GE Digital

GE Digital APM Installation

V4.3.0.4.0

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V4.3.0.4.0

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About This Document

This file is provided so that you can easily print this section of the GE Digital APM Help system.

You should, however, use the Help system instead of a printed document. This is because the Help system provides hyperlinks that will assist you in easily locating the related instructions that you need. Such links are not available in a print document format.

The GE Digital APM Help system can be accessed within GE Digital APM itself or via the GE Digital APM Documentation Website (https://www.meridium.com/secure/documentation/WebHelp/Home.htm).

Note: If you do not have access to the GE Digital APM Documentation Website, contact GE Global Support (https://www.ge.com/digital/asset-performance-management).

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Deploy GE Digital APM

The checklists in this section of the documentation contain all the steps necessary for deploying and configuring GE Digital APM whether you are deploying the product for the first time or upgrading from a previous version.

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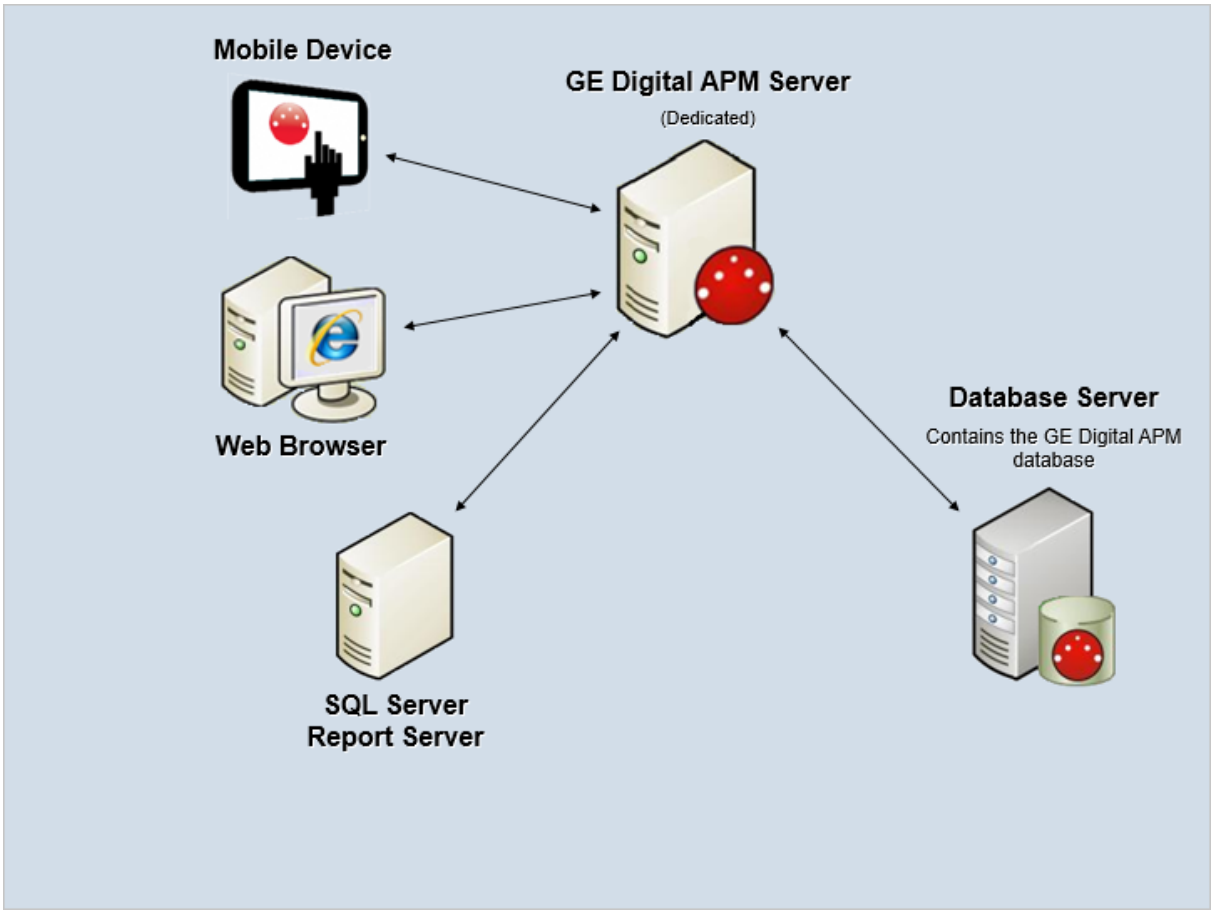
The Basic GE Digital APM System Architecture

In its most basic implementation, the GE Digital APM system consists of the machines shown in the following image.



The following are critical elements of the GE Digital APM system.

The GE Digital APM Server

A computer on which the GE Digital APM Server software is installed. The GE Digital APM Server machine contains Internet Information Services (IIS), which serves as the host for communication between the various systems. The GE Digital APM Server:

- Contains and executes the GE Digital APM business objects implemented using the .NET transaction management framework.
- Receives requests from a client, processes those requests, connects to the database to retrieve information, and returns that information to the client.
- Executes and enforces the business logic and business rules.
- Processes data.
- Performs calculations.

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Your GE Digital APM system could include multiple GE Digital APM Server instances.

- GE Digital APM Server machines that will receive and process requests from users are referred to as *dedicated* GE Digital APM Servers. You can have one or more dedicated APM Servers in your implementation. The number of dedicated APM Servers that you need will depend upon the number of users you have.
- GE Digital APM Server instances that exist to support other GE Digital APM components are referred to as *supporting* GE Digital APM Servers. We recommend that you install a supporting instance of the GE Digital APM Server on every GE Digital APM Server machine.

Consult the documentation on Redis for information about its incorporation into server configurations.

GE Digital APM Database Server

The computer on which the database software (Oracle or SQL Server) and the physical GE Digital APM databases or schemas reside. Your Database Server may contain multiple GE Digital APM databases or schemas (e.g., a test database and a production database). The GE Digital APM Database Server answers requests for data from GE Digital APM Servers. The GE Digital APM database or schema contains the metadata (information about Entity families, fields, System Codes, etc.) and the tables containing actual data. The GE Digital APM system allows for a single, central database. This approach enables cross-site and cumulative analyses.

SQL Server Report Server

The computer on which the SQL Server Reporting Services is installed. The SQL Server Report Server stores SQL Server reports. Reports can be developed via GE Digital APM, and when they are saved to the GE Digital APM Catalog, they will be simultaneously uploaded to the SQL Server Report Server. After they exist on the SQL Server Report Server, they can be easily viewed by other GE Digital APM users.

In addition to the custom reports that can be created using SQL Server Reporting Services, the GE Digital APM database contains baseline SQL Server Reporting Services reports.

Note that, while the SQL Server Report Server is part of the basic GE Digital APM architecture, it is not considered a *GE Digital APM Server*. Therefore, you are not required to install a supporting instance of the GE Digital APM Server on the SQL Server Report Server machine. You will, however, need to install the GE Digital APM Adapter for SSRS on this machine.

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How the Operating System is Configured in the GE Digital APM Testing Environment

This topic provides a list of all topics describing how the operating system is configured in the GE Digital APM testing environment.

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GE Digital APM Server Roles and Features

The following server roles and features are installed on all instances of the GE Digital APM Server in the GE Digital APM test environment.

ⓘ **Tip:** Roles and features can be added via the Add Roles and Features Wizard on a Windows Server machine. To add roles and features, in Server Manager, on the **Manage** menu, select **Add Roles and Features** to open the wizard. Select role-based or feature based installation, select the GE Digital APM Server from the server pool, and then continue through the wizard.

