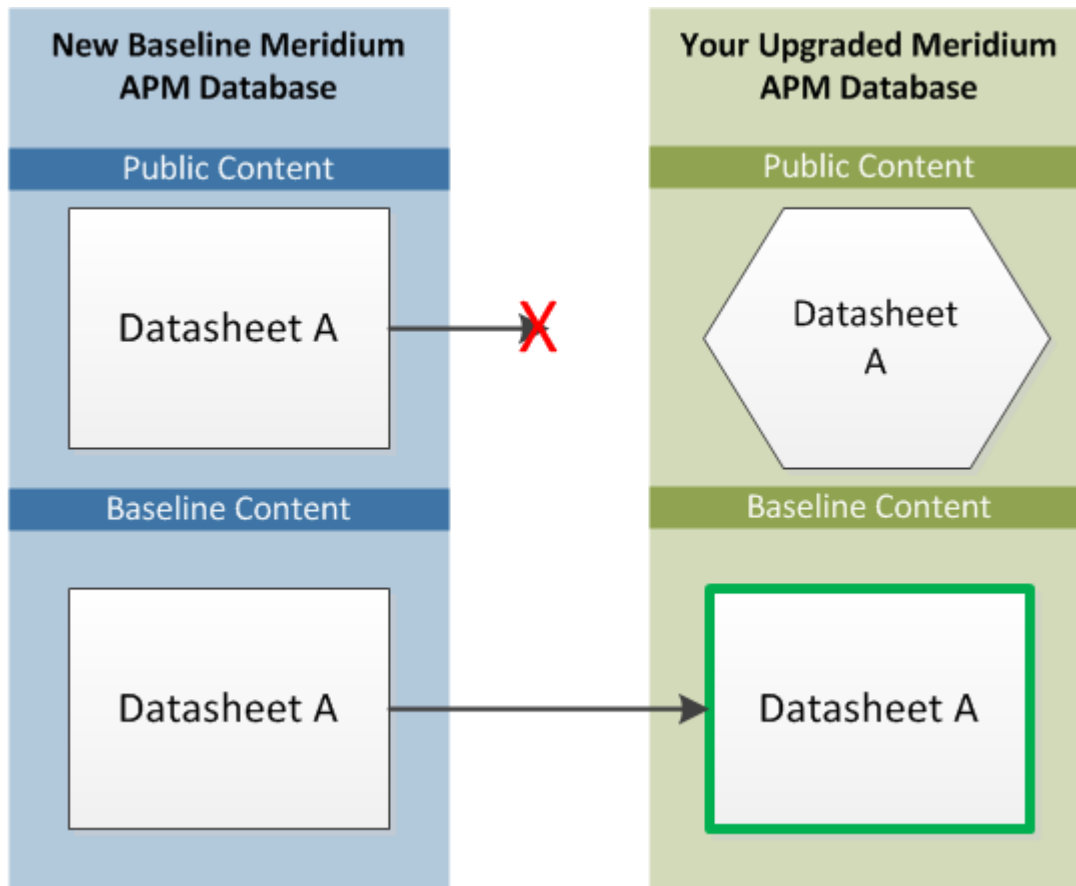
In this way, all your custom changes are retained. Likewise, however, your database will not contain the baseline changes that APM delivers in a given release . For this reason, you will want to determine which database items will be retained in your database so that you can determine which baseline changes your database will not contain after you upgrade. With that information, you can determine whether you want to:

- Continue to use your database content as is, without APM's changes

-or-

- Apply APM's changes manually to your customized database content.

Database content replacement versus protection

In general, you can assume that all the custom changes you have made to your database content will be retained in your upgraded database. In addition, you can assume that for any custom change that is protected in your database, your database will not contain any baseline changes that APM delivers for that item in a given release. In other words, if APM delivers updated changes to the baseline version of an item that you have customized in your database, you will not receive those changes because your custom changes will take precedence over the baseline changes. As a result, you should evaluate each baseline change that is delivered to determine if you want to apply those changes to your database content.

Note: Note: In a given release, there may be exceptions to the content protection criteria. These exceptions will be communicated via the APM Release Notes for that version. For example, if APM changes a baseline field caption, it is possible that APM can choose to

forcibly replace that field caption in your database even if you have customized that field caption already.

You can use the Database Comparison Tool (in pre-upgrade mode) to determine what content will be protected in your database. The output of this tool indicates:

- The baseline APM database content that has been updated in the target version (i.e., content that includes new baseline changes from APM).
  -and-
- Among the content that has been updated in the baseline APM database, that which you have customized in your pre-upgrade database.

Using a combination of the results from the Database Comparison Tool and your understanding of the content protection criteria, you can predict which baseline database content changes will not be available in your upgraded database. For example, consider the following scenario in which the Database Comparison Tool indicates that the baseline query Available Recommendations has been updated in the baseline APM database for your target version and that you have customized the Available Recommendations query in your pre-upgrade database.

Item Name	Item Path	Type	Baseline Changes	Custom Changes
Available Recommendations	Public\Meridium\Modules\Rec	Query	●	●

In this case, you can assume that your upgraded database will contain:

- Your public version of the Available Recommendations query with all your customizations (in the Public Catalog folder).
- The updated baseline Available Recommendations query only in the Baseline folder.

Before you upgrade your database, you can use the Database Comparison Tool to view the specific differences between the Available Recommendations query in the baseline APM database for the target version and the same baseline query as it exists in your current version. For example, you could see that APM has added the Asset Description column to the baseline query. At this point, you can decide whether or not you want to either manually apply that change to your custom query after you upgrade or manually replace your public query with the baseline query in the Baseline folder.

Protected database content

The following table lists the types of content that exist in your database and indicates whether customizations to an existing baseline item of that type will be protected during the database upgrade process.

For items in which your customizations will not be protected during an upgrade, to maintain your customizations, you will need to export your customized items from your pre-upgrade database using the Import/Export tool, and then import them into the upgraded database. Alternatively, you can customize the items again, manually, in the upgraded database.

For some attributes of families and family fields, APM may make a change in the baseline database that will be applied to your database, regardless of whether you have customized that item or not. In these cases, the affected content will not be protected. APM will, however, communicate such changes via the release notes for that version (i.e., in the content changes section). For example, if a family caption changes in the baseline database, your database should contain this change. Therefore, if you have made changes to the same family's caption, your customization will be overwritten. You can, however, obtain the baseline content after you upgrade your database.

Baseline Database Content Type	Protected?	Notes
Family attributes (Entity and Relationship)		
Associated Pages	Yes	Associated Pages are considered one database item per family. This means that if you customize one Associated Page (of many), the database upgrade process will consider all the Associated Pages for that family as customized.
Family description	Yes	None
Family captions	Yes	None
ID Template	Yes	None
Family help text	Yes	None
Datasheets	Yes	A single datasheet is considered one database item. This means that if you customize any attribute of a datasheet, the database upgrade process will consider the entire datasheet as customized.
Field attributes		
• Caption • Description • Help text • Override parent flag • ID flag • UTC	Yes	The UTC property will be protected based on whether records exist for the family to which the field belongs. If records exist in a family, the field property will be protected. In other words, if APM sets the UTC property in a baseline field to True and you already have records in the family to which that field belongs, you will not receive the updated property setting automatically.
Catalog Items		
Metric Views	No	Baseline Metric Views are always overwritten with the updated baseline Metric View.
Queries	Yes	None
Reports	Yes	None
Graphs	Yes	None
Security Groups		
Security Group caption	Yes	None
Security Group ID	Yes	None

Baseline Database Content Type	Protected?	Notes
Security Group description	Yes	None
Security Group privileges	No	Baseline Security Group privileges are always overwritten with the updated baseline Security Group privileges.
Records and links between records		

Baseline Database Content Type	Protected?	Notes
Records	Yes (with some exceptions)	After baseline records for a given family exist in your database, the records in that family will never be overwritten or updated during the database upgrade process, even if you have not customized them in any way. This means that if APM delivers updates to the existing baseline records or adds additional baseline records in a given family, you will not receive those changes by default. If this occurs, you can choose to perform an additional step to manually obtain the new records or revert your existing records to baseline. There are, however, several families whose records are not protected in this way. The following baseline families are considered recurring exceptions to the rule that all records and links are protected. This means that the database upgrade process will overwrite the baseline records in these families. In other words, all the baseline records in the following families will always be overwritten in your database with the updated baseline records: • Analysis Services Cube • CMMS System • Device • Device Data Presentation • Device Mapping • Device Mapping Family • Device Mapping Field • Pipe Properties • Security Group • Calibration Template Defaults This means that if you have customized any baseline record in one of the families in the preceding list, because all the baseline records are overwritten, your changes will be overwritten.

Baseline Database Content Type	Protected?	Notes
Links between records	Yes	When the records are protected, the relationships that link the records together are also maintained with that record.
Groups of records and links that make up a single entity (e.g., Baseline Risk Matrix)	Yes	A group of records and links that make up a single entity, also known as a composite entity, is treated as one entity for the purposes of the database upgrade process and content protection. After such an entity exists in your database, it will never be overwritten or updated during the database upgrade process, even if you have not customized the records and links in any way.
State Configuration		
State Configuration Roles	No	Baseline State Configuration Roles are always overwritten with the updated baseline State Configuration Roles.
State Configuration Role Description	Yes	None
State Configuration Role Caption	Yes	None
State Role Security Group assignments	Yes	None
Strategy Rules and Strategies	Yes	None
Other content		
System Codes and System Code Tables	Yes	None
Preferences	Yes	None
UOMs and UOM Conversion Sets	Yes	None
Scheduled Items	Yes	None
Rules Library Projects	Yes	None

Initiate the Database Upgrade Process

About This Task

When you initiate the database upgrade process, the APM system will begin upgrading your database through a process that consists of the following steps:

1. Unzipping the compressed database content folder and extracting its contents.
2. Checking the extracted files against the list of baseline files to determine if all the expected files are available.
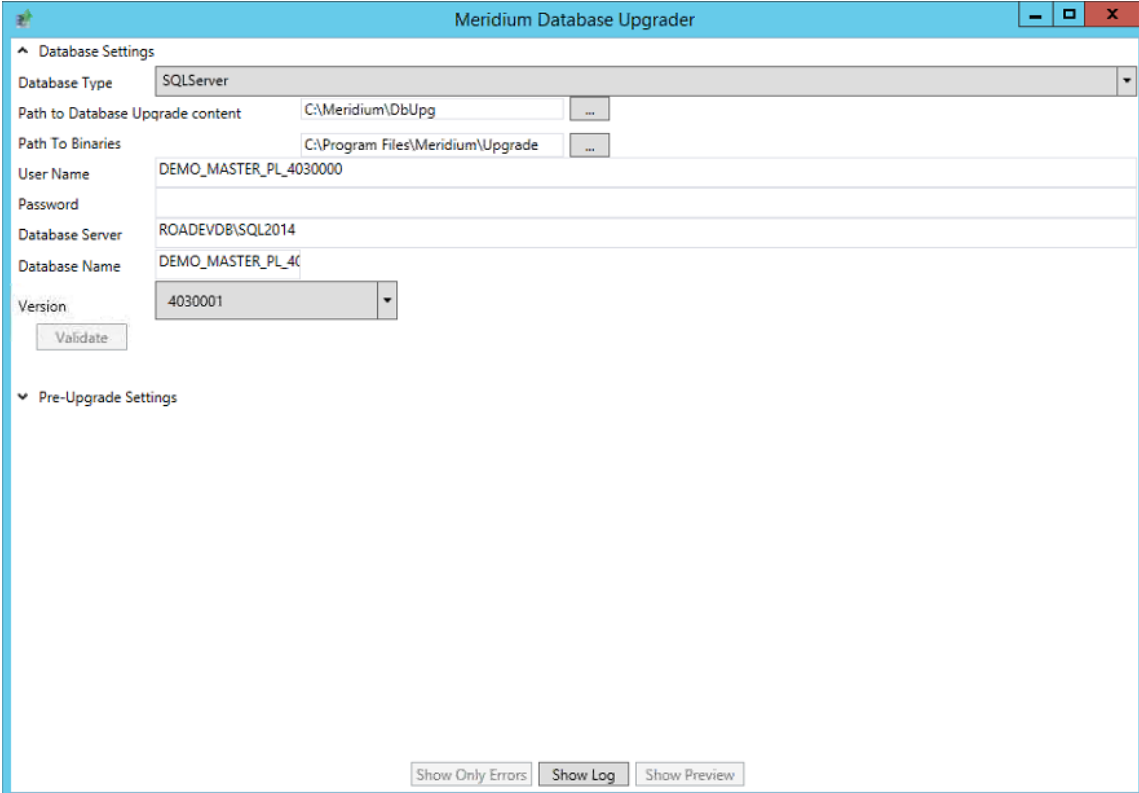
3. Loading the baseline database content into your database.
4. Processing each file and protecting your customized items according to the content protection process.

The following instructions assume that your dedicated APM Server already contains the version of the APM software that corresponds to the database version to which you want to upgrade your database, and that you are ready to upgrade your database in either a test or production environment.

Important: The database upgrade process can take several hours to complete, depending on the size of the database, available memory, and other factors. After you start the database upgrade process, you should not close the window unless you want to stop the database upgrade process.

Procedure

1. On the dedicated APM Server machine, on the Start menu, expand the Meridium APM Applications folder.
2. Select Database Upgrade Manager.
   The **Meridium Database Upgrader** window appears.

3. Enter the following information about the database that you want to upgrade to the new version:

   a. In the **Database Type** box, select the database type: SQLServer or Oracle.
      Depending on the value that you select, the remaining boxes may be hidden. The behavior of each box is described in its corresponding step.
   b. The **Path to Database Upgrade content** box contains the folder path for the compressed database content file that was installed when the APM Server software was upgraded. For example, if you accepted the default location during the APM Server

upgrade, the compressed file is installed in the folder `C:\Meridium\DbUpg`. In this box, select [...], then navigate to the compressed database content file whose file name contains MI_DB_Master, and then select it.

c. In the **User Name** box, enter the user name or schema name that can be used to log in to your database.

d. In the **Password** box, enter the password associated with the value in the **User Name** box.

e. In the **Database Server** box, enter the path to the Database Server machine where your database resides. This step applies only to SQL Server database types, and is hidden if you selected Oracle in the **Type** list.

f. In the **Database Name** box, enter the name of the database that you want to upgrade. This step applies only to SQL Server database types. If you selected **Oracle** in the **Type** list, the **Database Name** box will be hidden.

g. In the **Alias** box, enter the database alias for the database that you want to upgrade. This step applies only to Oracle database types. If you selected **SQLServer** in the **Database Type** box, the **Alias** box will be hidden.

h. In the **Version** box, select the version to which you want to upgrade.

4. Select **Validate**.

The **Meridium Database Upgrader** window expands.

The Database Upgrade Manager performs the following checks in the following order:

- Attempts to connect to the database.
- Attempts to locate the compressed database content file specified in the **Path to Database Upgrade content** box.

Note: Note: If the APM system encounters issues during the first two checks, corresponding messages will be displayed. If you see an error message, you should correct the issue by using the solution indicated in the message.

When the validation is complete, the list of tasks to be executed appears.

5. In the **Pre-Upgrade Settings** section:

   a. In the **Trace Level** box, select the value indicating the amount of detail that you want to include in the upgrade logs for each operation that occurs during the database upgrade process.

   b. For the **Ignore Failed Events** check box, which is, by default, cleared:

   - If you are running the database upgrade process in a test environment and want the APM system to continue processing your database even if a failure occurs, select the **Ignore Failed Events** check box. This will provide you with a comprehensive list of failures after the database upgrade process is complete, which you can use to review and correct the failures.
   - If you are running the database upgrade process in a test environment and want to review each failure as it occurs, accept the default selection. This means that if a failure occurs during the upgrade process, the upgrade process will pause automatically, allowing you to review and correct the failures as they occur.
   - If you are running the database upgrade process in a production environment, accept the default selection. At this point, you should have already run the database upgrade process in a test environment and resolved any errors that occurred. Therefore, you should not expect any errors to occur during the database upgrade process in your production environment. Using this option, however, will ensure that if an error does occur, the upgrade process will not continue.

6. To initiate the database upgrade process, select **Upgrade**.
   The **Progress** section displays the progress of the upgrade process.

7. After you have successfully upgraded your database, or if you encounter errors that you cannot resolve, send the upgrade logs associated with the upgrade process to APM. To do so:

   Note: If the following error message appears in your upgrade logs, please ignore it: `Could not find the guid for the content item named: IntegrationInterfaces.`

   a. On the **Meridium Database Upgrader** window, select **Show Log**.
      The log appears in a new window.

   b. Send the file to APM Support Team https://digitalsupport.ge.com/ . When you do, be sure to provide your company name and an indication that the files are database upgrade log files.

8. After you have successfully upgraded your database and sent the upgrade logs to APM Support Team https://digitalsupport.ge.com/, restart the APM Server.

Next Steps

- The next step in the APM Database Server upgrade workflow varies, depending on whether you initiated the upgrade in a test or production environment.

Upgrade Localization Database

About This Task

The following instructions explain how to upgrade a Localization database for use by APM Localization.

Procedure

1. On the APM Server machine, in the APM distribution package, navigate to the `C:\ProgramData\Meridium\Translations\Metadata` folder and `C:\ProgramData\Meridium\Translations\Application` folder.
   Validate that the folders are available.
2. If you have any custom `.mtm` files, add them to their respective folders.
3. On the APM server, navigate to `C:\ProgramData\Meridium`.
4. Open the `appsettings.Global.json` file using a text editor.
5. Modify the following values:
   a) DatabaseProvider: Set the localization service database provider as `Oracle` or `SQL` based on the Localization database.

   ```
   "LocalizerDatabase": {
           // Localizer service database provider. Valid values are
   PostgreSQL, SqlServer, Oracle
           "databaseProvider": "Oracle" or "databaseProvider":
   "SqlServer"}
   ```

   b) `connectionStrings`: The following lines of code show a sample `connectingString` for the SQL Server database or the Oracle database.

   ```
   "connectionStrings: {
                // Localizer service connection string for the above
   configured DatabaseProvider
                //Oracle "LocalizerDatabase": "Data
   Source=(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST={0})(PORT={1}))
   (CONNECT_DATA=(SERVICE_NAME={0})));User Id={0};Password={0};"
                //SQL LocalizerDatabase":
   "DATABASE={2};SERVER={3};UID={0};PASSWORD={1};MultipleActiveResultS
   ets=true;Max Pool Size=1000;",}}
   ```

6. On the APM server, navigate to `C:\Program Files\Meridium\Upgrade\DBUpgrade`.
7. Execute the `Meridium.Database.Upgrader.exe` script.

Configure the APM Server for Oracle Components

About This Task

When installing versions of Meridium APM prior to V4.0.0.0, you were instructed to modify the following files on the dedicated APM Server machine to bind the 64-bit .Net Framework to the Oracle.DataAccess component:

- `C:\WINDOWS\Microsoft.NET\Framework64\V2.0.50727\CONFIG\machine.config`
- `C:\Windows\Microsoft.NET\Framework64\V4.0.30319\CONFIG\machine.config`

The modifications from previous releases are no longer necessary with ODAC version 11.2.0.3 and must be removed. The following instructions provide details on removing the modifications from these files.

Procedure

1. On the APM Server machine, open two Windows explorer windows.
2. In one window, navigate to the folder `C:\WINDOWS\Microsoft.NET\Framework64\V2.0.50727\CONFIG`.

   -and-

In the other window, navigate to the folder `C:\Windows\Microsoft.NET\Framework64\V4.0.30319\CONFIG`.

3. In each folder, using a text editor (for example, Notepad), open the file `machine.config`.

4. In each file, between the opening and closing <configuration> tags, delete the following content:

```
<runtime>
    <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
        <dependentAssembly>
            <assemblyIdentity name="Oracle.DataAccess"
            publicKeyToken="89b483f429c47342" />
            <bindingRedirect oldVersion="2.0.0.0-10.9.9.9"
            newVersion="2.112.1.0" />
        </dependentAssembly>
    </assemblyBinding>
</runtime>
```

5. Save the files, and then close them.

Next Steps

• Refer to the APM Database Server upgrade workflow.

Remove Database Notification Elements from the Database

About This Task

After upgrading your APM Database Server, we recommend that a Database Administrator manually remove database notification elements from the database.

Procedure

For an Oracle server, the Database Administrator should run the command `REVOKE CHANGE NOTIFICATION FROM mi_connect_role`. Alternatively, for an SQL server, the Database Administrator should run the command `ALTER DATABASE <db_name> DISABLE BROKER`.

Next Steps

• Refer to the APM Database Server upgrade workflow.

Tips to Improve Performance

Although pagination helps improve the performance of queries, it cannot help while exporting data, using crosstab queries created from Select queries with plenty of rows, returning character large objects (CLOBs) to the client, and so on. This impacts the server-side memory, client-side memory, and the network bandwidth.

This topic provides suggestions to improve the performance of queries in other possible ways.

Avoid Full Table Scans

Full table scans can impact performance. Therefore, use indexes wherever possible. In addition, consider the following scenarios:

Database Indexes

The database team profiles the database performance periodically and maintains indexes as needed. However, if there is a need for a new index, reach out to the database team.

Outer Joins

Outer joins result in full table scans. Therefore, you must avoid them wherever possible.

Example:

```
SELECT d.name, d.deptno, e.name, e.mgr, d.loc
FROM dept d
LEFT OUTER JOIN emp e
ON  d.deptno = e.deptno
```

OR Conditions

OR conditions can slow down the query performance in large tables. Consider using a UNION instead of OR to avoid a full table scan.

For example, the following code sample...

```
SELECT [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] "Equipment ID"
, [MI_EQUIP000].[MI_EQUIP000_EQUIP_SHRT_DESC_C] "Equipment Short
Description"
, [MI_EQUIP000].[MI_EQUIP000_SITE_C] "Site"
, [MI_EQUIP000].MI_SITE_KEY "MI_SITE_KEY"
FROM [MI_EQUIP000]
WHERE [MI_EQUIP000].MI_SITE_KEY = 64262809275
OR [MI_EQUIP000].MI_ENTY_ID = 'My ID'
```

can be rewritten as follows:

```
SELECT [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] "Equipment ID"
, [MI_EQUIP000].[MI_EQUIP000_EQUIP_SHRT_DESC_C] "Equipment Short
Description"
, [MI_EQUIP000].[MI_EQUIP000_SITE_C] "Site"
, [MI_EQUIP000].MI_SITE_KEY "MI_SITE_KEY"
FROM [MI_EQUIP000]
WHERE [MI_EQUIP000].MI_SITE_KEY = 64262809275

UNION ALL

SELECT [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] "Equipment ID"
, [MI_EQUIP000].[MI_EQUIP000_EQUIP_SHRT_DESC_C] "Equipment Short
Description"
, [MI_EQUIP000].[MI_EQUIP000_SITE_C] "Site"
, [MI_EQUIP000].MI_SITE_KEY "MI_SITE_KEY"
FROM [MI_EQUIP000]
WHERE [MI_EQUIP000].MI_ENTY_ID = 'My ID'
```

The Asset Hierarchy Home Parameter

When Asset Hierarchy was created, there was no constant to represent the hierarchy home. Since the data type has changed over time and -1 is not intuitive, a new MetaSQL constant has been added. To make the queries more readable and protect you from future changes, use the new constant. (# :ahhome)

Example:

```
SELECT [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] "Equipment ID"
, [MI_EQUIP000].[MI_EQUIP000_EQUIP_SHRT_DESC_C] "Equipment Short
Description"
, [MI_EQUIP000].[MI_EQUIP000_SITE_C] "Site"
, [MI_EQUIP000].ENTY_KEY "ENTY_KEY"
FROM [MI_EQUIP000]
WHERE (? :ah :id=ctx) = (# :ahhome)
OR [MI_EQUIP000].ENTY_KEY IN (? :ah :id=ctx)
```

Query Caching

Queries are cached to improve performance. However, non-parameterized queries can slow down the performance. Therefore, consider using parameters to narrow down query results.

For example, consider the following query that does not use any parameters to filter the query results:

```
string sql = string.Format("SELECT MI_EQUIP000.MI_EQUIP000_SITE_C
FROM MI_EQUIP000 WHERE MI_EQUIP000.MI_EQUIP000_EQUIP_ID_C = {0}",
equip_id);
cmd.CommandText = sql;
cmd.ExecuteReader();
MetaSQL:
var qrymgr = new QueryManager();

string sql = string.Format("SELECT MI_EQUIP000.MI_EQUIP000_SITE_C
FROM MI_EQUIP000 WHERE MI_EQUIP000.MI_EQUIP000_EQUIP_ID_C = {0}",
equip_id);

var result = qrymgr.ExecuteQuerySync(sessionId, sql);
```

In this case, every equip_id value creates a new query to the list of cached queries resulting in a slower performance.

Therefore, consider rewriting the query such that 10,000 equipment records are queried in each iteration, as follows:

```
// Build the sql
string sql = "SELECT MI_EQUIP000.MI_EQUIP000_SITE_C FROM
MI_EQUIP000 WHERE MI_EQUIP000.MI_EQUIP000_EQUIP_ID_C = @equip_id";

// Set up the command
cmd.CommandText = sql;
cmd.Parameters.Add("@equip_id", equip_id);

// Execute the query
var reader = cmd.ExecuteReader();
MetaSQL:
var qrymgr = new QueryManager();

// Build the sql
string sql = "SELECT MI_EQUIP000.MI_EQUIP000_SITE_C FROM
MI_EQUIP000 WHERE MI_EQUIP000.MI_EQUIP000_EQUIP_ID_C = (? :s
id=equip_id)";
```

```
// Set up the query container.
QueryContainer qc = qrymgr.RetrieveQueryContainer(sessionId, sql);
qc.ParmContainer.ParmDesigns[0].ParmPrompts.Add(equip_id);

// Execute the query
var result = qrymgr.ExecuteQuerySync(sessionId, qc);
```

Parameter Size Declaration

In addition to setting up parameters (as described in the preceding example), if you want to improve performance further, consider setting the parameter size.

For example, equip_id is of the NVARCHAR data type, and hence, the size of the MIEQUIP000EQUIPIDC field is 255 characters. Therefore, you can set the size of this parameter in the qeury, as follows:

```
// Build the sql
string sql = "SELECT MI_EQUIP000.MI_EQUIP000_SITE_C FROM
MI_EQUIP000 WHERE MI_EQUIP000.MI_EQUIP000_EQUIP_ID_C = @equip_id";

// Build the parameter
var param = cmd.CreateParameter();
param.ParameterName = "@equip_id";
param.SqlDbType = SqlDbType.NVarChar;
param.Size = 255;
param.Value = equip_id;

// Set up the command
cmd.CommandText = sql;
cmd.params.add(param);

// Execute the query
var reader = cmd.ExecuteReader();
```

Note: You cannot specify the parameter size in MetaSQL.

Reduce the Number of Relationship Families

Entity families with more than 10 relationship families can slow down the loading of predecessor and successor families because of the number of joins involved in retrieving data.

The following query retrieves a list of all the entity families that contain more than 10 relationship families. Evaluate which relationship families are needed.

```
select fmly_id, fmly_caption_tx, count(*) rldf_count
from MI_FAMILIES fmly
join MI_REL_DEFINITIONS rlfa on ENFA_PRED_FMLY_KEY = fmly.FMLY_KEY or
ENFA_SUCC_FMLY_KEY = fmly.FMLY_KEY
group by fmly_id, fmly_caption_tx
having count(*) > 10
order by rldf_count
```

In addition, use a relationship definition to retrieve a relationship family. Avoid retrieving all the relationship families.

Use Advanced MetaSQL Features

Use the following MetaSQL features to rewrite complex queries using simple syntax, thus improving the query performance:

Analytic Functions

Using analytic functions, you can achieve aggregation of data over multiple groups in a single query.

Example:

```
SELECT DISTINCT [MI_MRBIANAL].[MI_CRITANAL_RSK_CAT_C] "Risk
Category"
, Min([MI_MRBIANAL].[MI_CRITANAL_PROB_OF_FAIL_UP_C])OVER
( PARTITION BY [MI_MRBIANAL].[MI_CRITANAL_RSK_CAT_C] ) "Min Prob of
Fail"
, Max([MI_MRBIANAL].[MI_CRITANAL_PROB_OF_FAIL_UP_C])OVER
( PARTITION BY [MI_MRBIANAL].[MI_CRITANAL_RSK_CAT_C] ) "Max Prob of
Fail"
, Avg([MI_MRBIANAL].[MI_CRITANAL_INSPE_PRIOR_UP_N])OVER ( PARTITION
BY [MI_MRBIANAL].[MI_CRITANAL_RSK_CAT_C] ) "Avg Insp Priority"
, Count([MI_EQUIP000].ENTY_ID)OVER ( PARTITION BY [MI_MRBIANAL].
[MI_CRITANAL_RSK_CAT_C] ) "# Assets"
FROM {MIR_HSRBICMP}
 JOIN [MI_CCRBICOM] ON {MIR_HSRBICMP}.SUCC_ENTY_KEY =
[MI_CCRBICOM].ENTY_KEY
 JOIN {MIR_HSRBICMP} Has_RBI_Components1 ON [MI_CCRBICOM].ENTY_KEY
= Has_RBI_Components1.SUCC_ENTY_KEY
 JOIN {MIR_RBICRAN} ON [MI_CCRBICOM].ENTY_KEY =
{MIR_RBICRAN}.PRED_ENTY_KEY
 JOIN [MI_EQUIP000] ON Has_RBI_Components1.PRED_ENTY_KEY =
[MI_EQUIP000].ENTY_KEY
 JOIN [MI_MRBIANAL] ON {MIR_RBICRAN}.SUCC_ENTY_KEY =
[MI_MRBIANAL].ENTY_KEY
ORDER BY [MI_MRBIANAL].[MI_CRITANAL_RSK_CAT_C] Asc
```

We support the following analytic functions:

- SUM
- MAX / MIN
- AVG
- LEAD / LAG
- COUNT
- ROW_NUMBER
- CUME_DIST
- PERCENT_RANK, PERCENTILE_DISC, PERCENTILE_CONT
- NTILE

For more information, refer to Analytic Functions.

Case Statements

Simple:

```
SELECT [MI_ACTION].[MI_ACTION_ID_C] "Action ID"
, [MI_ACTION].[MI_ACTION_SHORT_DESC_C] "Name"
, CASE YEAR([MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR])
     WHEN '2020' THEN 'Next Year'
     WHEN '2019' THEN 'This Year'
```

```
      WHEN '2018' THEN 'Last Year'
      WHEN '2017' THEN '2 Years Ago'
  ELSE 'Other' END "Year Due"
, [MI_ACTION].[MI_ACTION_RESOURCE_COST_N] "Cost"
, [MI_ACTION].[MI_ACTION_ANNUAL_COST_N] "Annual Cost"
, [MI_ACTION].[MI_ACTION_SHUTDOWN_L] "Shutdown Required"
, [MI_ACTION].[MI_ACTION_STATUS_C] "Status"
FROM [MI_ACTION]
ORDER BY [MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR] Desc
```

Standard:

```
SELECT [MI_ACTION].[MI_ACTION_ID_C] "Action ID"
, [MI_ACTION].[MI_ACTION_SHORT_DESC_C] "Name"
, CASE
      WHEN YEAR([MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR]) =
'2020' THEN 'Next Year'
      WHEN YEAR([MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR]) =
'2019' THEN 'This Year'
      WHEN YEAR([MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR]) =
'2018' THEN 'Last Year'
      WHEN YEAR([MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR]) =
'2017' THEN '2 Years Ago'
  ELSE 'Other' END "Year Due"
, [MI_ACTION].[MI_ACTION_RESOURCE_COST_N] "Cost"
, [MI_ACTION].[MI_ACTION_ANNUAL_COST_N] "Annual Cost"
, [MI_ACTION].[MI_ACTION_SHUTDOWN_L] "Shutdown Required"
, [MI_ACTION].[MI_ACTION_STATUS_C] "Status"
FROM [MI_ACTION]
ORDER BY [MI_ACTION].[MI_ACTION_TARGE_COMPL_DATE_CHR] Desc
```

Correlated Subqueries

Correlated subqueries allow you to write a child query that retrieves fields from a parent query. For more information, refer to https://learn.microsoft.com/en-us/sql/relational-databases/performance/subqueries?view=sql-server-2017#correlated.

Database Comparison Tool

About the APM Database Comparison Tool

Using the APM Database Comparison Tool, you can compare different databases. The following table identifies the purposes of available comparisons, and when you need to initiate each comparison.

Note: Note: All comparisons are made against the same constant: the baseline APM database for the target version.

Variable	Purpose of Comparison	When to Perform Comparison
The content of the baseline APM database for the source version.	Allows you to see the changes that APM has made since releasing the version from which you are upgrading.	Before upgrading your database.
The content of your customized database for the source version.	Allows you to see how the content of the baseline database for the target version compares to the changes you have made in the source version.	Before upgrading your database.
The content of your customized database for the target version.	Allows you to see how the content of the baseline database for the target version compares to the changes you have made in that version.	After upgrading your database.

You can use the APM Database Comparison Tool to:

- Initiate a new database comparison. The options that are available in the tool depend upon whether you are running the comparison against a pre-upgraded database or an upgraded database.

  -or-

- Load results from a previous database comparison.

The APM Database Comparison Tool works like a builder, which contains two screens:

- Connection Information: Lets you specify the connection information to the database whose content you want to compare against the content of the baseline database for the target version.

Comparison Details: Lets you run the comparison to identify the differences between the content of the two databases that you are comparing.
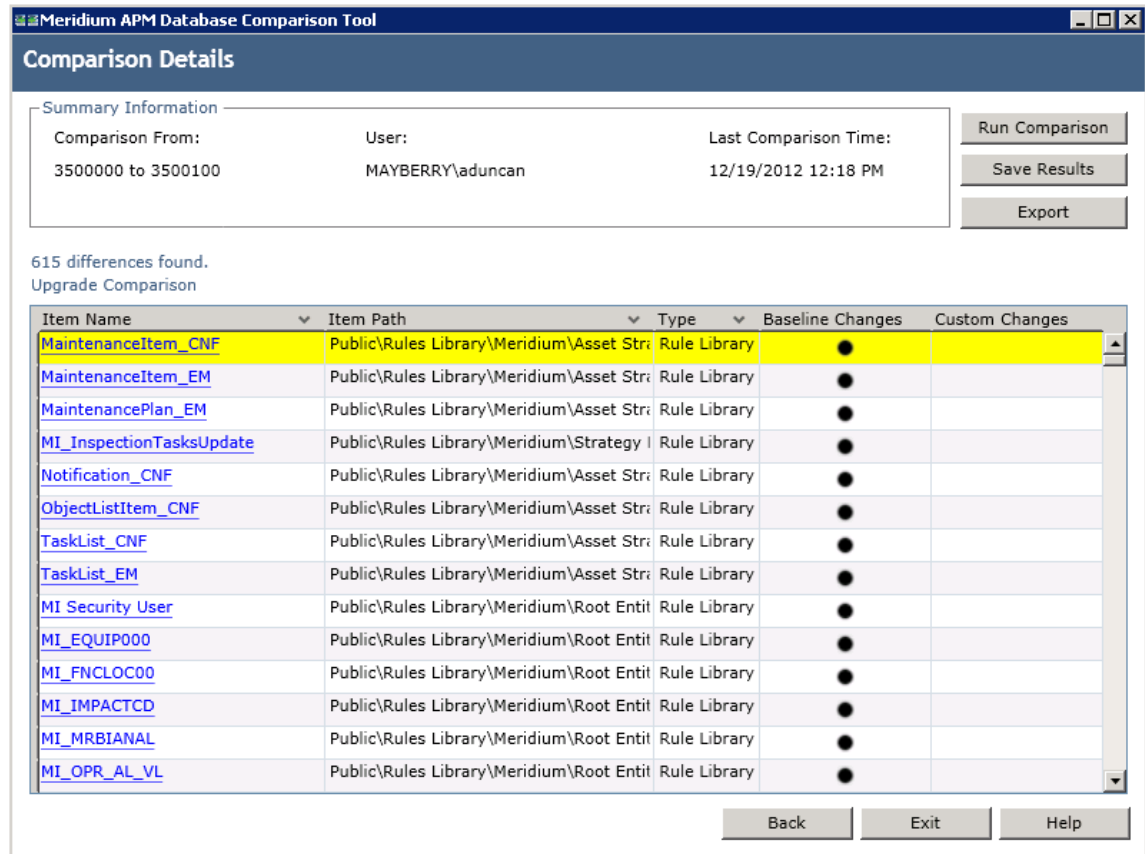
On this screen, you can also:

- Save the results to a .ZIP file, which can be reloaded into the tool later via the Connection Information screen.
- Export the results to an Excel file.

Run the Comparison Against a Pre-Upgraded Database

Before You Begin

1. On the APM Server, navigate to **C:\Windows\assembly** to verify that the 64-bit version of the Oracle.DataAccess component is installed.
2. If it is installed, then skip the rest of the steps in this Before You Begin section and proceed to step 1 in the Steps section.
   -or-
   If the 64-bit version of the component it is not installed, then obtain it from Oracle and install it on the APM Server. You must then complete the following additional steps.

   a. On the APM Server, navigate to the folder `C:\Windows\Microsoft.NET \Framework64\V4.0.30319\CONFIG\`.
   b. Using a text editor (e.g., Notepad), open the file `machine.config`.
   c. In the file, between the opening and closing <configuration> tags, add the following content.

```
<runtime>
      <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
            <dependentAssembly>
                  <assemblyIdentity name="Oracle.DataAccess"
                  publicKeyToken="89b483f429c47342" />
                  <bindingRedirect oldVersion="2.0.0.0-10.9.9.9"
                  newVersion="2.112.1.0" />
            </dependentAssembly>
      </assemblyBinding>
</runtime>
```

    d. Save the file, and then close it.

        You can now proceed to step 1 in the Steps section.

Procedure

1. On the APM Server, navigate to the folder `C:\Program Files\Meridium\Client\100.0.0.0`, and then open the file `DatabaseReport.exe`.

   The APM Database Comparison Tool appears, displaying the **Connection Information** screen.

2. In the **Meridium Datasource** box, enter the name of the data source that you want to use in the comparison.
3. In the **Meridium User Name** box, enter the User ID for a Security User that can log in to the specified data source.

Note: The specified Security User must be a Super User.

4. In the **Meridium Password** box, enter the password associated with the specified Security User.

5. In the **Source Version** box, enter the seven-digit database version that matches the version of your source database that is being compared. You must enter the version in the format *vvvmmzz*, where:

   - *vvv* is a three-digit number representing the main version.
   - *mm* is a two-digit number representing the maintenance release version, if applicable. If the maintenance release version is a single digit, you must prepend zero (0) to it. If there is no maintenance release version, you must enter 00.
   - *zz* is a two-digit number representing the hot fix version, if applicable. If the hot fix version is a single digit, you must prepend zero (0) to it. If there is no hot fix version, you must enter 00.

   For example, the database version number for V3.5.1MR6HF2 would be 3510602.

   If you do not know the main version, service pack version, and hot fix version of your database, you can find it using either of the following methods:

   - Run the following query against the database:

     Select **modl_ver_nbrfrom mi_modules**, where modl_nm = 'Meridium Core';
   - In Configuration Manager, on the **About Meridium APM** window (accessed via the Help menu), for the APM Framework Tools license, locate the value in the **Version** column. The database version you should enter in the **Source Version** box is this version number without the periods.

Meridium APM Framework Tools	3.5.0.0100	10/17/2012 11:23:26 PM	ACTIVE

6. In the **Path to Database Upgrade content** box, if a path is provided, confirm that it is the correct path pointing to the newer V4.X baseline content. If a path is not provided, you may enter the appropriate path.

   The path identifies the location of the newer baseline content file (e.g., MI_DB_Master_ 4000000.zip). The default path is C:\Meridium\DbUpg.
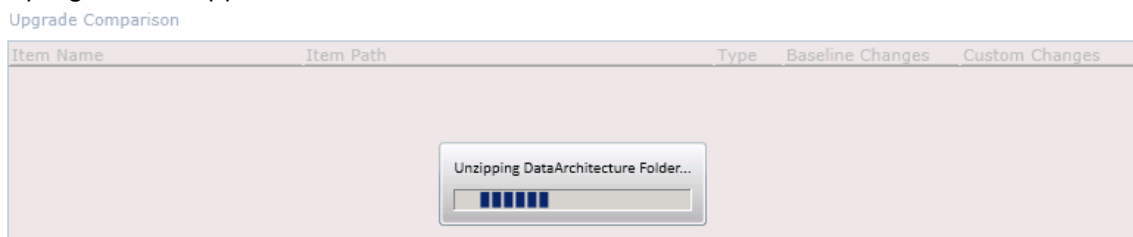
7. When you are finished specifying connection information, select **Next**.