In the **Server Roles** section:

- Application Server
- Web Server (IIS), and all features

In the **Features** section:

- .NET Framework 4.5 Features
  - .NET Framework 4.5
  - WCF Services
    - TCP Port Sharing
- Message Queuing
  - Message Queuing Services
- SMTP Server, and all features
- Windows Process Activation Service
  - Process Model
  - Configuration APIs

In the **Role Services** section for the **Application Server**:

- .NET Framework 4.5
- COM+ Network Access
- Distributed Transactions (clear the **WS-Atomic** check box)
  - Incoming Network Transactions
  - Outgoing Network Transactions
- TCP Port Sharing
- Web Server (IIS) Support, and all features
- Windows Process Activation Service Support
  - HTTP Activation, and all features
  - Message Queuing Activation, and all features
  - Named Pipes Activation, and all features
  - TCP Activation, and all features

In the **Role Services** section for the **Web Server Role (IIS)**:

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- Web Server
  - Common HTTP Features (clear the **WebDAV Publishing** check box)
    - Default Document
    - Directory Browsing
    - HTTP Errors
    - Static Content
    - HTTP Redirection
  - Health and Diagnostics (clear the **Custom Logging** check box)
    - HTTP Logging
    - Logging Tools
    - ODBC Logging
    - Request Monitor
    - Tracing
  - Performance
    - Static Content Compression
    - Dynamic Content Compression
  - Security (clear the **Centralized SSL Certificate Support** check box)
    - Request Filtering
    - Basic Authentication
    - Client Certificate Mapping Authentication
    - Digest Authentication
    - IIS Client Certificate Mapping Authentication
    - IP and Domain Restrictions
    - URL Authorization
    - Windows Authentication
  - Application Development (clear the **.NET Extensibility 3.5**, **ASP .NET 3.5**, **CGI**, and **Server Side Includes** check boxes)
    - .NET Extensibility 4.5
    - Application Initialization
    - ASP
    - ASP.NET 4.5
    - ISAPI Extensions
    - ISAPI Filters
    - WebSocket Protocol

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- Management Tools
  - IIS Management Console
  - IIS 6 Management Compatibility
    - IIS 6 Metabase Compatibility
    - IIS 6 Management Console
    - IIS 6 Scripting Tools, and all features
    - IIS 6 WMI Compatibility
  - IIS Management Scripts and Tools
  - Management Service

What's Next?

- Set the Local DTC Property Settings

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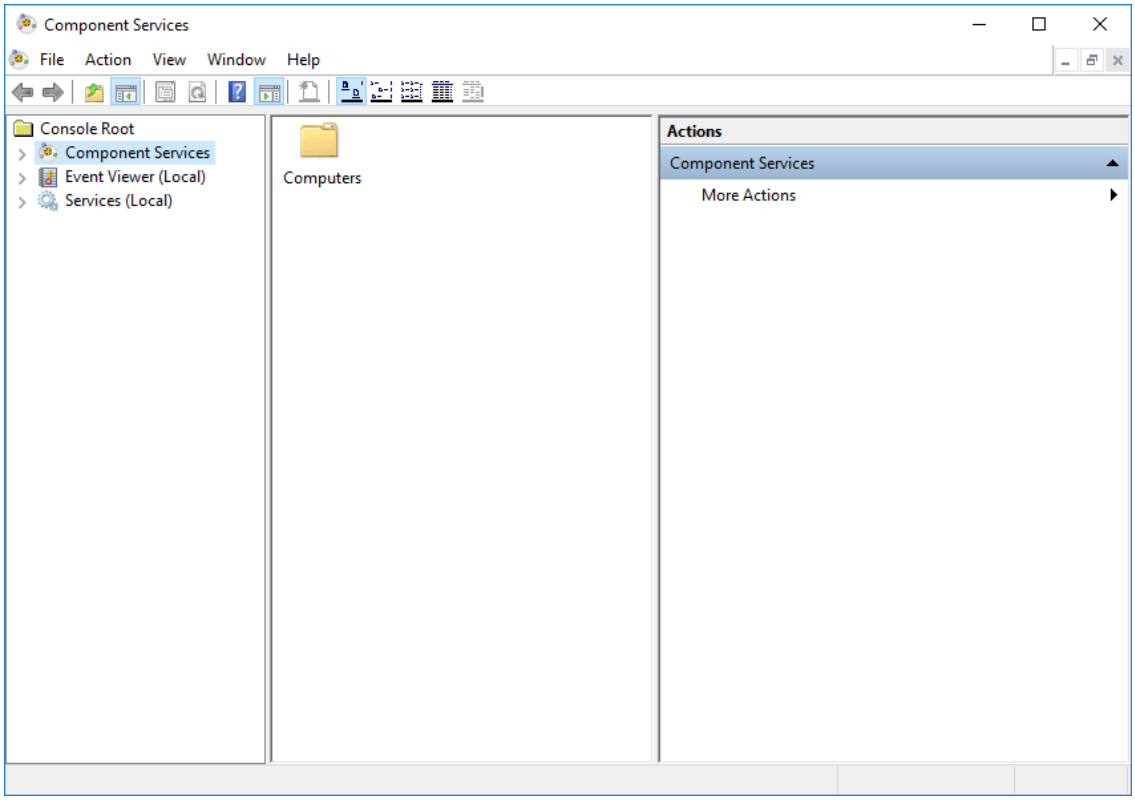
Set the Local DTC Property Settings

Note: The following settings apply to all GE Digital APM Server instances (both dedicated and supporting), regardless of whether they point to an Oracle or SQL Server Database Server machine.

Steps

1. On the machine that will contain the GE Digital APM Server instance, in the Server Manager, on the **Tools** menu, select **Component Services**.

   The **Component Services** window appears.



2. On the left side of the window, expand the **Component Services** node, then expand the **Computers** node, and then expand the **My Computer** node.

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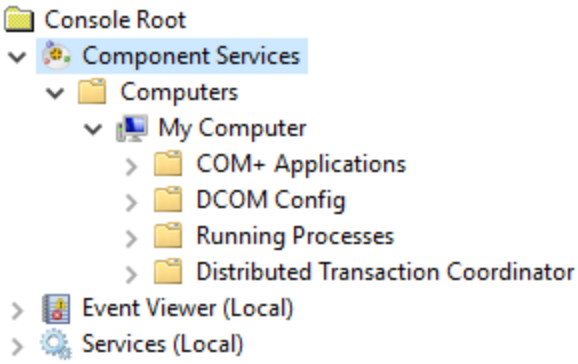
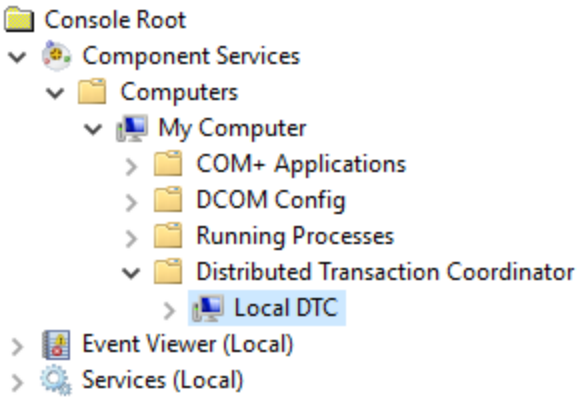


3. Expand the **Distributed Transaction Coordinator** node, and then select the **Local DTC** node.



4. In the window's toolbar, select (the Properties button).

   Tip: Alternatively, you can right-click the **Local DTC** node, and then select **Properties**.

   The **Local DTC Properties** window appears, displaying the **Tracing** section.