   If your database connection entries are valid, the **Comparison Details** screen appears.
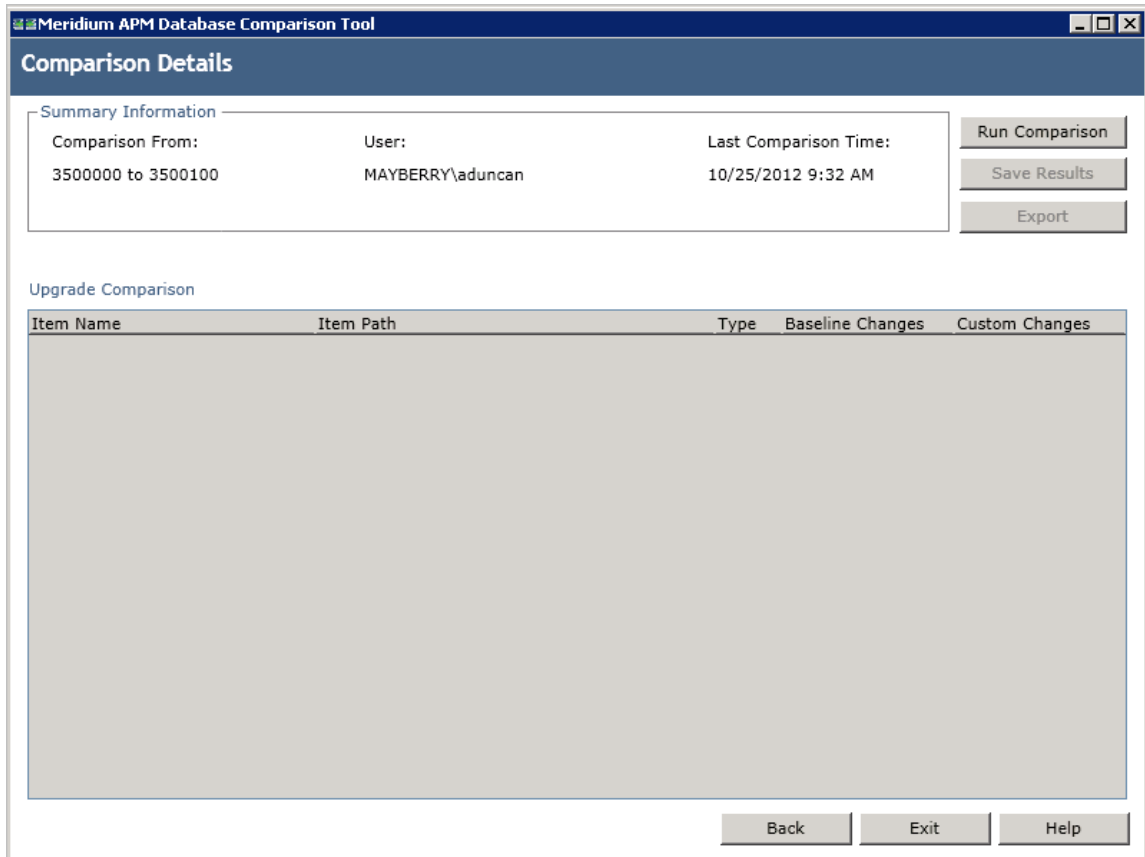
The following information appears in the **Summary Information** section:

- Comparison From: The database versions that will be compared, using the format <source version> to <target version>, where:

  - <source version> is the version of the source database that you are comparing against. The source version on the left should match the value in the **Source Version** box on the **Connection Information** screen.
  - <target version> is the version of the database content to which you are upgrading. The target version on the right should match the file that you specified in the **Path to Database Upgrade content** box on the **Connection Information** screen.
- User: The credentials of your Windows user.
- Last Comparison Time: The date and time of any previous database comparison performed with this database. If the comparison has never been performed with this database, then the current date and time is displayed.

8. Select Run Comparison.
   A progress bar appears.

Eventually, a command prompt window will appear, displaying the progress of the various comparison stages.

When the comparison is complete, the command prompt window closes automatically, and the comparison results appear in the **Upgrade Comparison** section of the **Comparison Details** screen.

About the Pre-Upgrade APM Database Comparison Tool Comparison Results Grid

When you perform a pre-upgrade database comparison, the results appear in a grid on the **Comparison Details** screen.

The grid contains the name of each item that was identified as different during the comparison process. You can determine the general difference using the Baseline Changes and **Custom Changes** columns. You can select any hyperlink in the left-most **Item Name** column to display more detailed comparison results using WinMerge.

The comparison results grid contains the following columns:

- Item Name: The name of the item. You can select any hyperlink in the **Item Name** column to display more detailed comparison results using WinMerge.
- Item Path: If the item is a Catalog item, this column displays the Catalog folder path. If the item is not a Catalog item, this column repeats the item name.
- Type: The type of item.
- Baseline Changes and Custom Changes: Contain black circles indicating that changes exist. In general, the **Baseline Changes** column contains a black circle if the baseline item has changed since the previous version. Likewise, the **Custom Changes** column contains a black circle if you have made custom changes to that item or if the item does not exist in your upgraded database.

The following table illustrates the possible combination of dots per item and explains how you can interpret those combinations.

Baseline Changes	Custom Changes	Explanation	Example
✓		The baseline item has changed between the two versions. -and- The item in your pre-upgrade database is the same as the item in the baseline database.	You are upgrading from V3.6.0.x to V4.0.0.0. In V3.5.0.0.0, the baseline family Asset Strategy was modified. You have not modified this family in your database.
	✓	The baseline item has not changed between the two versions. -and- There is difference between the baseline version of this item and the item in your upgraded database.	You are upgrading from V3.6.0.x to V4.0.0.0. The baseline query Reading History has not been modified since the last version release. You have modified this query prior to the upgrade.
✓	✓	The baseline item has changed between the two versions or is new to the later version. -and- There is a difference between the baseline version of this item and the item in your upgraded database, or this item does not exist in your upgraded database.	You are upgrading from V3.6.0.x to V4.0.0.0. In V3.5.0.0.0, the baseline query Asset Query was modified. You have modified this query prior to the upgrade.

You can select any column heading to sort the results by the values in that column. You can also filter the results by selecting ⌄ in any column heading, and then selecting the value by which you want to filter the results. For example, to see only queries in the results, you would select ⌄ in the **Type** column heading, and then select the **Query** check box, as shown in the following image.

The result would then contain only queries, as shown in the following image.

After you apply a filter, it will be displayed below the results, as outlined in red in the following image.

You can remove a filter by selecting below the grid.

Run the Comparison Against an Upgraded Database

About This Task

These instructions assume that you want to compare your upgraded database to the baseline version.

Important: The comparison process can take an hour or longer, depending upon the size of the databases being compared, available memory, and other factors. After you start the process, you should not close the progress window unless you want to stop the comparison process. You can continue working in other windows while the comparison is running.

Procedure

1. On the APM Server, on the Apps interface, in the **Meridium APM Applications** section, select **Database Upgrade Manager**.
   The **Meridium APM Database Comparison Tool** window appears, displaying the **Connection Information** screen.

2. In the **Meridium Data Source** box, enter the predefined data source that points to your upgraded APM database.
3. Enter the name of a APM Security User defined in your database.
4. Enter the password for that Security User.
5. Enter the version of the upgraded source database. For V4.0.0.0.0, this value would be 4000000.

6. In the **Path to Database Upgrade content** box, ensure that the correct path to the content is provided.
The path identifies the location of the baseline .zip file for the upgraded version. The default path is `C:\Meridium\DbUpg`, but this path could have been changed manually via the APM Server and Add-ons installer when APM was installed or upgraded.

7. Select **Next**.
The **Comparison Details** screen appears.
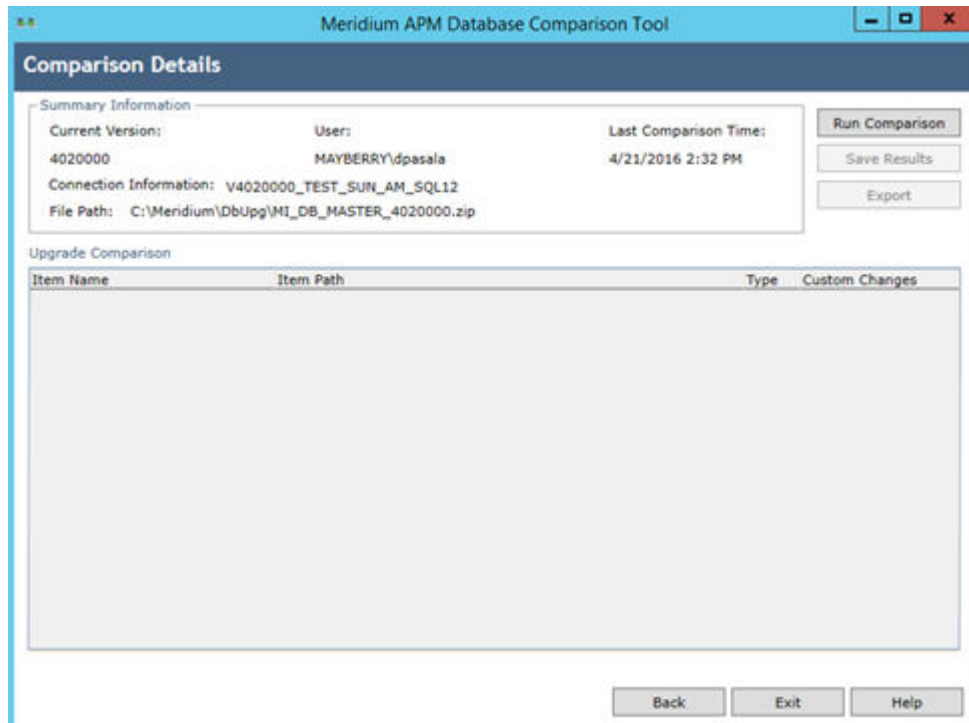
The following information appears in the **Summary Information** section:

- Comparison From: The database versions that will be compared, using the format:

  <source version> to <target version>

  ...where

  ○ <source version> is the version of the source database that you are comparing against. The source version on the left should match the value in the **Source Version** box on the **Connection Information** screen.

  ○ <target version> is the version of the database content to which you are upgrading. The target version on the right should match the file that you specified in the **Path to Database Upgrade content** box on the **Connection Information** screen.

- Connection Information: The name of the current database.
- **File Path:** The path to the Database Upgrade content .zip file.
- User: The credentials of your Windows user.
- Last Comparison Time: The date and time on which the database comparison for this database was last run. If the comparison has never been run for this database, the current date and time is displayed.

8. Select **Run Comparison**.
A progress bar appears, displaying the progress of the comparison process. Eventually, a command prompt window will appear, displaying the progress of the various comparison stages.
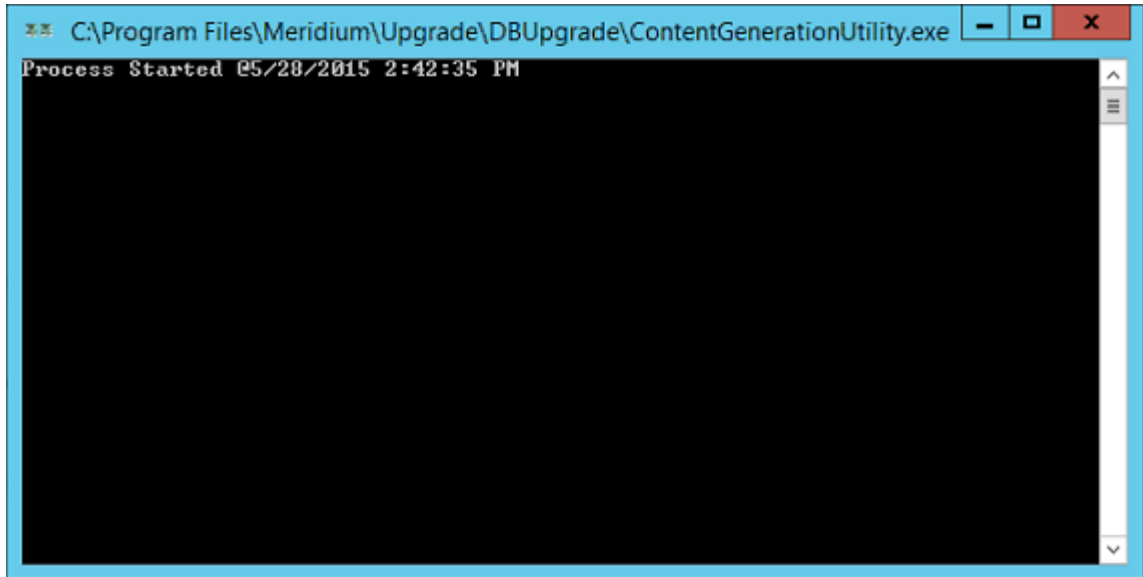
When the process is complete, the command prompt window closes automatically, and the comparison details appear in the Upgrade Comparison section on the Comparison Details screen of the APM Database Comparison Tool.

About the Post-Upgrade APM Database Comparison Tool Comparison Results Grid

When you perform a post-upgrade database comparison, the results appear in a grid on the **Comparison Details** screen.
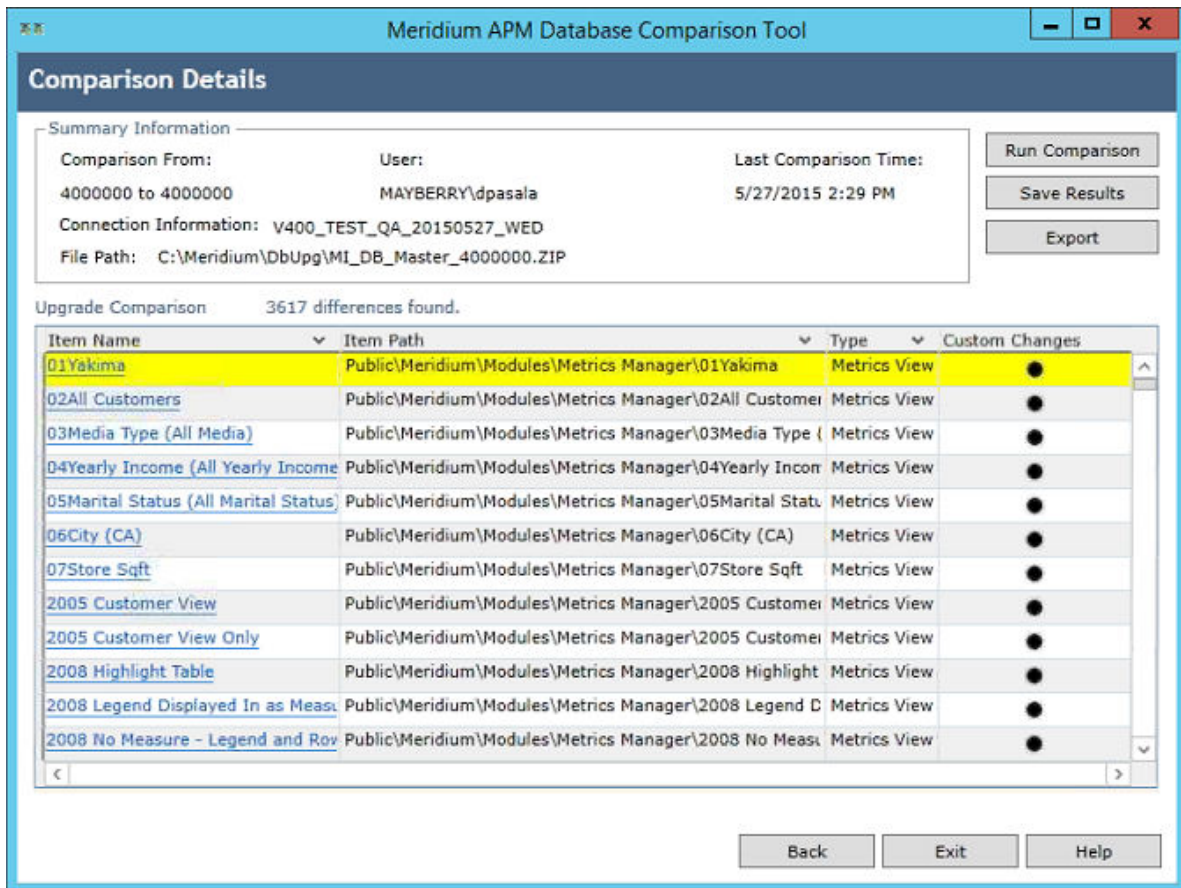
The grid contains the name of each item that was identified as different during the comparison process. The comparison results grid contains the following columns:

- Item Name: The name of the item. You can select any hyperlink in the **Item Name** column to display more detailed comparison results using WinMerge.
- Item Path: If the item is a Catalog item, this column displays the Catalog folder path. If the item is not a Catalog item, this column repeats the item name.
- Type: The type of item.
- Custom Changes: The cells in this column contain black circles indicating that custom changes have been made to the associated item.

You can select any column heading to sort the results by the values in that column. You can also filter the results by selecting ⌄ in any column heading, and then selecting the value by which you want to filter the results. For example, to see only items that are in Entity Families in the results, you would select ⌄ in the **Type** column heading, and then select the **Are in These** and **Entity Family** check boxes, as shown in the following image.

The result would then contain only queries, as shown in the following image.

After you apply a filter, it will be displayed below the results, as outlined in red in the following image.

API RBI Analysis	Public\Meridium\Modules\API RBI Connector\Queri	Query			
ASSET_GROUP_LOOKUP	Public\Meridium\Modules\CMMS Integration Interfa	Query			
ASSET_NUMBER_LOOKUP	Public\Meridium\Modules\CMMS Integration Interfa	Query			
Available Recommendations	Public\Meridium\Modules\Recommendation Manag	Query			●
Equipment Taxonomy Query	Baseline\Meridium\Modules\Core\Queries\Equipme	Query		●	

☒ ☑ ItemType=Query   Back   Exit   Help

You can remove a filter that you have applied by selecting ☒ next to the filter.

Revert Items to Baseline
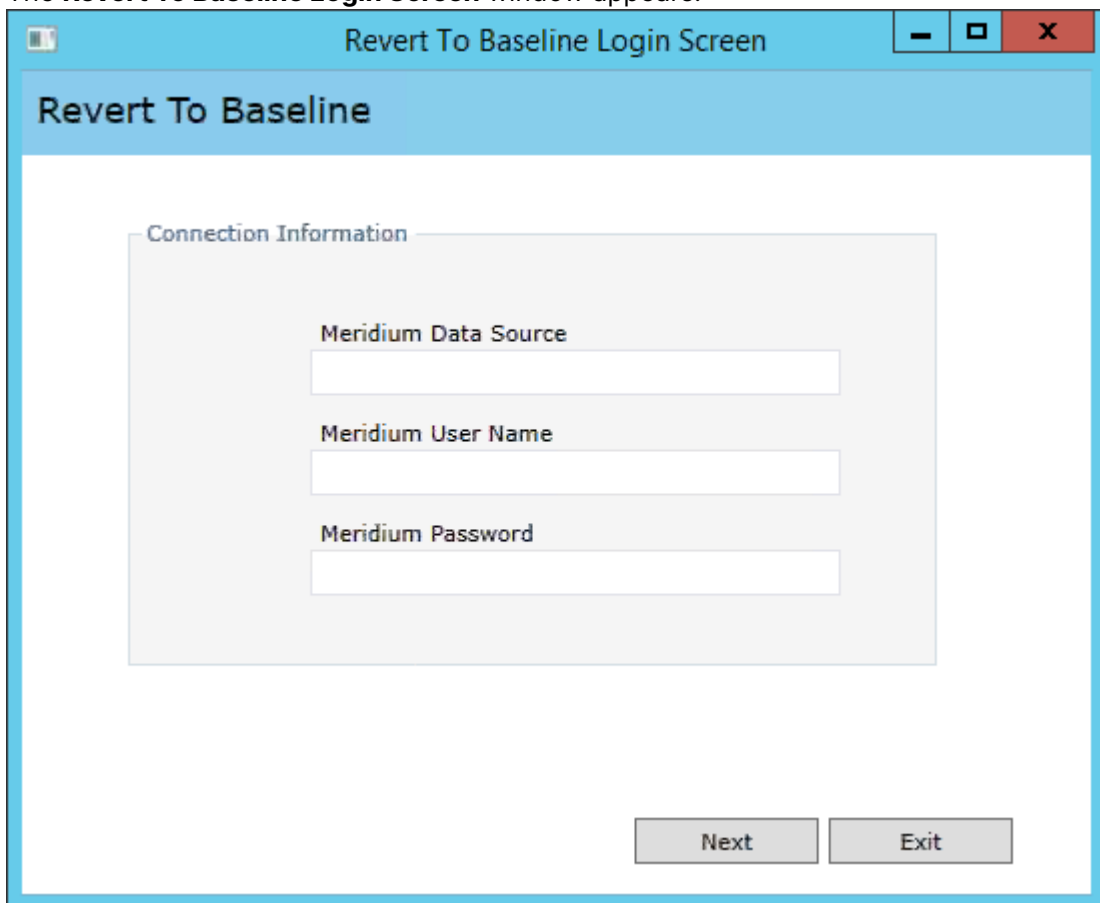
Before You Begin

- Create a data source.

Procedure

1. On the APM Server, navigate to `Meridium/Upgrade/DBUpgrade`, and then open the file `RevertToBaselineApp.exe`.
   The **Revert To Baseline Login Screen** window appears.

2. Enter a valid data source, user name, and password, and then select **Next**.

   Note: The value in the **Meridium Data Source** box should match exactly the Data Source ID of the data source.

The **Revert To Baseline** screen appears, displaying the families that you can revert to baseline.
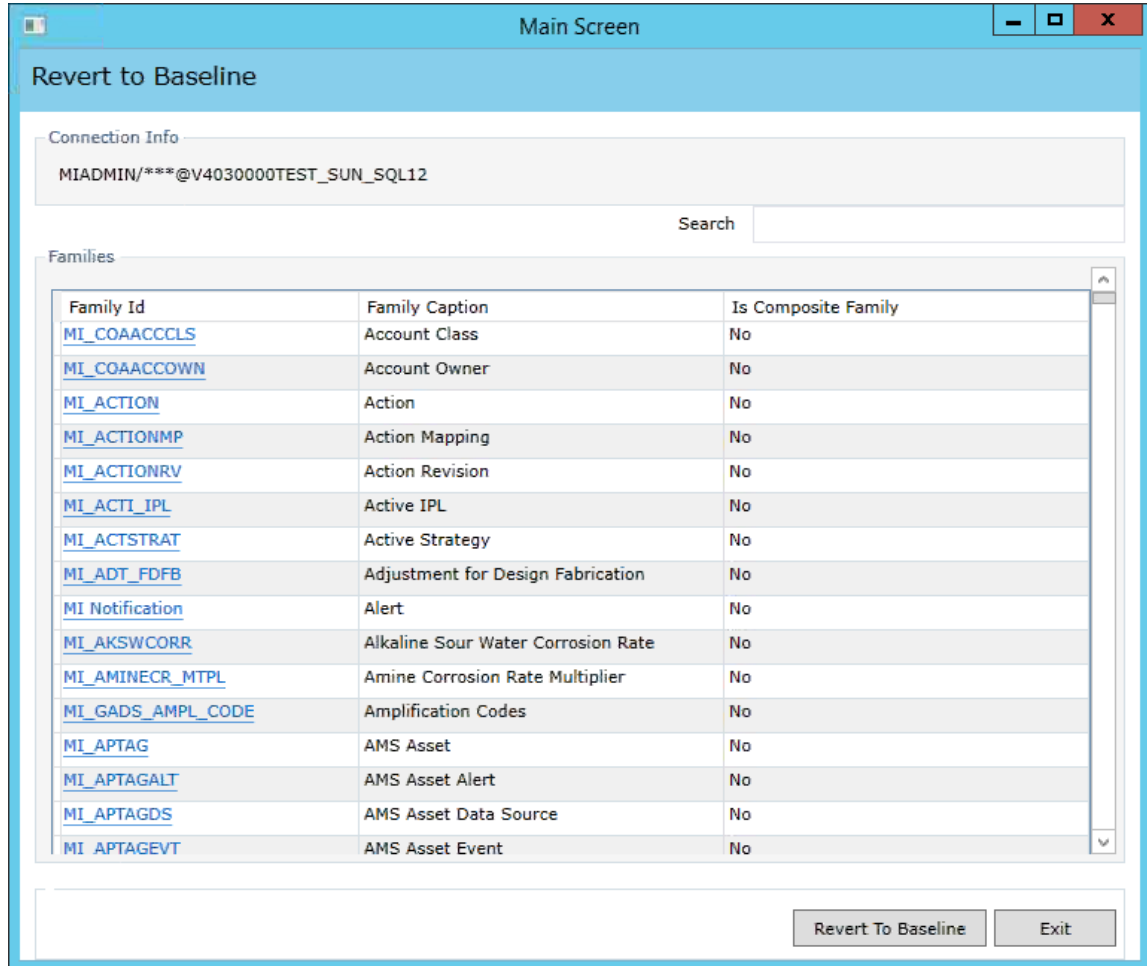
3. Select the row containing the family whose element you want to revert to baseline, and then select **Revert To Baseline**.

   Tip: You can enter a value in the **Search** box to search for a specific family.

   Note: If you want to revert records and links for a family for which the value in the **Is Composite Family** column is Yes, you will need to revert the records and links for the parent family of that family. If this is the case, based on the following table, please select the appropriate parent family for the child family whose records and links you want to revert to baseline.

Child Family to Revert	Parent Family to Select
MI_STRMAPP	MI_STMPCNFG
MI_RRSKMDT	MI_RRSKMAP

Child Family to Revert	Parent Family to Select
MI_CLMND_PR MI_MPPG_QRY	MI_DATA_GRP
MI_PROTDEFI MI_RISKTHRE MI_PROBDEFI MI_CONSDEFI MI_RISKCATE	MI_RISKMATR

The **Various Options For Revert** window appears.
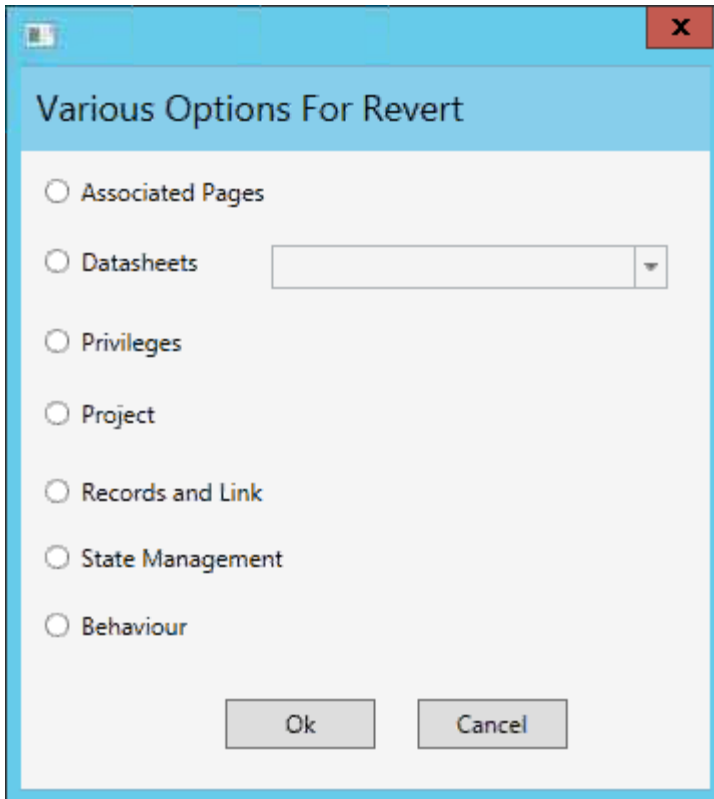
4. Select the check box for the revert to baseline action that you want to execute, and then select **OK**.

   Note: If you selected the **Datasheets** check box, before selecting **OK**, you will need to select a datasheet in the drop-down list box next to the **Datasheets** check box.

   If you selected the **Associated Pages**, **Datasheets**, **Privileges**, **Project**, or **Behavior** check box, the **Success** window appears, displaying a message indicating that the revert to baseline action has been completed. The following image shows the **Success** window after the action of reverting Privileges to baseline has been completed.
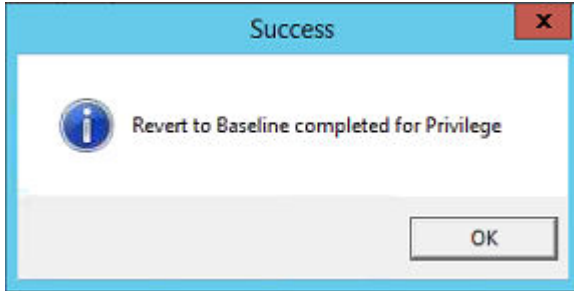
a. Select **OK**.

The **Success** and **Various Options For Revert** windows close.

-or-

If you selected the **Records and Link** check box, the **Revert to Baseline - Records and Links** window appears.
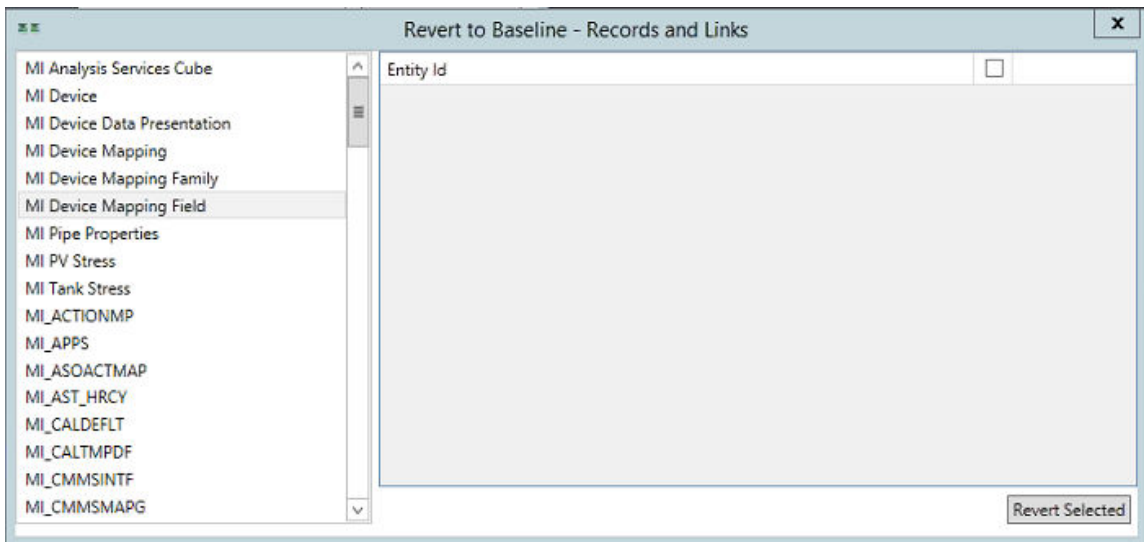
a. In the list on the left side of the window, select the family that contains the records and links that you want to revert to baseline.

The selected records and links appear in the list on the right side of the window.

b. If you want to revert the records and links for records in the family, in the list on the right side of the window, select the check box next to each record that you want to revert to baseline, and then select **Revert Selected**.

-or-

If you want to revert customized template values for the family to baseline, select a family on the left side of the window, and then, in the **My Template Defaults** row that appears, select **Compare**. Then, on the **My Template Defaults** window that appears, select **Revert**.

A message appears, indicating that the selected records and links have been reverted to baseline.

-or-

If you selected the **State Management** check box, the **State Management Mapper** window appears.
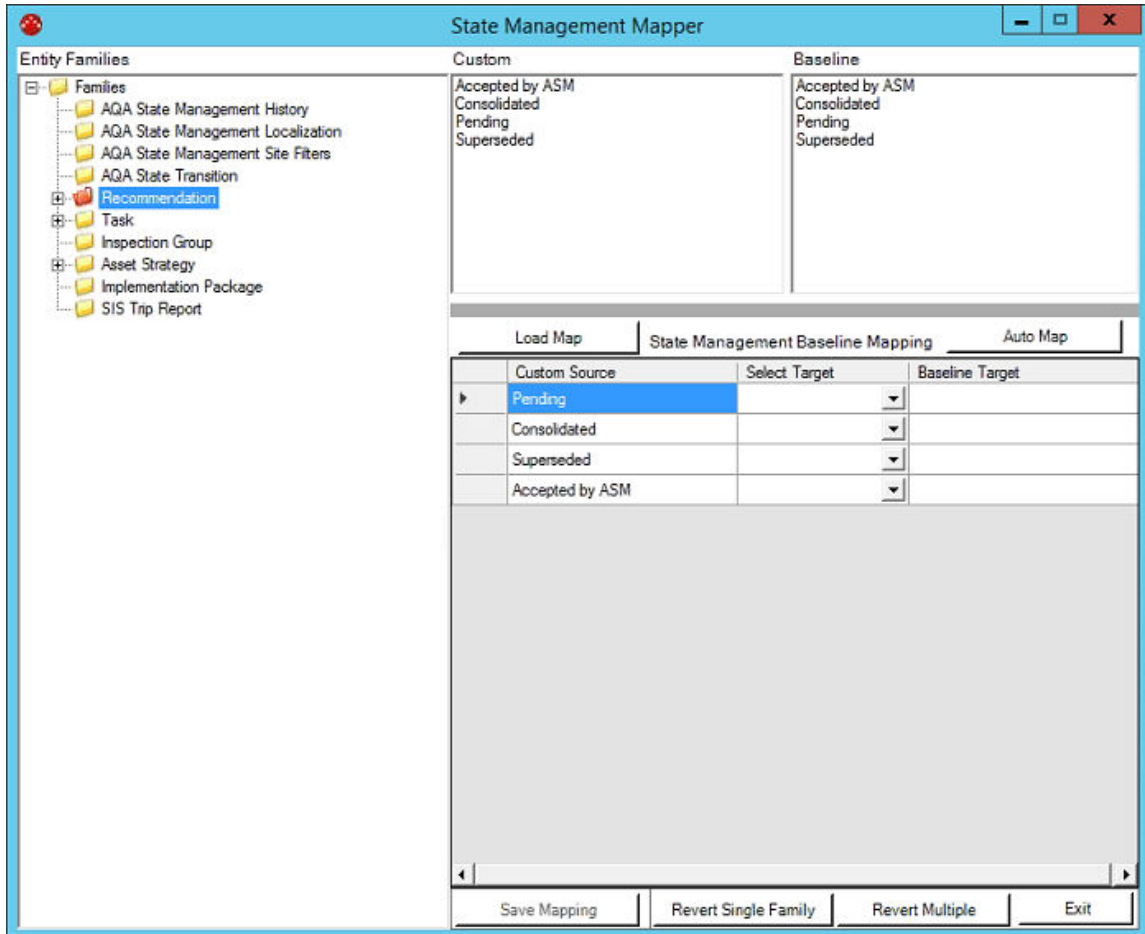
The family of the item that you selected in the Comparison Results grid is highlighted in the tree in the **Entity Families** section of the **State Management Mapper** window. In the **Custom** section, a list of the customized states for the family appears. In the **Baseline** section, a list of the baseline states for the family appears.

The customized states for the family also appear in the **Custom Source** column in the grid in the **State Management Baseline Mapping** section.

a. In the **State Management Baseline Mapping** section, in each cell in the **Select Target** column, select the baseline target for each customized state in the **Custom Source** column.

   Note: If you select **Auto Map**, the APM Database Comparison Tool will automatically assign baseline targets where possible. If you select **Load Map**, a window appears on which you can select a previously saved map of baseline target assignments.

   The selected targets appear in the cells in the **Baseline Target** column.

b. Select **Revert Single Family** or **Revert Multiple**.

   If you selected **Revert Single Family**, a message appears, asking if you want to save the current mapping and revert to it.
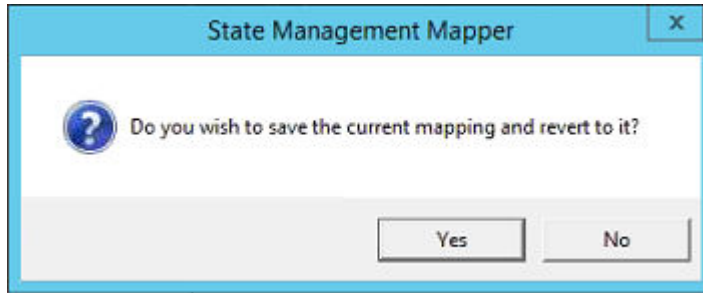
i. Select **Yes**.

A confirmation message appears.
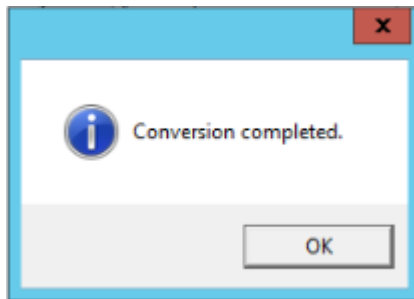
ii. Select **OK**.

The selected states are converted.

-or-

If you selected **Revert Multiple**, the **Browse For Folder** window appears.
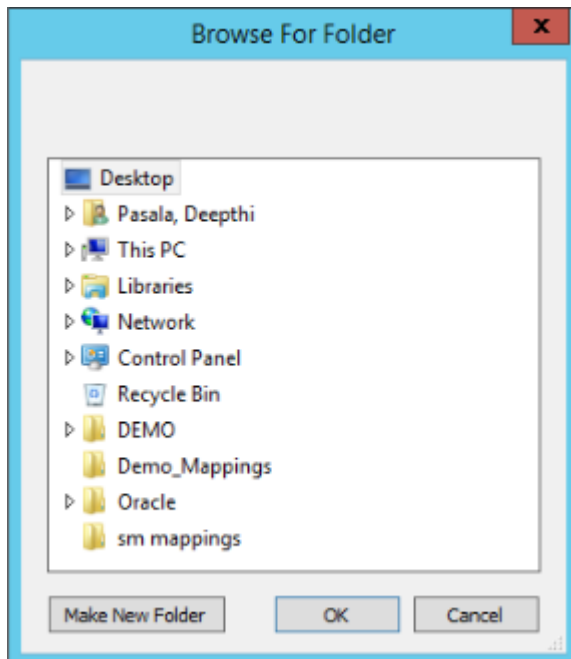
i. Navigate to the folder containing all of the families whose states you want to convert, and then select **OK**.

A message appears, asking you to confirm that you want to continue.
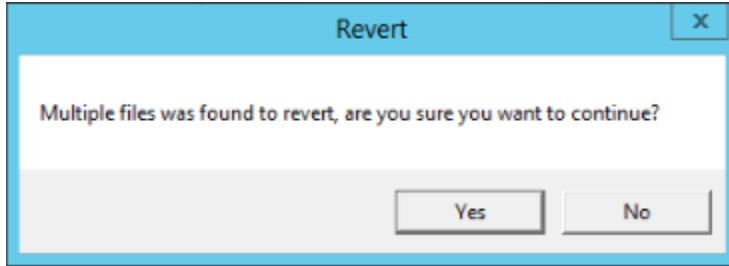
ii. Select **Yes**.

A confirmation message appears.
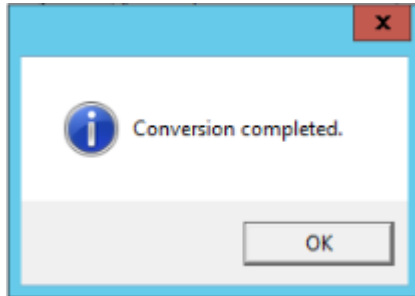
iii. Select **OK**.

The selected states are converted.

5. As needed, repeat steps 1 through 2 to revert additional items to baseline.

Save the Results to a .ZIP File

About This Task

After running the pre- or post-upgrade version of the APM Database Comparison Tool, if you save comparison results to a .ZIP file using the following instructions, you can reload those results at a later time. These instructions assume that you have already launched the APM Database Comparison Tool.