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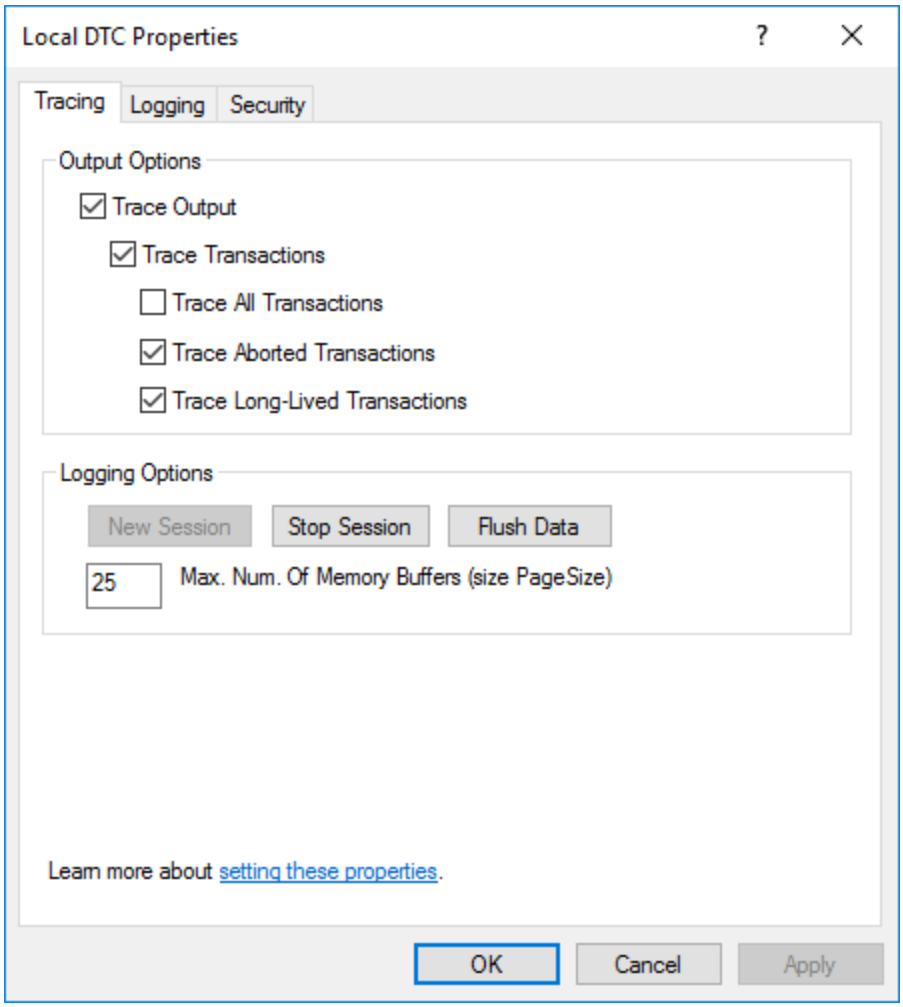

5. Select the **Security** tab.

   The **Security** section appears.

6. In the **Security Settings** subsection:
   a. Select the **Network DTC Access** check box, and *clear* the following check boxes:
      - **Allow Remote Clients**
      - **Allow Remote Administration**
   b. In the **Transaction Manager Communication** section, select the following options:
      - **Allow Inbound**
      - **Allow Outbound**
      - **Incoming Caller Authentication Required**

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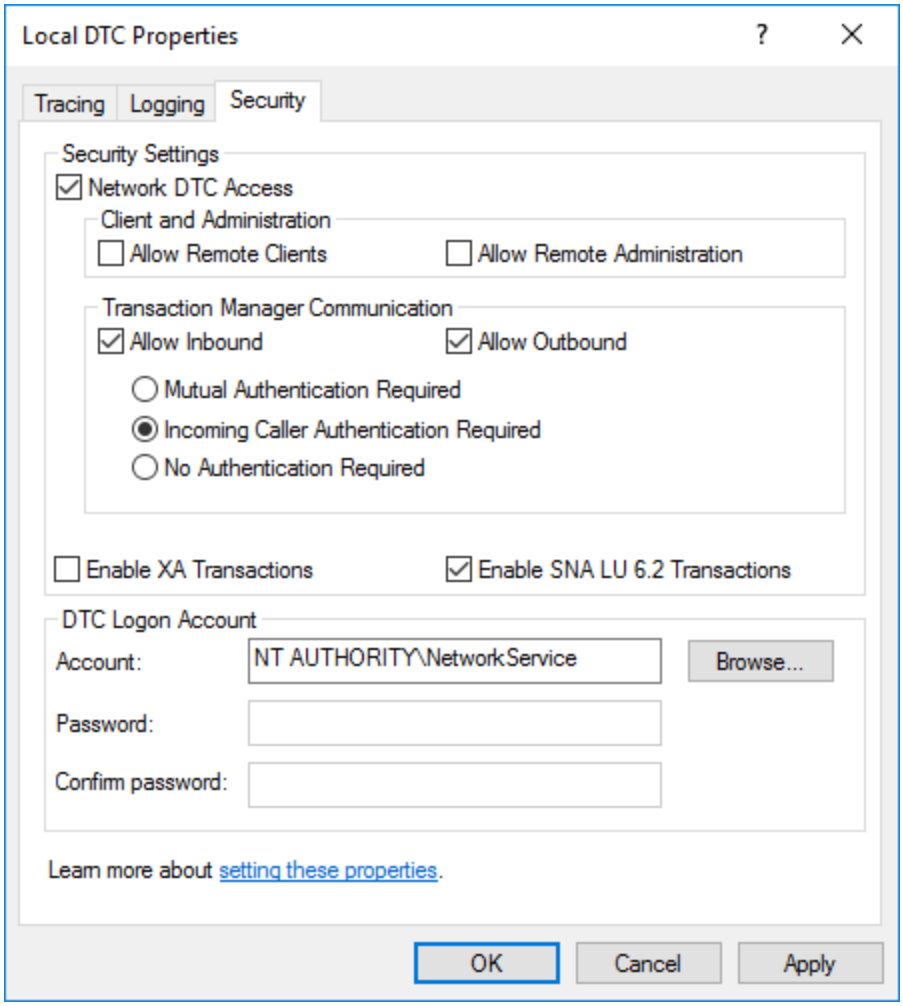
The Security Setting subsection should now display the selected settings seen in the following image.



7. Select **Apply**.

   A message appears, asking if you want to proceed.

8. Select **Yes**.

   A message appears, indicating that the MSDTC service was restarted.

9. Select **OK**, and then, on the **Local DTC Properties** window, select **OK**.

   The **Local DTC Properties** window closes, and your settings are saved.

What's Next?

- Install the GE Digital APM Server Software and Add-ons

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About the Operating System in the GE Digital APM Test Environment

The GE Digital APM test environment uses the 64-bit version of Windows Server 2012 R2 for all instances of the GE Digital APM Server (both dedicated and supporting). The operating system is not distributed by GE Digital and must be obtained from another vendor. Providing instructions on installing the operating system exceeds the scope of this documentation, but this documentation does provide guidelines on how the operating system in the GE Digital APM test environment is configured. We recommend that you configure your system to match the configuration used in the GE Digital APM test environment.

To configure your system to match the GE Digital APM test environment, on the machine that will server as the GE Digital APM Server machine, configure GE Digital APM Server roles and features and set the local DTC property settings. Note that, if installed, WebDAV must be disabled prior to installing the GE Digital APM Server and Add-ons software.

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GE Digital APM First-Time Installation Steps

This topic provides a list of all procedures related to first-time installation steps for GE Digital APM.

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Deploy GE Digital APM for the First Time

The following table outlines the steps that you must complete to deploy and configure GE Digital APM for the first time. After you have completed these steps, you will need to perform additional steps to configure the modules that you have purchased.

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. All steps are required unless otherwise noted.

Step	Task	Notes
1	Ensure that your system meets the hardware and software requirements for the basic GE Digital APM system architecture.	This step is required.
2	Review how the operating systems are configured in the GE Digital APM testing environment. To configure your system to match the GE Digital APM testing environment, on the machine that will serve as the GE Digital APM Server, you need to: • Configure GE Digital APM Server roles and features -and- • Set the local DTC property settings	This step is required. It is recommended that you configure your system to match the configuration used in the GE Digital APM testing environment.

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Step	Task	Notes
3	On the server machine on which you will install Elastic Search, download and install Java V1.8.0_73 or higher, then set an environment variable, for the system, for JAVA_HOME-E=C:\Program Files\Java\jdk1.8.0_73, and then, echo %JAVA_HOME% to verify. **Notes:** • The JAVA HOME variable should match the Java version that you installed, and its installation location. • For additional information regarding Java support for Elastic Search, consult the official Elastic Search documentation.	This step is required. Ensure that you complete this step on the machine on which you will install Elastic Search. **Note:** For optimum system performance, GE Digital recommends that you install Elastic Search on its own, dedicated server that contains no GE Digital APM components. -or- You can install Elastic Search on the GE Digital APM Server at the same time that you install the GE Digital APM Server Software and Add-ons software. If you utilize this deployment, to improve system per-

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Step	Task	Notes
		formance, GE Digital recommends that the server machine have a minimum of 24 GB RAM. ⚠ **IMPORTANT:** Any time you upgrade Java to a new version, you will need to reset this environmental variable.
4	Install the GE Digital APM Server and Add-ons software on each machine that will serve as a GE Digital APM Server.	This step is required. Consult the documentation on Redis for information about its incorporation into server configurations.
5	If you did not install Elastic Search on the GE Digital APM Server in the previous step, install Elastic Search on a dedicated server.	This step is required only if you did not install Elastic Search on the GE Digital APM Server. You must install Elastic Search on a server in your environment.

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Step	Task	Notes
6	Deploy the GE Digital APM Database Server, which includes creating and configuring your GE Digital APM database.	This step is required.
7	Deploy the GE Digital APM SQL Server Report Server.	This step is required.
8	Create Security User records for the individuals who will need to log in to GE Digital APM applications.	This step is required.
9	Activate licensed modules and products.	This step is required.
10	If you want to use non-English translations in GE Digital APM, deploy translations.	This step is required only if you want to deploy translations.
11	As needed, configure one of the virtual machine to execute all the scheduled jobs.	This step is required only if you have deployed the GE Digital APM in a clustered environment and you want to dedicate a virtual machine to run all the scheduled jobs.
12	As needed, deploy the GE Digital APM mobile application on mobile devices.	This step is required only if you are deploying the GE Digital APM mobile application on mobile devices.
13	As needed, enable Same Sign-On for on-site or off-site authentication.	This step is required only if you are enabling Same Sign-On.

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GE Digital APM Server First-Time Installation Steps

This topic provides a list of all procedures related to first-time installation steps for a GE Digital APM Server, as well as links to the related concept and reference topics.

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Install the GE Digital APM Server Software and Add-ons

The following instructions provide details on installing the GE Digital APM Server and Add-ons software on the GE Digital APM Server machine. The GE Digital APM Server machine is part of the basic GE Digital APM system architecture.

Before You Begin

These instructions assume that:

- Your system meets the hardware and software requirements for the GE Digital APM Server machine.

  Note: If your system does meet certain software requirements, a message may be displayed during the installation process that indicates the software requirement that is missing. Some software requirements, however, will be installed automatically if they are missing.

- You are an Administrator with full access to the machine that will serve as the GE Digital APM Server machine.

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

Note: If you want to run the GE Digital APM Server and Add-ons installer in silent mode from the command line, you must first ensure that Microsoft .NET Framework 4.5.2 is installed on the GE Digital APM Server machine. If it is not installed, an error will occur during installation. You can download this program from the official Microsoft website. If the GE Digital APM Server and Add-ons installer is run according to the procedure in this topic and Microsoft .NET Framework 4.5.2 has not yet been installed on the GE Digital APM Server machine, it will be installed automatically during the installation process.

⚠ **IMPORTANT:** Before installing the GE Digital APM Server and Add-ons software, via your IIS Manager, the WebDAV Publishing service needs to be 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.

Steps

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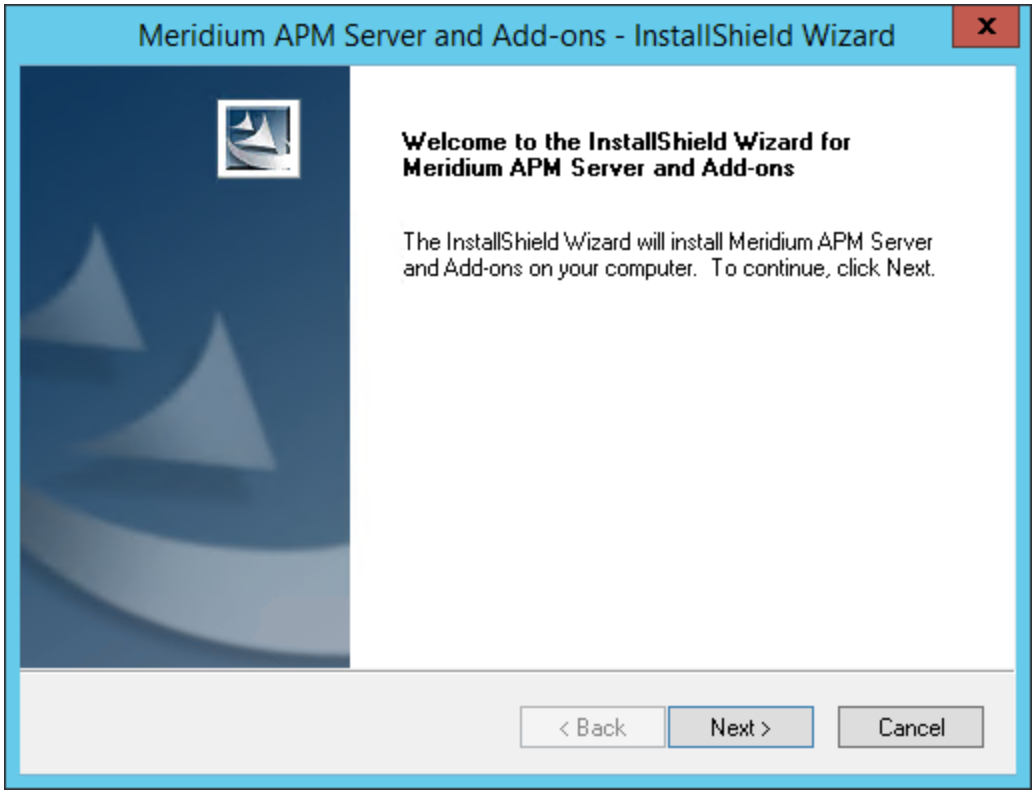
1. On the GE Digital APM Server machine, access the GE Digital APM distribution package, and then navigate to the folder **Setup\Meridium APM Server and Add-ons**.
2. Open the file **setup.exe**.

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

   The Meridium APM Server and Add-ons installer appears.

   Note: If a list of required programs appears in the installer, select **Install**. The installer will install the programs, and then the server will restart.



4. On the welcome screen, select **Next**.

   The **License Agreement** screen appears.

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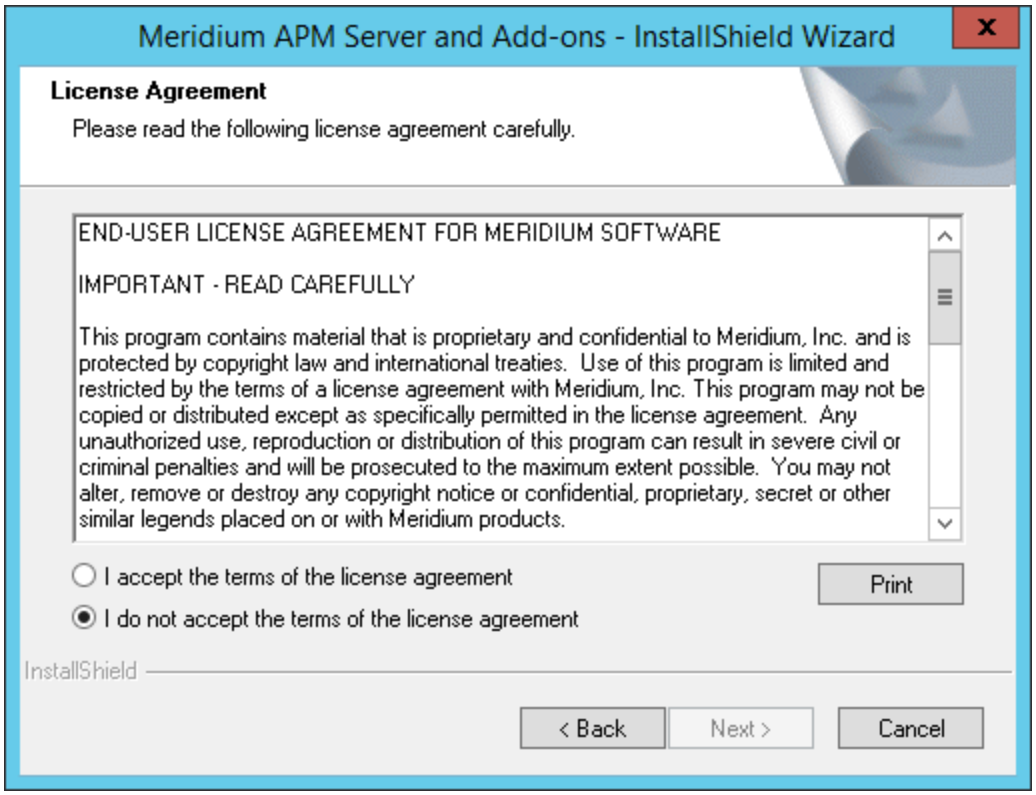

5. Read the License Agreement, and then, if you agree to the terms, select the **I accept the terms of the license agreement** check box. Then, select **Next**.