Procedure

1. On the **Comparison Details** screen, select **Save Results**.

The **Select file to save result** window appears. The folder path is set by default to `C:\Meridium\DbUpg`.
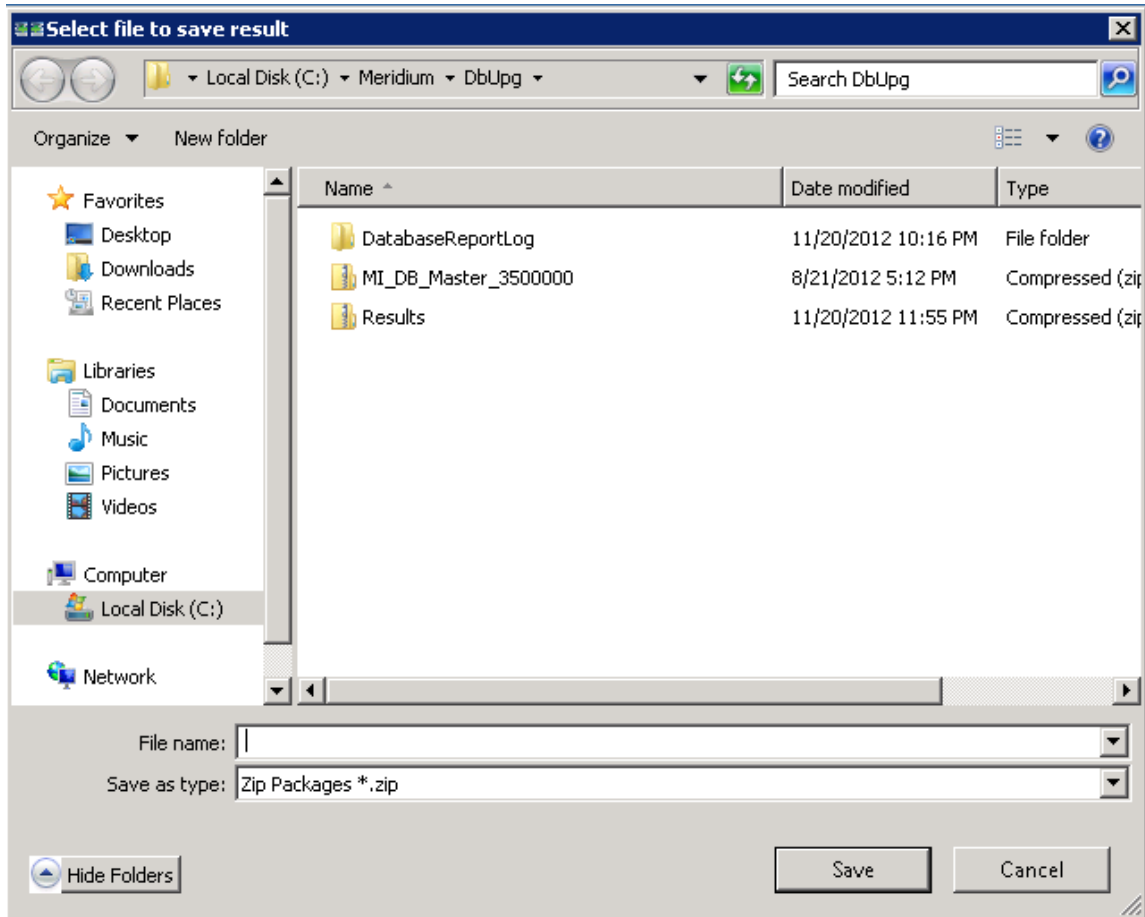
2. If you want to save the results to a location other than `C:/Meridium/DbUpg`, navigate to the location where you want to save the results.
3. In **File name** box, enter a name for the .zip file.
4. Select **Save**.
   The results are saved to the .zip file with the specified name in the specified location.

Reload Previous Comparison Results

About This Task

Using the pre- or post-upgrade version of the APM Database Comparison Tool, if you have saved previous comparison results to a .ZIP file, you can reload those results by following these instructions. These instructions assume that you have already launched the APM Database Comparison Tool.

Procedure

1. On the **Connection Information** screen, select **Load Results**.
   The **Select export of result** window appears. By default, the folder path is set to `C:\Meridium\DbUpg`.
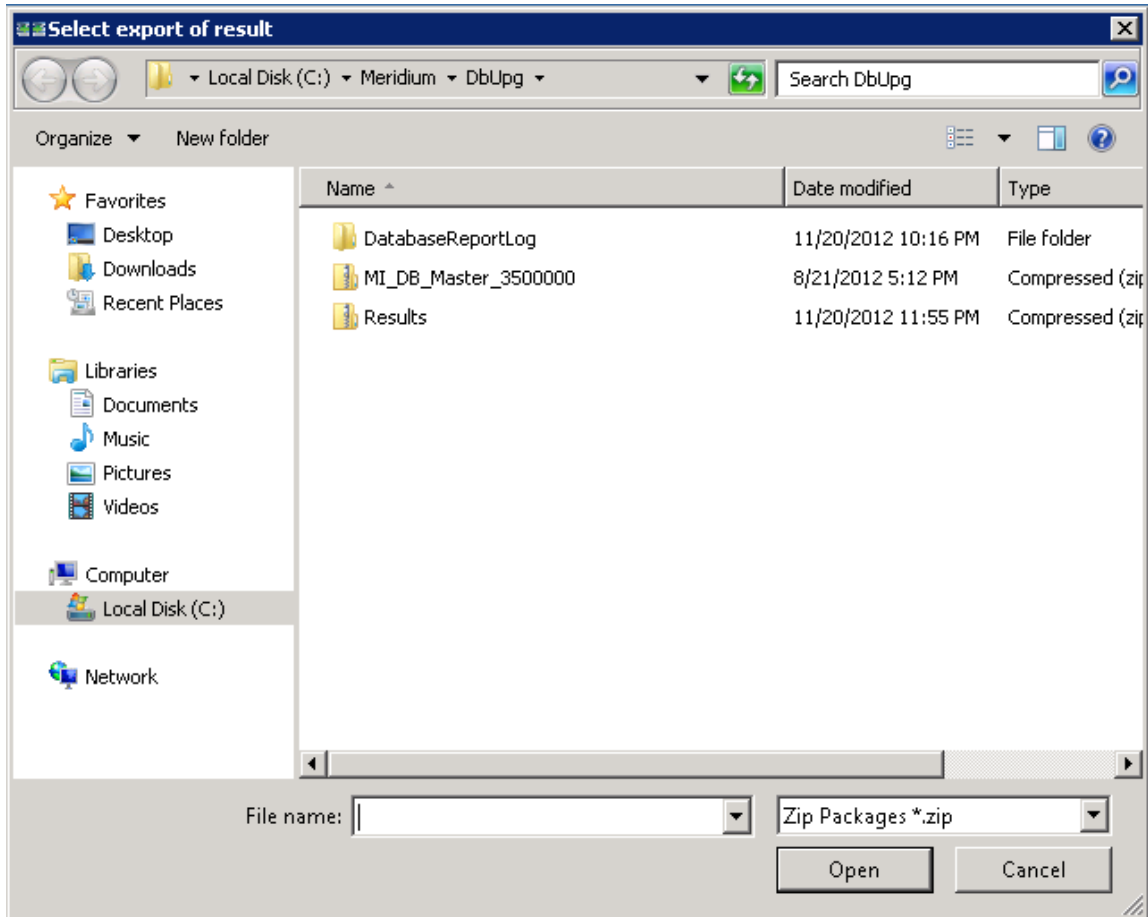
2. If the results that you want to reload are stored in a location other than `C:/Meridium/DbUpg`, navigate to the location containing the exported results.

3. Select the .zip file containing the results that you want to reload, and then select **Open**. A progress bar appears, indicating the progress of the loading process.

When the process is complete, the comparison results appear on the **Comparison Details** screen.

Export Comparison Results to an Excel File

About This Task

If you have run a database comparison using the pre- or post-upgrade version of the APM Database Comparison Tool and want to make the result available to users who do not have access to the APM Server, you can save the results to a Microsoft Excel file. The Excel file will contain the data that appears in the grid on the **Comparison Details** screen of the APM Database Comparison Tool. It will not present a detailed side-by-side comparison.

These instructions assume that you have already launched the APM Database Comparison Tool.

Procedure

1. On the **Comparison Details** screen, select **Export**.
   The **Select file to save result** window appears. By default, the folder path is set to `C:\Meridium\DbUpg`.
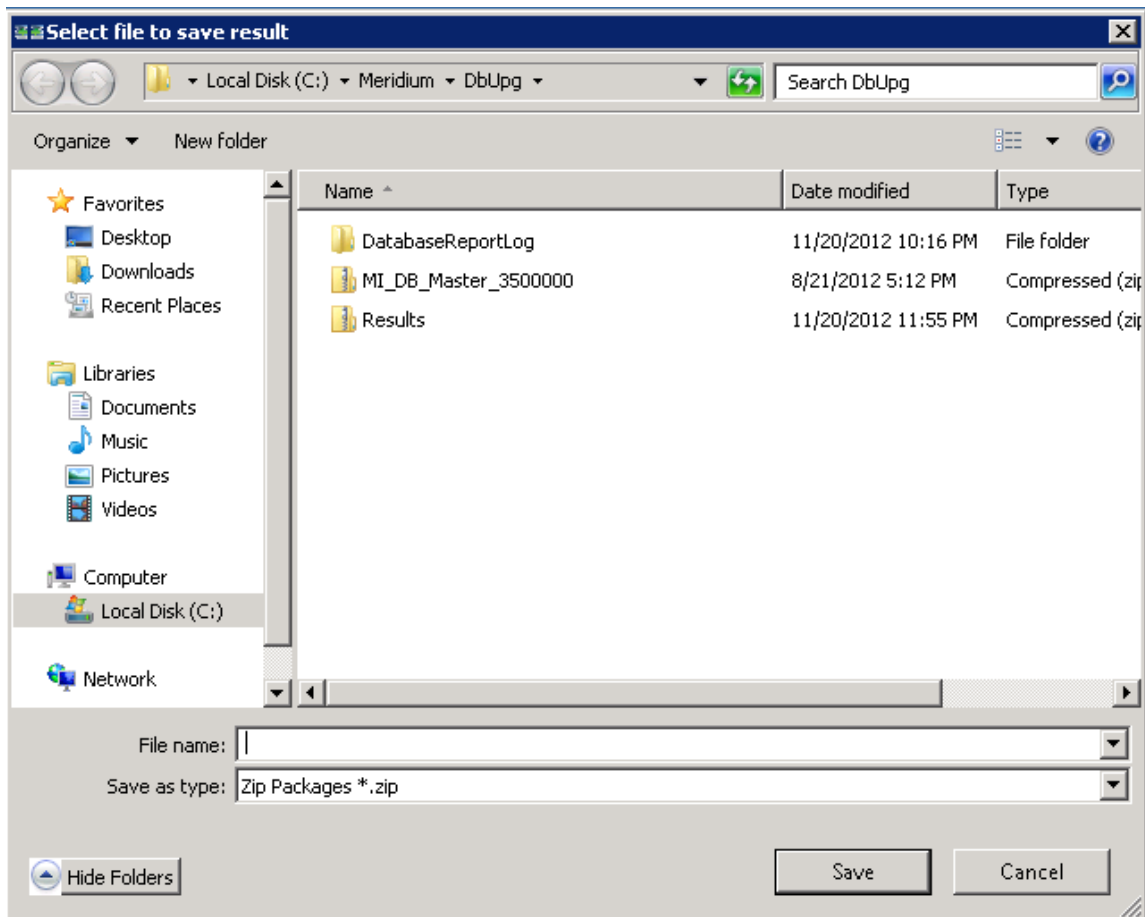
2. If you want to export the results to a location other than `C:/Meridium/DbUpg`, navigate to the location to which you want to export the results.
3. In **File name** box, enter a name for the Excel file, and then select **Save**.
   The results are saved to the Excel file with the specified name in the specified location, and a message appears, indicating that the file was saved successfully. The content of the Excel file will look similar to this:

▲	A	B	C	D	E
1	ModifiedID	ItemPath	ItemType	HasBaselineChanges	HasCustomChanges
2	MaintenanceItem_CNF	Public\Rules Library\Meridium\Asset Strategy Mana(	Rule Library	True	False
3	MaintenanceItem_EM	Public\Rules Library\Meridium\Asset Strategy Mana(	Rule Library	True	False
4	MaintenancePlan_EM	Public\Rules Library\Meridium\Asset Strategy Mana(	Rule Library	True	False
5	MI_InspectionTasksUpdate	Public\Rules Library\Meridium\Strategy Rules\MI_Ins	Rule Library	True	False
6	Notification_CNF	Public\Rules Library\Meridium\Asset Strategy Mana(	Rule Library	True	False
7	ObjectListItem_CNF	Public\Rules Library\Meridium\Asset Strategy Mana(	Rule Library	True	False
8	TaskList_CNF	Public\Rules Library\Meridium\Asset Strategy Mana(	Rule Library	True	False

The file contains one worksheet, ExportToExcel, with the following columns of information:

- ModifiedID: Displays the value that appeared in the **Item Name** column in the APM Database Comparison Tool.
- ItemPath: Displays the value that appeared in the **Item Path** column in the APM Database Comparison Tool.
- ItemType: Displays the value that appeared in the **Type** column in the APM Database Comparison Tool.
- HasBaselineChanges: Displays a value indicating whether or not a black circle appeared in the **Baseline Changes** column in the APM Database Comparison Tool. If no black circle appeared, then the value is False. If a black circle appeared, then the value is True.
- HasCustomChanges: Displays a value indicating whether or not a black circle appeared in the **Custom Changes** column in the APM Database Comparison Tool. If no black circle appeared, the value is False. If a black circle appeared, the value is True.

View Detailed Differences in WinMerge

About This Task

In the comparison results grid, for any item in the grid, you can access a detailed comparison of the differences between that item in your customized database and the baseline database for the target version. The detailed differences will be displayed in WinMerge. Information on using WinMerge exceeds the scope of the APM documentation, but can be found in the WinMerge Help system.

Procedure

1. In the comparison results grid, select the hyperlinked name of the item whose differences you want to view.
   The **Difference Details** screen appears.
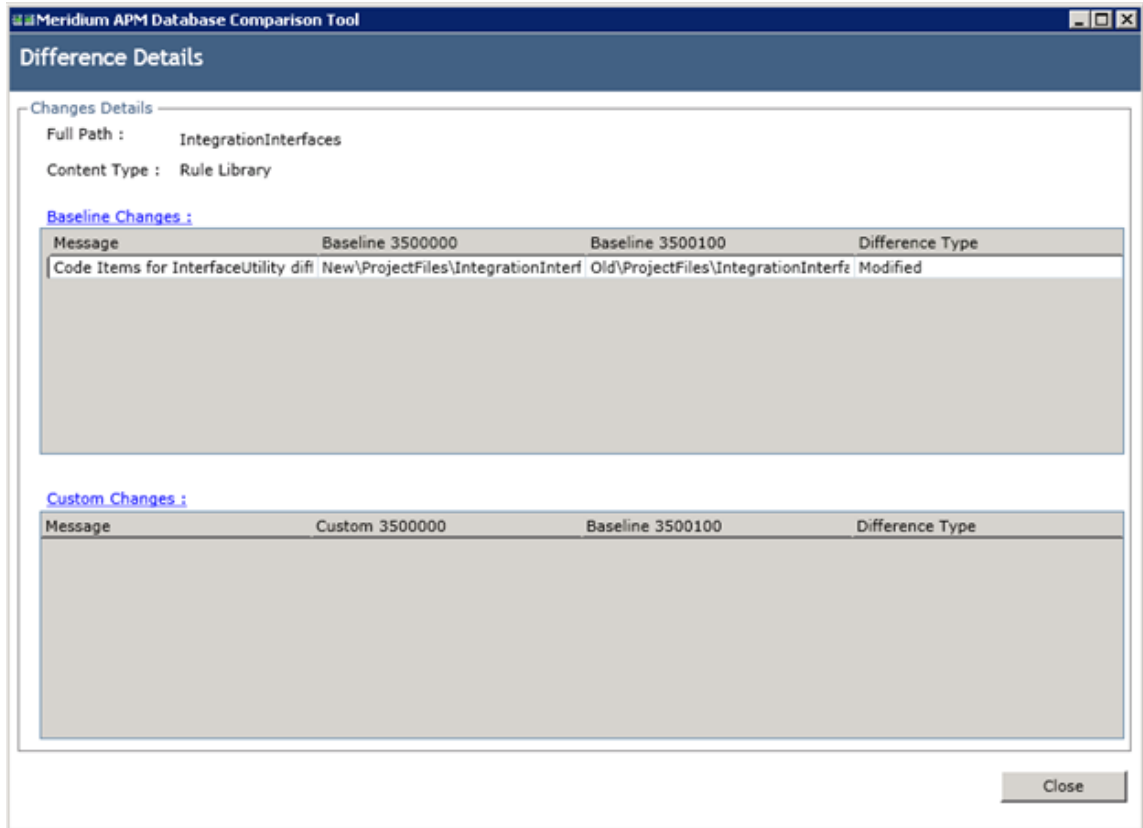
2. If differences are referenced in the upper section, select **Baseline Changes**.
   If differences are referenced in the upper section, select **Baseline Changes**.

   -or-

   If differences are referenced in the lower section, select **Custom Changes**.

   The sections shown in the following images can be accessed via the appropriate tabs:

   - In this section, the XML code for the item exists in one file per version (e.g., an entity family).
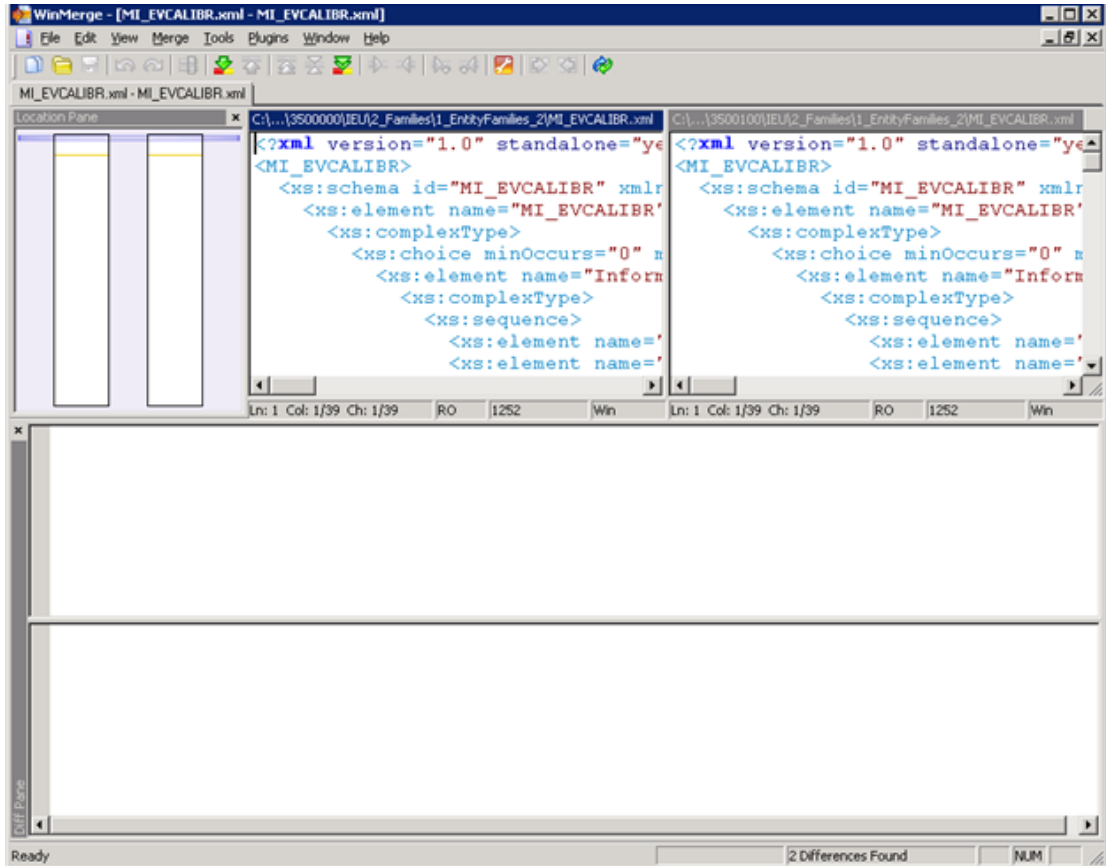
- In this section, the item exists in multiple files per version (e.g., a query), which you can use to select the two specific files that you want to compare.
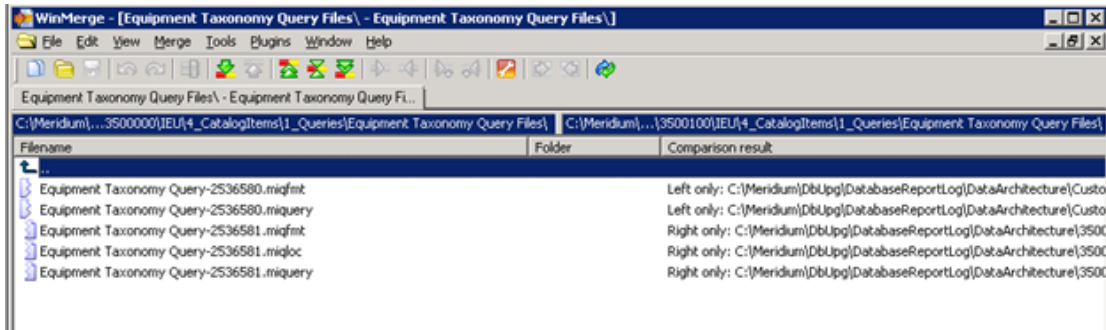
3. In the section displaying the detailed differences, scroll through the differences using WinMerge tools.
4. In the section that allows you to select two specific files that you want to compare, select the two files, right-click, and then select **Compare**.
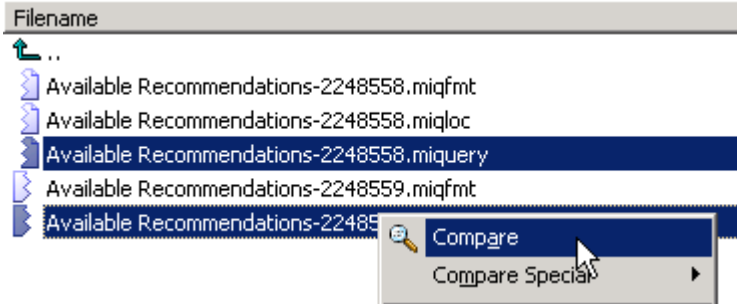
WinMerge appears, displaying the results of the comparison.

Chapter

3

Module Upgrade

Topics:

- Management of Change Upgrade
- Metrics and Scorecards Upgrade
- Policy Designer Upgrade
- Production Loss Analysis Upgrade
- Reliability Analytics Upgrade
- Reliability Centered Maintenance Upgrade
- Reports Upgrade
- Risk Based Inspection 580 Upgrade
- Risk Based Inspection 581 Upgrade
- Root Cause Analysis Upgrade
- Rounds Designer Upgrade
- Rounds Pro Upgrade
- R Scripts Upgrade
- SIS Management Upgrade
- Thickness Monitoring Upgrade

Action Management Upgrade

Upgrade or Update Recommended Actions to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 67
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 67

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

APM Connect Upgrade

Upgrade APM Connect and Adapters

For information on how to upgrade, refer to the corresponding module documentation:

- APM Connect
- OT Connect
- SAP Adapters
    - Upgrade SAP
    - Upgrade SAP PI

Advanced Visualization Upgrade

Upgrade or Update Advanced Visualization to V5.0.7.0.0

The following table provides you the reference to procedures to upgrade from an earlier Advanced Visualization version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0 **Note:** You cannot upgrade directly from V5.0.0.0.0 to V5.0.7.0.0.	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 68
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 68

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

Advanced Visualization is not upgraded automatically when you upgrade the components in the basic APM system architecture.

About This Task

The following instructions provide details on upgrading or updating Advanced Visualization to V5.0.7.0.0. Any content that was created inUpgrade from any version V5.0.0.0.0 through V5.0.6.0.0 will persist through this process and will be available post upgrade.

Note: You cannot upgrade directly from V5.0.0.0.0 to V5.0.7.0.0.

Procedure

1. Uninstall Advanced Visualization.
2. Install Advanced Visualization.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be updated to V5.0.7.0.0 automatically when you update the components in the basic APM system architecture. No additional steps are required.

Asset Criticality Analysis Upgrade

Upgrade or Update ACA to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 69
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 69

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be updated to V5.0.7.0.0 automatically when you update the components in the basic APM system architecture. No additional steps are required.

Asset Health Manager Upgrade

Upgrade or Update Asset Health Manager to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 69
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 69

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Upgrade from PDI to OT Connect	This step is required only if you are using Content Map records as health indicators sources.
2	**Optional:** Resync Health Indicators Depending on the status of potential health indicator sources in your database, the resync will result in one or both of the following scenarios: • If health indicators do not already exist for sources that are included as health indicators, the resync creates health indicators for those sources. • If health indicators exist for sources that are excluded as health indicators, the resync deletes health indicators for those sources. Additionally, if the exclusion table contains extraneous entries, the resync removes those entries.	This step is optional.

Asset Strategy Implementation Upgrade

Upgrade or Update Asset Strategy Implementation (ASI) to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 70
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 71

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Upgrade the ASI for SAP ABAP add-on in your SAP System.	This step is required.

Asset Strategy Management Upgrade

Upgrade or Update ASM to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 71
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 71

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Asset Strategy Optimization Upgrade

Upgrade or Update ASO to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 72
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 72

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be updated to V5.0.7.0.0 automatically when you update the components in the basic APM system architecture. No additional steps are required.

Calibration Management Upgrade

Upgrade or Update Calibration Management to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 72
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 72

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

When you upgrade:

- The Calibration Strategy and Device Type fields in each Calibration Profile are populated automatically.

- If using a GE Druck calibrator, in a Calibration Template that was created before the upgrade, if the value in the Temperature Element Type field is None, you must modify the value. Otherwise, you will not be able to link the Calibration Template to an Asset.

Step	Task	Notes
1	Update entity key parameters from :n to :k for the following catalog queries: • `Public\Meridium\Modules\Calibration Management\Queries` folder. ○ CalibMapStratList ○ Calibration Profile Linked Asset Query ○ CalibrationMappingList ○ Calibration_Device_Result ○ Equipment Profile Linked with Profile Template Query ○ Fluke Send Query Display Filtered ○ Functional Location Data Query ○ GetFamilyFields ○ GetLinkedFamilies ○ GetLinkedFields ○ GetLinkedStrategies ○ Instrument Data Query ○ Manage Calibration Task Query ○ Manage Calibration Task With Task Assigned Query ○ Manage Calibration Task Without Task Assigned Query ○ MapListFinal ○ Query For AnalogCalibrationReport ○ Query For AnalogCalibrationReport ○ Query For AnalogCalibrationTemplateReport ○ Query For AnalyzerMultiComponentCalibrationTemplateReport ○ Query For AnalyzerMultiComponentCalibrationTemplateSubReport ○ Query For AnalyzerSingleComponentCalibrationTemplateReport ○ Query For AnalyzerSingleComponentCalibrationTemplateSubReport ○ Query For AnalyzerMultiComponentCalibrationGraphs ○ Query For AnalyzerMultiComponentCali	This step is required only if you have previously modified the queries. This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes

2	Update Asset Hierarchy parameter from -1 to #ahhome for the following catalog queries:
	
	For example,
	(? :ah :id=entity_key) = '-1'must be updated to
	(? :ah :id=entity_key) = (#:ahhome)
	
	• `Public\Meridium`
	  `\Modules\Calibration`
	  `Management\Queries`
	  folder.
	
	   ◦ Applied Template Asset Context
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

3	Following queries have been modified to improve the performance. Revert these queries to baseline to avoid any issues while using Postgres Database.
	
	• `Public\Meridium`
	  `\Modules\Calibration`
	  `Management\Queries`
	  folder.
	
	   ◦ Recommendation Author List
	   ◦ Recommendation Reviewer List
		This step is required only if you have previously modified the queries.

Compliance Management Upgrade

Upgrade or Update Compliance Management to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 76
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 76

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

After you upgrade to the latest version of APM, following updates are automatically available:

- The MI Compliance Approver security role caption will be updated to MI Inspection Plan Approver.
- All security users who belong to the MI RBI Analyst security group will belong to the MI Inspection Plan Approver security role.
- The MI Inspection Plan Approver security role will have the MI ASM Analyst security group assigned.
- Compliance Recommendation Revision family will be renamed to Recommendation Revision. The datasheet for this family will be renamed to Recommendation Revision.
- The query Compliance Recommendation by Plan for Compliance will be renamed to Recommendation by Plan.
- The relationship family caption Has Compliance Recommendation will be updated to Inspection Plan Has Recommendation.

Step	Task	Notes
1	Configure Inspection Management ActiveMQ settings for MIExecution Service.	This step is optional. You can perform this step if you want to modify the default retries or concurrency settings.
2	Ensure that the Meridium MIExecution Service is installed and running.	If the basic APM system architecture is already installed, the Meridium MIExecution Service is automatically installed, and the service runs automatically.
3	Revert the following queries to baseline to remove the references to the MI_ENTITIES family that has been deprecated: • `Public/Meridium/ Modules/Inspection/ Compliance/Queries` folder. ◦ Inspection Tasks Available to Implement ◦ Recommendations by Inspection Plan ◦ Inspection Tasks for Asset ◦ Assets without Templates ◦ Compliance Template Assets	This step is required only if you have previously modified the queries. This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Configure Inspection Management ActiveMQ settings for MIExecution Service

The MIExecution Service, on each APM Server serves RBI, Inspection and Thickness Monitoring module queues. This service is configured to use a single shared ActiveMQ queue service across APM. Available queue configuration options include retries and concurrency limit.

Procedure

1. On the APM Server, access the folder that contains the MIExecution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\mi-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

```
"Queue_Config": {
        "Queues": [
          {
            "Name": "MI_IM_Queue",
            "ConcurrencyLimit": 8,
            "Retries": 5
          }
```

```
            ]
          }
```

Note: `ConcurrencyLimit` indicates the maximum number of messages that will be consumed concurrently. `Retries` indicates the number of times it retries to send the messages to ActiveMQ if it fails.

4. Update the key values as desired.
5. Save and close the file.
   The updated settings will be applied when the MIExecution Service is stopped and restarted.

Revert the Compliance Management Query to Baseline

This action is required only if you want to use the RBI Inspection Grouping functionality.

About This Task

If you have modified the Recommended Actions by Selected Plans query, perform the following steps to revert the query to baseline:

Procedure

1. Access the Catalog page.
2. Navigate to the following Public folder:
   `Public/Meridium/Modules/Inspection/Compliance/Queries/`
3. Select the check box next to the Recommended Actions by Selected Plans query, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the following Baseline folder.
   `Baseline/Meridium/Modules/Inspection/Compliance/Queries/`
6. Select the check box next to the Recommended Actions by Selected Plans query, and then select 🗐.
   The **Catalog Folder Browser** window appears.
7. Navigate to the Public folder containing the query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.

Compliance Recommendation - Revert to Baseline

About This Task

The default datasheet for Compliance Recommendation family has been updated and it includes the Certification and the Chamber fields.

Family	Family ID	Datasheet Updated (Default)
Compliance Recommendation	MI_COMP_RECOMM	Compliance Recommendation

If you have customized the default datasheet for the Compliance Recommendation family, and want to view Certification and Chamber-related data, then you must do one of the following:

- Using Family Management, edit the default datasheet for the Compliance Recommendation family. Next, add the Certification, Chamber, and Applicable Regulation fields in the datasheet.
- Run Revert to Baseline for each family.

Important: Running this utility overwrites your current datasheet and replaces it with the baseline version. You must be a super user in APM to run the Revert to Baseline utility.

Procedure

1. Log in to the server where APM is installed.
2. Navigate to *<Installation Directory>*`\Meridium\Upgrade\DBUpgrade`.
3. Run the `RevertToBaselineApp.exe` file as administrator.
   The **Revert To Baseline Login** window appears.

4. In the **Meridium Data Source** box, enter the data source name that you want to access.
5. Enter your login credentials, and then select **Next**.
   The available families that can be reverted to baseline appear.
6. Select the Compliance Recommendation family, and then select **Revert to Baseline**.
   The **Various Options For Revert** window appears.

7. Select **Datasheets**.
   Select the Default Datasheet from the drop-down list, and then select **Ok**.

Compliance Strategy Template Datasheet - Revert to Baseline

About This Task

The default datasheet for Compliance Strategy Template family has been updated. The field Policy Name is included and the deprecated field Policy Key is removed from the datasheet.

Family	Family ID	Datasheet Updated (Default)
Compliance Strategy Template	MI_COMP_STRAT_TEMP	Compliance Strategy Template

If you have customized the default datasheet for Compliance Strategy Template family, then you must do one of the following:

- Using Family Management, edit the default datasheet for the Compliance Strategy Template family. Replace the Policy field to Policy Name field in the datasheet.
- Run Revert to Baseline for each family.

Important: Running this utility overwrites your current datasheet and replaces it with the baseline version. You must be a super user in APM to run the Revert to Baseline utility.

Procedure

1. Log in to the server where APM is installed.
2. Navigate to *<Installation Directory>*`\Meridium\Upgrade\DBUpgrade`.
3. Run the `RevertToBaselineApp.exe` file as administrator.
   The **Revert To Baseline Login** window appears.

4. In the **Meridium Data Source** box, enter the data source name that you want to access.
5. Enter your login credentials, and then select **Next**.
   The available families that can be reverted to baseline appear.
6. Select the Compliance Strategy Template family, and then select **Revert to Baseline**.
   The **Various Options For Revert** window appears.
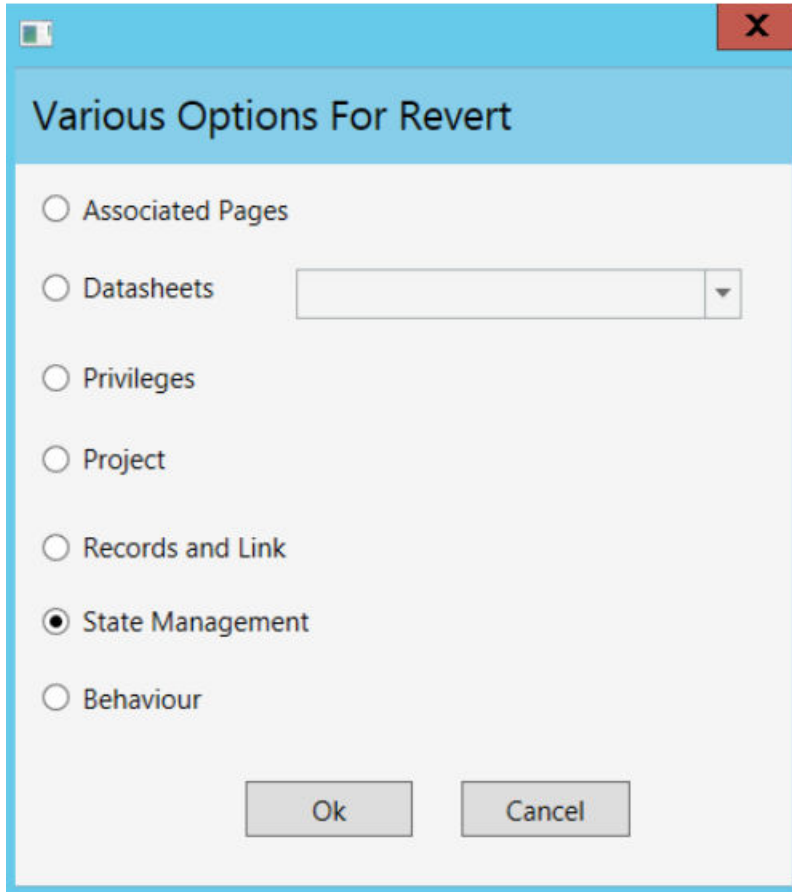
7. Select **Datasheets**.
   Select the Default Datasheet from the drop-down list, and then select **Ok**.

eLog Upgrade

Upgrade or Update eLog to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 82
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 83

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Failure Modes and Effects Analysis Upgrade

Upgrade or Update FMEA to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 83
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 83

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Generation Availability Analysis Upgrade

Upgrade or Update GAA to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 83
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 84

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Generation Availability Analysis Wind Upgrade

Upgrade or Update GAA Wind to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 84
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 84

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Hazards Analysis Upgrade

Upgrade or Update Hazards Analysis to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 85
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 85

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes

1	[Update entity key parameters](#) from :n to :k for the following catalog queries:
	
	• `Public\Meridium\Modules\Hazards Analysis\Queries` folder.
	
	   ◦ Hazard Analysis Asset Query
	
	• `Public\Meridium\Modules\Hazards Analysis\What If\Queries` folder.
	
	   ◦ What If Analysis Query
	   ◦ What If Mitigated Risk Query
	   ◦ What If Risk Query
	
	• `Public\Meridium\Modules\Hazards Analysis\HAZOP\Queries` folder.
	
	   ◦ Hazards Analysis Deviation Mitigated Risk Query
	   ◦ Hazards Analysis Mitigated Risk Query
	   ◦ Hazards Analysis Query
	   ◦ Hazop_Reference_Documents_Query
	   ◦ Hazop_Team_Member_Query
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

2	Update Asset Hierarchy parameter from -1 to #ahhome for the following catalog queries:
	
	For example,
	(? :ah :id=entity_key) = '-1'
	must be updated to
	(? :ah :id=entity_key) = (#:ahhome)
	
	• `Public\Meridium\Modules\Hazards Analysis\Queries` folder.
	
	   ◦ HAZOP_ANALYSIS_ASSET_OVERVIEW
	   ◦ Hazards Analysis Risk Overview Query
	   ◦ WHATIF_ANALYSIS_ASSET_OVERVIEW
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes
3	Following queries have been modified to improve the performance. Revert these queries to Baseline to see the improved performance. • `Public\Meridium\Modules\Hazards Analysis\Queries` folder. ◦ HAZOP_ANALYSIS_ASSET_OVERVIEW ◦ WHATIF_ANALYSIS_ASSET_OVERVIEW	This step is required only if you have previously modified the queries.

Update the Query Parameter Type

About This Task

After the database for APM is upgraded, if the entity key fields are of the type string, you must modify the catalog query parameters to use the correct type by performing the following steps:

Procedure

1. Access the **Query** page.
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to :k.

   For example, (? :n) must be updated to (? :k).
6. Select **Save**.
   The modified query is saved.

Revert the Hazard Analysis Queries to Baseline

This action is required only if you have modified the Hazard Analysis queries.

About This Task
If you have modified the Hazard Analysis queries, perform the following steps to revert the query to baseline.

Procedure

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert.
   For Hazard Analysis, the public queries are stored in the following folder:

```
Public\Meridium\Modules\Hazards Analysis\Queries
```

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, prompting you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the Baseline folder for queries.

   For Hazard Analysis, the baseline queries are stored in the following folder:
   ```
   Baseline/Meridium/Modules/Hazards Analysis/Queries
   ```

6. Select the check box next to the query that you want to revert, and then select 📑.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.
9. Repeat Steps 2-8 for each query that you want to revert to baseline.

Inspection Management Upgrade

Upgrade or Update Inspection Management to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 88
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 88

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Note: If you are using Inspection Field Data Collection for Offline Inspections, please follow the upgrade steps to install the latest app on mobile devices used for Inspection Field Data Collection.

After you upgrade:

A new Human Resource role, Contract Inspector (ID: CONTRACT INSPECTOR) is now available in MI_RESOURCE_ROLE system code table. This is to facilitate the enhancement where a Contract Inspector can now update the Status field in Inspection records to Pending Approval without being the user defined in the Inspection Report Owner field if they are also a Team Member in the associated Inspection record.

Step	Task	Notes

1	**Update entity key parameters**
	from :n to :k for the following catalog queries:
	
	• `Public/Meridium/ Modules/Inspection/ Overview Queries` folder.
	  ◦ All Inspections for Unit
	  ◦ All Tasks for Asset
	  ◦ Returns all Inspection Tasks between the provided date range
	  ◦ All Health Evaluations for Asset
	
	• `Public/Meridium/ Modules/Inspection/ Compliance/Queries` folder.
	  ◦ Recommendations to Supersede on Inspection Plan
	  ◦ Inspection Tasks Available to Implement
	  ◦ Inspection Tasks for Asset
	  ◦ Recommended Actions by Selected Plans
	  ◦ Compliance Template Assets
	
	• `Public/Meridium/ Modules/Inspection/ Report Queries` folder.
	  ◦ MI_INSPHIST_ASSETDTL
	  ◦ Inspection History - General Findings
	  ◦ Inspection History Details
	  ◦ Inspection Recommendation History
	  ◦ Inspection History – Thickness Monitoring Summary
	  ◦ All Inspection Tasks in a Work Pack
	  ◦ MI Reference Document
	  ◦ MI_FIND_GEN
	  ◦ MI_FIND_CHECK
	  ◦ MI_INSPPSUB
	  ◦ MI_RECINSP
	  ◦ MI_TEAMINSP
	  ◦ MI Asset Corrosion Analysis
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes

2	Revert the following queries to baseline to remove the references to the MI_ENTITIES family that has been deprecated:
	
	• `Public/Meridium/ Modules/Inspection/ Overview Queries` folder.
	
	  ◦ All Inspections for Unit
	  ◦ All Inspections for Unit and Below
	  ◦ All Inspections for Asset
	  ◦ All Inspections for Asset with Inspection Grouping
	  ◦ All Tasks for Asset
	  ◦ All Tasks for this Unit
	  ◦ All Tasks for Unit
	  ◦ My Open Inspections
	  ◦ Open Inspection Recommendations for Unit (State Management)
	  ◦ Open Inspection Recommendations for Unit (Status)
	  ◦ Open Inspections for Unit
	  ◦ Open Recommendations for Asset (State Management)
	  ◦ Open Recommendations for Asset (Status)
	  ◦ Overdue Inspection Recommendations for Unit (State Management)
	  ◦ Overdue Inspection Recommendations for Unit (Status)
	  ◦ Recommendations Due for Implementation for Unit (Status)
	  ◦ Recommendations Due for Implementation for Unit (State Management)
	  ◦ Overdue Tasks for Unit
	
	• `Public/Meridium/ Modules/Inspection/ Report Queries` folder.
	
	  ◦ Inspection History – Thickness Monitoring Summary
	  ◦ Inspection History Details
	  ◦ Inspection Recommendation History
	  ◦ MI Asset Corrosion Analysis
	  ◦ MI_INSPBSUB
	  ◦ MI_INSPPSUB
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

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Step	Task	Notes
3	Revert the following queries to baseline to support notifications generation functionality in SAP from APM: • `Public/Meridium/ Modules/SAP Integration Interfaces/Queries` folder. ○ Get Tasks for Work Order Generation	This step is required only if you have previously modified the queries. This step will be completed automatically when you upgrade the components in the basic APM system architecture.
4	Configure Inspection Management ActiveMQ settings for MIExecution Service.	This step is optional. You can perform this step if you want to modify the default retries or concurrency settings.
5	Ensure that the Meridium MIExecution Service is installed and running.	If the basic APM system architecture is already installed, the Meridium MIExecution Service is automatically installed, and the service runs automatically.

Step	Task	Notes
6	If you have previously used the following queries and want to continue to use them, you must export the queries from the previous version and import them into the current version. They are no longer used in the application and have been removed. Folder: `Public/Meridium/ Modules/Inspection/ Document Queries` • All Equipment That Can Have API 510 External Checklist Inspections • All Equipment That Can Have API 510 Internal Checklist Inspections • All Equipment That Can Have API 510 Internal Exchanger Checklist Inspections • All Equipment That Can Have API 570 External Checklist Inspections • All Equipment That Can Have API 653 External Checklist Inspections • All Equipment That Can Have API 653 Internal Checklist Inspections • All Equipment That Can Have Bundle Inspections • All Equipment That Can Have External PRD Checklist Inspections • All Equipment That Can Have Full Inspections • All Equipment That Can Have General Inspections • All Equipment That Can Have Inspections • All Equipment That Can Have Pressure Test Inspections • All Inspection Records • All Inspection Records for selected equipment • Get Inspections by Asset Key • Get Inspections by Function Location Key Folder: `Public/Meridium/ Modules/Inspection/Work Pack Queries` • All Work Packs • Number of Inspections in a Work Pack	This step is optional.

Step	Task	Notes
7	Revert the following queries to baseline to fix the query compilation error: Folder: `Public/Meridium/Modules/Inspection/Compliance/Queries` • All Inspection Plans for Unit • Assets with Templates without Inspection Plans • Assets without Templates • Compliance Superseded Recommendations Folder: `Public/Meridium/Modules/Inspection/Overview Queries` • Top-Level Work Packs Folder: `Public/Meridium/Modules/Inspection/Review Queries` • Bundle Inspections for Review for Current User - Choose State • Bundle Inspections for Review - Choose State and Reviewer • Bundle Inspections Pending Approval for Current User • Full Inspections for Review for Current User - Choose State • Full Inspections for Review - Choose State and Reviewer • Full Inspections Pending Approval for Current User • General Inspections for Review for Current User - Choose State • General Inspections for Review - Choose State and Reviewer • General Inspections Pending Approval for Current User • Pressure Inspections Pending Approval for Current User • Pressure Test Inspections for Review for Current User - Choose State • Pressure Test Inspections for Review - Choose State and Reviewer	This step is required only if you have previously modified the queries.

Step	Task	Notes

8	Revert the following Inspection Management queries to baseline:
	
	• `Public\Meridium`
	`\Modules\Inspection`
	`\Work Pack Queries`
	`\All Inspections in a`
	`Work Pack`
	
	• `Public\Meridium`
	`\Modules\Inspection`
	`\Review Queries\Open`
	`Inspections for Bulk`
	`Review`
		This step is required only if you have previously modified the queries.

9	Revert the following Inspection Management queries to baseline as the MI_SM_STATES.SMST_STAT_IND field is deprecated :
	
	• `Public\Meridium`
	`\Modules\Inspection`
	`\Overview Queries`
	`\Open Recommendations`
	`for Unit`
		This step is required only if you have previously modified the queries.

Step	Task	Notes
10	Map the following Baseline Inspection Document Status to the respective State: 	Status	State	 |---|---| 	DRAFT	MI_DRAFT	 	APPROVED	MI_APPROVED	 	RE-REFERRED	MI_REWORK	 	PENDING APPROVAL	MI_PENDING_APPROVAL	 	AUDITED	MI_AUDITED		This step will be completed automatically, when you upgrade the components in the basic APM system architecture. **Note:** Select the Revert to Baseline utility if you have a custom state machine at Inspection parent family and want to use the baseline state. You may want to skip this upgrade if you have custom statuses that you want to convert to a custom state machine. In this scenario, skip the database upgrade, configure your custom state machine, and then use the Map Inspection Status to State upgrade utility available in the Inspection Admin Preferences page. For more details on the steps to follow if you want to skip the baseline upgrade, refer to the KBA 000039706. If State Management is customized for families under the Inspection parent family (MI_INSP_001), refer to the KBA 000040189 to use the baseline state.

Step	Task	Notes

11	Revert the following queries to baseline to remove the references to the Status field in Inspection family that has been replaced by State Management fields.
	
	• `Public/Meridium/ Modules/Inspection/ Overview Queries` folder.
	
	  ◦ Open Inspections for Unit
	  ◦ My Open Inspections
	  ◦ Users Open Inspections (Including Team Members)
	  ◦ User's Open Inspections
	• `Public/Meridium/ Modules/Inspection/ Report Queries` folder.
	
	  ◦ MI_INSPFULL
	  ◦ MI_INSP_GEN
	  ◦ MI_INSPPTST
	  ◦ MI_INSPBUND
	  ◦ Inspection History Details
	• `Public/Meridium/ Modules/Inspection/ Work Pack Queries` folder.
	
	  ◦ All Inspections in a Work Pack
	• `Public/Meridium/ Modules/Inspection/ Review Queries` folder.
	
	  ◦ All Inspections for Reviewer
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes
12	Execute the Revert to Baseline utility to update the following Datasheets:	This step is required only if you have modified the following datasheets: - Full Visual Inspection - Visual Inspection - Visual Inspection SAP Integration - EU Inspection Report - General Inspection - Default - General Inspection - General Inspection SAP Integration - API 510 External Checklist - Default - API 510 Internal Checklist - Default - API 510 Internal Exchanger Checklist - Default - API 570 External Checklist - Default - API 653 External Checklist - Default - API 653 Internal Checklist - Default - Checklist Inspection Template - External PRD Checklist - PRD Pop Test Checklist - ILI Checklist - Default - Third Party Damage Checklist - Default - Bundle Inspection - Default - Bundle Inspection - Bundle Inspection SAP Integration - Pressure Test Inspection - Default - Pressure Test Inspection - Pressure Test Inspection SAP Integration - Bundle Sub-Inspection - Findings

Family Name	Datasheet Name
Full Inspection	- Full Visual Inspection - Visual Inspection - Visual Inspection SAP Integration - EU Inspection Report
General Inspection	- General Inspection - Default - General Inspection - General Inspection SAP Integration
API 510 External Checklist	API 510 External Checklist - Default
API 510 Internal Checklist	API 510 Internal Checklist - Default
API 510 Internal Exchanger Checklist	API 510 Internal Exchanger Checklist - Default
API 570 External Checklist	API 570 External Checklist - Default
API 653 External Checklist	API 653 External Checklist - Default
API 653 Internal Checklist	API 653 Internal Checklist - Default
Checklist Inspection Template	Checklist Inspection Template
External PRD Checklist	External PRD Checklist
PRD Pop Test Checklist	PRD Pop Test Checklist
ILI Checklist	ILI Checklist - Default
Third Party Damage Checklist	Third Party Damage Checklist - Default
Bundle Inspection	Bundle

Step	Task	Notes
13	The users with Baseline Human Resource Roles will be assigned the security Roles based on the following table: Human Resource Role / Security Role table below	This step will be completed automatically when you upgrade the components in the basic APM system architecture

Human Resource Role	Security Role
INSPECTOR	MI Inspector
INSPECTION SUPERVISOR	MI Inspection Supervisor
CONTRACT INSPECTOR	MI Contract Inspector

Step	Task	Notes
14	Change the following system code tables display format to Description only: • MI_FINDING_TYPE • MI_ACTION • MI_INSPECTION_METHOD_CATEGORY • MI_DAMAGE_MECHANISM • MI_DAMAGE_MODE • MI_INSPECTION_PROFILE_CATEGORY	This step is required only if you have modified the values in the system code tables.
15	Revert the following Inspection Management dashboard to baseline as the ALL INSPECTIONS PENDING APPROVAL FOR REVIEWER widget has been removed: • `Public\Meridium` `\Modules\Mechanical` `Integrity\Dashboards` `\Inspection Overview`	This step is required only if you have previously modified the dashboard.

Revert Inspection Management Queries to Baseline

This action is required only if you have modified the Inspection Management queries.

About This Task

If you have modified the Inspection Management query, perform the steps to revert the query to baseline.

Procedure

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert.

The queries are stored in specific sub-folders within the `Public/Meridium/Modules/Inspection/` folder.

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.

4. Select **OK**.
   The selected query is deleted.

5. Navigate to the Baseline folder for queries.

   The baseline queries are stored in specific sub-folders within the `Baseline/Meridium/Modules/Inspection/` folder.

6. Select the check box next to the query that you want to revert, and then select 🗐.
   The **Catalog Folder Browser** window appears.

7. Navigate to the folder containing the public query that you deleted in step 3.

8. Select **OK**.
   A success message appears indicating that the selected Item has been copied successfully.

9. Repeat Steps 2-8 for each query that you want to revert to baseline.

Inspection Datasheets - Revert to Baseline

About This Task

The default datasheets on Inspection families supported for Inspection Field Data Collection have been updated to include fields to track download information:

Family	Family ID	Datasheet Updated (Default)
Full Inspection	MI_INSPFULL	Full Visual Inspection
General Inspection	MI_INSP_GEN	General Inspection - Default
API 510 External Checklist	MI_API510EXT_CHECK	API 510 External Checklist - Default
API 510 Internal Checklist	MI_API510INT_CHECK	API 510 Internal Checklist - Default
API 510 Internal Exchanger Checklist	MI_API510IEX_CHECK	API 510 Internal Exchanger Checklist - Default
API 570 External Checklist	MI_API570EXT_CHECK	API 570 External Checklist - Default
API 653 External Checklist	MI_API653EXT_CHECK	API 653 External Checklist – Default
API 653 Internal Checklist	MI_API653INT_CHECK	API 653 Internal Checklist - Default
External PRD Checklist	MI_EXTNL_PRD_CHECK	External PRD Checklist
PRD Pop Test Checklist	MI_PRD_PT_CHECK	PRD Pop Test Checklist
Checklist Inspection Template	MI_GEN_INSP_TMP	Checklist Inspection Template

If you have customized the default datasheet for any of these families and want to see the download data for Inspection Field Data Collection must do one of the following:

• Using Family Management, edit the default datasheet of each family. Add a new section, Download Information with the following fields:

- Downloaded
- Last Downloaded By
- Last Downloaded Date
- Last Synced Back By
- Last Synced Date
- Run Revert to Baseline for each family.

Important: Running this utility overwrites your current datasheet and replaces it with the baseline version. You must be a super user in APM to run the Revert to Baseline utility.

Procedure

1. Log in to the server where APM is installed.
2. Navigate to `<Installation Directory>\Meridium\Upgrade\DBUpgrade`.
3. Run the `RevertToBaselineApp.exe` file as administrator.
   The **Revert To Baseline Login** window appears.

4. In the **Meridium Data Source** box, enter the data source name that you want to access.
5. Enter your login credentials, and then select **Next**.
   The available families that can be reverted to baseline appear.
6. Select the Inspection family that you want to update, and then select **Revert to Baseline**.
   The **Various Options For Revert** window appears.
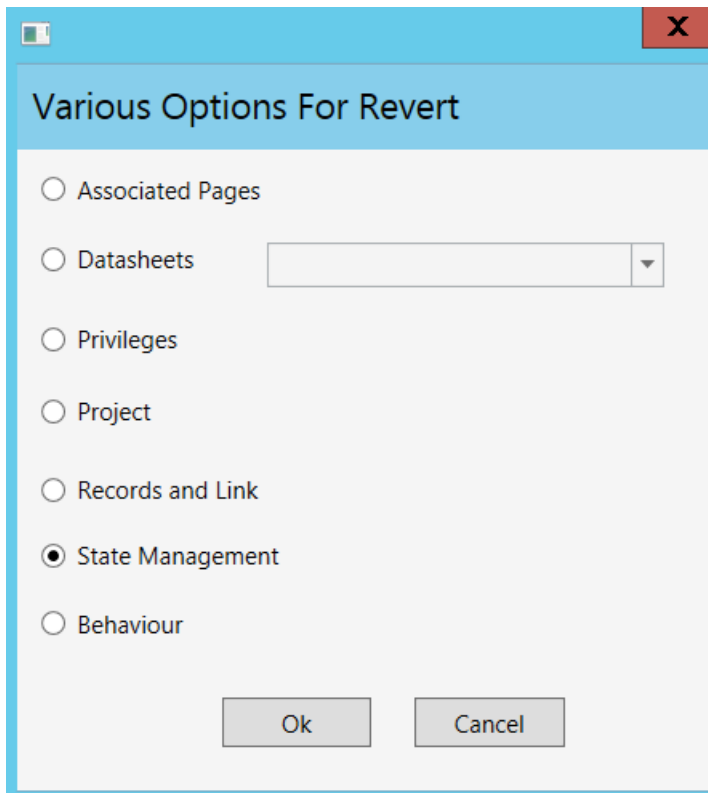
7. Select **Datasheets**.
   Select the Default Datasheet from the drop-down, and then select **Ok**.
8. Repeat steps 6-7 for each Inspection Family.

Update the Query Parameter Type

After the database upgrade for APM, if the entity key fields are of the type string, you must modify the catalog query parameters to use the correct type by performing the following steps.

Procedure

1.
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to key.

   For example, (? :n) must be updated to (? :k).
6. Select **Save**.
   The modified query is saved.

Inspection Recommendation State Management - Revert to Baseline

About This Task

The Inspection Recommendation state management is now available with a new state configuration for the approval workflow. This state configuration allows Inspection Recommendation approval workflow to use the State field, instead of the Status field. For more information about the new state configuration, refer to the topic. If you are using a customized state configuration for the approval workflow and want to use the functionality of the new state management without impacting the current approval workflow, you must map the existing states to the new states using the Revert to Baseline utility. You can run this utility in any of the following conditions:

- You are using customized state configuration for the approval workflow and want to use the new state configuration.
- You have a customized state configuration for the approval workflow, but using the recommendation status for the approval workflow, and want to use the new state configuration.

Important: Running this utility overrites your current state configuration. After you transition to the new state configuration, you cannot revert to the old state configuration.

Before You Begin

- You must be a super user in APM.
- The State Configuration for Inspection Recommendation must be enabled.

Procedure

1. Log in to the server where APM is installed.
2. Navigate to `<Installation Directory>\Meridium\Upgrade\DBUpgrade`.
3. Run the `RevertToBaselineApp.exe` file as administrator.
   The **Revert To Baseline Login** window appears.

4. In the **Meridium Data Source** box, enter the data source name that you want to access.
5. Enter your login credentials, and then select **Next**.
   The available families that can be reverted to baseline appear.

6. Select the Inspection Recommendation family, and then select **Revert to Baseline**.
   The **Various Options For Revert** window appears.

Various Options For Revert

- ○ Associated Pages
- ○ Datasheets   [▼]
- ○ Privileges
- ○ Project
- ○ Records and Link
- ● State Management
- ○ Behaviour

[Ok]   [Cancel]

7. Select **State Management**, and then select **Ok**.
   The **State Management Mapper** window appears.

State Management Mapper

Entity Families	Custom	Baseline

Custom:
Approved
Canceled
Completed
Consolidated
In Progress
Pending Approval
Pending Review
Proposed
Rejected
Superseded

Baseline:
Approved
Canceled
Completed
Consolidated
In Progress
Pending Approval
Pending Review
Proposed
Rejected
Superseded

State Management Baseline Mapping

Custom Source	Select Target	Baseline Target
Approved	▼	Approved
Canceled	Canceled ▼	Canceled
Completed	▼	
Consolidated	▼	
In Progress	▼	
Pending Review	▼	
Pending Approval	▼	
Proposed	▼	
Rejected	▼	
Superseded	▼	

8. In the **Entity Families** pane, select **Inspection Recommendation**.
   The State Management Baseline Mapping table appears and contains the following columns:

   - Custom Source: Contains all the existing states that are available for mapping to the new states.
   - Select Target: Allows you to select the new states that you want to map to the existing states.
   - Baseline Target: Displays the newly mapped states corresponding to the existing states.

9. Using the **Select Target** column, select the state that you want to map to the existing state.

   Note: You can use the **Auto Map** button to automatically map the existing states to the new states based on the state name.

10. Repeat step 9 for all the existing states.

11. Select **Save Mapping**.

12. Browse for the path where you want to save the mapping file, and then select **Save**.
    A .xml file containing the state mappings is saved.

13. Select **Revert Single Family**.

14. Select the state mapping file that you saved in step 12, and then select **OK**.
    The mapping operation starts. After the operation is successfully completed, a success message appears.

15. Select **Exit**.
    The Revert to Baseline utility is closed.

Configure APM to Create Task Revisions

About This Task

You can configure APM to create records that track changes to Task record values, so that you can keep a historical record of Task data on a given date and time. Throughout this documentation, GE Vernova refers to these revision-tracking records as Task Revision records. The family caption, however, is not necessarily Task Revision.

APM provides the following Task Revision families, but you can create your own:

- Task Revision
- Inspection Task Revision

GE Vernova assumes that you do not want a Task Revision record to be created when you create a new Task record or update an existing Task record. If, however, you want these Task Revision records to be created, you will need to perform the following step.

Procedure

Configure the Has Task Revision relationship to include the Task family as the predecessor and its Task Revision subfamily as the successor.

Results

When you create or modify a task, a Task Revision is created and linked to the task.

About Configuring the Has Task Revision Relationship

The Has Task Revision relationship family is used to link Task Revisions to Tasks. If a relationship definition exists between a Task family and its Task Revision subfamily, when you create a Task record in that family, the APM system will automatically create a Task Revision and link it to the Task. The Task Revision serves as a historical record of the Task data on a given date and time. If you later update the Task, a new Task Revision will be created.

GE Vernova assumes that you do not want a Task Revision to be created when you create a new Task or update an existing Task. If, however, you do want these Task Revisions to be created, you will need to configure the Has Task Revision relationship to include the required families. No relationship definitions are configured for this family in the baseline APM database.

The following table provides an example of a relationship definition that you might configure for the Has Task Revision relationship if you are using the root Task family.

Predecessor	Successor	Cardinality
Task	Task Revision	One to Many

Inspection Task Revision

GE Vernova assumes that you do not want an Inspection Task Revision to be created when you create a new Inspection Task or update an existing Inspection Task. If, however, you do want these Inspection Task Revisions to be created, you will need to configure the Has Task Revision relationship to include the required families. No relationship definitions are configured for this family in the baseline Inspection Management product.

The following table provides an example of a relationship definition that you might configure for the Has Task Revision relationship if you are using the Inspection Task family.

Predecessor	Successor	Cardinality
Inspection Task	Inspection Task Revision	One to Many

Configure Inspection Management ActiveMQ settings for MIExecution Service

The MIExecution Service,on each APM Server serves RBI, Inspection and Thickness Monitoring module queues. This service is configured to use a single shared ActiveMQ queue service across APM. Available queue configuration options include retries and concurrency limit.

Procedure

1. On the APM Server, access the folder that contains the MIExecution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\mi-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

```
"Queue_Config": {
        "Queues": [
          {
            "Name": "MI_IM_Queue",
            "ConcurrencyLimit": 100,
            "Retries": 5,
              "LimitPerTenantRequired": true
          }
        ]
          }
```

   Note: `ConcurrencyLimit` indicates the maximum number of messages that will be consumed concurrently. `Retries` indicates the number of times it retries to send the messages to ActiveMQ if it fails. `LimitPerTenantRequired` indicates whether Maximum Concurrency limit per Tenant is specified in scheduler service for the queue.

4. Update the key values as desired.

5. Save and close the file.
   The updated settings will be applied when the MIExecution Service is stopped and restarted.

Inspection Management Security Groups and Roles

The following table lists the baseline Security Groups available for users within this module, as well as the baseline Roles to which those Security Groups are assigned.

Important: Assigning a Security User to a Role grants that user the privileges associated with all of the Security Groups that are assigned to that Role. To avoid granting a Security User unintended privileges, before assigning a Security User to a Role, be sure to review all of the privileges associated with the Security Groups assigned to that Role. Also, be aware that

additional Roles, as well as Security Groups assigned to existing Roles, can be added via Security Manager.

Security Group	Roles
MI Inspection	MI Mechanical Integrity Administrator MI Mechanical Integrity Power MI Mechanical Integrity User
MI Inspection Viewer	MI APM Viewer MI Mechanical Integrity Viewer

The following roles can be assigned to a group or user:

- Inspector
- Inspection Supervisor
- SC Recommendations Implementer
- SC Recommendations Reviewer

These roles are used in State Management.

Family	MI Inspection	MI Inspection Viewer
Entity Families		
Alert	View, Insert, Update, Delete	View
Certification	View, Insert, Update, Delete	View
Checklist Finding	View, Insert, Update, Delete	View
Conditional Alerts	View, Insert, Update, Delete	View
Corrosion	View, Insert, Update, Delete	View
Equipment	View, Insert, Update, Delete	View
Event	View, Insert, Update, Delete	View
Finding	View, Insert, Update, Delete	View
Human Resource	View	View
Inspection Method	View, Insert, Update, Delete	View
Inspection Profile	View, Insert, Update, Delete	View
Inspection Team Member	View, Insert, Update, Delete	View
Inventory Group Configuration	View	View
Potential Degradation Mechanisms	View	View
RBI Degradation Mechanisms	View	View
RBI Inspection Auto-Selection Criteria	View	View
Recommendation	View, Insert, Update, Delete	View
Reference Document	View, Insert, Update, Delete	View
Resource Role	View, Insert, Update, Delete	View
SAP System	View	View
Security User	View	View

Family	MI Inspection	MI Inspection Viewer
Strategy	View, Update	View
Task	View, Insert, Update, Delete	View
Taxonomy References	View	View
Time Based Inspection Interval	View, Insert, Update, Delete	View
Time Based Inspection Setting	View, Insert, Update, Delete	View
Work Pack	View, Insert, Update, Delete	View
Relationship Families		
Belongs to a Unit	View, Update, Insert, Delete	View
Checklist Has Finding	View, Insert, Update, Delete	View
Has Certifications	View, Insert, Update, Delete	View
Has Degradation Mechanisms	View	View
Has Findings	View, Insert, Update, Delete	View
Has Inspection Method	View, Insert, Update, Delete	View
Has Inspection Profile	View, Insert, Update, Delete	View
Has Inspection Scope	View, Insert, Update, Delete	View
Has Inspections	View, Insert, Update, Delete	View
Has Potential Degradation Mechanisms	View	View
Has Recommendations	View, Insert, Update, Delete	View
Has Reference Documents	View, Insert, Update, Delete	View
Has Roles	View, Insert, Update, Delete	View
Has Sub-Inspections	View, Insert, Update, Delete	View
Has Tasks	View, Insert, Update, Delete	View
Has Task History	View, Insert	View
Has Task Revision	View, Insert	View
Has Team Member	View, Insert, Update, Delete	View
Has Taxonomy Hierarchy Element	View	View
Has Taxonomy Mapping	View	View
Has Time Based Inspection Interval	View, Insert, Update, Delete	View
Has Work Pack	View, Update, Insert, Delete	View
Is a User	View	View
Is Planned By	View, Insert, Update, Delete	View
Is Executed By	View, Insert, Update, Delete	View

Note: Security privileges for all modules and catalog folders can be found in the APM documentation.

Note that:

- The family-level privileges granted to the following families are also spread to all of their subfamilies:

- Event
- Taxonomy References
- The Has Task History relationship family is inactive in the baseline APM database.
- In addition to the families listed in the preceding table, members of the MI Inspection Security Group have View privileges to additional families to facilitate integration with the Risk Based Inspection module. Since these families are not used elsewhere in Inspection Management, they are not listed in this table.

Note: As part of implementing Inspection Management, you will decide whether you want to link Inspection records to Equipment records, Functional Location records, or both. If you want to link Inspection records to Functional Location records, you will need to grant members of the MI Inspection Security Group at least View privileges to the Functional Location family and the Functional Location Has Equipment relationship family. All new users are automatically assigned to the Everyone user group.

Revert Inspection Management Dashboard to Baseline

Before You Begin

This action is required only if you have modified the Inspection Management dashboard.

About This Task

If you have modified the Inspection Management dashboard, perform the following steps to revert the dashboard to baseline.

Procedure

1. [Access the Catalog page](#).
2. Navigate to the Public folder for the dashboard that you want to revert.

   The dashboards are stored within the `Public/Meridium/Modules/Mechanical Integrity/Dashboards/` folder.

3. Select the check box next to the dashboard that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected dashboard.
4. Select **OK**.
   The selected dashboard is deleted.
5. Navigate to the Baseline folder for dashboards.

   The baseline dashboards are stored within the `Public/Meridium/Modules/Mechanical Integrity/Dashboards/` folder.

6. Select the check box next to the dashboard that you want to revert, and then select 🗐.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public dashboard that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.
9. Repeat Steps 2-8 for each dashboard that you want to revert to baseline.

Layers of Protection Analysis Upgrade

Upgrade or Update LOPA to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 113
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 113

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes

1	Update entity key parameters from :n to :k for the following catalog queries:
	
	• `Public\Meridium\Modules\LOPA\Queries` folder.
	
	   ◦ ALL LOPA Query
	   ◦ Consequence Modifier LOPA Query
	   ◦ Safeguard LOPA Query
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

2	Update Asset Hierarchy parameter from -1 to #ahhome for the following catalog queries:
	
	For example, (? :ah :id=entity_key) = '-1' must be updated to (? :ah :id=entity_key) = (#:ahhome).
	
	• `Public\Meridium\Modules\LOPA\Queries` folder.
	
	   ◦ LOPA_ASSET_CONTEXT_APPROVED
	   ◦ LOPA_ASSET_CONTEXT_UNDER_REVIEW
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Update the Query Parameter Type

About This Task

After the database for APM is upgraded, if the entity key fields are of the type string, you must modify the catalog query parameters to use the correct type by performing the following steps:

Procedure

1. Access the **Query** page.
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to :k.

   For example, (? :n) must be updated to (? :k).

6. Select **Save**.
   The modified query is saved.

Life Cycle Cost Analysis Upgrade

Upgrade or Update LCC to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 115
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 115

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Revert the following query to baseline to retain the order of secondary elements after you create or copy a Scenario: • `Public\Meridium\Modules\LCC \Queries` folder: ◦ Get Element Details for Scenario	This step is required only if you have previously modified the query. Otherwise, this step will be completed automatically when you upgrade the components in the basic APM system architecture.

To revert queries to baseline:

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert: `Public/Meridium/ Modules/<module name>/Queries`

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.

4. Select **OK**. The selected query is deleted.
5. Navigate to the module-specific Baseline folder for queries: `Baseline/Meridium/Modules/<module name>/Queries`
6. Select the check box next to the query that you want to revert, and then select ⬚.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A message appears, indicating that the selected item has been copied successfully.
9. Repeat steps 2-8 for each query that you want to revert to baseline.

Management of Change Upgrade

Upgrade or Update MoC to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 116
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.0.0.0 through V4.6.2.0.0 on page 116

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.0.0.0 through V4.6.2.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes

1	Update entity key parameters from :n to :k for the following catalog queries:
	
	• `Public\Meridium \Modules\Management Of Change\Queries` folder.
	
	  ◦ Change Project Checklist Query
	  ◦ Checklist Questions Query
	  ◦ Exceptions Admin Query
	  ◦ Exception Graph Query
	  ◦ MOC Checklists Admin Query
	  ◦ Remaining Questions
	  ◦ Task states count query
	  ◦ Task Summary Graph Query
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

2	Update Asset Hierarchy parameter from -1 to #ahhome for the following catalog queries:
	
	For example, (? :ah :id=entity_key) = '-1' must be updated to (? :ah :id=entity_key) = (#:ahhome).
	
	• `Public\Meridium \Modules\Management Of Change\Queries` folder
	
	  ◦ All Change Projects
	  ◦ All MOC Tasks
	• `Public\Meridium \Modules\Management Of Change\Dashboards \Queries` folder.
	
	  ◦ MOC Calendar Query
	  ◦ MOC Permanent Projects
	  ◦ MOC Temporary Expired Projects
	  ◦ MOC Temporary Projects
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Update the Query Parameter Type

About This Task

After the database for APM is upgraded, if the entity key fields are of the type string, you must modify the catalog query parameters to use the correct type by performing the following steps:

Procedure

1. Access the **Query** page.
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to :k.

   For example, (? :n) must be updated to (? :k).
6. Select **Save**.
   The modified query is saved.

Metrics and Scorecards Upgrade

Upgrade or Update Metrics and Scorecards to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 118
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 118

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Deploy the new Work History cube.	**Important:** Before deploying the new Work History cube, ensure that: • The Security User who will run the Analysis Services Deployment Wizard has been granted View permissions to the cubes associated with the Metric Views. • The cubes are active. This step is required, and the baseline work history cube must be redeployed. The baseline Work History cube was modified such that even if the event or equipment data do not meet the standard classification defined for the Work History cube, with minor modifications to the event and asset criticality data used by the cube, the cube will work with the non-standard event and equipment data.
2	If you have modified a cube that belongs to a previous version, you must manually make the same modifications to the current Work History cube.	This step is required only if you have modified a Work History cube that belongs to a previous version. If you have made modifications to the Work History cube, then you must manually make those updates again.

Step	Task	Notes
3	Verify that your event and asset criticality data meet the standard classification requirements, and modify the event or asset criticality data for the Work History cube as needed.	This step is required. If you are an existing user who uses the work history cube, you can map the event or asset criticality data available in your database to the standard event or asset criticality data defined for the work history cube using one of the following procedures: • Modifying the corresponding views for the work history cube in the APM database. • Modifying records available for the corresponding event or asset criticality data family by constructing and executing an update query.
4	Localize the event and equipment values in APM .	This step is required only if you want to localize the event and equipment values in the Work History cube.
5	Schedule cubes for processing on the SQL Server Analysis Server.	This step is required.

About Configuring a Cube for Usage Metrics Tracking

You can track the activity of the users in your system. Usage metrics are stored in the MI_SEC_LOG_EVENTS system table. When a user logs in to APM, actions of the user are stored in batches for that session in the MI_SEC_LOG_EVENTS table.

The MI_SEC_LOG_EVENTS table records the following events:

• Successful logins
• Failed logins
• Password changes
• User account creation, activation, deactivation, modification
• Session expiry

The following table describes the columns that exist in the MI_SEC_LOG_EVENTS table:

Column ID	Description
SECL_KEY	Stores the values that identify the events in the MI_SEC_LOG_EVENTS table.
SECL_EVENT_NM	Stores the names of the events.
SECL_USER_ID	Stores the user IDs of the users who attempt to log in to APM.
SECL_ADMIN_ID	Stores the user IDs of the Administrators who create, update, and delete users.
LAST_UPDT_DT	Stores the value that identifies the date and time when a record was last updated.

Note: Usage metrics are recorded only for activities performed via APM. Usage metrics are not recorded for activities performed in the APM Administrative applications.

To view the usage metrics that have been tracked for your system, you must create a cube based upon the MI_SEC_LOG_EVENTS table. After you create the cube, you must join the MI_SEC_LOG_EVENTS and the MIV_MI_IS_A_USER tables. You must also join the MIV_MI_IS_A_USER and MIV_MI_HUMAN_RESOURCE tables.

Note: Before you use the cube in the Metrics and Scorecards module, you must enable usage metrics tracking via the **Monitoring** page in Configuration Manager .

About Scheduling Cubes for Processing

An Analysis Services cube is a combination of measures and dimensions that together determine how a set of data can be viewed and analyzed. A cube is a static object and initially represents the data that existed in Analysis Services for the selected measures and dimensions when the cube was created. To keep a cube current, it must be processed regularly, whereby the cube is updated with the most current data in Analysis Services.

To make sure that a cube always provides users with the most current data, you should schedule it for processing regularly, usually on a daily basis. One way to process cubes and shared dimensions successfully is to do so manually on the Analysis Server. Using this method, you can process shared dimensions first, and then process the related cubes. Processing cubes manually, however, is not a viable option if you have many cubes that you want to process on a daily basis.

Instead, a preferable option would be to schedule cubes for processing using Data Transformation Services (DTS). This functionality is available in the SQL Server Business Intelligence Development Studio, which is included in SQL Server Standard Edition. For details on creating a DTS package that can be used to process objects according to a custom schedule, see your SQL Server documentation.

Install SQL Server Analysis Services on the Server

SQL Server Analysis Services is the foundation for the APM Metrics and Scorecards module because it serves as a storage and management mechanism for cubes, which can then be accessed and viewed via APM. To support Metrics and Scorecards features, SQL Server Analysis Services must be installed on the machine that will serve as the Analysis Server. The Analysis Server must be set up as a machine that is separate from the APM Application Server.

Where Does This Software Need to Be Installed?

SQL Server Analysis Services must be installed on the machine that will function as the Analysis Server. You do not need to install any SQL Server components on the Application Server to support the Metrics and Scorecards functionality.

Performing the Installation

SQL Server Analysis Services can be installed using the SQL Server Standard Edition installation package, which you may have received from APM or from a third-party vendor, depending upon the licensing options you selected when you purchased the APM product. Instructions for performing the installation can be found in the documentation included in the SQL Server Standard Edition installation package.

Creating the Analysis Services Database, Data Source, and Cubes

In addition to creating the Analysis Services database, data source, and cubes, the cubes must be processed before they will be available for use in the APM system. For details on completing these tasks, consult your SQL Server documentation.

Migrate SQL Server Cubes

About This Task

If you are upgrading from a previous version of APM and you have existing Metrics and Scorecards objects (e.g., Metric Views and KPIs) that are based upon SQL Server 2005 or SQL Server 2008 R2 Analysis Services cubes, you may be able to migrate your cubes while maintaining the proper functioning of your existing APM objects.

- If you have SQL Server 2008, SQL Server 2012, or SQL Server 2014 cubes, you must migrate them to SQL Server 2016.

The following workflow provides a general overview of the process for migrating cubes from an older version of SQL Server Analysis Services to a newer version of SQL Server Analysis Services. For more details, you should see your SQL Server documentation.

Important: Depending upon the complexity of your cubes, you may or may not be able to migrate them successfully. We recommend that you attempt to migrate them using the following procedure. If you review the cubes after the migration and determine that the migration was not successful, the cubes will need to be rebuilt. In that case, any KPIs and Metric Views that were based upon those cubes must also be rebuilt.

Procedure

1. On the SQL Server Analysis Services Server where the older version of SQL Server Analysis Services is installed, open the **SQL Server Management Studio** window.
2. Connect to the SQL Sever Analysis Services database that you want to upgrade.
3. In the **Object Explorer** pane, right-click **Databases**, and select **Backup**.
   The **Backup Database - <Database Name>** window appears, where <Database Name> is the name of the database that you want to upgrade.
4. To the right of the **Backup file** box, select the **Browse** button, and specify the location where the database will be backed up.
5. Specify any additional settings, and then select **OK**.
   The selected database is saved to an .ABF file in the specified location.
6. Open the **SQL Server Management Studio** window for the new version of SQL Server Analysis Services.
7. In the **Object Explorer** pane, right-click **Databases**, and select **New Database**.
   The **New Database** window appears.
8. In the **Database name** box, enter a name for the database that you are migrating to the new version of SQL Server Analysis Services.
9. Specify any additional settings, and then select **OK**.
   The specified database is created, and a corresponding node appears in the **Object Explorer** pane.
10. Right-click the node representing the new database, and then select **Restore**.
    The **Restore Database** window appears.
11. In the **Backup** file, enter the file path or select the **Browse** button and navigate to the database file that you backed up in step 5.
12. Specify an additional settings, and then select **OK**.

Your SQL Server Analysis Services database is migrated to the new SQL Server Analysis Services version.

13. In the APM, in the Metrics and Scorecards module, modify the remaining properties of each Analysis Services Cube record, including selecting the appropriate new SQL Server Analysis Server. You can do by using the **Manage Cubes** page in the Metrics and Scorecards module.

14. View existing objects (e.g. Metric Views and KPIs) that are based upon the migrated cubes to ensure that the correct data is being displayed. If the correct data is not displayed, rebuild the cubes and the objects that are based upon them. For details on rebuilding cubes, see your SQL Server documentation.

Deploy the Work History Cube

Procedure

1. Copy the `Cubes` folder from the Release CD to the SQL Server Analysis Services server.

2. On the SQL Server Analysis Services server, in the `Cubes` folder, select the `Work History` folder.
   The following files and folders appear:

   - Work_History.asdatabase
   - Work_History.configsettings
   - Work_History.deploymentoptions
   - Work_History.deploymenttargets
   - Work_History.asassemblylocations
   - MDXFunctions folder

3. Run the Analysis Services Deployment Wizard program.
   The **Welcome** page appears.

4. Select **Next**.

5. When the wizard prompts you to choose the database file, navigate to the `Work History` folder, and then select the `Work History.asdatabase` file.

6. Perform all steps of the wizard to deploy the Work History database to the SQL Server Analysis Services server.

   Note: For more information, refer to the MSDN documentation regarding Analysis Services Deployment Wizard.

About Modifying the Work History Cube

The baseline Work History cube provided with the Metrics and Scorecards module uses the following standard classifications for event and asset criticality data. If the event or asset criticality data in your database cannot be classified as one of following the standard IDs, the data, by default, will be classified as *Unknown*.

- Event Type

  ○ Standard Event Types

    ○ ID: Miscellaneous; Caption: Miscellaneous
    ○ ID: PM/PdM; Caption: PM/PdM
    ○ ID: Repair; Caption: Repair
    ○ ID: Unknown; Caption: Unknown

- Event Breakdown Indicator

- Standard Event Breakdown Indicators

  - ID: N, Caption: N
  - ID: Y, Caption: Y
  - ID: Unknown, Caption: Unknown
- Event Priority

  - Standard Event Priorities

    - ID: 1, Caption: Very Low
    - ID: 2, Caption: Low
    - ID: 3, Caption: Medium
    - ID: 4, Caption: High
    - ID: 5, Caption: Emergency
    - ID: Unknown, Caption: Unknown
- Event Detection Method

  - Standard Event Detection Methods

    - ID: 0001, Caption: Continuous Condition Monitoring
    - ID: 0002, Caption: Corrective Maintenance
    - ID: 0003, Caption: Formal Inspection
    - ID: 0004, Caption: Operator Routine Observation
    - ID: 0005, Caption: Periodic Condition Monitoring
    - ID: 0006, Caption: Preventive Maintenance
    - ID: 0007, Caption: Production Interference
    - ID: 0008, Caption: Radar Operator Observation
    - ID: Unknown, Caption: Unknown
- Asset Criticality Data

  - Standard Asset Criticality Data

    - ID: A, Caption: High
    - ID: B, Caption: Medium
    - ID: C, Caption: Low
    - ID: Unknown, Caption: Unknown

Modify the Event or Asset Criticality Data for Work History Cube

If the event or asset criticality data in your database does not match with the standard IDs used for the work history cube, then you have to modify the corresponding views on the server or map the event or asset criticality data to the standard event or asset criticality data using the corresponding families.

Modify the Non-Standard Event Type Data Using the View

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.
- Verify the standard classification defined for event or asset criticality data.

Procedure

1. In the **Views**, select MIV_MI_FAC_WORK_HSTY view, and then run the following query to check if the Event Type data matches the standard classification defined.

SELECT distinct MI_EVENT_TYP_CHR from MI_EVENT

2. Verify if the results match the standard event type IDs defined by the Work History cube.
3. If the results do not match, then modify the case statement CASE MI_EVENT_TYP_CHR in the view to display the standard event type IDs.

> **Example**
>
> Suppose the distinct Event Types returned by the query run in Step 1 are *Miscellaneous*, *Repair* ,*PM/PdM*, and *Inspection* and if *Inspection* event in your data should be *PM/PdM* event, then modify the CASE statement in the View as follows:
>
> ```
> CASE MI_EVENT_TYP_CHR
>
>   WHEN 'Miscellaneous' THEN 'Miscellaneous'
>
>   WHEN 'PM/PdM' THEN 'PM/PdM'
>
>   WHEN 'Repair' THEN 'Repair'
>
>   WHEN 'Inspection' THEN 'PM/PdM'
>
>   ELSE 'Unknown'
>
> END AS EventType
> ```

Modify the Non-Standard Event Priority Data Using the View

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.
- Verify the standard classification defined for event or asset criticality data.

Procedure

1. In the **Views**, select MIV_MI_FAC_WORK_HSTY view, and then run the following queries to check if the Event priority data matches the standard classification defined.

   SELECT distinct MI_EVWKHIST_ORDR_PRTY_C from MI_EVWKHIST

   SELECT distinct MI_EVWKHIST_RQST_PRTY_C from MI_EVWKHIST

2. Verify if the results match the standard event priority IDs defined by the Work History cube.
3. If the results do not match, then modify the case statement CASE ISNULL(MI_EVWKHIST_ORDR_PRTY_C, MI_EVWKHIST_RQST_PRTY_C) in the view to display the standard event priority IDs.