   The **Select Installation Location** screen appears.

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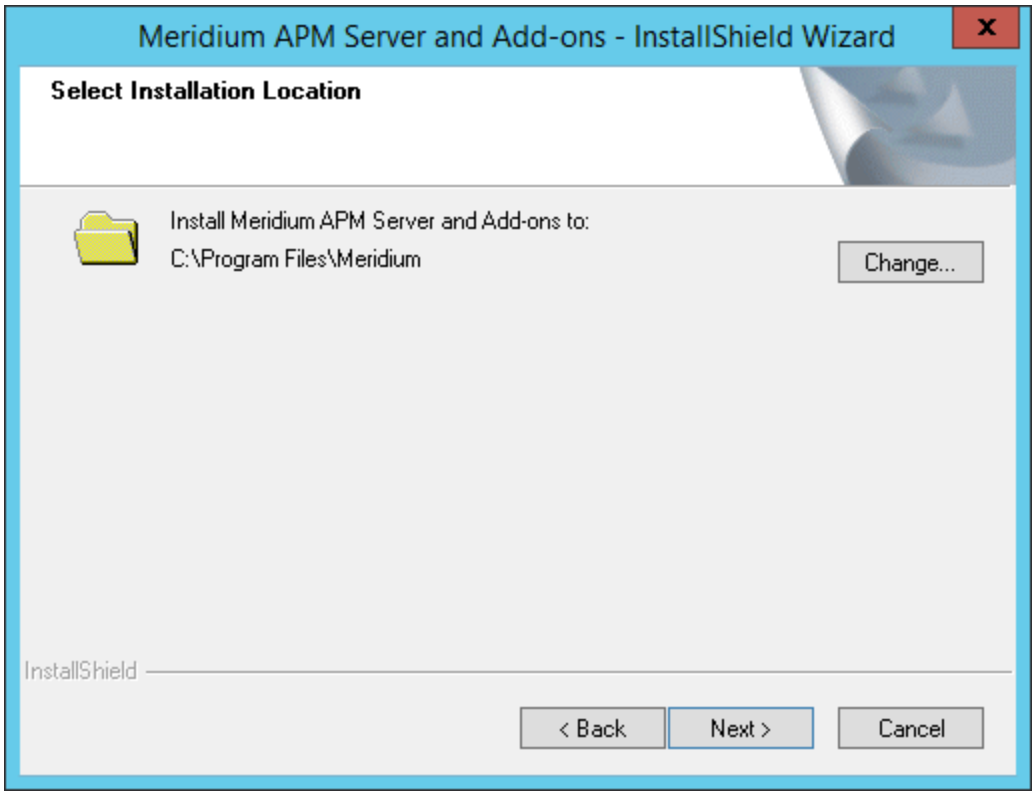

6. By default, the Meridium APM Server and Add-ons software will be saved to the following folder: **C:\Program Files\Meridium**. If you are satisfied with the default location where the software will be installed, select **Next**.

   -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 Meridium APM Server and Add-ons 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 **Select the features you want to install** screen appears.

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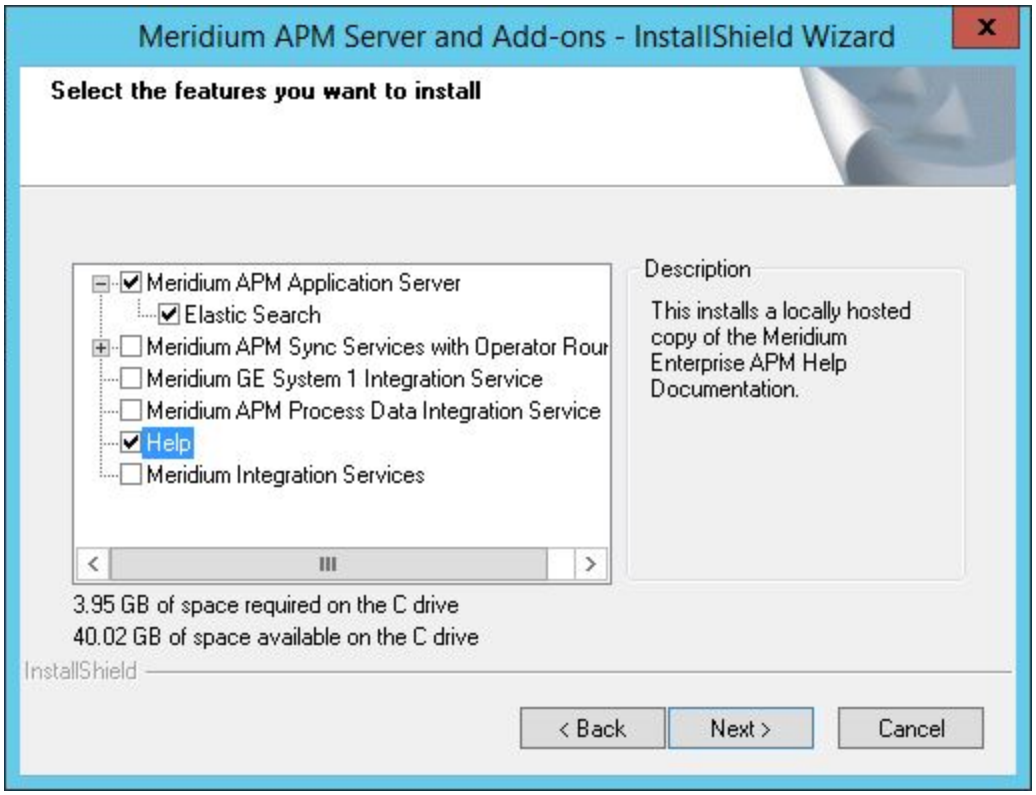

⚠**IMPORTANT:** The **Select the features you want to install** screen lets you specify which features you want to install on the GE Digital APM Server machine. These instructions assume that you want to deploy only the GE Digital APM Server software and help files.

Note: Deploying the help files will create a locally stored copy of the files on your GE Digital APM Server. By default, GE Digital APM is configured to point to these locally stored files when help is accessed, but the setting is configurable.

7. In the tree, select the **Meridium APM Application Server** and **Help** check boxes.
8. If you will install Elastic Search on its own, dedicated server, clear the **Elastic Search** check box, and then select **Next**.

   -or-

   To install Elastic Search on the GE Digital APM Server, ensure that the **Elastic Search** check box is selected, and then select **Next**.