> **Example**
>
> Suppose the distinct Event Priorities returned by the query are *1*, *2*,*3*, *4*,*5*, and *M* and if *M* in your data should be event priority *3*, then you should modify the CASE statement in View as:
>
> ```
> CASE ISNULL(MI_EVWKHIST_ORDR_PRTY_C,
> MI_EVWKHIST_RQST_PRTY_C)
> ```

```
WHEN 'Very Low' THEN '1'

WHEN 'Low' THEN '2'

WHEN 'Medium' THEN '3'

WHEN 'High' THEN '4'

WHEN 'Emergency' THEN '5'

WHEN '1' THEN '1'

WHEN '2' THEN '2'

WHEN '3' THEN '3'

WHEN '4' THEN '4'

WHEN '5' THEN '5'

WHEN 'M' THEN '3'

ELSE 'Unknown'

END AS Priority
```

Modify the Non-Standard Event Detection Method Data Using the View

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.
- Verify the standard classification defined for event or asset criticality data.

Procedure

1. In the **Views**, select MIV_MI_FAC_WORK_HSTY view, and then run the following queries to check if the Event detection method data matches the standard classification defined.

   SELECT distinct MI_EVWKHIST_DETCT_MTHD_CD_C from MI_EVWKHIST

2. Verify if the results match the standard event detection method IDs defined by the Work History cube.

3. If the results do not match, then modify the case statement CASE MI_EVWKHIST_DETCT_MTHD_CD_C in the view to display standard event detection method IDs.

   > **Example**
   >
   > Suppose distinct Event Detection Methods returned by the query are *0001*, *0002,0003*, *0004,0005,0006,0007,0008*, and *0009* and if *0009* in your data should be *0001* event detection method, then you should modify the CASE statement in View as:
   >
   > ```
   > CASE MI_EVWKHIST_DETCT_MTHD_CD_C
   >
   > WHEN 'Continous Condition Monitoring' THEN '0001'
   >
   > WHEN 'Corrective Maintenance' THEN '0002'
   > ```

```
WHEN 'Formal Inspection' THEN '0003'

WHEN 'Operator Routine Observation' THEN '0004'

WHEN 'Periodic Condition Monitoring' THEN '0005'

WHEN 'Preventive Maintenance' THEN '0006'

WHEN 'Production Interference' THEN '0007'

WHEN 'Radar operator Observation' THEN '0008'

WHEN '0001' THEN '0001'

WHEN '0002' THEN '0002'

WHEN '0003' THEN '0003'

WHEN '0004' THEN '0004'

WHEN '0005' THEN '0005'

WHEN '0006' THEN '0006'

WHEN '0007' THEN '0007'

WHEN '0008' THEN '0008'

WHEN '0009' THEN '0001'

ELSE 'Unknown'

END AS DetectionMethod
```

Modify the Non-Standard Event Breakdown Data Using the View

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.
- Verify the standard classification defined for event or asset criticality data.

Procedure

1. In the **Views**, select MIV_MI_FAC_WORK_HSTY view and then run the following query to check if the Event Breakdown data matches the standard classification defined.

   SELECT distinct MI_EVWKHIST_BRKDN_IND_F from MI_EVWKHIST

2. Verify if the results match the standard event breakdown IDs defined by the Work History cube.
3. If the results do not match, then modify the case statement CASE MI_EVWKHIST_BRKDN_IND_F in the view to display the standard event breakdown IDs.

Example

Suppose the distinct Event Breakdown returned by the query is *Y*, *N*, and *No* and if *No* in your data is should be *N* event breakdown, then you should modify the CASE statement in View as:

```
CASE MI_EVWKHIST_BRKDN_IND_F

 WHEN 'Y' THEN 'Y'

 WHEN 'N' THEN 'N'

 WHEN 'No' THEN 'N'

 ELSE 'Unknown'

END AS Breakdown
```

Modify the Non-Standard Equipment Criticality Data Using the View

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.
- Verify the standard classification defined for event or asset criticality data.

Procedure

1. In the **Views**, select MIV_MI_FAC_EQUIPMENT view, and then run the following queries to check if the Equipment Criticality data matches the standard classification defined.

   SELECT distinct MI_EQUIP000_CRITI_MTHD_IND_C from MI_EQUIP000
2. Verify if the results match the standard equipment criticality IDs defined by the Work History cube.
3. If the results do not match, then modify the case statement CASE MI_EQUIP000_CRITI_IND_C in the view to display standard equipment criticality IDs.

Example

Suppose distinct Equipment Criticality returned by the query in Step 1 is *A*, *B*, *C*, and *H* and if *H* in your data is actually *A* equipment criticality ID, then you should modify the CASE statement in the View as:

```
CASE MI_EQUIP000_CRITI_IND_C

WHEN 'HIGH' THEN 'A'

WHEN 'Medium' THEN 'B'

WHEN 'Low' THEN 'C'

WHEN 'A' THEN 'A'

WHEN 'B' THEN 'B'

WHEN 'C' THEN 'C'
```

```
WHEN 'H' THEN 'A'

ELSE 'Unknown'

END AS EquipmentCriticality
```

Modify the Non-Standard Functional Location Criticality Data Using the View

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.
- Verify the standard classification defined for event or asset criticality data.

Procedure

1. In the **Views**, select MIV_MI_FAC_FNC_LOC view, and then run the following queries to check if the Functional Location Criticality data matches the standard classification defined.

    SELECT distinct MI_FNCLOC00_CRTCAL_IND_C from MI_FNCLOC00
2. Verify if the results match the standard functional location criticality IDs defined by the Work History cube.
3. If the results do not match, then modify the case statement CASE A.MI_FNCLOC00_CRTCAL_IND_C in the view to display standard functional location criticality IDs.

    > **Example**
    >
    > Suppose the distinct functional location criticality returned by the query in Step 1 is *A*, *B*,*C*, and *M* and if *M* in your data should be *B* functional location criticality ID, then you should modify the CASE statement in the View as:
    >
    > ```
    > CASE A.MI_FNCLOC00_CRTCAL_IND_C
    >
    > WHEN 'HIGH' THEN 'A'
    >
    > WHEN 'Medium' THEN 'B'
    >
    > WHEN 'Low' THEN 'C'
    >
    > WHEN 'A' THEN 'A'
    >
    > WHEN 'B' THEN 'B'
    >
    > WHEN 'C' THEN 'C'
    >
    > WHEN 'M' THEN 'B'
    >
    > ELSE 'Unknown'
    >
    > END AS FunctionalLocationCriticality
    > ```

Map the Non-Standard Event Type Data to Standard Event Type IDs Using Queries for Event Type Dimension Family

This topic describes how to map the event type data available in your database to the standard event type data defined for a work history cube.

Procedure

1. In the **Applications** menu, navigate to the **TOOLS** section, and then select **Queries**.
   The **Query** page appears.
2. Select **Create New**.
   The **Select a Family or Query** window appears.
3. Search for the Event Type Dimension family, and then select **Add**.
   The **Design** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears.
5. Run the query `SELECT [MI_DIM_EVENT_TYPE].[EventType] "EventType", [MI_DIM_EVENT_TYPE].[EventTypeCaption] "EventTypeCaption" FROM [MI_DIM_EVENT_TYPE].`
   The standard event type data available in APM appears in the query results.
6. Run the query `SELECT distinct MI_EVENT_TYP_CHR from MI_EVENT.`
   The event type data available in your database appears in the query results.
7. Verify if the event type data returned by the query in Step 6 matches the standard event type IDs returned by the query in Step 5.
8. If the results do not match, perform the following steps to map the event type data available in your database with the standard event type ID available in APM:

   a) In the **SQL** workspace, enter the following update query:
   ```
   UPDATE [MI_DIM_EVENT_TYPE] SET [MI_DIM_EVENT_TYPE].[EventTypeCaption]
   = '<New Data>' WHERE [MI_DIM_EVENT_TYPE].[EventTypeCaption] =
   '<Standard Data Caption>'
   ```

   Note: In this query:

   - <New Data> denotes the event type data that you want to map to the standard event type ID available in APM.
   - <Standard Data Caption> denotes the captions corresponding to the standard event type data available in APM.

   b) Replace <New Data> with a value that you want to map with the standard event type data available in APM.
   c) Replace <Standard Data Caption> with the caption available for the corresponding event type ID to which the new event type data will be mapped.
   d) Run the query.
      The **Execute Query** window appears.
   e) Select **Yes**.
      The event type data is mapped to the standard event type ID defined for the work history cube.

   > **Map an Event Type to a Standard Event Type ID**
   >
   > The following standard event type data is returned by the query run in Step 5.

EventType	EventTypeCaption
Miscellaneous	Miscellaneous
PM/PdM	PM/PdM
Repair	Repair
Unknown	Unknown

The following event type data is returned by the query run in Step 6:

- INSPECTION
- PM/PdM
- Reading
- Repair

If you want to map the event type INSPECTION to the standard event type ID Miscellaneous:

- Run the query `UPDATE [MI_DIM_EVENT_TYPE] SET [MI_DIM_EVENT_TYPE].[EventTypeCaption] = 'INSPECTION' WHERE [MI_DIM_EVENT_TYPE].[EventTypeCaption] = 'Miscellaneous'.`
  The event type INSPECTION is mapped to the standard event type ID Miscellaneous.

Map the Non-Standard Event Priority Data to Standard Event Priority IDs Using Queries for Event Priority Dimension Family

This topic describes how to map the event priority data available in your database to the standard event priority data defined for a work history cube.

Procedure

1. In the **Applications** menu, navigate to the **TOOLS** section, and then select **Queries**..
   The **Query** page appears.
2. Select **Create New**.
   The **Select a Family or Query** window appears.
3. Search for the Event Priority Dimension family, and then select **Add**.
   The **Design** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears.
5. Run the query `SELECT [MI_DIM_EVENT_PRIORITY].[Priority] "Priority", [MI_DIM_EVENT_PRIORITY].[PriorityCaption] "PriorityCaption" FROM [MI_DIM_EVENT_PRIORITY].`
   The standard event priority data available in APM appears in the query results.
6. Run the following queries:

   - `SELECT distinct MI_EVWKHIST_BRKDN_IND_F from MI_EVWKHIST`
   - `SELECT distinct MI_EVWKHIST_RQST_PRTY_C from MI_EVWKHIST`

   The event priority data available in your database appears in the query results.
7. Verify if the event priority data returned by the query in Step 6 matches the standard event priority IDs returned by the query in Step 5.

8. If the results do not match, perform the following steps to map the event priority data available in your database with the standard event priority ID available in APM:

a) In the **SQL** workspace, enter the following update query:
```
UPDATE [MI_DIM_EVENT_PRIORITY] SET [MI_DIM_EVENT_PRIORITY].
[PriorityCaption] = '<New Data>' WHERE [MI_DIM_EVENT_PRIORITY].
[PriorityCaption] = '<Standard Data Caption>'
```

   Note: In this query:

   - <New Data> denotes the event priority data that you want to map to the standard event priority ID available in APM.
   - <Standard Data Caption> denotes the captions corresponding to the standard event priority data available in APM.

b) Replace <New Data> with a value that you want to map with the standard event priority data available in APM.

c) Replace <Standard Data Caption> with the caption available for the corresponding event priority ID to which the new event priority data will be mapped.

d) Run the query.
   The **Execute Query** window appears.

e) Select **Yes**.
   The event priority data is mapped to the standard event priority ID defined for the work history cube.

Map Event Priority Data to a Standard Event Priority ID

The following standard event priority data is returned by the query run in Step 5.

Priority	PriorityCaption
1	Very Low
2	Low
3	Medium
4	High
5	Emergency
Unknown	Unknown

The following event priority data is returned by the query run in Step 6:

- 1
- 2
- 3
- 4

If you want to map the event priority data 1 to the standard event priority ID 5:

- Run the query `UPDATE [MI_DIM_EVENT_PRIORITY] SET [MI_DIM_EVENT_PRIORITY].[PriorityCaption] = '1' WHERE [MI_DIM_EVENT_PRIORITY].[PriorityCaption] = 'Emergency'`.
  The event priority data 1 is mapped to the standard event priority ID 5.

Map the Non-Standard Event Detection Methods to Standard Event Detection Method IDs Using Queries for Event Detection Method Dimension Family

This topic describes how to map the event detection methods available in your database to the standard event detection methods defined for a work history cube.

Procedure

1. In the **Applications** menu, navigate to the **TOOLS** section, and then select **Queries**.
   The **Query** page appears.
2. Select **Create New**.
   The **Select a Family or Query** window appears.
3. Search for the Event Detection Method Dimension family, and then select **Add**.
   The **Design** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears.
5. Run the query `SELECT [MI_DIM_EVENT_DETECTION].[DetectionMethod] "DetectionMethod", [MI_DIM_EVENT_DETECTION].[DetectionMethodCaption] "DetectionMethodCaption" FROM [MI_DIM_EVENT_DETECTION].`
   The standard event detection methods available in APM appears in the query results.
6. Run the query `SELECT distinct MI_EVWKHIST_DETCT_MTHD_CD_C from MI_EVWKHIST.`
   The event detection methods available in your database appears in the query results.
7. Verify if the event detection methods returned by the query in Step 6 match the standard event detection method IDs returned by the query in Step 5.
8. If the results do not match, perform the following steps to map the event detection methods available in your database with the standard event detection method ID available in APM:

   a) In the **SQL** workspace, enter the following update query:
   ```
   UPDATE [MI_DIM_EVENT_DETECTION] SET [MI_DIM_EVENT_DETECTION].
   [DetectionMethod] = '<New Data>' WHERE [MI_DIM_EVENT_DETECTION].
   [DetectionMethod] = '<Standard Data Caption>'
   ```

   Note: In this query:

   - <New Data> denotes the event detection method that you want to map to the standard event detection method ID available in APM.
   - <Standard Data Caption> denotes the captions corresponding to the standard event detection method available in APM.

   b) Replace <New Data> with a value that you want to map with the standard event detection method available in APM.
   c) Replace <Standard Data Caption> with the caption available for the corresponding event detection method ID to which the new event detection method will be mapped.
   d) Run the query.
      The **Execute Query** window appears.
   e) Select **Yes**.
      The event detection method is mapped to the standard event detection method ID defined for the work history cube.

   > **Map an Event Detection Method to a Standard Event Detection Method ID**
   >
   > The following standard event detection methods are returned by the query run in Step 5.

DetectionMethod	DetectionMethodCaption
0001	Continuous Condition Monitoring
0002	Corrective Maintenance
0003	Formal Inspection
0004	Operator Routine Observation
0005	Periodic Condition Monitoring
0006	Preventive Maintenance
0007	Production Interference
0008	Radar Operator observation

The following event detection methods are returned by the query run in Step 6:

- Inspection
- Observation
- Preventive Maintenance
- Production Interference

If you want to map the event detection method Inspection to the standard event detection method ID 0001:

- Run the query `UPDATE [MI_DIM_EVENT_DETECTION] SET [MI_DIM_EVENT_DETECTION].[DetectionMethod] = 'Inspection' WHERE [MI_DIM_EVENT_DETECTION].[DetectionMethod] = '0001'.`
  The event detection method Inspection is mapped to the standard event detection method ID 0001.

Map the Non-Standard Event Breakdown Data to Standard Event Breakdown IDs Using Queries for Event Breakdown Dimension Family

This topic describes how to map the event breakdown data available in your database to the standard event breakdown data defined for a work history cube.

Procedure

1. In the **Applications** menu, navigate to the **TOOLS** section, and then select **Queries**.
   The **Query** page appears.
2. Select **Create New**.
   The **Select a Family or Query** window appears.
3. Search for the Event Breakdown Dimension family, and then select **Add**.
   The **Design** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears.
5. Run the query `SELECT [MI_DIM_EVENT_BREAKDOWN].[Breakdown] "Breakdown", [MI_DIM_EVENT_BREAKDOWN].[BreakdownCaption] "BreakdownCaption" FROM [MI_DIM_EVENT_BREAKDOWN].`
   The standard event breakdown data available in APM appears in the query results.
6. Run the query `SELECT distinct MI_EVWKHIST_BRKDN_IND_F from MI_EVWKHIST.`
   The event breakdown data available in your database appears in the query results.

7. Verify if the event breakdown data returned by the query in Step 6 matches the standard event breakdown IDs returned by the query in Step 5.
8. If the results do not match, perform the following steps to map the event breakdown data available in your database with the standard event breakdown ID available in APM:

   a) In the **SQL** workspace, enter the following update query:
   ```
   UPDATE [MI_DIM_EVENT_BREAKDOWN] SET [MI_DIM_EVENT_BREAKDOWN].
   [BreakdownCaption] = '<New Data>' WHERE [MI_DIM_EVENT_BREAKDOWN].
   [BreakdownCaption] = '<Standard Data Caption>'
   ```

   Note: In this query:

   - <New Data> denotes the event breakdown data that you want to map to the standard event breakdown ID available in APM.
   - <Standard Data Caption> denotes the captions corresponding to the standard event breakdown data available in APM.

   b) Replace <New Data> with a value that you want to map with the standard event breakdown data available in APM.
   c) Replace <Standard Data Caption> with the caption available for the corresponding event breakdown ID to which the new event breakdown data will be mapped.
   d) Run the query.
   The **Execute Query** window appears.
   e) Select **Yes**.
   The event breakdown data is mapped to the standard event breakdown ID defined for the work history cube.

Map an Event Breakdown Indicator to a Standard Event Breakdown ID

The following standard event breakdown data is returned by the query run in Step 5.

Breakdown	BreakdownCaption
N	N
Unknown	Unknown
Y	Y

The following event breakdown data is returned by the query run in Step 6:

- No
- Yes
- Unknown

If you want to map the event breakdown indicator Yes to the standard event breakdown ID Y:

- **Run the query** `UPDATE [MI_DIM_EVENT_BREAKDOWN] SET [MI_DIM_EVENT_BREAKDOWN].[BreakdownCaption] = 'Yes' WHERE [MI_DIM_EVENT_BREAKDOWN].[BreakdownCaption] = 'Y'.`
  The event breakdown indicator Yes is mapped to the standard event breakdown ID Y.

Map the Non-Standard Asset Criticality Data to Standard Asset Criticality IDs Using Queries for Asset Criticality Dimension Family

This topic describes how to map the asset criticality data available in your database to the standard asset criticality IDs defined for a work history cube.

Procedure

1. In the **Applications** menu, navigate to the **TOOLS** section, and then select **Queries**.
   The **Query** page appears.
2. Select **Create New**.
   The **Select a Family or Query** window appears.
3. Search for the Asset Criticality Dimension family, and then select **Add**.
   The **Design** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears.
5. Run the query `SELECT [MI_DIM_ASSET_CRITICALITY].[Criticality] "Criticality", [MI_DIM_ASSET_CRITICALITY].[CriticalityCaption] "CriticalityCaption" FROM [MI_DIM_ASSET_CRITICALITY]`.
   The standard asset criticality data available in APM appears in the query results.
6. Run the following queries:

   - For equipment criticality data, run the query `SELECT distinct MI_EQUIP000_CRITI_MTHD_IND_C from MI_EQUIP000`.
     The equipment criticality data available in your database appears in the query results.
   - For functional location criticality data, run the query `SELECT distinct MI_FNCLOC00_CRTCAL_IND_C from MI_FNCLOC00`.
     The functional location criticality data available in your database appears in the query results.

7. Verify if the asset criticality data returned by the query in Step 6 matches the standard asset criticality IDs returned by the query in Step 5.
8. If the results do not match, perform the following steps to map the asset criticality data available in your database with the standard asset criticality ID available in APM:

   a) In the **SQL** workspace, enter the following update query:
      `UPDATE [MI_DIM_ASSET_CRITICALITY] SET [MI_DIM_ASSET_CRITICALITY].[CriticalityCaption] = '<New Data>' WHERE [MI_DIM_ASSET_CRITICALITY].[CriticalityCaption] = '<Standard Data Caption>'`

      Note: In this query:

      - <New Data> denotes the asset criticality data that you want to map to the standard asset criticality ID available in APM.
      - <Standard Data Caption> denotes the captions corresponding to the standard asset criticality data available in APM.
   b) Replace <New Data> with a value that you want to map with the standard asset criticality data available in APM.
   c) Replace <Standard Data Caption> with the caption available for the corresponding asset criticality ID to which the new asset criticality data will be mapped.
   d) Run the query.
      The **Execute Query** window appears.
   e) Select **Yes**.

The asset criticality data is mapped to the standard asset criticality ID defined for the work history cube.

Map Asset Criticality Data to a Standard Asset Criticality ID

The following standard asset criticality data are returned by the query run in Step 5.

Criticality	CriticalityCaption
A	High
B	Medium
C	Low
Unknown	Unknown

The following asset criticality data are returned by the query run in Step 6:

- X
- Y
- Z
- H

If you want to map the asset criticality data X to the standard asset criticality ID A:

- Run the query `UPDATE [MI_DIM_ASSET_CRITICALITY] SET [MI_DIM_ASSET_CRITICALITY].[CriticalityCaption] = 'X' WHERE [MI_DIM_ASSET_CRITICALITY].[CriticalityCaption] = 'High'`.
  The asset criticality data X is mapped to the standard asset criticality ID A.

Localize the Event or Asset Criticality Values

By default, the Meridium Work History cube displays the event and asset criticality data in English. However, you can modify the event or asset criticality values to other languages supported by APM. The examples in this topic explain how to modify event and asset criticality values, and how you can verify, in APM, that those modifications have been implemented.

Before You Begin

- Log in to SQL Server Management Studio and connect to the database.

Example: Localize the Event Type Values

Procedure

1. In the **Tables**, select the table MI_DIM_EVENT_TYPE.
   The table values appear, displaying the event type ID and the event caption.
2. In the **EventTypeCaption** column, select the cell for the event type that you want to localize, and then manually modify the caption.
3. Save the modification, and then process the cube.

4. Log in to APM.
5. Access the **Metrics and Scorecards** page and create a new Metric View.
   The design page for the Metric View appears.
6. In the Metric Views design page, in the **Rows/X-Axis** subsection, select ＋.
   The **Add to Rows** window appears.
7. In the **Event Type**, select **Event Type-Breakdown**, and then select **Event Type**.
   The caption for the event breakdown values appears in the language to which you have modified.
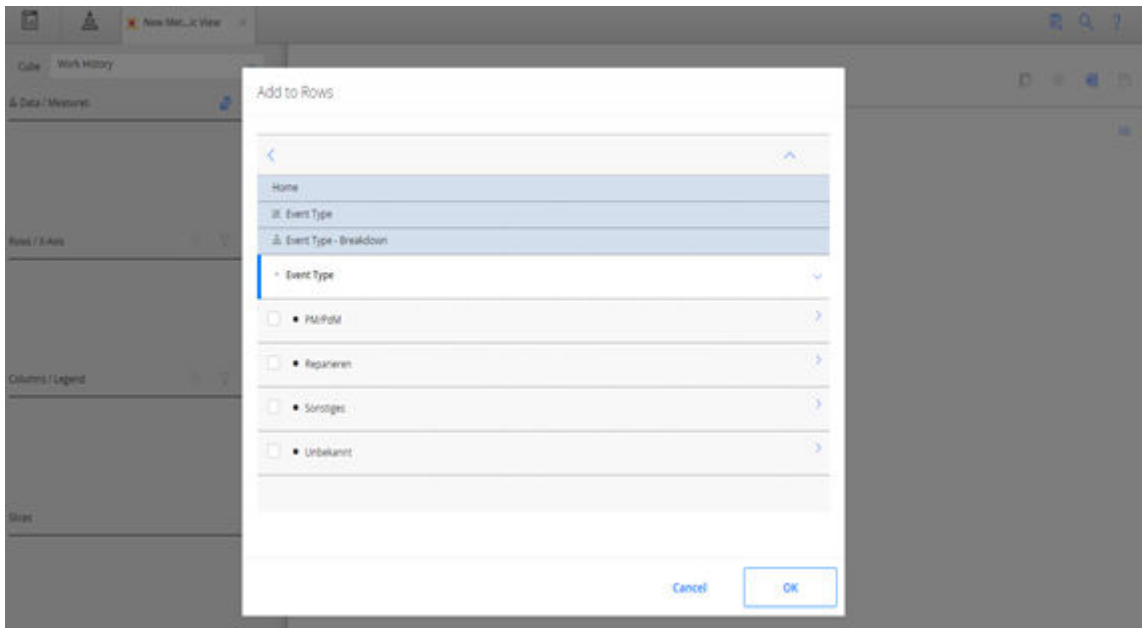
Example: Localize the Event Breakdown Values

Procedure

1. In the **Tables**, select the table MI_DIM_EVENT_BREAKDOWN.
   The table values appear, displaying the breakdown ID and the breakdown caption.
2. In the **BreakdownCaption** column, select the cell for the breakdown that you want to localize, and then manually modify the caption.
3. Save the modification, and then process the cube.
4. Log in to APM.
5. Access the **Metrics and Scorecards** page and create a new Metric View.
   The design page for the Metric View appears.
6. In the Metric Views design page, in the **Rows/X-Axis** subsection, select ＋.
   The **Add to Rows** window appears.
7. In the **Event Type**, select **Event Type-Breakdown**, and then select **Breakdown**.
   The caption for the event type values appears in the language to which you have modified.

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Example: Localize the Event Priority Values

Procedure

1. In the **Tables**, select the table MI_DIM_EVENT_PRIORITY.
   The table values appear, displaying the Priority ID and the Priority caption.
2. In the **PriorityCaption** column, select the cell for the priority caption that you want to localize, and then manually modify the caption.
3. Save the modification, and then process the cube.
4. Log in to APM.
5. Access the **Metrics and Scorecards** page and create a new Metric View.
   The design page for the Metric View appears.
6. In the Metric Views design page, in the **Rows/X-Axis** subsection, select ＋.
   The **Add to Rows** window appears.
7. In the **Event Priority**, select **Priority**, and then select **Priority**.
   The caption for the priorities appears in the language to which you have modified.
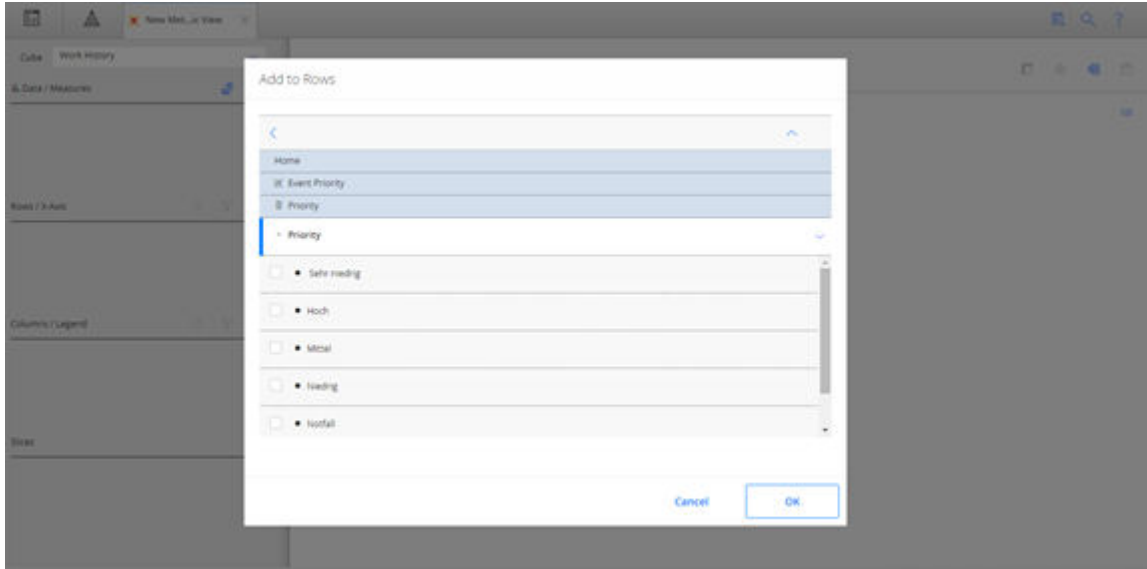
Example: Localize Event Detection Method Values

Procedure

1. In the **Tables**, select the table MI_DIM_EVENT_DETECTION_METHOD.
   The table values appear, displaying the event type ID and the event caption.
2. In the **DetectionMethodCaption** column, select the cell for the detection method that you want to localize, and then manually modify the caption.
3. Save the modification, and then process the cube.
4. Log in to APM.
5. Access the **Metrics and Scorecards** page and create a new Metric View.
   The design page for the Metric View appears.
6. In the Metric Views design page, in the **Rows/X-Axis** subsection, select ╋.
   The **Add to Rows** window appears.
7. In the **Event Detection**, select **Detection**, and then select **Detection Method**.
   The caption of the Detection Method values appear in the language to which it was modified.
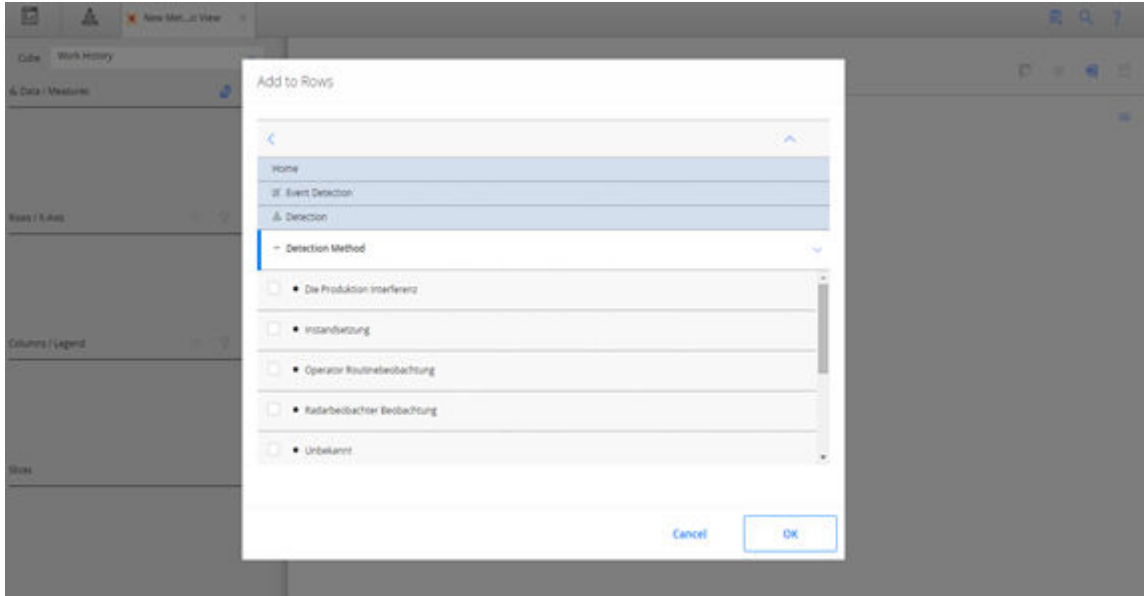
Example: Localize Equipment Criticality Values

Procedure

1. In the **Tables**, select the table MI_DIM_ASSET_CRITICALITY.
   The table values appear, displaying the Criticality ID and the Criticality caption.
2. In the **CriticalityCaption** column, select the cell for the caption that you want to localize, and then manually modify the caption.
3. Save the modification, and then process the cube.
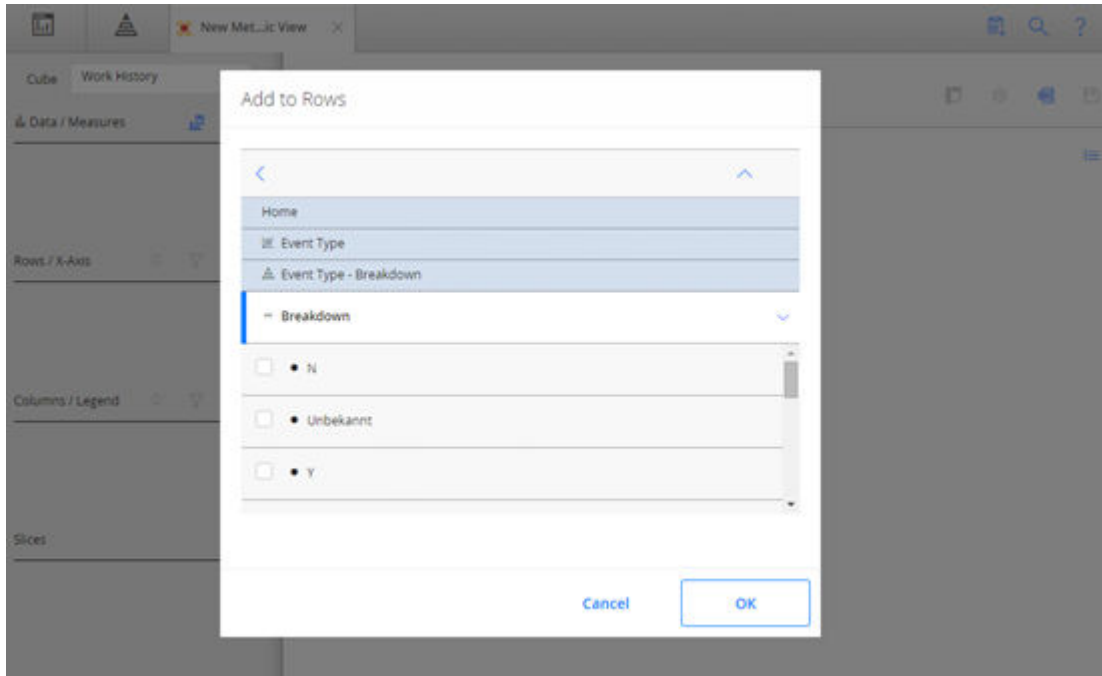4. Log in to APM.
5. Access the **Metrics and Scorecards** page and create a new Metric View.
   The design page for the Metric View appears.
6. In the Metric Views design page, in the **Rows/X-Axis** subsection, select ╂.
   The **Add to Rows** window appears.
7. In the **Equipment**, select **Criticality**, and then select **Criticality**.
   The caption of the criticality values appear in the language to which it was modified.
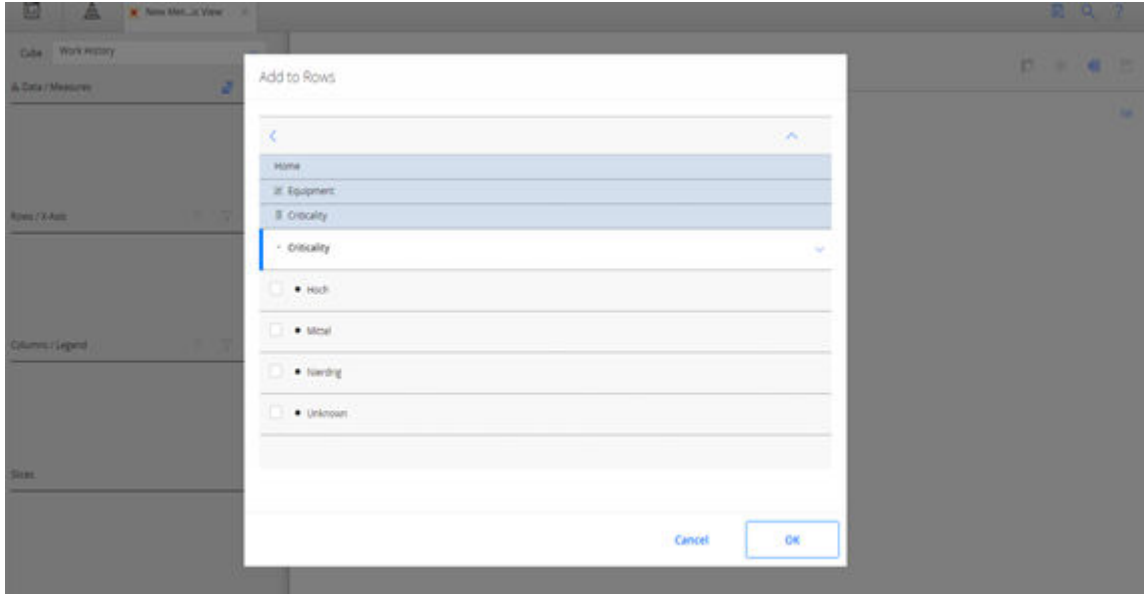
Example: Localize Functional Location Criticality Values

Procedure

1. In the **Tables**, select the table MI_DIM_ASSET_CRITICALITY.
   The table values appear, displaying the criticality ID and the criticality caption.
2. In the **CriticalityCaption** column, select the cell for the caption that you want to localize, and then manually modify the caption.
3. Save the modification, and then process the cube.
4. Log in to APM.
5. Access the **Metrics and Scorecards** page and create a new Metric View.
   The design page for the Metric View appears.
6. In the Metric Views design page, in the **Rows/X-Axis** subsection, select ┼.
   The **Add to Rows** window appears.
7. In the **Functional Location**, select **Criticality**, and then select **Criticality**.
   The caption of the functional location criticality values appear in the language to which it was modified.

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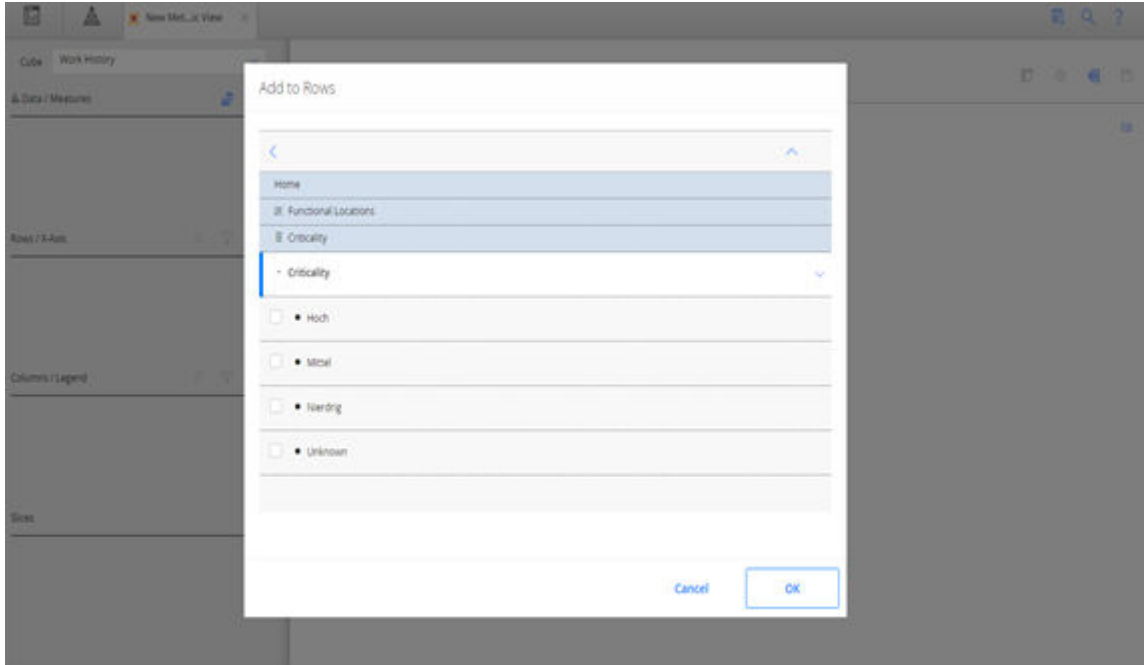
Policy Designer Upgrade

Upgrade or Update Policy Designer to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Note: If your APM database contains a large number of Policy Execution History records, the upgrade may take a long time or may time out. To avoid this issue, only the most recent 3,000,000 records are upgraded. You can choose to remove some or all the Policy Execution History records before the upgrade. For information, refer to Improve Upgrade Performance on page 5.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 143
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 144

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Configure the time limit for the Policy Execution Service.	This step is optional. You can perform this step if you want to modify the policy execution time limit for the Policy Execution Service. By default, the policy execution time limit is 15 minutes per policy instance.
2	Configure the time limit for the execution of the Math node.	This step is optional. You can perform this step if you want to modify the Math node execution time limit for the Policy Execution Service. By default, the Math node execution time limit is 5 minutes.
3	Configure the SubPolicy Node for Policy Execution on page 154	This step is optional.
4	Configure the alternative query for the **Policy Designer Overview** page.	This step is optional. You can perform this step if you are facing performance issues with the **Policy Designer Overview** page.
5	Configure the settings for the Policy Execution Service.	This step is optional. You can perform this step if you want to modify the default retries, concurrency, or duplicate trigger timeout settings.
6	On the APM Server, stop and restart the Meridium Policy Execution service.	This step is required. If your system architecture contains more than one APM Server, you must complete this step for every server that you want to use for policy execution. You can review the log files for this service at `C:\ProgramData\Meridium\Logs`.
7	Configure the settings for the Policy Trigger Service.	This step is optional. You can perform this step if you want to modify the default retries or concurrency settings.

Step	Task	Notes
8	On the APM Server, stop and restart the Meridium Policy Trigger service.	This step is required. If your system architecture contains more than one APM Server, you must start the Policy Trigger Service on at least one APM Server. You can review the log files for this service at `C:\ProgramData\Meridium\Logs`.
9	On the APM Server, reset IIS.	This step is required only if you have modified the time out value for the Math node execution or Policy Execution in the `appSettings.json` configuration file.
10	Review and upgrade the following items: • Baseline Policies • Relationship Nodes • Delete Entity Nodes • Nodes in Sub Policies • Policies and Queries referencing Content GUIDs • Query nodes • Policy Instances	This step is required. For more information, refer to About Upgrading Policy Designer and Family Policies on page 155.

About the Asset Health Services

When you deploy the Asset Health Manager, OT Connect, and Policy Designer modules together, the services used by each module interact with each other in various ways. This topic summarizes those services and describes a standard system architecture containing the components used by all three modules.

Services Summary

The following services are used by the Asset Health Manager, OT Connect, and Policy Designer modules:

- Asset Health Indicator Service: Automatically updates the following field values in a Health Indicator record when reading values related to the health indicator source record (for example, an OT Source Tag or Measurement Location record) change:

  - Alert Level
  - Last Reading Date
  - Last Char Reading Value (for records that accept character values)
  - Last Numeric Reading Value (for records that accept numeric values)

  This service also facilitates the automatic creation of Health Indicator records for configured sources.

- Policy Trigger Service: When an input to a policy (that is, an associated record in the APM database or reading value in the process historian) changes, when a policy schedule is

due, or a user submits an Execute Now request, a message is added to the policy trigger queue. The Policy Trigger Service monitors the trigger queue. When it receives a message, it determines which policy instances should be executed for the message, and then it sends corresponding messages to the policy execution queue. Even if your APM system is configured with multiple Policy Execution servers, only one policy execution queue is used.

- Policy Execution Service: The Policy Execution Service handles the execution of policies. Specifically, the Policy Execution Service monitors the policy execution queue and executes the policy instances that are added to it. If the APM system is configured with multiple Policy Execution servers, when each Policy Execution Service completes the execution of a policy instance, it will execute the next instance from the shared policy execution queue. In this way, the policy execution load is automatically balanced across all available Policy Execution Services.

- OT Connect Service: Monitors the subscribed tags (that is, tags that are used in policies and health indicators) and when data changes occur on these tags adds messages to the appropriate queues. This service also facilitates the automatic import and synchronization of tags from a configured OT Source. For more information, refer to the OT Connect section of the documentation.

Standard System Architecture Configuration

The following diagram illustrates the machines in the APM system architecture when the Policy Designer, OT Connect, and Asset Health Manager (AHM) modules are used together. This image depicts the standard configuration, where the OPC Server software and the OT Connect Adapter Service are on the same machine.

Note: In this example configuration, only one machine of each type is illustrated. Your specific architecture may include multiple APM Servers, multiple OPC Servers, or multiple APM Servers used for policy executions.

GE Digital APM Server
(Dedicated)

Contains:
- Policy Execution Service
- Policy Trigger Service
- Asset Health Indicator Service
- OT Connect Conductor Service

GE Digital APM Workstations

Database Server

Contains the GE Digital APM database

SQL Server Report Server

OPC Server

Contains the OPC Server software and the OT Connect Adapter Service

Process Historian
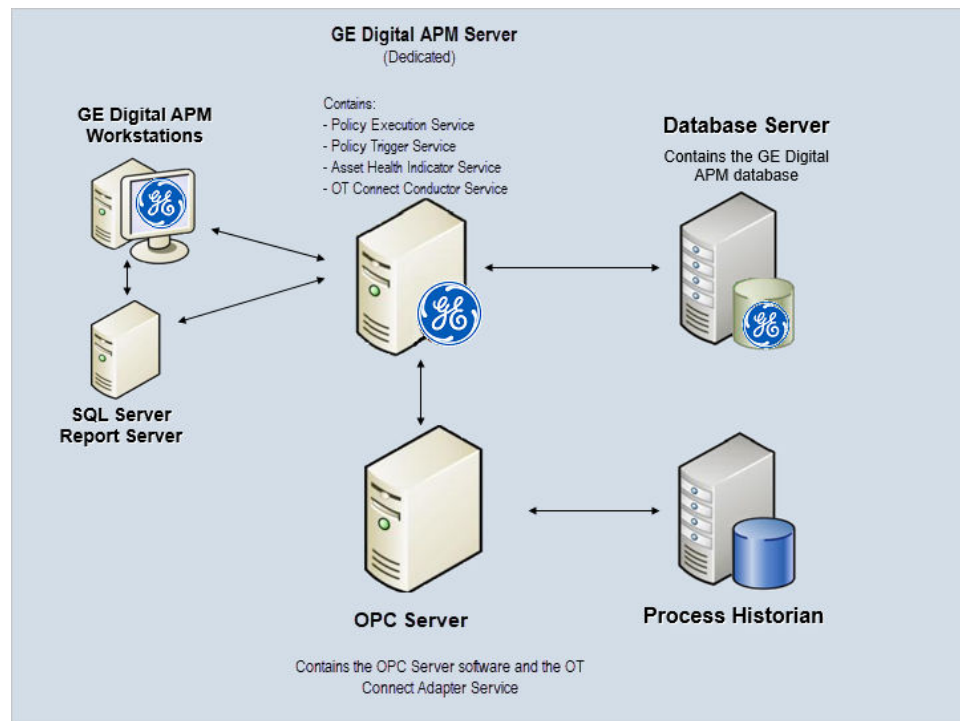
The following table summarizes the machines illustrated in this diagram and the software and services that you will install when you complete the first-

time deployment steps for Asset Health Manager, OT Connect, and Policy Designer.

Machine	Software Installed	Service Installed with APM Software
APM Server	APM Server software	Asset Health Indicator Service
		Policy Trigger Service
		Policy Execution Service
		OT Connect Conductor Service
OPC Server	GE Vernova OT Connect Adapter software	OT Connect Adapter Service
	OPC Server software	N/A
Process Historian	Process historian software	N/A

About Policy Execution

Policy designers can configure a policy to be executed on a schedule or automatically when records or reading values associated with the policy are updated. Policies may also be executed on demand. This topic describes the ways that the items configured in the first-time deployment workflow facilitate each type of policy execution.

Note: Only the active instances of active policies are executed.

Automatic Execution

When any record or reading value is updated by the APM Server, or when a reading value for a tag associated with one or more policies is updated on the process historian, a message is added to the policy trigger queue. The Policy Trigger Service monitors the trigger queue. When it receives a message, it determines which policy instances should be executed for the message, if any. Only active policy instances associated with the record or reading update will be executed. The Policy Trigger Service then sends corresponding messages to the policy execution queue for each relevant policy instance. Finally, a Policy Execution Service executes each policy instance that was added to the policy execution queue in turn.

Scheduled Execution

When a scheduled policy is due, a scheduled job adds a message to the policy trigger queue. The Policy Trigger Service monitors the trigger queue and sends messages to the policy execution queue for each active instance of the policy. Finally, a Policy Execution Service executes each active instance that was added to the policy execution queue in turn.

On Demand Execution

When you request a policy or policy instance execution from the Policy Designer user interface, or select a hyperlink configured to execute a policy or policy instance, a message is added to the policy trigger queue. The Policy Trigger Service monitors the trigger queue and sends messages to the policy execution queue for each active instance of the policy. Finally, a Policy Execution Service executes each active instance that was added to the policy execution queue in turn.

Configure Queue Settings for Policy Execution Service

About This Task

The Policy Execution Service processes messages from queues, which are managed by ActiveMQ. The Policy Execution Service provides the following queue configuration options:

- Retries
- Redelivery attempts and interval
- Concurrency limit

Increasing the concurrency limit allows the policy execution service to process more messages in parallel, resulting in higher throughput of policy executions, provided that the system has available resources. Reducing the concurrency limit reduces the policy execution throughput and the system resources used by policy execution. APM recommends that the concurrency limit be less than or equal to the number of logical processors on the APM Server used for policy executions.

Procedure

1. On the APM Server, access the folder that contains the Policy Execution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\policy-execution`.

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

```
"triggerMessageSettings": {
    "concurrencyLimit": 8,
        "retries": 5,
        "redeliveryAttempts": 3,
        "redeliveryMinInterval": 1,
        "redeliveryMaxInterval": 2440,
        "redeliveryDelta": 5
    },
    "executionMessageSettings": {
        "concurrencyLimit": 8,
        "retries": 5,
        "redeliveryAttempts": 3,
        "redeliveryMinInterval": 1,
```

```
                   "redeliveryMaxInterval": 2440,
                   "redeliveryDelta": 5
                 }
```

4. Update the key values as desired.
5. Save and close the file.
   The updated settings will be applied when the Meridium Policy Execution service is
   stopped and restarted.

Configure Queue Settings for Policy Trigger Service

About This Task

The Policy Trigger Service processes messages from queues, which are managed by
ActiveMQ. The Policy Execution Service provides the following queue configuration options:

- Retries
- Redelivery attempts and interval
- Concurrency limit
- Duplicate Measurement Location reading trigger elimination timeout

Procedure

1. On the APM Server, access the folder that contains the Policy Trigger Service files.

   Note: If you have installed APM in the default location, you can locate the folder in
   `C:\Program Files\Meridium\ApplicationServer\policy-trigger`.
2. Access the `appsettings.json` file in an application that can be used to modify JSON
   files (for example, Notepad++).
3. In the file, locate the following text:

```
"DuplicateTriggerTimeout": 5000,

"notificationMessageSettings": {
    "concurrencyLimit": 16,
    "retries": 10,
    "redeliveryAttempts": 3,
    "redeliveryMinInterval": 1,
    "redeliveryMaxInterval": 2440,
    "redeliveryDelta": 5
  }
```

4. Update the key values as desired.
5. Save and close the file.
   The updated settings will be applied when the Meridium Policy Trigger service is stopped
   and restarted.

Configure the Time Limit for Policy Execution

About This Task

The Policy Execution Service limits the amount of time allocated to execute each policy
instance. This ensures that the Policy Execution Service queue is not backlogged when a
poorly designed policy takes too long to execute. If a policy execution is canceled as a result
of the time limit, an error message appears in the policy execution history indicating that the
time limit was exceeded. By default, the policy execution time limit is set to 15 minutes per

policy instance. The minimum time limit is 1 minute, and the maximum time limit is 1 hour. This topic describes how to modify the Policy Execution Service configuration to change the time limit for policy execution.

Procedure

1. On the APM Server, access the folder that contains the Policy Execution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in the following directory:

   `C:\Program Files\Meridium\ApplicationServer\policy-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

   ```
   "PolicyExecutionTimeoutMs": 900000
   ```

4. Replace `900000` with the time limit value in milliseconds, that you want to apply to policy executions.

   Note: The value you enter should be between the minimum time limit of 60000 milliseconds (that is, 1 minute) and the maximum time limit of 3600000 milliseconds (that is, 1 hour).

5. Save and close the file.
   The modified settings are applied when the Policy Execution Service is restarted. If the execution time of a policy instance exceeds the time limit that you have specified, the execution is canceled, and an error message is added to the policy execution history.

6. On the APM Server, access the folder that contains the Meridium configuration files.

   Note: If you have installed APM in the default location, you can locate the folder in the following directory:

   `C:\Program Files\Meridium`

7. Go to `C:\Program Files\Meridium\ApplicationServer\api`.

8. Access the `appsettings` file in an application that can be used to modify JSON files (for example, Notepad++).

9. Repeat steps 3 through 5.
   The modified settings are applied when Meridium Policy Execution service is stopped and restarted on each policy execution server and IIS is reset on the APM Server.

Configure Execution Time Out Value for Math Node

About This Task

If the execution of a Math node in a policy takes a very long time, the execution times out after a pre-defined duration. By default, the execution times out after 1 minute. However, you can configure the interval after which the execution must time out for the Math node.

Procedure

1. On the Policy Execution Server, go to `C:\Program Files\Meridium \ApplicationServer\policy-execution`.

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

```
"MathNodeExecutionTimeout": 60000
```

4. Replace `60000` with the interval value in milliseconds at which the execution of the Math node must time out.
5. Save and close the file.
6. On the APM Server, go to `C:\Program Files\Meridium\ApplicationServer\api`.
7. Access the `appsettings` file in an application that can be used to modify JSON files (for example, Notepad++).
8. Repeat steps 3 through 5.
   The updated settings will be applied when the Policy Execution Service is stopped and restarted on the Policy Execution Server and IIS is reset on the APM Server.

Configure the Default Historical Readings Time Range for the OT Connect Tag node

About This Task

During policy execution, if a specific time range to retrieve the historical data for the OT Connect Tag node cannot be determined. For example, if there is no collection filter applied to the Historical Readings output from the node, by default, two years of data will be added. However, you can change the default time range by modifying the settings on the Policy Execution Server and APM Server.

Procedure

1. On the Policy Execution Server, go to `C:\Program Files\Meridium \ApplicationServer\policy-execution`.
2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example; Notepad++).
3. In the file, locate the following text:

```
"DefaultHdaTimeRangeYrs": 2
```

4. Replace `2` with the number of years for which you want to retrieve the historical data of the OT Connect Tag node.
5. On the APM Server, go to `C:\Program Files\Meridium\ApplicationServer\api`.
6. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).
7. Repeat steps 3 through 5.
   The updated settings will be applied when the Policy Execution Service is restarted on the Policy Execution Server and IIS is reset on the APM Server.

Configure Alternative Query for the Policy Designer Overview Page

About This Task

To optimize the performance of the **Policy Designer Overview** page in the systems with a large volume of policy execution history records, the Policies tab displays a simplified view which does not display the latest policy execution results. If you want to see the latest results in the Policies list, you can configure the **Policy Designer Overview** page to use the

alternative query (Policy Overview – Policies Alternate Query) that is provided in the APM Catalog.

Note: When you configure an alternative query for **Policy Designer Overview** page, you might face some performance issues.

Procedure

1. Access APM using the super user account.
2. Access the **Catalog** page.
3. In the **Catalog** section, select **Public** > **Meridium** > **Modules** > **Policy Manager** > **Queries**. The **Queries** workspace appears, displaying the catalog items of the Queries folder in a table.
4. Select the check box corresponding to the Policy Overview – Policies query.
5. In the same row, select ⚙.
   The **Catalog Item Properties** window appears, displaying the properties of the Policy Overview – Policies query.
6. In the **Name** box, modify the value to rename the query.
7. Select **Done**.
   The Policy Overview – Policies query is renamed.
8. Select the check box corresponding to the alternative query (Policy Overview – Policies Alternate Query).
9. In the same row, select ⚙.
   The **Catalog Item Properties** window appears, displaying the properties of the alternative query.
10. In the **Name** box, delete the existing value, and then enter `Policy Overview – Policies`.
11. Select **Done**.
    The alternative query is configured for the **Policy Designer Overview** page.

Configure Multiple APM Servers for Policy Execution

Depending on the number of policies that you need to manage in your system, you may have multiple APM Servers to process policy executions. Based on your company preference for server load balancing, you can configure these servers using global load balancing or isolated load balancing.

Regardless of the approach you use, you must fully configure each APM Server according to the steps for deploying the basic APM system architecture. In addition, each APM Server must be configured to use the same instance of Redis and ActiveMQ.

Global Load Balancing

In global load balancing, you configure all APM Servers to process policy executions in a single load-balanced cluster. In this scenario, an increase in policy execution demand can be absorbed across all servers in your system architecture.

In this scenario, you must:

- Configure and start the Policy Trigger Service on at least one APM Server.
- Configure and start the Policy Execution Service on all APM Servers.
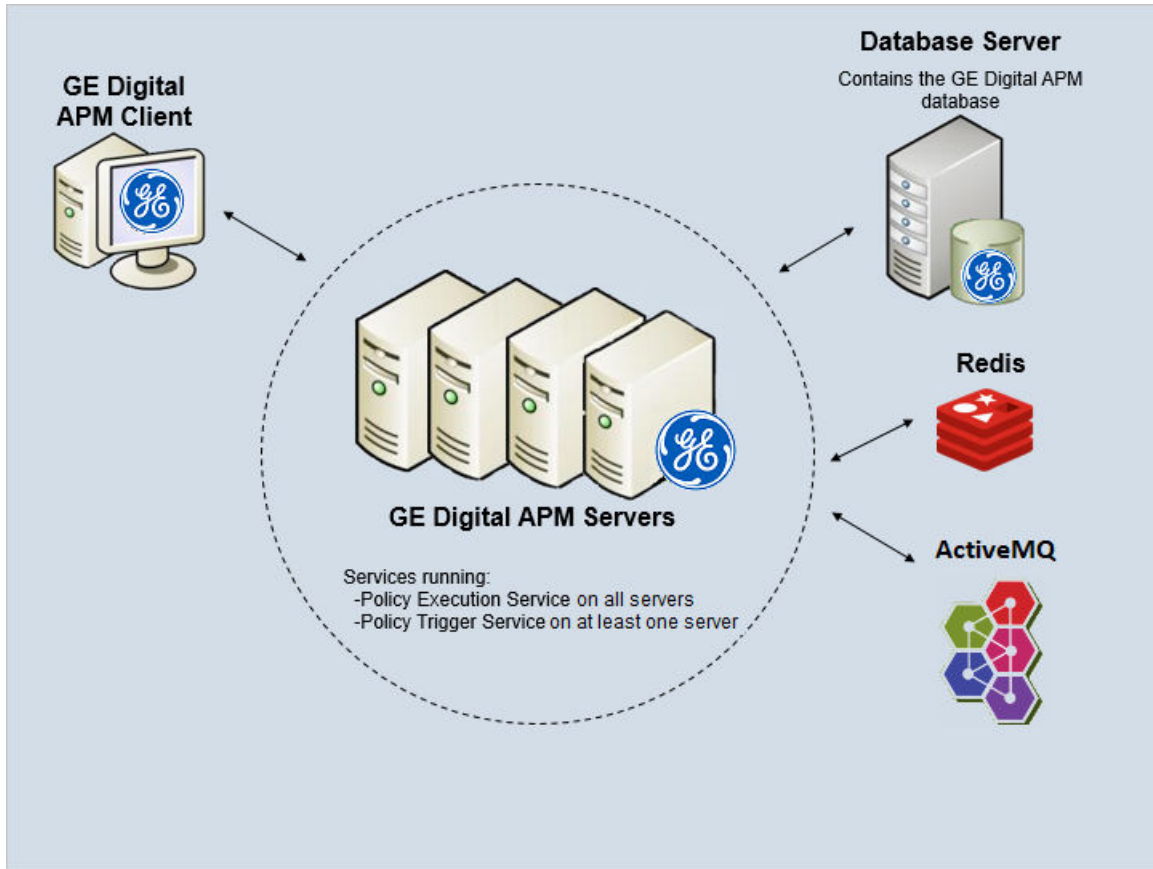
Isolated Load Balancing

In isolated load balancing, you configure designated APM Server(s) to process policy executions. In this scenario, the policy execution processes are isolated from other APM Server processes, therefore preventing an increase in policy execution activity from negatively impacting other processes.

In this scenario, you must:

- Configure and start the Policy Trigger service on at least one APM Server.
- Configure and start the Policy Execution Service on only the APM Servers that you want to use to process policy executions.

Configure the SubPolicy Node for Policy Execution

About This Task

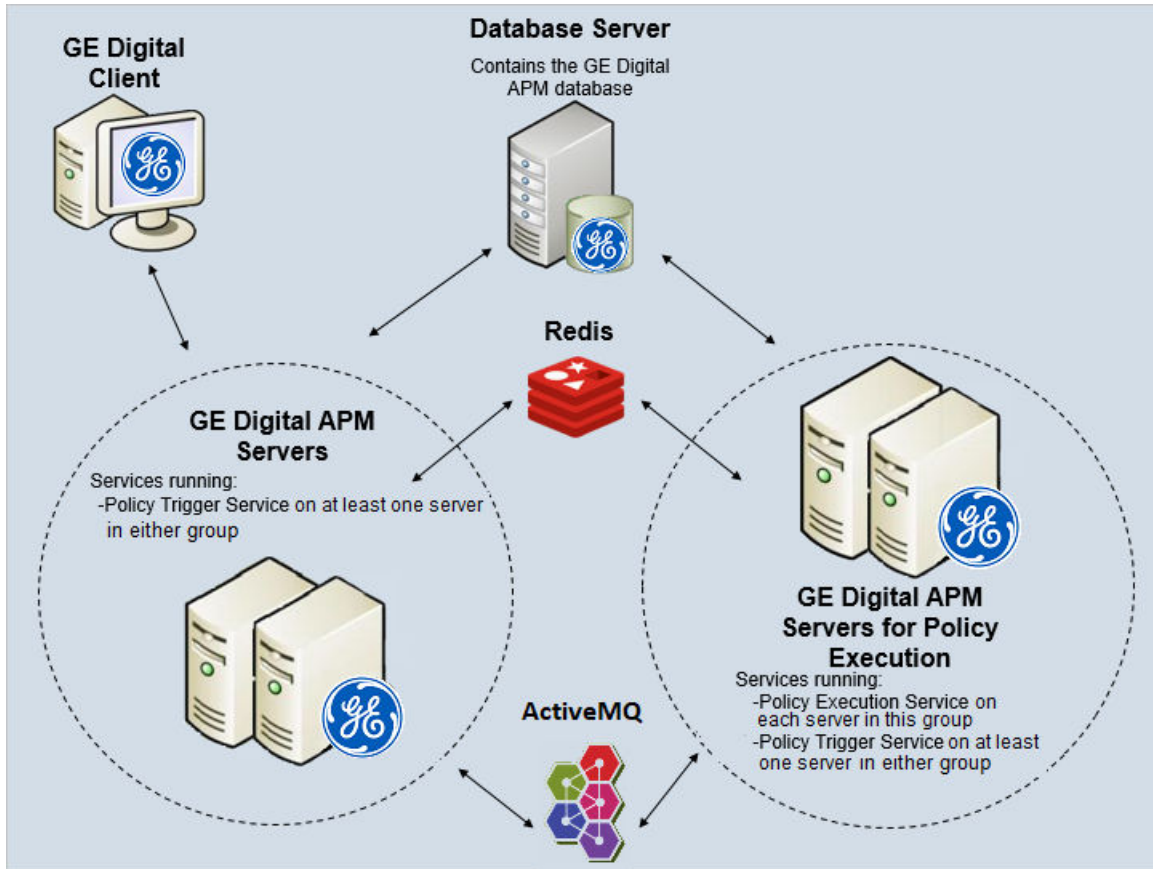If the policies contain recursive sub policies in them, the policy does not execute. If the sub policy nesting is more than 10 levels, the policy does not get executed. This topic describes how to modify the Policy Execution Service configuration to change the recursion limit for policy execution.

.

Procedure

1. On the APM Server, access the folder that contains the Policy Execution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in the following directory:

   `C:\Program Files\Meridium\ApplicationServer\policy-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

   ```
   "MaxSubPolicyDepth": 10
   ```

4. Replace `10` with the MaxSubPolicyDepth that you want to apply to policy executions.

5. Save and close the file.
   The modified settings are applied when the Policy Execution Service is restarted. If the execution of a sub policy instance exceeds 10, the execution is canceled, and an error message is added to the execution log and execution history.
6. On the APM Server, access the folder that contains the Meridium configuration files.

   Note: If you have installed APM in the default location, you can locate the folder in the following directory:

   `C:\Program Files\Meridium`
7. Go to `C:\Program Files\Meridium\ApplicationServer\api`.
8. Access the `appsettings` file in an application that can be used to modify JSON files (for example, Notepad++).
9. Repeat steps 3 through 5.
   The modified settings are applied when Meridium Policy Execution service is stopped and restarted on each policy execution server and IIS is reset on the APM Server.

Configure Policy Reference Clean Up Batch Size

About This Task

When policies and policy instances are inserted, modified or deleted, this may result in changes to very large numbers of related records. In order to optimize the performance for the end user, the related record clean-up is completed in batches by a background task. You can configure the batch size and the frequency for this task. The batch size must be less than 1000 in order to avoid database table locks.

Procedure

1. On the APM Server, access the folder that contains the Policy Execution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\policy-execution`.
2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).
3. In the file, locate the following text:

   ```
   "PolicyRefCleanupBatchSize": 500,
   "PolicyRefCleanUpFreqSeconds": 15,
   ```

4. Update the key values as desired.
5. Save and close the file.
   The updated settings will be applied when the Meridium Policy Execution service is stopped and restarted.

About Upgrading Policy Designer and Family Policies

This topic provides some of the significant changes in Policy Designer and Family Policies modules in the current version, along with the impact and action items for each change.

Most of the existing policies, policy instances, policy execution history, family policies, and queries are upgraded automatically. However, due to the complexity of the changes introduced in the current version, some of the records are not upgraded automatically. In that

case, errors or warnings appear, and policies and policy instances are deactivated. You must follow the instructions in this document to complete the upgrade.

- **Deprecation of the MI_ENTITIES table**: The number of references to the MI_ENTITIES table in the product cause the table and the number of joins to that table grow very large. To enhance scalability, this dependency has been removed. As a result of this change, Delete Entity, Create Relationship, and Delete Relationship nodes require an additional Family ID or Family Key input.

  The upgrade process attempts to automatically upgrade policies and family policies that use these nodes to add the required Family IDs. However, due to the complexity of the changes introduced in the current version, some of these records are not upgraded automatically (for example, policies or family policies that use queries referencing the MI_ENTITIES system table, queries that contain Union statements). In that case, errors or warnings appear, and policies and policy instances are deactivated. If that happens, you must review the upgrade logs, identify the family IDs, and then upgrade the following items:

  - Baseline policies
  - Create Relationship and Delete Relationship nodes
  - Delete Entity nodes
  - Nodes used in SubPolicies
  - Query nodes
  - Policy instances
  - Policy Execution History records

- **Deprecation of the CONTENT_GUID field**: The Content GUID output has been removed from all applicable policy nodes. In the Policy Instance and Policy Event families, the Content GUID foreign key fields have been replaced with the entity key foreign key fields. Therefore, before you upgrade, you must identify the Policies, Family Policies, and queries that reference Content GUID. After the upgrade, you must verify that they work as expected.

  In addition, the Policy has Policy Instance relationship family has been created to relate the Policy and Policy Instance entity families. Similarly, the Policy Instance has Policy Event relationship family has been created to relate the Policy Instance and the Policy Event entity families.

- **JSON data changes**: The JSON data stored in the Instance Mappings field in Policy Instance records includes the family ID in addition to the entity key of the mapped records.

- **Hyperlinks changes**: Some of the hyperlinks in the execution history include the family ID in addition to the entity key of the linked records.

- **Scheduler changes**: The new Scheduler upgrade utility creates scheduled jobs for active scheduled policies. You may be required to recreate schedules for policies that were deactivated during the upgrade.

Note: For a complete list of changes in the Policy Designer and Family Policies modules, refer to the Family Policies and Policy Designer sections of the APM V5.0.0.0.0 Release Notes.

Limitations:

If you import Policies or Family Policies from a previous version, and if they use a Create Relationship, Delete Relationship, or Delete Entity node, you may have to modify the policy model. For instructions, refer to Upgrade Relationship Nodes and Upgrade Delete Entity Nodes on page 159.

Similarly, if the Policies or Family Policies that you import use query nodes, you may have to modify the policy model. For instructions, refer to Upgrade Query Nodes on page 161.

Note: If you run the post-upgrade utility multiple times, the Upgrade Log will contain multiple conflicting log entries for each policy node. In most cases, this indicates that a policy node was successfully upgraded during the first run of the utility, and no changes were made in subsequent runs.

Access Upgrade Logs

About This Task

Most of the existing policies, policy instances, policy execution history, family policies, and queries are upgraded automatically. The new Scheduler upgrade utility creates scheduled jobs for these active scheduled policies.

However, due to the complexity of the changes introduced in the current version, some of these records are not upgraded automatically (for example, policies or family policies that use queries referencing the MI_ENTITIES system table, queries that contain union statements). In that case, errors or warnings appear, and policies and policy instances are deactivated. If that happens, you must review the upgrade logs to identify the required changes and then manually modify the policy models and queries.

These upgrade logs appear in a new field, Upgrade Log, in the Policy and Family Policy records. This field contains information on the upgrade steps that you have performed, including any errors or warnings.

Note: If you run the post-upgrade utility multiple times, the Upgrade Log will contain multiple conflicting log entries for each policy node. In most cases, this indicates that a policy node was successfully upgraded during the first run of the utility, and no changes were made in subsequent runs.

This topic describes how to access these upgrade logs.

Procedure

1. Access the Policy or the Family Policy for which you want to review the logs.
2. Select **Upgrade Logs**.
   The **Upgrade Logs** workspace appears, displaying the upgrade steps, errors, and warnings, as applicable.

Next Steps

1. Resolve any errors in the upgrade logs by modifying the policy model.
2. As needed, update queries referenced by the policy.
3. Reactivate each Policy.

About Identifying Family IDs

During the upgrade, one of the following methods is used to identify the family IDs used in a Create Relationship, Delete Relationship, or a Delete Entity node:

- If an entity key input to the node is sourced from an input node (for example, an entity node or a Health Indicator node), the family ID is normally identified, and the upgrade will happen automatically, except in the following cases:

   ○ The entity key input is sourced from an entity node where the family is not configured.
   ○ The entity key input is sourced from a Point Value node, where the entity key is defined in a policy instance.

- ◦ The family referenced by the node does not exist.
- ◦ The family referenced by the node is not licensed in the APM database.
- If an entity key input to the node is sourced from a query node, the upgrade process attempts to identify the family ID based on the query definition. This process considers entity key fields (that is, <family ID>.ENTY_KEY) as well as other system fields that contain entity keys of related records, including predecessor and successor key fields for relationships, created or updated by user key fields, site key fields, and so on. This process attempts to ascertain the relevant family ID even if the entity key field is defined in a sub query. However, it is not possible to determine the family ID if the query contains a union (among other reasons).

For Create Relationship and Delete Relationship nodes, if the predecessor family ID cannot be determined, the upgrade process will not attempt to determine the successor family ID. If it is not possible to identify the family IDs to use in a Create Relationship, Delete Relationship, or Delete Entity node, a warning message appears in the Upgrade Log field, and the policy is deactivated. Family policies cannot be deactivated, therefore, only the warning message appears in the Upgrade Log field. You must then review these error messages and manually modify the policy models and queries. For instructions on accessing the upgrade log, refer to Access Upgrade Logs on page 157.

To upgrade Create Relationship, Delete Relationship, and Delete Entity nodes where an entity key input is sourced from a Point Value node input in a sub policy, refer to Upgrade Nodes in SubPolicies.

Note: If the entity key input is sourced from a Point Value node where the entity key is defined in the policy instance, the Upgrade Logs field may contain a warning message indicating that the Point Value node is not mapped to any calling policy. The most common use case for this policy instance configuration is to test a sub policy independently from the calling policy. If the family ID can be determined from the calling policy, the sub policy can be successfully upgraded.

Upgrade Baseline Policies

About This Task

If you modified a baseline Policy or Family Policy, after the upgrade, the changes to the Policy or Family Policy are retained. This topic describes how to ensure that the Policy or Family Policy works as expected after the upgrade.

Procedure

1. Review the upgrade logs to check if the upgrade has failed for the modified baseline Policy or Family Policy.
2. If there is a warning message in the upgrade log, correct the policy model, and reactivate the Policy.

   Note: A Family Policy is not deactivated if upgrade fails; therefore, you need not reactivate it.
3. If you cannot correct the policy model, revert the Policy or Family Policy to baseline, and then reapply your changes from the previous version.
   The baseline Policy or Family Policy is upgraded.

Upgrade Create Relationship and Delete Relationship Nodes

About This Task

For each Create Relationship and Delete Relationship node, the upgrade process attempts to identify the IDs of the predecessor and successor entity families. If, however, the upgrade process fails to identify the predecessor or successor entity families, a warning message is logged, and the Policies are deactivated. This topic describes how to upgrade the nodes in such scenarios.

Note: Family Policies are not deactivated; only a warning message is logged in the upgrade logs in case of a failure.

Procedure

1. Review the upgrade logs to identify the nodes for which the upgrade has failed.
2. For each node, modify the policy model to provide any of the following details as applicable.

   - If all the records belong to the same family, provide the family ID.
   - If all the records do not belong to the same family, provide the family keys of all the associated families.

3. If applicable, modify the underlying queries in each node.
4. Reactivate the Policy (not required for a Family Policy).
   The Create Relationship and Delete Relationship nodes are upgraded.

Upgrade Delete Entity Nodes

About This Task

For each Delete Entity node, the upgrade process attempts to identify the ID of the family whose records must be deleted. If, however, the upgrade process fails to identify the ID of the family, and the Policies are deactivated. This topic describes how to upgrade the nodes in such scenarios.

Note: Family Policies are not deactivated; only a warning message is logged in the upgrade logs in case of a failure.

Procedure

1. Review the upgrade logs to identify the nodes for which the upgrade has failed.
2. For each node, modify the policy model to provide any of the following details as applicable.

   - If all the records belong to the same family, provide the family ID.
   - If all the records do not belong to the same family, provide the family keys of all the associated families.
   - If the families are included in the Asset Hierarchy, provide all Asset Families.

3. If applicable, modify the underlying queries used in each node.
4. Reactivate the Policy (not required for a Family Policy).
   The Delete Entity nodes are upgraded.

Upgrade Create Relationship, Delete Relationship, and Delete Entity Nodes in Sub Policies

About This Task

If a Create Relationship, Delete Relationship, or a Delete Entity node is used in a Sub Policy, and if entity keys are passed to this node via Point Value nodes representing inputs to the Sub Policy node, the upgrade process attempts to identify the ID of the relevant families from the related query or entity nodes in the calling Policy. This process supports multiple levels of Sub Policies as well.

If, however, the Sub Policy is used by more than one calling Policy, the Create Relationship, Delete Relationship, and Delete Entity nodes in the Sub Policy are upgraded automatically only if all the calling Policies specify entity keys of the same family. If the calling Policies specify entity keys from multiple families, the related node in the Sub Policy is not upgraded; an error message appears in the upgrade log of each calling Policies and Sub Policies, and they are deactivated.

Note: Family Policies are not deactivated; only an error message is logged in the upgrade logs in case of a failure.

Important: The upgrade fails if there is a circular reference between the calling Policies and Sub Policies. In this case, remove the circular reference before the upgrade process is restarted.

This topic describes how to upgrade the nodes in such scenarios.

Procedure

1. Review the upgrade logs to identify the nodes for which the upgrade has failed.
2. If there is a circular reference between the calling Policies and Sub Policies, modify the policy model (and queries as applicable).
3. If the calling Policies specify entity keys from multiple families, modify the policy model to specify the entity keys of the families.
4. Reactivate the Policy (not required for a Family Policy).
   The Create Relationship, Delete Relationship, and Delete Entity nodes in the Sub Policy are upgraded.

Upgrade Policies and Queries Referencing Content GUID Fields

About This Task

The Content GUID system field is no longer supported. As a result, the Policy Designer data model has been modified as follows:

- The Content GUID foreign key fields in the Policy Instance and Policy Event families have been replaced with the entity key foreign key fields.
- The Policy has Policy Instance relationship family has been created to relate the Policy and Policy Instance entity families. Similarly, the Policy Instance has Policy Event relationship family has been created to relate the Policy Instance and the Policy Event entity families.

During the upgrade, the fields that have been removed are replaced as specified in the following table.

Fields in Previous Versions	Fields in Current Version
[MI_PCYEVENT].[MI_PCYEVENT_POLICY_INST_GUID]	[MI_PCYEVENT].[MI_PCYEVENT_POLICY_INST_KEY]
[MI_POLICY_INST].[MI_POLICY_INST_POLICY_GUID]	[MI_POLICY_INST].[MI_POLICY_INST_POLICY_KEY]
[MI_POLICY_INST].CONTENT_GUID	[MI_POLICY_INST].ENTY_KEY
[MI_POLICY].CONTENT_GUID	[MI_POLICY].ENTY_KEY

If a Create Entity or Edit Entity node is configured to modify one of the fields in the aforementioned table, the node is modified to reference the new field.

Similarly, if the Content GUID output from a predecessor node is used in a policy node, it is replaced with the entity key output of the predecessor node. This will resolve the scenarios where the Content GUID output from an Entity or Current Entity node referencing the Policy or Policy Instance family was used to update a related Policy Instance or Policy Event record, respectively.

Procedure

1. Before the upgrade, identify the Policies and Family Policies that reference Content GUID, along with queries that reference the fields used in previous versions (as listed in the preceding table).
2. After the upgrade, verify that all the Policies, Family Policies, and queries work as expected. If not, modify the policy models and queries as needed.

Upgrade Query Nodes

About This Task

If query nodes in Policies and Family Policies use Catalog queries that are no longer valid (for example, queries referencing the MI_ENTITIES system table), during the upgrade, an error message appears in the upgrade log.

In addition, if a query column is referenced from a sub query, the column alias may contain extra quotation marks. During the upgrade, these extra quotation marks are removed from the column alias.

Procedure

1. Review the upgrade logs to identify the queries for which the upgrade has failed.
2. For each query, modify the query, and if required, the policy model.
3. Reactivate the Policy (not required for a Family Policy).
   The query nodes are upgraded.

Upgrade Policy Instances

About This Task

The Mappings fields of a Policy Instance defines the APM records and other input values that must be evaluated when the Policy Instance is executed. During the upgrade, family IDs for input nodes that represent APM entity records are specified in the Mappings field.

For example, suppose a Policy contains the following input nodes:

- n1: An entity node that references the Equipment family

- n2: A Measurement Location node
- n4: A Predix Time Series node
- n5: A Health Indicator node
- n6: A Point Value node, which can reference a different family in each Policy Instance
- n7: A User node

The following image shows the configuration of these nodes:

The following table describes the Mappings field before and after the upgrade.

Before the Upgrade	After the Upgrade

```
[
  {
    "nodeId": null,
    "entityKey": null,
    "familyId": null,
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n1",
    "entityKey": "64262245942",
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n2",
    "entityKey": "64251802979",
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n4",
    "entityKey": null,
    "fieldId": null,
    "constant": "TS-ASSET-
TYPE1.TS-TAG14"
  },
  {
    "nodeId": "n5",
    "entityKey": "64251807817",
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n6",
    "entityKey": "64251874565",
    "fieldId":
"MI_FNCLOC00_FNC_LOC_DESC_C",
    "constant": null
  },
  {
    "nodeId": "n7",
    "entityKey": "64251959752",
    "fieldId": null,
    "constant": null
  }
]
```

```
[
  {
    "nodeId": null,
    "entityKey": null,
    "familyId": null,
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n1",
    "entityKey": "64262245942",
    "familyId": "MI_EQUIP000",
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n2",
    "entityKey": "64251802979",
    "familyId": "MI_MEAS_LOC",
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n4",
    "entityKey": null,
    "familyId": null,
    "fieldId": null,
    "constant": "TS-ASSET-
TYPE1.TS-TAG14"
  },
  {
    "nodeId": "n5",
    "entityKey": "64251807817",
    "familyId": "MI_HLTH_IND",
    "fieldId": null,
    "constant": null
  },
  {
    "nodeId": "n6",
    "entityKey": "64251874565",
    "familyId": "MI_FNCLOC00",
    "fieldId":
"MI_FNCLOC00_FNC_LOC_DESC_C",
    "constant": null
  },
  {
    "nodeId": "n7",
    "entityKey": "64251959752",
    "familyId": "MI Security
User",
    "fieldId": null,
    "constant": null
  }
]
```

If, however, the upgrade process fails to identify the family ID of an input node in the policy model, or the family ID of the record specified in a point value input in the Policy Instance, a

warning message appears in the upgrade log, and the Policy Instance is deactivated. This can happen if the family does not exist or it is not licensed.

Note: If the APM system contains Policies, Family Policies, or custom Data Loaders that update the value of the Mappings field in Policy Instance records, you must modify them to add the family ID. For assistance, please contact GE Vernova Support.

This topic describes how to upgrade Policy Instances if the upgrade fails.

Procedure

1. Review the upgrade logs to identify the Policy Instances for which the upgrade has failed.
2. For each Policy Instance, modify the policy model or instance to provide the correct family ID.
3. Reactivate the Policy Instance.
   The Policy Instances are upgraded.

About the Policy Execution History Upgrade

About This Task

During the upgrade, the hyperlinks in the policy execution history are now updated to use the family ID of records as applicable. In some cases, the upgrade process fails to identify the family ID. This can happen if the record was deleted or the family is not licensed. This may result in broken links in the policy execution history summary or node-level execution history details.

Note: You cannot correct the broken links.

Note: If your APM database contains a large number of Policy Execution History records, the upgrade may take a long time or may time out. To avoid this issue, only the most recent 3,000,000 records are upgraded. You can choose to remove some or all the Policy Execution History records before the upgrade. For information, refer to Improve Upgrade Performance on page 5.

Production Loss Analysis Upgrade

Upgrade or Update PLA to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 165
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 165

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Reliability Analytics Upgrade

Upgrade or Update Reliability Analytics to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 165
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 165

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Ensure that the Meridium Simulation Service is installed and running.	If the basic APM system architecture is already installed, the Meridium Simulation Service is automatically installed and run.
2	Revert the following query to baseline to view the Recommendation chart on the **RA Overview** page: • `Public\Meridium\Modules\Reliability Manager\Queries` folder: ◦ Dashboard - Recommendation Summary	This step is required only if you have previously modified the query. Otherwise, this step will be completed automatically when you upgrade the components in the basic APM system architecture.

To revert queries to baseline:

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert: `Public/Meridium/Modules/<module name>/Queries`
3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**. The selected query is deleted.
5. Navigate to the module-specific Baseline folder for queries: `Baseline/Meridium/Modules/<module name>/Queries`
6. Select the check box next to the query that you want to revert, and then select 🗐.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A message appears, indicating that the selected item has been copied successfully.
9. Repeat steps 2-8 for each query that you want to revert to baseline.