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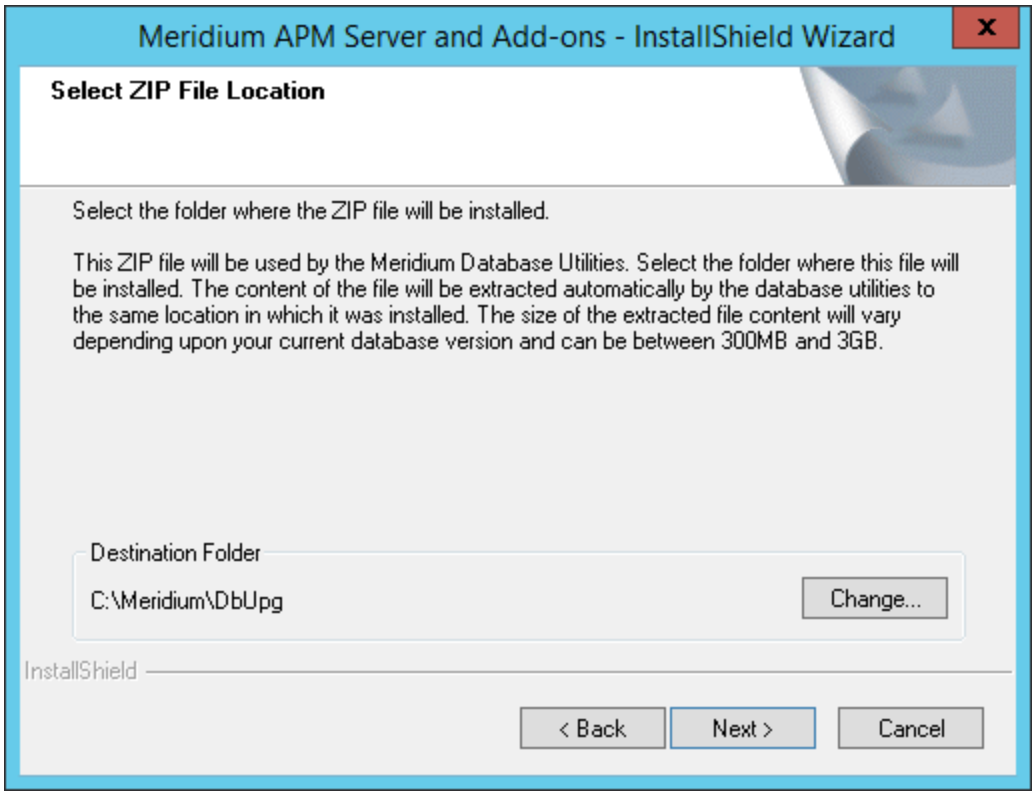
Note: You must install Elastic Search on a server in your environment.

For optimum system performance, GE Digital recommends that you install Elastic Search on its own, dedicated server that contains no GE Digital APM components. If you choose to deploy Elastic Search in this way, you should clear the **Elastic Search** check box in this step. If you utilize this deployment, you will install Elastic Search on a dedicated server in a subsequent procedure.

If you leave the **Elastic Search** check box selected in this step, Elastic Search will be installed on the GE Digital APM Server. If you utilize this deployment, to improve system performance, GE Digital recommends that the server machine have a minimum of 24 GB RAM.

The **Select ZIP File Location** screen appears.



9. On the **Select ZIP File Location** screen, change the default destination folder if needed, and then select **Next**.

   The **Websites** screen appears.

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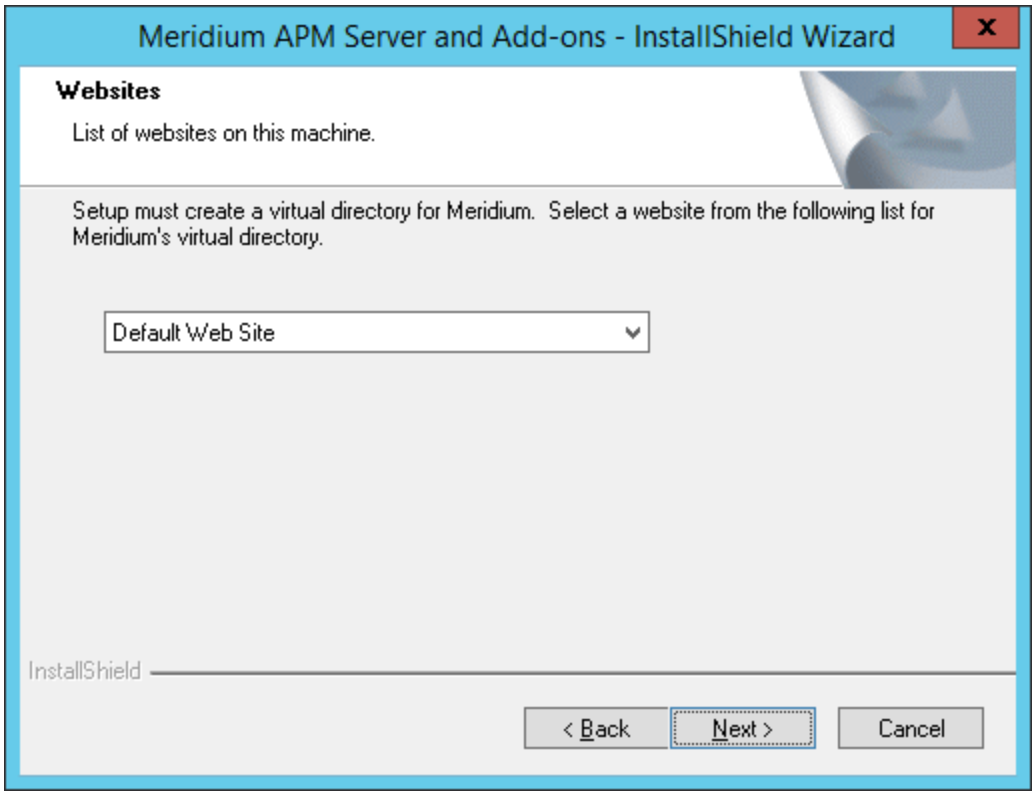

10. If necessary, change the website for Meridium's virtual directory, and then select **Next**.

    The **Select Location for ElasticSearch files** screen appears.

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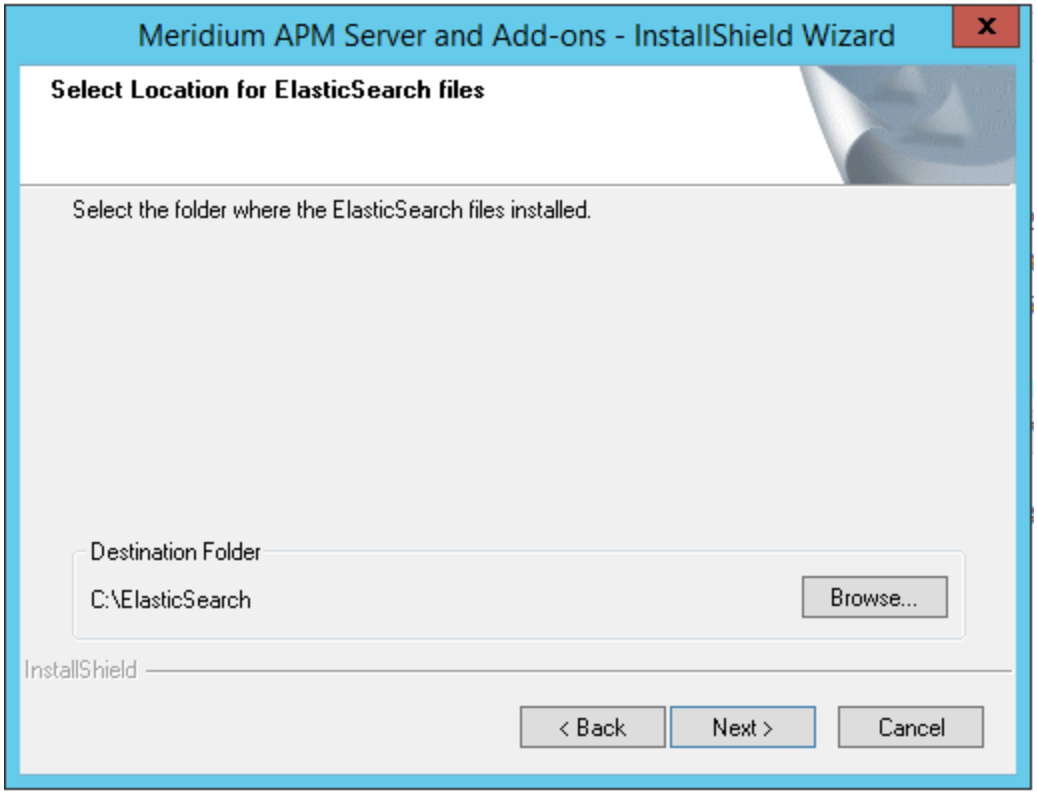

11. On the **Select Location for ElasticSearch files** screen, change the default destination folder if needed, and then select **Next**.

    The **Complete the Installation** screen appears.