Reliability Centered Maintenance Upgrade

Upgrade or Update RCM to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 167
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 167

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Reports Upgrade

Upgrade or Update Reports to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 167
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 167

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Risk Based Inspection 580 Upgrade

Upgrade or Update RBI 580 to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 168
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 168

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

After you upgrade:

- All RBI Assets with Active Analyses will have a related Inspection Plan record created.
- All RBI recommendations for an RBI Asset will be related to Inspection Plan record of the RBI Asset.
- The state caption for RBI Recommendation family with State ID MI_ACCEPTED will be updated to "Approved".
- The Recommendation Methodology field on RBI Recommendation will be updated to RBI 580 where previously the field had the value of "Criticality Calculator".
- All security users who belong to the 'MI RBI Analyst' security group will belong to the MI Inspection Plan Approver security role.
- The MI Inspection Plan Approver security role will have the MI ASM Analyst security group assigned.
- Piping Stress updated

  - In some of the Piping Stress records for B31.3, WPB was misspelled as WFB. These records are now updated based on ASME standards.
  - In some of the Piping Stress records for B31.3 and B31.1 for the year 2014, where the Material Specification field contained the value B366 and B622, the Material Grade had the value NS instead of N/A. These records are now updated based on ASME standards.
- RBI 580 Representative Fluid contents have been updated for the following fluids to match the API 581, 3rd Edition, Addendum 1 specification:

  - C13-16 (Diesel)
  - C17-25 (Gas Oil)
  - C25+ (Resid)
  - C5
  - Chlorine
  - CO

- EO
- H2
- H2O (Water)
- H2S
- HCl
- HF
- MEOH (Methanol)
- NH3
- Phosgene
- Steam

For information on the updated RBI 580 Representative Fluid Contents, refer to the topic.

- The Data Mapping Group record that satisfies the following conditions, along with its child records, will be reverted to baseline:

  - The value in the Source Family field is Criticality RBI Component - Exchanger Bundle.
  - The value in the Target Family field is RBI Criticality Analysis.

- In some of the PV Stress records that contain the value SA/AS 1548, SB-187, SB-308, or SB-211 in the Material Specification field, values in the Minimum Yield Strength field are updated based on ASME 2010 standards.

Step	Task	Notes

1	Update entity key parameters for the following catalog queries:
	
	• `Public\Meridium\Modules\Risk Based Inspection\Queries` folder.
	
	  ◦ Criticality Consequence Evaluation
	  ◦ Invalid Inspections for Non-Intrusive Requirement Met
	  ◦ Maximum Internal Corrosion Rate
	  ◦ PRD Consequence Evaluation
	  ◦ RBI Asset Risk Query
	  ◦ RBI Asset Risk Sub Query
	  ◦ RBI Components for an Asset
	  ◦ RBI Corrosion Loops for a Functional Location
	  ◦ RBI DM Query
	  ◦ RBI Pipeline Consequence Evaluation
	  ◦ Review Analyses by Asset 580
	  ◦ Review Analyses by Asset 581
	  ◦ Review Analyses by Corrosion Loop 580
	  ◦ Review Analyses by Corrosion Loop 581
	  ◦ Select Protected Assets
	  ◦ Select RBI Components
	  ◦ Unlinked Corrosion Loops
	  ◦ View Protected RBI Components
	
	• `Public\Meridium\Modules\Risk Based Inspection\Queries\Mapping Queries` folder.
	
	  ◦ Env Cracking Mapping
	  ◦ External Corrosion Mapping
	  ◦ Flammable Consequence Mapping
	  ◦ Internal Corrosion Mapping
	  ◦ RBI-CNAFC Query MI_CCRBICEB
	  ◦ RBI-CNAFC Query MI_CCRBICOM
	  ◦ RBI-CNAFC Query MI_CCRBICPI
	  ◦ RBI-CNAFC Query MI_CCRBICTB
	  ◦ RBI-CNAFC Query MI_CRTHPARDME by Pipeline
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

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Step	Task	Notes

2	Revert the following queries to baseline to remove the references to the MI_ENTITIES family that has been deprecated:
	
	• `Public\Meridium`
	`\Modules\Mechanical`
	`Integrity\Queries`
	`\Dashboard Queries`
	folder.
	
	  ◦ RBI Risk Matrix Query
	  ◦ RiskMatrix
	
	• `Public\Meridium`
	`\Modules\Risk Based`
	`Inspection\Queries`
	folder.
	
	  ◦ Analyses Created For Evergreening – 580
	  ◦ Invalid Inspections for Non-Intrusive Requirement Met
	  ◦ RBI Components for an Asset
	  ◦ RBI Component for Unit
	  ◦ Review Analysis by Asset 580
	  ◦ Review Analysis by Corrosion Loop 580
	  ◦ Select RBI Components
	  ◦ Valid Inspections for Non-Intrusive Requirement Met
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

3	Add FMLY_KEY column to the following catalog queries:
	
	• `Public\Meridium`
	`\Modules\Risk Based`
	`Inspection\Queries`
	folder.
	
	  ◦ Review Analyses by Asset
	  ◦ Review Analyses by Corrosion Loop
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

4	Add existing RBI Component Types to the MI RBI COMPONENT TYPES system code table.	This step is required only if you have additional RBI Component type records that are not provided in the baseline APM database.
5	Revert the RBI Corrosion Loop datasheet to baseline.	This step is required only if you have modified the RBI Corrosion Loop datasheet.

Step	Task	Notes
6	Configure Risk Based Inspection ActiveMQ settings for MIExecution Service.	This step is optional. You can perform this step if you want to modify the default retries or concurrency settings.
7	Ensure that the Meridium MIExecution Service is installed and running.	If the basic APM system architecture is already installed, the Meridium MIExecution Service is automatically installed, and the service runs automatically.

8	Revert the following queries to baseline to fix the query compilation error:
	
	• `Public\Meridium`
	`\Modules\Mechanical`
	`Integrity\Queries`
	`\Dashboard Queries`
	folder.
	
	  ◦ RBI 581 Assets Mitigation Overview Query
	  ◦ RiskMatrix
	
	• `Public\Meridium`
	`\Modules\Risk Based`
	`Inspection\Queries`
	folder.
	
	  ◦ Active Analyses for Evergreening – 580
	  ◦ Analyses Created For Evergreening – 580
	  ◦ RBI Flexible Configurations
	  ◦ RBI Flexible Validation Records
	  ◦ Review Analysis by Corrosion Loop 580
	  ◦ Select Protected Assets
		This step is required only if you have previously modified the queries.

9	Revert the following queries to baseline:
	
	`Public\Meridium\Modules`
	`\Risk Based Inspection`
	`\Queries\Criticality`
	`Consequence Evaluation`
	folder.
		This step is required only if you are using Flexible Configurations with a custom Consequence Evaluation Family.

Step	Task	Notes

10	Revert the following queries to baseline:
	
	• `Public\Meridium\Modules\Risk Based Inspection\Report Queries` folder.
	
	    ◦ MI RBI Analysis Summary Query
	    ◦ MI Inspection Management Summary Query
	    ◦ MI Thickness Monitoring Summary Query
	
	• `Public\Meridium\Modules\Risk Based Inspection\Queries` folder.
	
	    ◦ RBI Asset Risk Query
		This step is required only if you have previously modified the queries and you want to support Functional Location as an Asset.

11	Revert the following queries to baseline as the MI_SM_STATES.SMST_STAT_IND field is deprecated : • `Public\Meridium\Modules\Risk Based Inspection\Queries\Review Analyses by Corrosion Loop 580` folder. • `Public\Meridium\Modules\Risk Based Inspection\Queries\Review Analyses by Corrosion Loop 581` folder. • `Public\Meridium\Modules\Risk Based Inspection\Queries\Review Analyses by Asset 580` folder. • `Public\Meridium\Modules\Risk Based Inspection\Queries\Review Analyses by Asset 581` folder.	This step is required only if you have previously modified the queries.

Step	Task	Notes
12	Revert the following queries to baseline • `Public\Meridium\Modules\Risk Based Inspection\Queries` folder. ◦ Process Unit Query	This step is required only if you have previously modified the queries.
13	Revert the following queries to baseline: • `Public\Meridium\Modules\Inspection\Compliance\Queries` folder. ◦ Inspection Tasks for Asset	This step is required only if you have previously modified the queries and you need to update the Inspection Task hyperlink in the **Inspection Plan** page to open in a Datasheet dialog.
14	All Inspection Plans will be updated as follows: • The **Risk Category** field will be set to the most conservative Risk Category of all active RBI Analyses linked to the parent RBI Asset. • The **Driving Component** field will be set to the RBI Component with the RBI Analysis with the most conservative risk. • The **RBI Date** field will be set to the most conservative Date Criticality Calculated of all active RBI Analyses linked to the parent RBI Asset. • The **Plan Date** field will be set to the most conservative Date Criticality Calculated plus 10 years of all active RBI Analyses linked to the parent RBI Asset.	This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Update Query Parameter Type

After the database upgrade for APM, if the entity key fields are used as a parameter, you must modify the catalog query parameters to use the correct type by performing the following steps.

Procedure

1. Access the **Query** page.
2. Select **Browse**.

   The **Select a query from the catalog** window appears.

3. Navigate to the folder containing the query that you want to update, and select the link for the query.
The **Results** workspace appears.
4. Select the **SQL** tab.
The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to keys.

For example, (? :n) should be updated as (? :k).
6. Select **Save**.
The modified query is saved.

Revert the Risk Based Inspection Queries to Baseline

This action is required only if you have modified the Risk Based Inspection queries.

About This Task

If you have modified the Risk Based Inspection query, perform the following steps to revert the query to baseline.

Procedure

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert.
   For Risk Based Inspection 580, the public queries are stored in the following folder:
   `Public/Meridium/Modules/Risk Based Inspection/Queries`

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the Baseline folder for queries.
   For Risk Based Inspection 580, the baseline queries are stored in the following folder:
   `Baseline/Meridium/Modules/Risk Based Inspection/Queries`

6. Select the check box next to the query that you want to revert, and then select 🗐.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.
9. Repeat Steps 2-8 for each query that you want to revert to baseline.

Add FMLY_KEY column to Query

Procedure

1. Access the **Query** page
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.

4. Select the **Design** tab.
   The **Design** workspace appears, where you can modify the query.
5. Scroll through the **Field** list to get to the end.
6. Add a new column with the following options:

   Alias: FMLY_KEY

   Table: rbianalyses

   Sort: None

   Sort Index: 0

   Include: Checked

   Display: Unchecked

   Hyperlink: (Don't modify)

   Criteria: (Don't modify)

   Or: (Don't modify)
7. Select **Save**.
   The modified query is saved.

Add RBI Component Types

Procedure

1. Log in to APM as an administrator.
2. Go to **Admin > Configuration Manager > System Codes and Tables**.
3. Search for MI RBI COMPONENT TYPES.
4. In the System Code section, select ╋.
   The **Create System Code** window appears.
5. Add the RBI Component Types to the system code table.
6. Select **Save**.
7. Log out of APM and log in.
8. To add existing RBI Component Types to the MI RBI COMPONENT TYPES system code table, perform the following steps:

   a) Select ▣, and enter EquipmentTypes.
      A blank EquipmentTypes datasheet appears.
   b) In the **CriticalityItemType** box, select the existing RBI Component Type that you have added.
   c) Enter values in the required boxes, and then select 💾 to save the record.
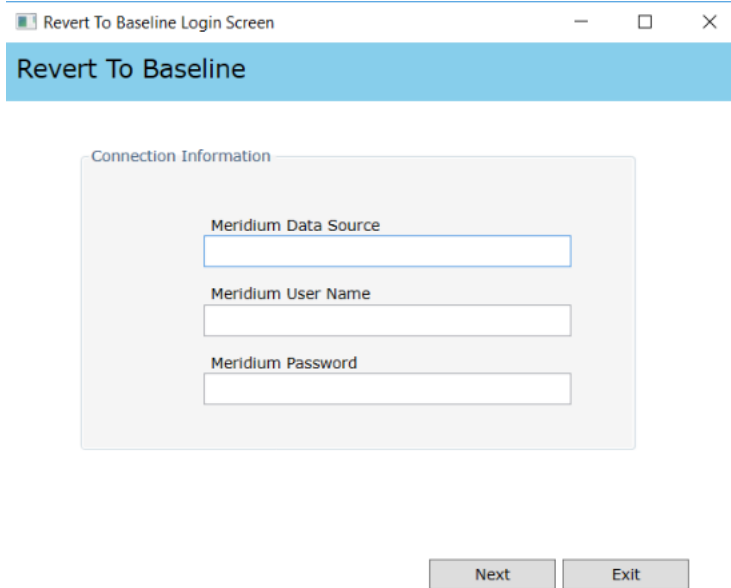
Revert Datasheets to Baseline

About This Task

If you have customized the default datasheet, then you must perform the following steps.

Note: Running this utility overwrites your current datasheet and replaces it with the baseline version. You must be a super user in APM to run the Revert to Baseline utility.

Procedure

1. Log in to the APM Server.
2. Navigate to the `\Meridium\Upgrade\DBUpgrade` folder.
3. Run the `RevertToBaselineApp.exe` file as an administrator.
   The **Revert To Baseline Login Screen** window appears.

4. In the **Meridium Data Source** box, enter the data source name that you want to access.
5. Enter your login credentials, and then select **Next**.
   The available families that can be reverted to baseline appear.
6. Select **Design** tab.
   The available families that can be reverted to baseline appear.
7. Select the family and then select **Revert to Baseline**.
   The **Various Options For Revert** window appears.

8. Select **Datasheets**.
9. Select the default datasheet from the drop-down list box, and then select **Ok**.

Configure Risk Based Inspection ActiveMQ settings for MIExecution Service

The MIExecution Service,on each APM Server serves RBI, Inspection and Thickness Monitoring module queues. This service is configured to use a single shared ActiveMQ queue service across APM. Available queue configuration options include retries and concurrency limit.

Procedure

1. On the APM Server, access the folder that contains the MIExecution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\mi-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).
3. In the file, locate the following text:

```
"Queue_Config": {
        "Queues": [
          {
            "Name": "MI_RBI_Queue",
            "ConcurrencyLimit": 100,
            "Retries": 5,
                "LimitPerTenantRequired": true
          }
        ]
          }
```

Note: `ConcurrencyLimit` indicates the maximum number of messages that will be consumed concurrently. `Retries` indicates the number of times it retries to send the messages to ActiveMQ if it fails. `LimitPerTenantRequired` indicates whether Maximum Concurrency limit per Tenant is specified in scheduler service for the queue.

4. Update the key values as desired.
5. Save and close the file.
   The updated settings will be applied when the MIExecution Service is stopped and restarted.

Revert the Compliance Management Query to Baseline

This action is required only if you want to use the RBI Inspection Grouping functionality.

About This Task

If you have modified the Recommended Actions by Selected Plans query, perform the following steps to revert the query to baseline:

Procedure

1. Access the Catalog page.
2. Navigate to the following Public folder:
   `Public/Meridium/Modules/Inspection/Compliance/Queries/`
3. Select the check box next to the Recommended Actions by Selected Plans query, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the following Baseline folder.
   `Baseline/Meridium/Modules/Inspection/Compliance/Queries/`
6. Select the check box next to the Recommended Actions by Selected Plans query, and then select ⧉.
   The **Catalog Folder Browser** window appears.
7. Navigate to the Public folder containing the query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.

Add Completion Comments Field to RBI Recommendation Datasheet

Procedure

1. In the **Applications** menu, navigate to **ADMIN** > **Configuration Manager** > **Family Management**.
   The **Family Management** page appears, displaying the list of already existing families.
2. In the left pane, in the **Entity** section, select the RBI Recommendation entity.
   The workspace for the RBI Recommendation entity appears.
3. In the workspace, select the **Datasheets** tabs.
4. Select **Manage Datasheets**.
   The **Datasheet Builder** page appears.

5. On the **Datasheet Caption** drop-down menu, select the RBI Recommendation datasheet. The datasheet appears in the **Datasheet Builder** workspace.

    Note: If you have a custom datasheet, select the custom datasheet.
6. In the **Available Items** pane, select the Completion Comments field and drag it into the **Datasheet Builder** workspace.
   The field is added to that datasheet.
7. Select **Save**.
   The datasheet is saved.

Verify Specified Tmin Mapping Availability

Before You Begin

Before you add the Specified Tmin mapping to APM, you must verify if the mapping is already added.
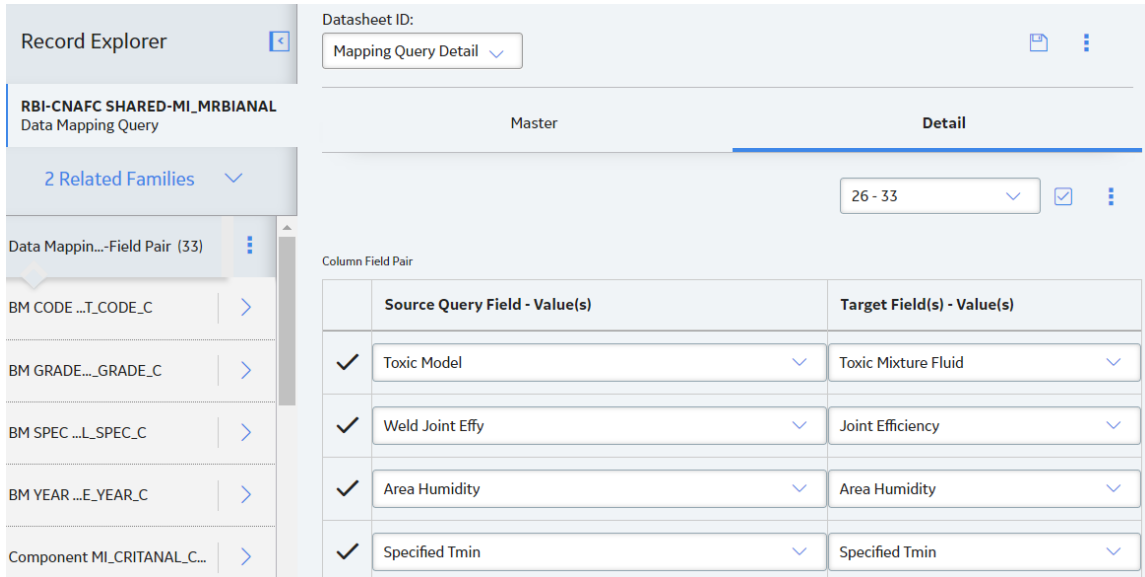
Procedure

1. Using the global search, search for RBI-CNAFC SHARED-MI_MRBIANAL, and then select the data mapping query.
2. In the **Record Explorer**, select **All Possible Families**.
3. Select **Data Mapping Column-Field Pair**.
4. In the **Source Query** box, verify the value. It must be `Public\Meridium\Modules\Risk Based Inspection\Queries\Mapping Queries\RBI-CNAFC Query MI_CCRBICOM`.
5. In the **Datasheet ID** box, select **Mapping Query Details**.

6. Select the **Detail** tab.
7. Verify if the Specified Tmin mapping is available in the list.

8. If the Specified Tmin mapping query is not available, manually.

Add Specified Tmin Mapping

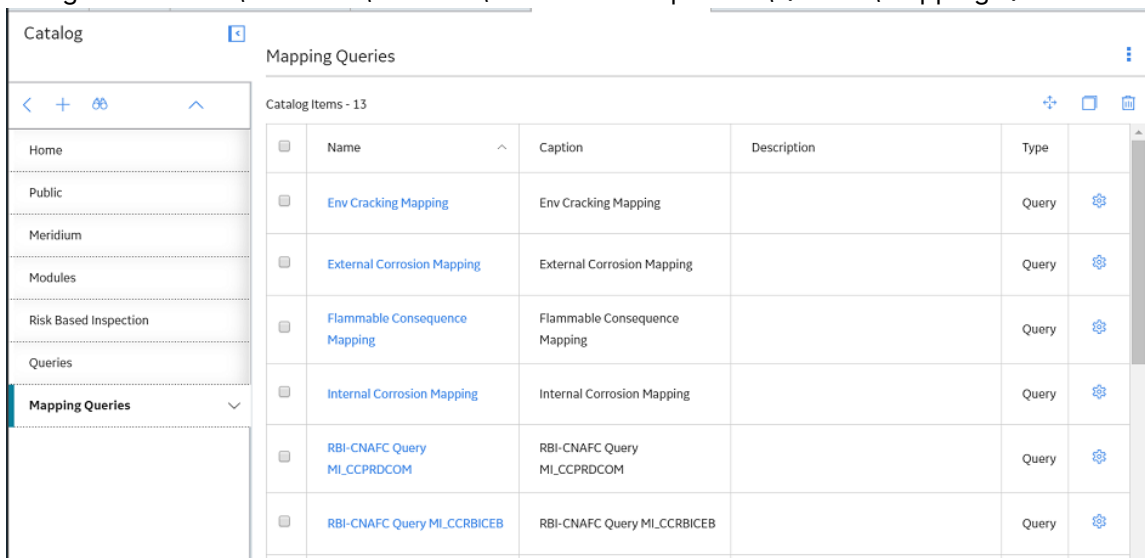### Before You Begin

- Verify if Specified Tmin mapping is already available.

Procedure

1. In the **Applications** menu, navigate to the **TOOLS** section, and then select **Catalog**.
2. Navigate to Public\Meridium\Modules\Risk Based Inspection\Queries\Mapping Queries.

3. Select the **RBI-CNAFC Query MI_CCRBICOM** data mapping query.

   The **Enter Parameter Values** dialog box appears.

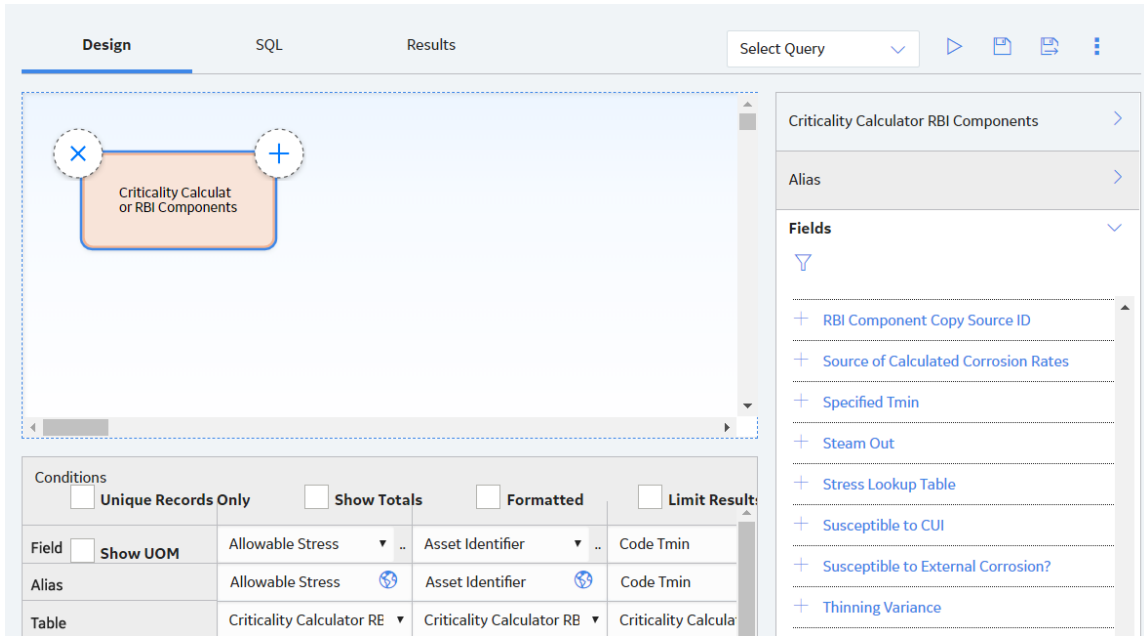## Enter Parameter Values

ENTY_KEY

MRD ~ Meridium, Inc.

Cancel   Done

4. Select **Cancel**.
5. Select **Design** tab.
6. In the **Field** row of the table, verify if Specified Tmin is available.

7. If Specified Tmin is available in the table, proceed to step 10.

8. If Specified Tmin is not available, select Specified Tmin from the **Fields** pane.

   Specified Tmin is added to the table.

9. Select 🖫.

10. Using the global search, search for RBI-CNAFC SHARED-MI_MRBIANAL, and then select the data mapping query.

11. In the Record Explorer, select **Data Mapping Column-Field Pair**.

12. In the **Source Query** box, verify the value. It must be Public\Meridium\Modules\Risk Based Inspection\Queries\Mapping Queries\RBI-CNAFC Query MI_CCRBICOM.
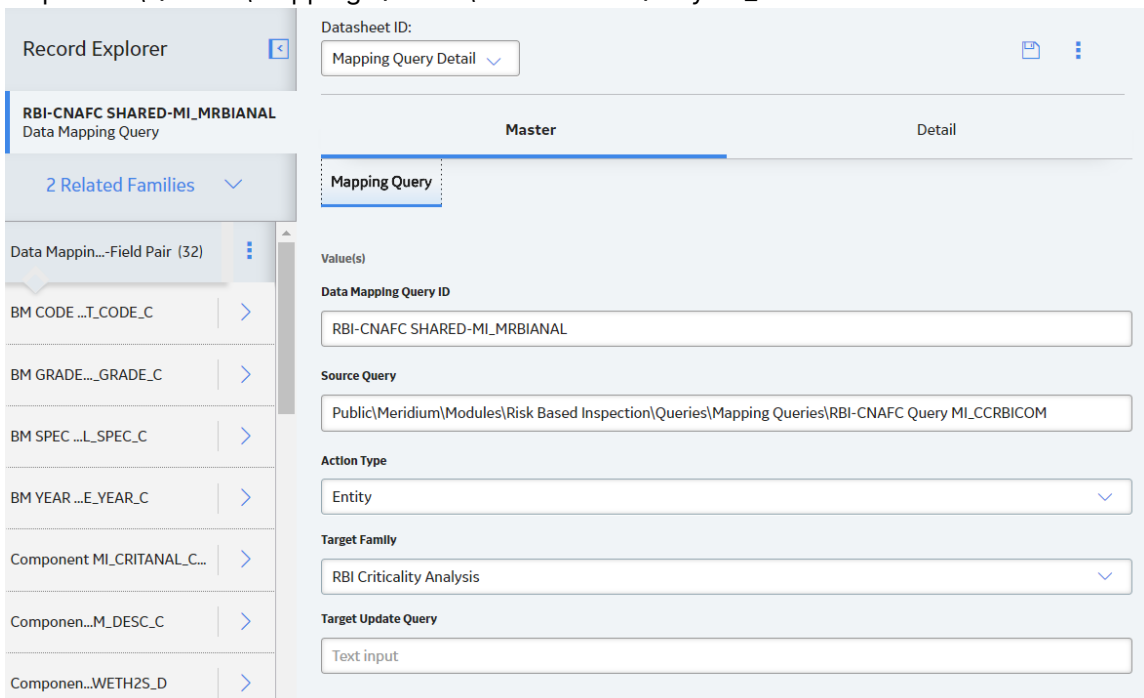
13. In the workspace, select ⋮, and then select **Add New Record**.
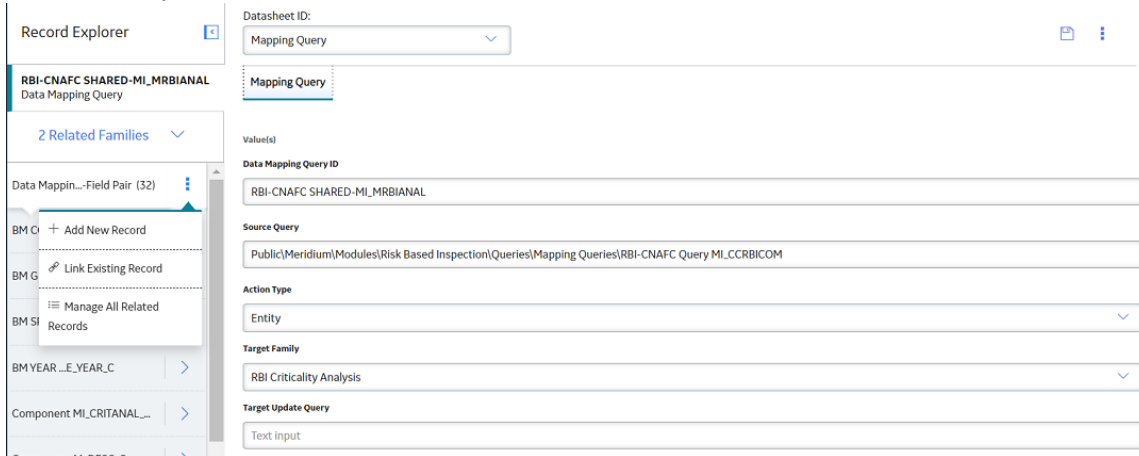
14. Select **Specified Tmin** in both **Source** and **Target** fields.
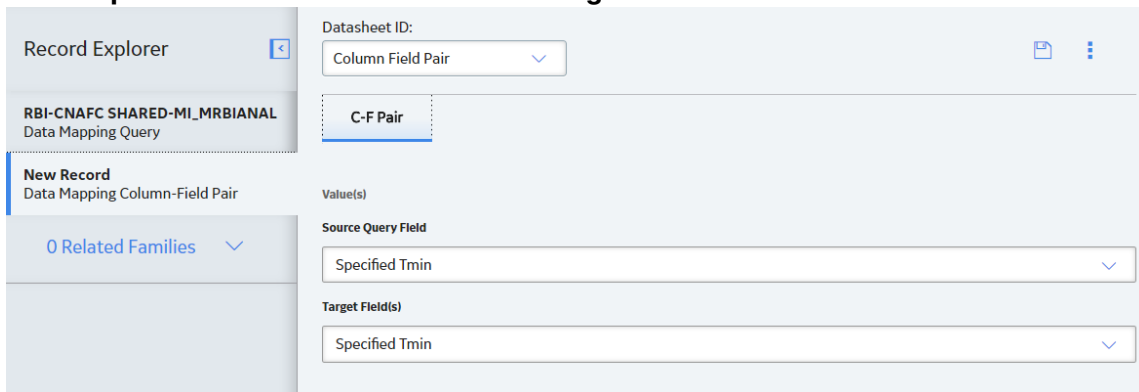
15. Select **Save**.

The Specified Tmin mapping is added.

16. Repeat steps 10 through 15 for the following data mapping queries:
    - RBI-CNAFC MI_CCRBICEB-MI_MRBIANAL by Component
    - RBI-CNAFC MI_CCRBICTB-MI_MRBIANAL by Component
    - RBI-CNAFC SHARED-MI_RBIPIPEANLY

Revert the Process Units Overview Queries to Baseline

This action is required only if you have modified the Process Units Overview queries.

About This Task

Due to changes in the Asset Hierarchy filter, the existing Process Unit query and the Asset Counts for Units sub-query requires updates. If you have modified these queries, perform the following steps to revert the queries to baseline.

Procedure

1. Access the **Query** page.
2. Select **Browse**.

   The **Select a query from the catalog** window appears.

3. Navigate to the `Baseline/Meridium/Modules/Risk Based Inspection/Queries/` folder.
4. Select the link for the Asset Counts for Units baseline query.
   The **Results** workspace appears.
5. Select the **SQL** tab.
6. Copy the code from the **SQL** workspace.
7. From the Catalog, navigate to the `Public/Meridium/Modules/Risk Based Inspection/Queries/` folder.
8. Select the link for the Asset Counts for Units query.
   The **Results** workspace appears.
9. Select the **SQL** tab.
10. Replace the code in the **SQL** workspace with the code that you have copied.
11. Repeat Steps 3-10 for the Process Unit Query.

Revert the Finalize Risk Queries to Baseline

This step is required only if you have modified the queries that are used for the **Finalize Risk** button in the **Assets** section of the **Risk Based Inspection Overview** page and the **Unit Summary** page.

About This Task

To include PRD analyses when performing a bulk Finalize Risk operation, the Finalize Risk queries require updates. If you have modified these queries, perform the following steps to revert the queries to baseline.

Procedure

1. Access the **Query** page.
2. Select **Browse**.

   The **Select a query from the catalog** window appears.
3. Navigate to the `Baseline/Meridium/Modules/Risk Based Inspection/Queries/` folder.
4. Select the link for the Review Analyses by Asset 580 baseline query.
   The **Results** workspace appears.
5. Select the **SQL** tab.
6. Copy the code from the **SQL** workspace.
7. From the Catalog, navigate to the `Public/Meridium/Modules/Risk Based Inspection/Queries/` folder.
8. Select the link for the Review Analyses by Asset 580 query.
   The **Results** workspace appears.
9. Select the **SQL** tab.
10. Replace the code in the **SQL** workspace with the code that you have copied.
11. Repeat Steps 3-10 for the Review Analyses by Corrosion Loop 580 query.

Risk Based Inspection 581 Upgrade

Upgrade or Update RBI 581 to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 186
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 186

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

After you upgrade:

- All RBI Assets with Active Analyses will have a related Inspection Plan record created.
- All RBI recommendations which are not in the Archived state for an RBI Asset with Active Analyses will be related to Inspection Plan record of the RBI Asset.
- The state caption for RBI Recommendation family with State ID MI_ACCEPTED will be updated to Approved.
- The Recommendation Methodology field on RBI Recommendation will be updated to RBI 581 where previously the field had the value RBI 581 Recommendation.
- All security users who belong to the MI RBI Analyst security group will belong to the MI Inspection Plan Approver security role.
- The MI Inspection Plan Approver security role will have the MI ASM Analyst security group assigned.
- Piping Stress updated
  - In some of the Piping Stress records for B31.3, WPB was misspelled as WFB. These records are now updated based on ASME standards.
  - In some of the Piping Stress records for B31.3 and B31.1 for the year 2014, where the Material Specification field contained the value B366 and B622, the Material Grade had the value NS instead of N/A. These records are now updated based on ASME standards.

- The following new RBI 581 Representative Fluids will be added to match the API 581, 3rd Edition, Addendum 1 specification:
  - Acid-LP
  - Acid-MP
  - Acid-HP
  - C1-C2
  - C3-C4
  - C6-C8
  - C9-C12

  For information on the new RBI 581 Representative Fluid Contents, refer to the topic.
- RBI 581 Representative Fluid contents will be updated for the following fluids to match the API 581, 3rd Edition, Addendum 1 specification:
  - C13-16 (Diesel)
  - C17-25 (Gas Oil)
  - C25+ (Resid)
  - C5
  - Chlorine
  - CO
  - EO
  - H2
  - H2O (Water)
  - H2S
  - HCl
  - HF
  - MEOH (Methanol)
  - NH3
  - Phosgene
  - Steam

  For information on the updated RBI 580 Representative Fluid Contents, refer to the topic.
- RBI 581 Representative Fluid content will be updated for the following families to match the API 581, 3rd Edition, Addendum 1 specification:
  - Component Damage Flammable
  - Toxic Release Constants HFH2S
  - Toxic Cons Eq Constant
  - Toxic Cons Eq Misc Chem

Step	Task	Notes

1	Update entity key parameters for the following catalog queries:
	
	• `Public\Meridium\Modules\Risk Based Inspection - 581\Queries` folder.
	
	   ◦ RBI 581 Consequence Evaluation
	   ◦ RBI Components for Inventory Group
	   ◦ RBI-581 DM Query
	
	• `Public\Meridium\Modules\Risk Based Inspection - 581\Report Queries` folder.
	
	   ◦ RBI 581 Asset Risk-Components
	   ◦ RBI 581 Asset Risk-Corrosion Analysis
	   ◦ RBI 581 Asset Risk-Degradation Mechanisms
	   ◦ RBI 581 Asset Risk-Equipment Data
	   ◦ RBI 581 Asset Risk-Inspection History
	   ◦ RBI 581 Asset Risk-RBI Recommendations
	   ◦ RBI 581 Asset Risk-Ref Documents
	   ◦ RBI 581 Asset Risk-Risk Targets Results
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes

2	Revert the following queries to baseline to remove the references to the MI_ENTITIES family that has been deprecated:
	
	• `Public\Meridium\Modules\Mechanical Integrity\Queries\Dashboard Queries` folder.
	  ◦ RBI Risk Matrix Query
	  ◦ RiskMatrix
	• `Public\Meridium\Modules\Risk Based Inspection – 581\Queries` folder.
	  ◦ Analyses Created For Evergreening – 581
	  ◦ RBI Components for Inventory Group
	• `Public\Meridium\Modules\Risk Based Inspection\Queries` folder.
	  ◦ RBI Components for an Asset
	  ◦ RBI Component for Unit
	  ◦ Review Analysis by Asset 581
	  ◦ Review Analysis by Corrosion Loop 581
	  ◦ Select RBI Components
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

3	Add FMLY_KEY column to the following catalog queries:
	
	• `Public\Meridium\Modules\Risk Based Inspection\Queries` folder.
	  ◦ Review Analyses by Asset
	  ◦ Review Analyses by Corrosion Loop
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

4	Add a new Data Mapping Column-Field Pair record to map the Measured External Corrosion Rate field from an RBI Component to the Base Material Measured Rate field in the associated RBI 581 External Damage Evaluation.	Due to content protection, the data mapping must be added manually. For more information, refer to KBA 000036783.

Step	Task	Notes
5	Add existing RBI Component Types to the MI RBI COMPONENT TYPES system code table.	This step is required only if you have additional RBI Component type records that are not provided in the baseline APM database.
6	Revert the RBI Corrosion Loop datasheet to baseline.	This step is required only if you have modified the RBI Corrosion Loop datasheet.
7	Configure Risk Based Inspection ActiveMQ settings for MIExecution Service.	This step is optional. You can perform this step if you want to modify the default retries or concurrency settings.
8	Ensure that the Meridium MIExecution Service is installed and running.	If the basic APM system architecture is already installed, the Meridium MIExecution Service is automatically installed, and the service runs automatically.
9	Recalculate the RBI 581 Risk Analyses to get the correct Calculated T-min field value where the Geometry Type field is set to Spherical Head or Hemispherical Head.	This step is required if you have RBI 581 Risk Analyses where Geometry Type field is set to Spherical Head or Hemispherical Head. For more information, refer to KBA 000037009.
10	Recalculate the RBI 581 Risk Analyses with a related RBI 581 External Cracking Damage Evaluation or RBI 581 Cracking Damage Evaluation where the Final Damage Factor field is set to greater than 5000.	This step is required if you have RBI 581 Risk Analyses with a related RBI 581 External Cracking Damage Evaluation or RBI 581 Cracking Damage Evaluation where the Final Damage Factor field is set to greater than 5000. For more information, refer to KBA 000037206.

Step	Task	Notes

11	Revert the following queries to baseline to fix the query compilation error:
	
	• `Public\Meridium \Modules\Mechanical Integrity\Queries \Dashboard Queries` folder.
	   ◦ RBI 581 Assets Mitigation Overview Query
	   ◦ RiskMatrix
	• `Public\Meridium \Modules\Risk Based Inspection\Queries` folder.
	   ◦ Select Protected Assets
	• `Public\Meridium \Modules\Risk Based Inspection – 581\Queries` folder.
	   ◦ Analyses Created For Evergreening – 581
	   ◦ Analyses Ready For Evergreening for Unit- 581
		This step is required only if you have previously modified the queries.

12	Revert the following queries to baseline • `Public\Meridium \Modules\Risk Based Inspection – 581\Report Queries` folder. ◦ RBI 581 Asset Risk- Equipment Data	This step is required only if you have previously modified the queries and you want to support Functional Location as an Asset.
13	Revert the following queries to baseline • `Public\Meridium \Modules\RBI 581\Queries\AST Bottom Base Damage Factor Lookup` folder.	This step is required only if you have previously modified the queries. For more information, refer to KBA 000038729.

Step	Task	Notes

14	**Revert the following queries to baseline**
	
	• `Public\Meridium\Modules\Risk Based Inspection\Queries` folder.
	
	  ◦ Process Unit Query
	
	• `Public\Meridium\Modules\Risk Based Inspection – 581\Queries` folder.
	
	  ◦ Display RBI Components for Inventory Group
		This step is required only if you have previously modified the queries.

15	Update the hyperlinks navigating to the RBI 581 Inventory Groups page to use the new URL as the old URL is not supported now. Previous URL: #rbi-admin-preferences/rbi-581-inventory-groups/unit/{unitkey}/group/{groupkey} Updated URL: #rbi /rbi-581-inventory-groups/unit/{unitkey}/group/{groupkey}	This step is required only if you have any custom dashboards or queries navigating to the RBI 581 Inventory Groups page.
16	**Revert the following queries to baseline** • `Public\Meridium\Modules\Risk Based Inspection – 581\Queries\Mapping Queries` folder. ◦ RBI-CNAFC Query MI_CCRBICOM 581CRKEV	This step is required only if you have previously modified the queries and you want to support Suggest PDMs workflow.