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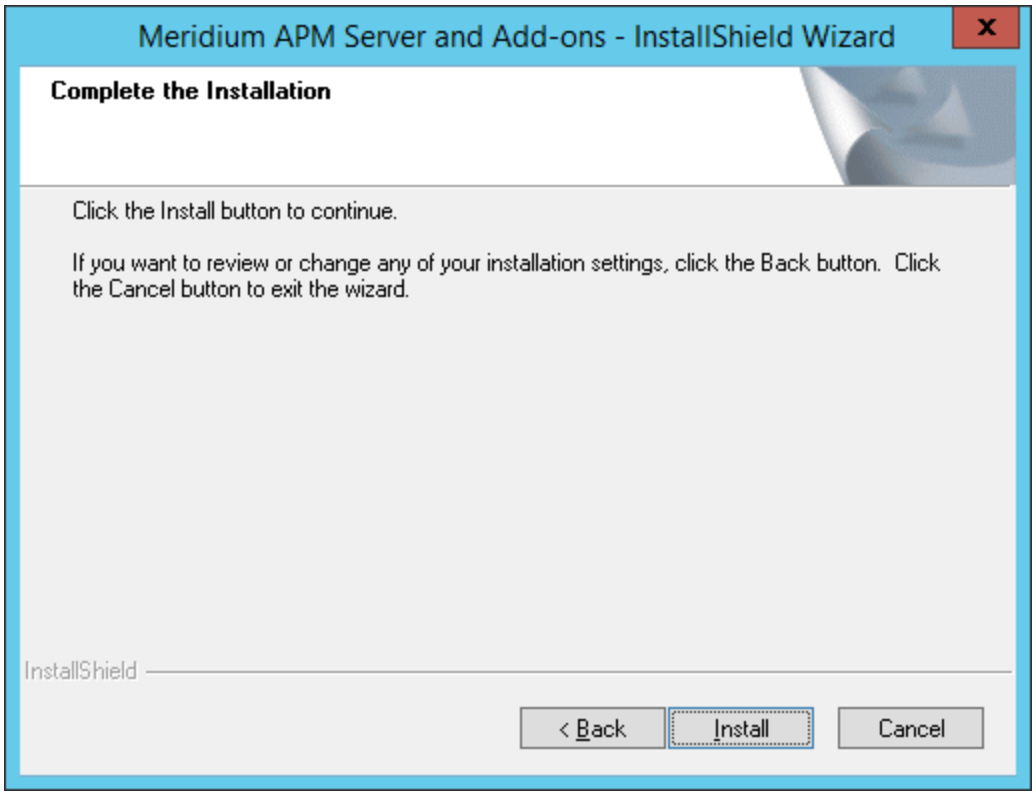

12. Select **Install**.

    The **Setup Status** screen appears, displaying a progress bar. When the installation is complete, the **Installation Complete** screen appears.

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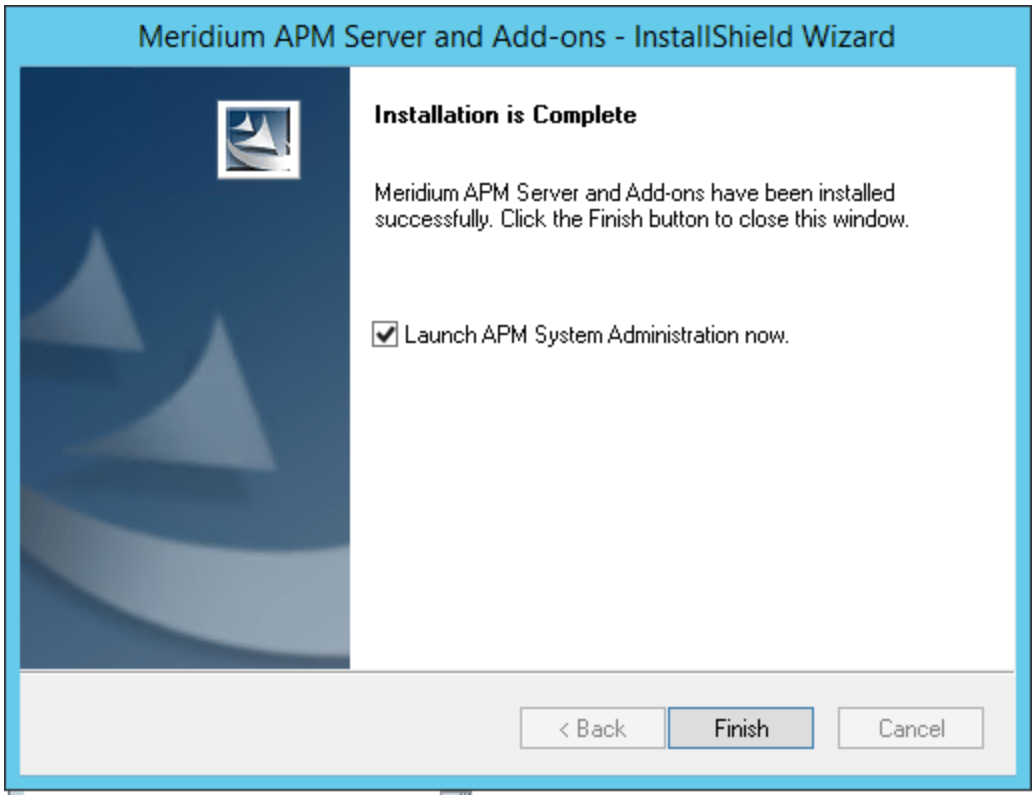

13. Clear the **Launch APM System Administration now** check box, and then select **Finish**.

> **Note:** If prompted to restart your computer, accept the selection **Yes, I want to restart my computer now**, and then select **Finish**.

The Meridium APM Server and Add-ons installer closes.

What's Next?

- The next step in the first-time deployment workflow is deploying the GE Digital APM Database Server.
- The next step in the upgrade workflow is upgrading the SQL Server Report Server.

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Install, Repair, or Uninstall GE Digital APM Server Components After the Initial Installation

If you need to install a GE Digital APM component on a machine *after* the initial installation is complete, you can run the GE Digital APM Server and Add-ons installer in *modify mode*, which will allow you to make changes to the current installation on that machine. Note that the same prerequisites are required when you run the installer in modify mode. You can also run the installer in *repair mode* to update installed components, or in *remove mode* to uninstall GE Digital APM components.

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

Steps

1. On the GE Digital APM Server machine, via the Control Panel, access the **Programs and Features** window.
2. In the grid, select the **Meridium APM Server and Add-on** item, and then select **Change**.

   The Meridium APM Server and Add-ons installer appears, displaying the **Preparing Setup** screen, which contains a progress bar. After completion, the **Welcome** screen appears.

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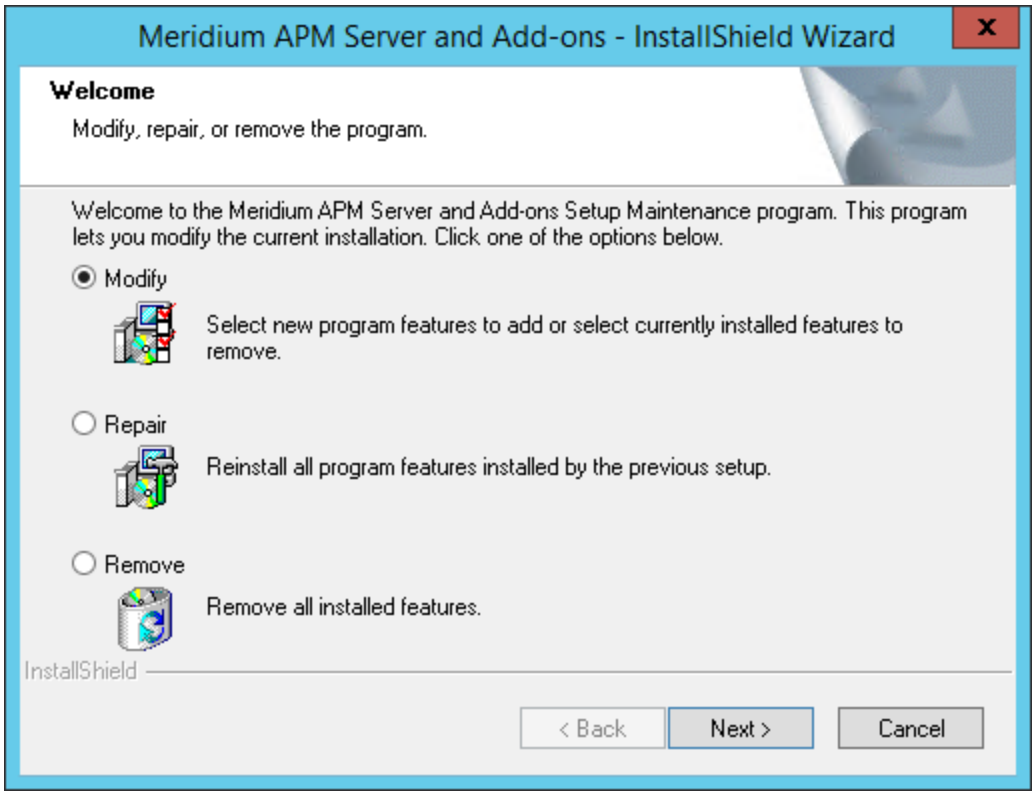

The **Welcome** screen contains the following options:

- **Modify:** Runs the installer in modify mode, which allows you to install additional components on the machine or uninstall specific components. This option is selected by default.
- **Repair:** Runs the installer in repair mode, which allows you to update the components that are installed on the machine.
- **Remove:** Runs the installer in remove mode, which uninstalls *all* the GE Digital APM components that are installed on the machine.