Step	Task	Notes
17	Revert the following queries to baseline to remove the references to the Status field in Inspection family that has been replaced by State Management fields: • `Public\Meridium \Modules\Risk Based Inspection - 581\Report Queries` folder. ◦ RBI 581 Asset Risk-Inspection History	This step is required only if you have previously modified the queries.
18	Revert the following queries to baseline: • `Public\Meridium \Modules\Inspection \Compliance\Queries` folder. ◦ Inspection Tasks for Asset	This step is required only if you have previously modified the queries and you need to update the Inspection Task hyperlink in the **Inspection Plan** page to open in a Datasheet dialog.
19	All Inspection Plans will be updated as follows: • The **Risk Category** field will be set to the most conservative Risk Category at RBI Date of all active RBI Analyses linked to the parent RBI Asset. • The **Driving Component** field will be set to the RBI Component with the RBI Analysis with the most conservative risk. • The **RBI Date** field will be set to the most conservative RBI Date field of all active RBI Analyses linked to the parent RBI Asset. • The **Plan Date** field will be set to the most conservative Plan Date field of all active RBI Analyses linked to the parent RBI Asset.	This step will be completed automatically when you upgrade the components in the basic APM system architecture.
20	Add the **RBI-581** tab to Criticality RBI Component datasheets.	This step is required only if you have customized the datasheet for one or more of the Criticality RBI Components.

Update Query Parameter Type

After the database upgrade for APM, if the entity key fields are used as a parameter, you must modify the catalog query parameters to use the correct type by performing the following steps.

Procedure

1. Access the **Query** page.
2. Select **Browse**.

   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to keys.

   For example, (? :n) should be updated as (? :k).
6. Select **Save**.
   The modified query is saved.

Revert the Risk Based Inspection 581 Queries to Baseline

This action is required only if you have modified the Risk Based Inspection 581 queries.

About This Task

If you have modified the Risk Based Inspection 581 query, perform the following steps to revert the query to baseline.

Procedure

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert.
   For Risk Based Inspection 581, the public queries are stored in the following folder:
   `Public/Meridium/Modules/RBI 581/Queries`

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the Baseline folder for queries.

   For Risk Based Inspection 581, the baseline queries are stored in the following folder:
   `Baseline/Meridium/Modules/RBI 581/Queries`

6. Select the check box next to the query that you want to revert, and then select 📋.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.

9. Repeat Steps 2-8 for each query that you want to revert to baseline.

Add FMLY_KEY column to Query

Procedure

1. Access the **Query** page
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **Design** tab.
   The **Design** workspace appears, where you can modify the query.
5. Scroll through the **Field** list to get to the end.
6. Add a new column with the following options:

   Alias: FMLY_KEY

   Table: rbianalyses

   Sort: None

   Sort Index: 0

   Include: Checked

   Display: Unchecked

   Hyperlink: (Don't modify)

   Criteria: (Don't modify)

   Or: (Don't modify)
7. Select **Save**.
   The modified query is saved.

Add RBI Component Types

Procedure

1. Log in to APM as an administrator.
2. Go to **Admin > Configuration Manager > System Codes and Tables**.
3. Search for MI RBI COMPONENT TYPES.
4. In the System Code section, select ╋.
   The **Create System Code** window appears.
5. Add the RBI Component Types to the system code table.
6. Select **Save**.
7. Log out of APM and log in.
8. To add existing RBI Component Types to the MI RBI COMPONENT TYPES system code table, perform the following steps:

   a) Select 📋, and enter EquipmentTypes.
      A blank EquipmentTypes datasheet appears.

b) In the **CriticalityItemType** box, select the existing RBI Component Type that you have added.

c) Enter values in the required boxes, and then select 💾 to save the record.

Revert Datasheets to Baseline

About This Task

If you have customized the default datasheet, then you must perform the following steps.

Note: Running this utility overwrites your current datasheet and replaces it with the baseline version. You must be a super user in APM to run the Revert to Baseline utility.

Procedure

1. Log in to the APM Server.
2. Navigate to the `\Meridium\Upgrade\DBUpgrade` folder.
3. Run the `RevertToBaselineApp.exe` file as an administrator.
   The **Revert To Baseline Login Screen** window appears.

4. In the **Meridium Data Source** box, enter the data source name that you want to access.
5. Enter your login credentials, and then select **Next**.
   The available families that can be reverted to baseline appear.
6. Select **Design** tab.
   The available families that can be reverted to baseline appear.
7. Select the family and then select **Revert to Baseline**.
   The **Various Options For Revert** window appears.

8. Select **Datasheets**.
9. Select the default datasheet from the drop-down list box, and then select **Ok**.

Configure Risk Based Inspection ActiveMQ settings for MIExecution Service

The MIExecution Service, on each APM Server serves RBI, Inspection and Thickness Monitoring module queues. This service is configured to use a single shared ActiveMQ queue service across APM. Available queue configuration options include retries and concurrency limit.

Procedure

1. On the APM Server, access the folder that contains the MIExecution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\mi-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).

3. In the file, locate the following text:

```
"Queue_Config": {
        "Queues": [
          {
            "Name": "MI_RBI_Queue",
            "ConcurrencyLimit": 100,
            "Retries": 5,
               "LimitPerTenantRequired": true
          }
        ]
          }
```

Note: `ConcurrencyLimit` indicates the maximum number of messages that will be consumed concurrently. `Retries` indicates the number of times it retries to send the messages to ActiveMQ if it fails. `LimitPerTenantRequired` indicates whether Maximum Concurrency limit per Tenant is specified in scheduler service for the queue.

4. Update the key values as desired.
5. Save and close the file.
   The updated settings will be applied when the MIExecution Service is stopped and restarted.

Add Completion Comments Field to RBI Recommendation Datasheet

Procedure

1. In the **Applications** menu, navigate to **ADMIN** > **Configuration Manager** > **Family Management**.
   The **Family Management** page appears, displaying the list of already existing families.
2. In the left pane, in the **Entity** section, select the RBI Recommendation entity.
   The workspace for the RBI Recommendation entity appears.
3. In the workspace, select the **Datasheets** tabs.
4. Select **Manage Datasheets**.
   The **Datasheet Builder** page appears.
5. On the **Datasheet Caption** drop-down menu, select the RBI Recommendation datasheet.
   The datasheet appears in the **Datasheet Builder** workspace.

   Note: If you have a custom datasheet, select the custom datasheet.
6. In the **Available Items** pane, select the Completion Comments field and drag it into the **Datasheet Builder** workspace.
   The field is added to that datasheet.
7. Select **Save**.
   The datasheet is saved.

Add the RBI-581 Tab to Criticality RBI Component Datasheets

Before You Begin

Note: You must repeat this procedure for each Criticality RBI Component datasheet that you have customized.

If you have customized the datasheet for one or more of the Criticality RBI Components, after activating the RBI 581 license, you must perform the following procedure to add the **RBI-581** section to those customized datasheets. The following table indicates the fields that must appear on each datasheet.

Caption	Field ID	Criticality RBI Component - Cylindrical Shell	Criticality RBI Component - Exchanger Bundle	Criticality RBI Component - Exchanger Header	Criticality RBI Component - Exchanger Tube	Criticality RBI Component - Piping	Criticality RBI Component - Tank Bottom
Base Material	Base MaterialMI_CCRBICOM_BASE_MATER_C	✓	✓	✓	✓	✓	✓
Cladding Material	MI_CCRBICOM_CLADDING_MATERIL_C	✓	✓	✓	✓	✓	✓
Cladding Present	MI_CCRBICOM_CLADDING_PRESENT_L	✓	✓	✓	✓	✓	✓
CM Corrosion Rate	MI_CCRBICOM_CM_COR_RT_C	✓	✓	✓	✓	✓	✓
Coefficient Y Material	MI_CCRBICOM_COEFFICNT_Y_MTRL_C	✗	✗	✗	✗	✓	✗
Corrosion Allow	MI_RBICOMPO_CORRO_ALLOW_N	✓	✓	✓	✓	✓	✓
Detection System	MI_CCRBICOM_DETECTION_SYSTEM_C	✓	✓	✓	✓	✓	✓
Fluid Velocity	MI_CCRBICOM_FLUID_VELOCITY_N	✓	✓	✓	✓	✓	✓
Furnished Cladding Thk	MI_CCRBICOM_FRNSHD_CLDDG_THK_N	✓	✓	✓	✓	✓	✓
Geometry Type	MI_CCRBICOM_GEOMETRY_TYPE_C	✓	✓	✓	✓	✓	✓
GFF Component Type	MI_CCRBICOM_GFF_COMPO_TYPE_CHR	✓	✓	✓	✓	✓	✓

Caption	Field ID	Criticality RBI Component - Cylindrical Shell	Criticality RBI Component - Exchanger Bundle	Criticality RBI Component - Exchanger Header	Criticality RBI Component - Exchanger Tube	Criticality RBI Component - Piping	Criticality RBI Component - Tank Bottom
Has Release Prevention Barrier?	MI_CCRBICTB_HAS_RELEA_PREVE_F	✕	✕	✕	✕	✕	✓
Is Intrusive?	MI_RBICOMPO_IS_INTRU_CHR	✓	✓	✓	✓	✓	✓
Isolation System	MI_CCRBICOM_ISOLA_SYSTE_CHR	✓	✓	✓	✓	✓	✓
Liner Present	MI_CCRBICOM_LINER_PRESE_CHR	✓	✓	✓	✓	✓	✓
Liner Type	MI_CCRBICOM_LINER_TP_C	✓	✓	✓	✓	✓	✓
Minimum Structural Thickness	MI_CCRBICOM_MNMM_STRCTRL_THS_N	✓	✓	✓	✓	✓	✓
Mitigation System	MI_CCRBICOM_MITIGATION_SYSTM_C	✓	✓	✓	✓	✓	✓
Percent Liquid Volume	MI_RBICOMPO_PER_LIQ_VOL_N	✓	✓	✓	✓	✓	✓
pH of Water	MI_CCRBICOM_PH_OF_WATER_N	✓	✓	✓	✓	✓	✓
Specified Tmin	MI_CCRBICOM_SPECIFIED_TMIN_N	✓	✓	✓	✓	✓	✓
Total Acid Number	MI_CCRBICOM_TOTAL_ACID_NUMBR_N	✓	✓	✓	✓	✓	✓

Procedure

1. Access the Family Management page.

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2. In the left section, select the Criticality RBI Component whose datasheet you want to modify.
   In the workspace, the corresponding Criticality RBI Component family appears, displaying the **Information** section.
3. In the workspace, select the **Datasheets** tab, and then select **Manage Datasheets**.
   The **Datasheet Builder** page appears, displaying the datasheet layout of the selected Criticality RBI Component family.
4. In the upper-right corner of the page, select ⊡.
   A **new section** tab appears at the top of the workspace, displaying a blank section.
5. On the new tab, rename new section to RBI-581.
6. In the **RBI-581** section, select ▤.
7. In the right column, in the top cell, enter Value(s).
8. In the left pane, locate a field that corresponds to the table at the beginning of this topic, and then add that field into the empty cell in the **Value(s)** column using the drag-and-drop method.
   In the cell, an input box that corresponds to the selected field appears.
9. In the left column, enter the caption that corresponds to the field. For example, if you added the Coefficient Y Material field to the **Value(s)** column, then enter Coefficient Y Material in the corresponding cell in the left column.
10. In the upper-right corner of the page, select ⊟.
    In the **RBI-581** section, in the table, a new row appears.
11. Repeat steps 8 to 10 for each of the fields specified in the table at the beginning of this topic.
12. In the upper-right corner of the page, select **Save**.
    The datasheet for the Criticality RBI Component that you selected in step 2 is saved, and the **RBI-581** tab appears on the selected Criticality RBI Component datasheet.

Revert the Process Units Overview Queries to Baseline

This action is required only if you have modified the Process Units Overview queries.

About This Task

Due to changes in the Asset Hierarchy filter, the existing Process Unit query and the Asset Counts for Units sub-query requires updates. If you have modified these queries, perform the following steps to revert the queries to baseline.

Procedure

1. Access the **Query** page.
2. Select **Browse**.

   The **Select a query from the catalog** window appears.
3. Navigate to the `Baseline/Meridium/Modules/Risk Based Inspection/Queries/` folder.
4. Select the link for the Asset Counts for Units baseline query.
   The **Results** workspace appears.
5. Select the **SQL** tab.
6. Copy the code from the **SQL** workspace.
7. From the Catalog, navigate to the `Public/Meridium/Modules/Risk Based Inspection/Queries/` folder.

8. Select the link for the Asset Counts for Units query.
    The **Results** workspace appears.
9. Select the **SQL** tab.
10. Replace the code in the **SQL** workspace with the code that you have copied.
11. Repeat Steps 3-10 for the Process Unit Query.

Root Cause Analysis Upgrade

Upgrade or Update RCA to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 202
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 202

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Revert the following queries to baseline to view the **Recommendation Summary** chart on the **RCA Overview** page and the **Recommendations** chart in the **Overview** section of an RCA Analysis: • `Public\Meridium\Modules` `\Failure Elemination\Queries` `\Dashboard Queries` folder: ◦ RCA recommendation-V4 • `Public\Meridium\Modules\RCA` `\Queries` folder: ◦ Recommendation Overview Graph	This step is required only if you have previously modified the queries. Otherwise, this step will be completed automatically when you upgrade the components in the basic APM system architecture.
2	Revert the following queries to baseline to retrieve the document path of images used in the Comprehensive Analysis Report via Reference Documents: • `Public\Meridium\Modules\RCA` folder: ◦ Get Image Reference Documents Query • `Public\Meridium\Modules\RCA` `\SSRS` folder: ◦ ReferenceImageDocumentsReport	This step is required only if you have previously modified the queries. Otherwise, this step will be completed automatically when you upgrade the components in the basic APM system architecture.
3	Revert the following datasheets to baseline: • RCA Analysis Detail • 5 Whys The aforementioned datasheets are used in RCA Analyses and RCA Events respectively.	This step is required only if you have previously modified the datasheets. Otherwise, this step will be completed automatically when you upgrade the components in the basic APM system architecture.
4	Revert the following query to baseline to use a Tracking Item query: • `Public\Meridium\Modules\RCA` `\Queries` folder. ◦ Find HR User for Tracking Item	This step is required only if you have previously modified the query. Otherwise, this step will be completed automatically when you upgrade the components in the basic APM system architecture.

To revert queries to baseline:

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert: `Public/Meridium/ Modules/<module name>/Queries`
3. Select the check box next to the query that you want to revert, and then select .
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**. The selected query is deleted.
5. Navigate to the module-specific Baseline folder for queries: `Baseline/Meridium/ Modules/<module name>/Queries`
6. Select the check box next to the query that you want to revert, and then select .

The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A message appears, indicating that the selected item has been copied successfully.
9. Repeat steps 2-8 for each query that you want to revert to baseline.

Rounds Designer Upgrade

Upgrade or Update Rounds to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 204
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 204

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Grant permissions to the Everyone group to view records that belong to the Site Reference family.	This step is required.
2	Ensure all existing checkpoints have descriptions.	This step is required.

Step	Task	Notes
3	Ensure that the Source ML Description field is present on the Offline Forms datasheet for the Operator rounds Recommendation family.	This field is present by default on the datasheet in baseline APM. If you did not modify this Offline Forms datasheet, no change is required. However, if you previously removed the Source ML Description field from the Offline Forms datasheet, you must return the field to the datasheet.
4	As needed, modify your server timeout settings.	This step is only required if you want to process large amounts of data in a single transaction (for example, if you collect a large number of readings for a Route or several Routes and then attempt to upload all of those readings simultaneously). If you need to modify server timeout settings, follow the instructions in Article 000032427.
5	Delete the Reading Value Character and Reading Value Numeric fields from the ID Template for the Reading family.	This step is optional. In V4.3.0.7.0, to enhance the performance of uploading readings, the Reading Value Character and Reading Value Numeric fields in the ID Template for the Reading family were removed. However, if you previously modified the ID Template fields for this family, your configuration is preserved when you upgrade to V4.3.0.7.0 or later. As a result, if you want to apply the performance increase, you must manually remove these fields. For more details, see Article 000032623.

Upgrade Steps for Lubrication

If you have Lubricant, Lubrication Requirement, or Lubrication Requirement Template records in your database, complete these steps.

Procedure

- Complete the following steps prior to upgrading your database:

Table 1: Pre-Upgrade Steps

Step	Task	Notes

1	Review the values in the Manufacturer field in Lubricant records and consolidate any near-matches.
	
	For example, if some of your existing records contain the value "ABC Company" and others contain "A B C Company" to refer to the same manufacturer, you should modify one or the other so that the values match exactly.
	
	Tip: You can use the following query, which returns a list of manufacturers in alphabetical order, to review the values:
	
	``
	SELECT DISTINCT
	[MI_LUBRICANT].
	[MI_LUBRICANT_MFR_C]
	        "Lubricant
	Manufacturer" FROM
	[MI_LUBRICANT]
	ORDER BY
	[MI_LUBRICANT].
	[MI_LUBRICANT_MFR_C]
	        Asc
	``
		This step is required only if you have Lubricant records in your database.
		
		This step is necessary because a new Lubricant Manufacturer record will be created during the upgrade for each value in the Manufacturer field in Lubricant records prior to upgrading (and the value will be replaced with a reference to the corresponding Lubricant Manufacturer record).

2	Review the values in the Priority field in Lubrication Requirement and Lubrication Requirement Template records and consolidate any near-matches.
	
	For example, if some of your existing records contain the value "High" and others contain "Hihg" to refer to the same level of priority, you should modify one or the other so that the values match exactly.
	
	Tip: You can use the following query, which returns a list of priority values in alphabetical order, to review the values:
	
	``
	SELECT DISTINCT
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_PRIOR_C
	]
	        "Priority"
	FROM [MI_LUBR_REQ]
	ORDER BY
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_PRIOR_C
	]
	    ASC
	``
		This step is required only if you have Lubrication Requirement and Lubrication Requirement Template records in your database.
		
		This step is necessary because a new entry in the system code table MI_LUBR_PRIORITY will be added during the upgrade for each value in the Priority field in Lubrication Requirement and Lubrication Requirement Template records prior to upgrading.

Step	Task	Notes

3	Review the values in the Component field in Lubrication Requirement and Lubrication Requirement Template records and consolidate any near-matches.
	
	For example, if some of your existing records contain the value "Bearing" and others contain "Bearings" to refer to the component, you should modify one or the other so that the values match exactly.
	
	Tip: You can use the following query, which returns a list of components in alphabetical order, to review the values:
	
	<pre>SELECT DISTINCT
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_COMP_C]
	      "Component"
	FROM [MI_LUBR_REQ]
	ORDER BY
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_COMP_C]
	    ASC</pre>
		This step is required only if you have Lubrication Requirement and Lubrication Requirement Template records in your database.
		
		This step is necessary because a new Lubrication Component record will be created during the upgrade for each value in the Component field in Lubrication Requirement and Lubrication Requirement Template records prior to upgrading (and the Component Type field will be updated with a reference to the corresponding Lubrication Component record).

Step	Task	Notes
4	Review the values in the Method field in Lubricant records and consolidate any near-matches. For example, if some of your existing records contain the value "Grease Gun" and others contain "greasegun" to refer to the method, you should modify one or the other so that the values match exactly. **Tip:** You can use the following query, which returns a list of methods in alphabetical order, to review the values: ``` SELECT DISTINCT [MI_LUBRICANT]. [MI_LUBRICANT_METHOD _C] "Method" FROM [MI_LUBRICANT] ORDER BY [MI_LUBRICANT]. [MI_LUBRICANT_METHOD _C] Asc ```	This step is required only if you have Lubricant records in your database. This step is necessary because a new Lubrication Method record will be created during the upgrade for each unique value in the Method field in Lubricant records prior to upgrading (and the Method field will be deprecated). In addition, the new Method Type field in Lubrication Requirement and Lubrication Requirement Template records will be populated with the Entity Key of the corresponding Lubrication Method record.

Step	Task	Notes
| 5 | Review the values in the Capacity Unit of Measure field in Lubrication Requirement and Lubrication Requirement Template records and consolidate any near-matches. Then, ensure that each value matches exactly the system code Description value for an entry in the MI_LM_REFERENCES System Code Table. If a corresponding entry does not exist, and you want to use the value in your upgraded database, add an entry.<br><br>**Important:** You can add an entry directly to the MI_LM_REFERENCES System Code Table or you can add a reference to an entry in the global UOME System Code Table. However, do not add a given value to the MI_LM_REFERENCES System Code Table using both methods.<br><br>**Tip:** You can use the following queries, which return a list of Capacity Unit of Measure values in alphabetical order, to review the values:<br><br>○ Lubrication Requirement records:<br><br>```
SELECT

DISTINCT
[MI_LUBR_REQ].
[MI_LUBR_REQ_CAPTY
_UOM_C] "Capacity
Unit of Measure"
FROM

[MI_LUBR_REQ]
WHERE
[MI_LUBR_REQ].
[MI_LUBR_REQ_CAPTY
_UOM_C] IS NOT
NULL ORDER BY

[MI_LUBR_REQ].
[MI_LUBR_REQ_CAPTY
_UOM_C] Asc
```<br><br>○ Lubrication Requirement Template records:<br><br>```
SELECT DISTINCT
[MI_LR_TMPLT].
[MI_LR_TMPLT_CAPTY
_UOM_C]

"Capacity Unit of
Measure" FROM
[MI_LR_TMPLT]
WHERE

[MI_LR_TMPLT].
[MI_LR_TMPLT_CAPTY
_UOM_C] IS NOT
NULL ORDER BY

[MI_LR_TMPLT].
``` | This step is required only if you have Lubrication Requirement and Lubrication Requirement Template records in your database.<br><br>This step is necessary because the new Capacity Unit of Measure field in Lubrication Requirement and Lubrication Requirement Template records will be populated automatically with a reference to the unit of measure that corresponds to the value in the deprecated Capacity Unit of Measure field.<br><br>If the deprecated Capacity Unit of Measure field contains a value that does not correspond to an entry in the MI_LM_REFERENCES System Code Table, no value will be added to the new field. |

- Complete the following steps after upgrading your database:

Table 2: Post-Upgrade Steps

Step	Task	Notes
1	Confirm that appropriate the Lubricant Manufacturer records were created. Add or remove records as necessary. **Tip:** You can use the following query, which returns a list of the Lubricant Manufacturer records in your upgraded database, to review the values: ```SELECT DISTINCT [MI_LUBR_MANU].[MI_LUBR_MANU_MANU_ID_C]``` ```"Manufacturer ID" FROM [MI_LUBR_MANU] ORDER BY [MI_LUBR_MANU].[MI_LUBR_MANU_MANU_ID_C] Asc```	See notes for Step 1 in the pre-upgrade steps.
2	Confirm that appropriate entries were created in the system code table MI_LUBR_PRIORITY. **Tip:** ◦ Access the System Codes and Tables page to confirm the entries. ◦ For more information, refer the System Codes and Tables documentation.	See notes for Step 2 in the pre-upgrade steps.
3	Confirm that appropriate entries were created in the system code table MI_LUBR_PRIORITY. **Tip:** You can use the following query, which returns a list of the Lubrication Component records in your upgraded database, to review the values: ```SELECT DISTINCT [MI_LUBR_COMP].[MI_LUBR_COMP_ID_C] "ID" FROM [MI_LUBR_COMP] ORDER BY [MI_LUBR_COMP].[MI_LUBR_COMP_ID_C] Asc```	See notes for Step 3 in the pre-upgrade steps.

Step	Task	Notes
4	Confirm that appropriate Lubrication Method records were created. Add or remove records as necessary. **Tip:** You can use the following query, which returns a list of the Lubrication Method records in your upgraded database, to review the values: ``` SELECT DISTINCT [MI_LUBR_METH]. [MI_LUBR_METH_ID_C] "Method ID" FROM [MI_LUBR_METH] ORDER BY [MI_LUBR_METH]. [MI_LUBR_METH_ID_C] Asc ```	See notes for Step 4 in the pre-upgrade steps.

Step	Task	Notes

5	For all Lubrication Requirement and Lubrication Requirement Template records that contained a value in the deprecated Capacity Unit of Measure field, confirm that the new Capacity Unit of Measure field contains a reference to the corresponding unit of measure.
	
	Tip: You can use the following queries to locate records where the deprecated field contains a value, but the new field does not.
	
	◦ Lubrication Requirement records:
	
	<pre>SELECT
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_CAPTY
	_UOM_C] "Capacity
	Unit of
	Measure(Depr",
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_CAPAC
	ITY_UOM_C]
	"Capacity Unit of
	Measure",
	[MI_LUBR_REQ].ENTY
	_KEY "ENTY_KEY",
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_COMP_
	TYPE_N]
	"Component Type",
	[MI_LUBR_REQ].
	[MI_MEAS_LOC_DESC_
	C] "Description"
	FROM
	[MI_LUBR_REQ]
	WHERE
	([MI_LUBR_REQ].
	[MI_LUBR_REQ_CAPTY
	_UOM_C] IS NOT
	NULL AND
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_CAPAC
	ITY_UOM_C] IS
	NULL) ORDER BY
	[MI_LUBR_REQ].
	[MI_LUBR_REQ_CAPTY
	_UOM_C] Asc</pre>
	
	◦ Lubrication Requirement Template records:
	
	<pre>SELECT DISTINCT
	[MI_LR_TMPLT].
	[MI_LR_TMPLT_CAPTY
	_UOM_C] "Capacity
	Unit of
	Measure(Depr",
	[MI_LR_TMPLT].
	[MI_LR_TMPLT_CAPAC
	ITY_UOM_C]
	"Capacity Unit of
	Measure_",
	[MI_LR_TMPLT].ENTY
	_KEY "ENTY_KEY",
	[MI_LR_TMPLT].</pre>
		See notes for in the pre-upgrade steps.

Grant Data Permissions to the Everyone Group

Procedure

1. In the **Applications** menu, navigate to **ADMIN** > **Configuration Manager** > **Data Permissions**.
2. Select the Site Reference family.
   The workspace for the Site Reference family appears, displaying a list of assigned Security Users and Groups for the family.
3. Select 👥.
   The **Assign Groups** window appears.
4. In the list, select the Everyone group, and then select **Update**.
   The Everyone group is assigned to the family and appears in the workspace.
5. On the row containing the Everyone group, select the **View** check box.
6. Select 💾.
   The Everyone group is granted permission to view records that belong to the Site Reference family.

Rounds Pro Upgrade

Upgrade or Update Rounds Pro to V5.0.7.0.0

Pre-upgrade Steps

The following steps must be completed by Rounds Pro mobile users before the APM server is upgraded.

1. Ensure all data available on the mobile device is synced with the APM server. This includes all the Readings and Recommendations.
2. Ensure all Routes Instances are Checked-In.
3. Logout from the Round Pro mobile app.
4. Do not login to the app until the APM server upgrade is complete.
5. After the server upgrade is complete, ensure that you are using the latest version of the Rounds Pro mobile app.

Upgrade Steps

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	• Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 214
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 214

Upgrade or Update Rounds to V5.0.7.0.0

Pre-upgrade Steps

The following steps must be completed by Rounds Pro mobile users before the APM server is upgraded.

1. Ensure all data available on the mobile device is synced with the APM server. This includes all the Readings and Recommendations.
2. Ensure all Routes Instances are Checked-In.
3. Logout from the Round Pro mobile app.
4. Do not login to the app until the GE Vernova server upgrade is complete.
5. After the server upgrade is complete, ensure that you are using the latest version of the Rounds Pro mobile app.

Upgrade Steps

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

R Scripts Upgrade

Upgrade or Update R Scripts to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 214
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 215

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Specify R Server Credentials

Before You Begin

You must be a Super User or member of the MI Configuration Role security group to modify the R Server credentials.

Procedure

1. In the **Applications** menu, navigate to **ADMIN** > **Operations Manager** > **Connections**.
   The **Connections** page appears.
2. Select **R Server**.
   The **R Server** workspace appears.
3. In the **R Server Version** box, specify the version of R Server.
4. In the **Server Address** box, enter the URL of the R Server (for example, `http://MyRServer:7400/deployr`).
5. In the **User Name** and **Password** boxes, enter the user name and password that you want to use for the R Server connection.
6. Select **Save**.
   The R Server credentials are saved.
7. Select **Perform Connection Test** to confirm that the connection is valid.

SIS Management Upgrade

Upgrade or Update SIS Management to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 215
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 216

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	[Update entity key parameters](#) from :n to :k for the following catalog queries: • `Public\Meridium\Modules\SIS Management\Queries` folder. - Add_SIS_Trip_Report_Detail_Search - IF_Proof_Test_Tasks - LS_Proof_Test_Tasks - PIL Search for Reports - SIL_Anaysis_Doc_Query - SIS Find ASM Actions for IF - SRS_Report_Query • `Public\Meridium\Modules\SIS Management\Queries\Dashboard Queries` folder. - SIS Proof Tests Summary Failed - SIS Proof Tests Summary Failed LS - SIS Proof Tests Summary Passed - SIS Proof Tests Summary Passed LS • `Public\Meridium\Modules\SIS Management\SIL\Queries` folder. - SIL Analysis Risk Query - SIL Analysis Query - SIL Assignment Summary Query • `Public\Meridium\Modules\SIS Management\Proof Tests\Queries` folder. - SIS Proof Test Query • `Public\Meridium\Modules\SIS Management\Proof Test Templates\Queries\` folder. - Proof Test Template Query • `Public\Meridium\Modules\SIS`	This step is required only if you have previously modified the queries. This step will be completed automatically when you upgrade the components in the basic APM system architecture.

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Step	Task	Notes

2	Update Asset Hierarchy parameter from -1 to #ahhome for the following catalog queries:
	
	For example,
	(? :ah :id=entity_key) = '-1'must be updated to (? :ah :id=entity_key) = (#:ahhome).
	
	• `Public\Meridium \Modules\SIS Management\Dashboard Queries` folder.
	
	  ◦ Overdue Hazards Analysis
	  ◦ SIL Distribution for Graph
	  ◦ SIS Proof Tests Failed
	  ◦ SIS Proof Tests Failed LS
	  ◦ SIS Proof Tests Passed
	  ◦ SIS ProofTests Passed LS
	
	• `Public\Meridium \Modules\SIS Management\Queries` folder.
	
	  ◦ All SIL Analyses Tasks Base Query
	  ◦ SIL_ANALYSIS_ASSET_OVER VIEW
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes

3	Following queries have been modified to improve the performance. Revert these queries to Baseline to see the improved performance.
	
	• `Public\Meridium`
	`\Modules\SIS`
	`Management\Queries`
	folder.
	
	    ◦ All SIL Analyses Tasks Base Query
	    ◦ SIL_ANALYSIS_ASSET_OVER VIEW
	
	• `Public\Meridium`
	`\Modules\SIS`
	`Management\Queries`
	`\Dashboard Queries`
	folder.
	
	    ◦ SIL Distribution for Graph
	    ◦ SIS Proof Tests Failed
	    ◦ SIS Proof Tests Failed LS
	    ◦ SIS Proof Tests Passed
	    ◦ SIS Proof Tests Passed LS
		This step is required only if you have previously modified the queries.

Update the Query Parameter Type

About This Task

After the database for APM is upgraded, if the entity key fields are of the type string, you must modify the catalog query parameters to use the correct type by performing the following steps:

Procedure

1. Access the **Query** page.
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to :k.

   For example, (? :n) must be updated to (? :k).
6. Select **Save**.
   The modified query is saved.

Revert the SIS Management Queries to Baseline

This action is required only if you have modified the SIS Management queries.

About This Task

If you have modified the SIS Management queries, perform the following steps to revert the query to baseline.

Procedure

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert.

   For SIS Management, the public queries are stored in the following folder:

   `Public\Meridium\Modules\SIS Management`

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, prompting you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the Baseline folder for queries.

   For SIS Management, the baseline queries are stored in the following folder:

   `Baseline/Meridium/Modules/SIS Management`

6. Select the check box next to the query that you want to revert, and then select 📄.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.
9. Repeat Steps 2-8 for each query that you want to revert to baseline.

Thickness Monitoring Upgrade

Upgrade or Update Thickness Monitoring to V5.0.7.0.0

Upgrading or updating to the V5.0.7.0.0 is a two-step process. You need to first upgrade to APM V4.6.2.0.0 or later and then follow the steps to upgrade or update to V5.0.7.0.0.

The following table provides you the reference to procedures to upgrade from an earlier APM version to the latest version.

Upgrade from	Upgrade to	Procedure
V5.0.0.0.0 through V5.0.6.0.0	V5.0.7.0.0	Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0 on page 221
V4.6.2.0.0 through V4.6.11.0.0	V5.0.7.0.0	Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0 on page 221

Upgrade from any version V5.0.0.0.0 through V5.0.6.0.0

This module will be upgraded to V5.0.7.0.0 automatically when you upgrade the components in the basic APM system architecture. No additional steps are required.

Upgrade from any version V4.6.2.0.0 through V4.6.11.0.0

The following tables outline the steps that you must complete to upgrade this module to V5.0.7.0.0. These instructions assume that you have completed the steps for upgrading the basic APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Step	Task	Notes
1	Uninstall the previous version of the Meridium Device Service on all of the machines that will connect to devices that will be used with Thickness Monitoring.	This step is required only if you will use any device to collect data that you transfer to Thickness Monitoring.
2	Install the Meridium Device Service on all of the machines that will connect to devices that will be used with Thickness Monitoring.	This step is required only if you will use any device to collect data that you transfer to Thickness Monitoring. If you are using HTTPS to connect to APM, follow the instructions in HOW TO: V4 Thickness Monitoring - Devices - Dataloggers and Secure HTTPS Browsers on Windows Machines.

Step	Task	Notes
3	If you have previously modified the following Pipe Properties records, follow the steps mentioned in KBA 000035691 to get the updated values for the records.	This step is optional.

Schedule	Nominal Diameter - NPS	Nominal Diameter - DN	Outside Diameter	Nominal Wall Thickness (Old)	Internal Diameter (Old)	Nominal Wall Thickness (New)	Internal Diameter (New)
30	2.5	65	2.875 (Inches)	0.125 (Inches)	2.625 (Inches)	0.1888 (Inches)	2.4999 (Inches)
40	36	900	36 (Inches)	0.688 (Inches)	34.624 (Inches)	0.75 (Inches)	34.5 (Inches)

Step	Task	Notes

4	Update entity key parameters from :n to :k for the following catalog queries:
	
	• `Public/Meridium/ Modules/Thickness Monitoring/Queries` folder.
	
	   ◦ TML Groups for an Asset
	   ◦ TMLs for an Asset
	   ◦ Datalogger TMLs
	   ◦ TM Assets
	   ◦ AvailableTMTasks
	   ◦ Inspection Tasks for MDE
	   ◦ Measurement Input Reference
	
	• `Public/Meridium/ Modules/Thickness Monitoring/Piping Rotation/Queries` folder.
	
	   ◦ Measurement Input Reference for Piping Asset
	   ◦ Rotation Revisions by Rotation Event and Band
	   ◦ Datalogger TMLs - Piping Asset
	   ◦ Piping Components with Number of Positions
	   ◦ Rotation History for Component
	   ◦ Rotation What-Ifs for Component
	
	• `Public/Meridium/ Modules/Mechanical Integrity/Report Queries` folder.
	
	   ◦ MI Thickness Monitoring Summary Query
		This step is required only if you have previously modified the queries.
		
		This step will be completed automatically when you upgrade the components in the basic APM system architecture.

Step	Task	Notes
5	Revert the following queries to baseline to remove the references to the MI_ENTITIES family that has been deprecated: • `Public/Meridium/ Modules/Thickness Monitoring/Queries` folder. ◦ Assets with TM Tasks ◦ Assets Near or Past Retirement ◦ Corrosion Distribution ◦ Excessive Corrosion ◦ Measurement Input Reference ◦ MI_TASKS_FOR_MDE ◦ Remaining Life Less than 180 Months ◦ Thickness Inspections ◦ TM Assets Requiring a Calculation ◦ TM Assets ◦ TML Groups for an Asset ◦ TMLs for an Asset	This step is required only if you have previously modified the queries. This step will be completed automatically when you upgrade the components in the basic APM system architecture.
6	Family keys stored in the TM Family Preferences are upgraded to store Family IDs.	This step will be completed automatically when you upgrade the components in the basic APM system architecture.
7	Configure Thickness Monitoring ActiveMQ Settings for MIExecution Service on page 227.	This step is optional. You can perform this step if you want to modify the default retries or concurrency settings.
8	Ensure that the Meridium MIExecution Service is installed and running.	If the basic APM system architecture is already installed, the Meridium MIExecution Service is automatically installed, and the service runs automatically.

Step	Task	Notes

9	Update the following query to add the system field mentioned.
	
	`Public/Meridium/`
	`Modules/Thickness`
	`Monitoring/Piping`
	`Rotation/Queries/`
	`Rotation History for`
	`Component`
	
	Column Name: CRT_DT (CRT_DT)
		Refer to KBA 000068267 for more details.

10	If you use the following query and want to use it in APM V5.0.7.0.0, you must export the query and import it into APM V5.0.7.0.0.
	
	`Public/Meridium/`
	`Modules/Thickness`
	`Monitoring/Queries/`
	`Measurements Near or`
	`Less than T-Min`
	
	Note: The query is no longer used in APM and has been removed.
		This step is optional.

11	Revert the following queries to baseline to fix the query compilation error:
	
	• Folder: `Public/Meridium/`
	`Modules/Thickness`
	`Monitoring/Queries`
	
	　◦ Thickness Inspections
	　◦ TM Assets
	　◦ TM Assets Requiring a Calculation
		This step is required only if you have previously modified the queries.

Install the Meridium Device Service

About This Task

Important: You must repeat this procedure on every machine to which a datalogger will be connected.

Note: If you are using Cloud APM or the URL is secured (https), follow the instructions in KBA 000055071 to install the Meridium Device Service.

Procedure

1. Access the **TM Dataloggers** page.
2. In the **Select TMLs** pane, select the check box next to a TML, and then select **Apply**.
3. Select **Send To Device**.

Note: A datalogger does not need to be connected.

The **Meridium Device Service Not Found** window appears.

4. Select the **Download** link.
   MeridiumDevices.exe is downloaded.
5. Run **MeridiumDevices.exe**, and then follow the instructions in the installer.
   The Meridium Device Service is installed.
6. In the **Meridium Device Service Not Found** window, select **Continue**.
   Dataloggers can now be used with Thickness Monitoring.

Update the Query Parameter Type

After the database upgrade for APM, if the entity key fields are of the type string, you must modify the catalog query parameters to use the correct type by performing the following steps.

Procedure

1. Access the **Query** page.
2. Select **Browse**.
   The **Select a query from the catalog** window appears.
3. Navigate to the folder containing the query that you want to update, and select the link for the query.
   The **Results** workspace appears.
4. Select the **SQL** tab.
   The **SQL** workspace appears, where you can modify the SQL code.
5. Modify all the entity key numeric parameters to key.

   For example, (? :n) must be updated to (? :k).
6. Select **Save**.
   The modified query is saved.

Revert the Thickness Monitoring Queries to Baseline

This action is required only if you have modified the Thickness Monitoring queries.

About This Task
If you have modified the following Thickness Monitoring queries, perform the following steps to revert the queries to baseline:

- Assets Near or Past Retirement
- Assets with TM Tasks
- Corrosion Distribution
- Excessive Corrosion
- Remaining Life Less than 180 Months
- Thickness Inspections
- TM Assets
- TM Assets Requiring a Calculation

Procedure

1. Access the Catalog page.
2. Navigate to the Public folder for the query that you want to revert.

   For Thickness Monitoring, the public queries are stored in the following folder:

```
Public/Meridium/Modules/Thickness Monitoring/Queries
```

3. Select the check box next to the query that you want to revert, and then select 🗑.
   The **Confirm Delete** window appears, asking you to confirm if you want to delete the selected query.
4. Select **OK**.
   The selected query is deleted.
5. Navigate to the Baseline folder for queries.

   For Thickness Monitoring, the baseline queries are stored in the following folder:
   ```
   Baseline/Meridium/Modules/Thickness Monitoring/Queries
   ```

6. Select the check box next to the query that you want to revert, and then select 📄.
   The **Catalog Folder Browser** window appears.
7. Navigate to the folder containing the public query that you deleted in step 3.
8. Select **OK**.
   A success message appears indicating that the selected item has been copied successfully.
9. Repeat Steps 2-8 for each query that you want to revert to baseline.

Configure Thickness Monitoring ActiveMQ Settings for MIExecution Service

The MIExecution Service,on each APM Server serves RBI, Inspection and Thickness Monitoring module queues. This service is configured to use a single shared ActiveMQ queue service across APM. Available queue configuration options include retries and concurrency limit.

Procedure

1. On the APM Server, access the folder that contains the MIExecution Service files.

   Note: If you have installed APM in the default location, you can locate the folder in `C:\Program Files\Meridium\ApplicationServer\mi-execution`

2. Access the `appsettings.json` file in an application that can be used to modify JSON files (for example, Notepad++).
3. In the file, locate the following text:

```
"Queue_Config": {
        "Queues": [
          {
            "Name": "MI_TM_Queue",
            "ConcurrencyLimit": 100,
            "Retries": 5,
                "LimitPerTenantRequired": true
          }
        ]
            }
```

   Note: `ConcurrencyLimit` indicates the maximum number of messages that will be consumed concurrently. `Retries` indicates the number of times it retries to send the messages to ActiveMQ if it fails. `LimitPerTenantRequired` indicates whether Maximum Concurrency limit per Tenant is specified in scheduler service for the queue.
4. Update the key values as desired.
5. Save and close the file.

The updated settings will be applied when the MIExecution Service is stopped and restarted.