3. Select the necessary option, and then select **Next**.

   If you selected the **Modify** option, then the **Select the features you want to install** screen appears.

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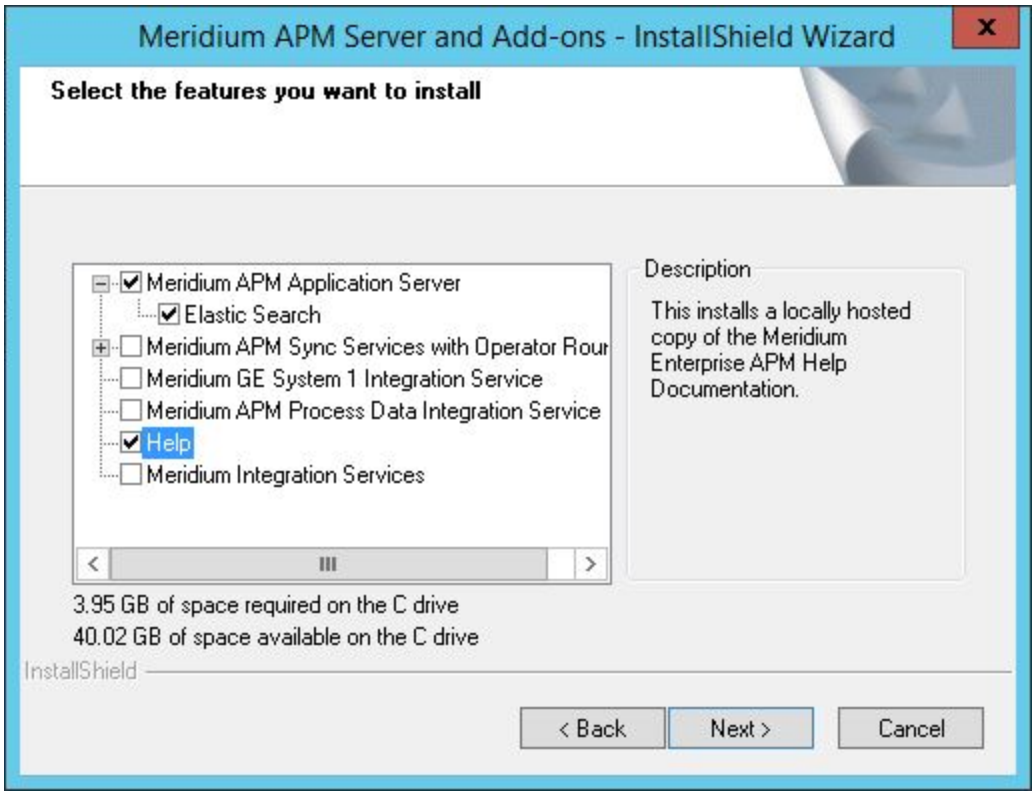

The components that are currently installed on the machine are selected in the tree. If you want to *remove* one or more of these components, you can clear the check box beside each component that you want to remove.

a. Select the check boxes beside the additional components that you want to install, and then select **Next**.

   A message appears, indicating that the installer is checking your machine for the required prerequisites for the features that you want to install.

   If one or more prerequisites are missing on the machine, the **Meridium Installer** screen will appear, displaying a message that indicates which prerequisites still need to be installed on the machine before you can install the feature that is dependent on those prerequisites. This message also indicates what you can do to continue. If you see this screen, you should read the message in detail, and either select **Back** to clear the selection whose prerequisites are missing, and then continue through the installation without installing that component, or close the installer, install the missing prerequisite, and then run the installer again later.

   If all the prerequisites for the selected components are installed on the machine, then the **Websites** screen appears.

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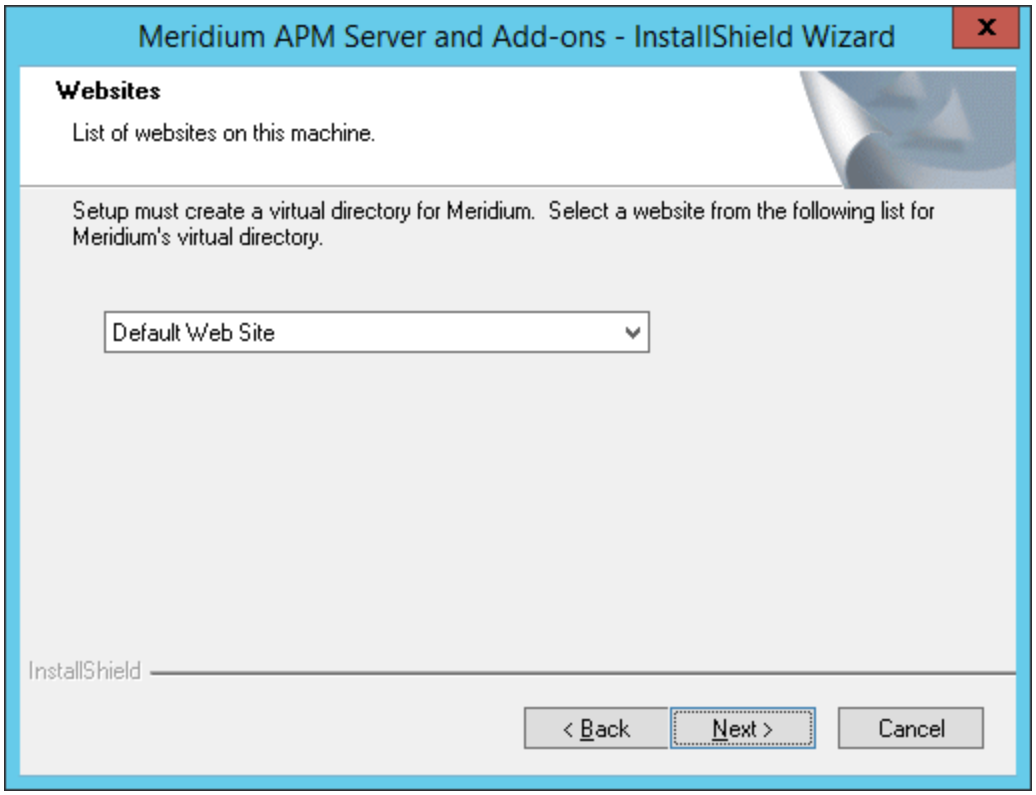

The **Websites** screen lets you specify where the installer will create a virtual directory for Meridium. This website is configured in the IIS Manager on the GE Digital APM Server machine. The websites list contains all the websites that are configured on the GE Digital APM Server machine. The default website is *Default Web Site*. Throughout this documentation, we assume that you have chosen to install GE Digital APM under the *Default Web Site*.

b. In the list of websites, select the website where you want the installer to create a virtual directory, and then select **Next**.

> **Note:** If you are installing Elastic Search, the **Select Location for ElasticSearch files** screen appears. If it does, select the location where you want to install the ElasticSearch files, and then select **Next**.

The **Setup Status** screen appears, displaying a progress bar. After the server is configured, the **Maintenance Complete** screen appears.

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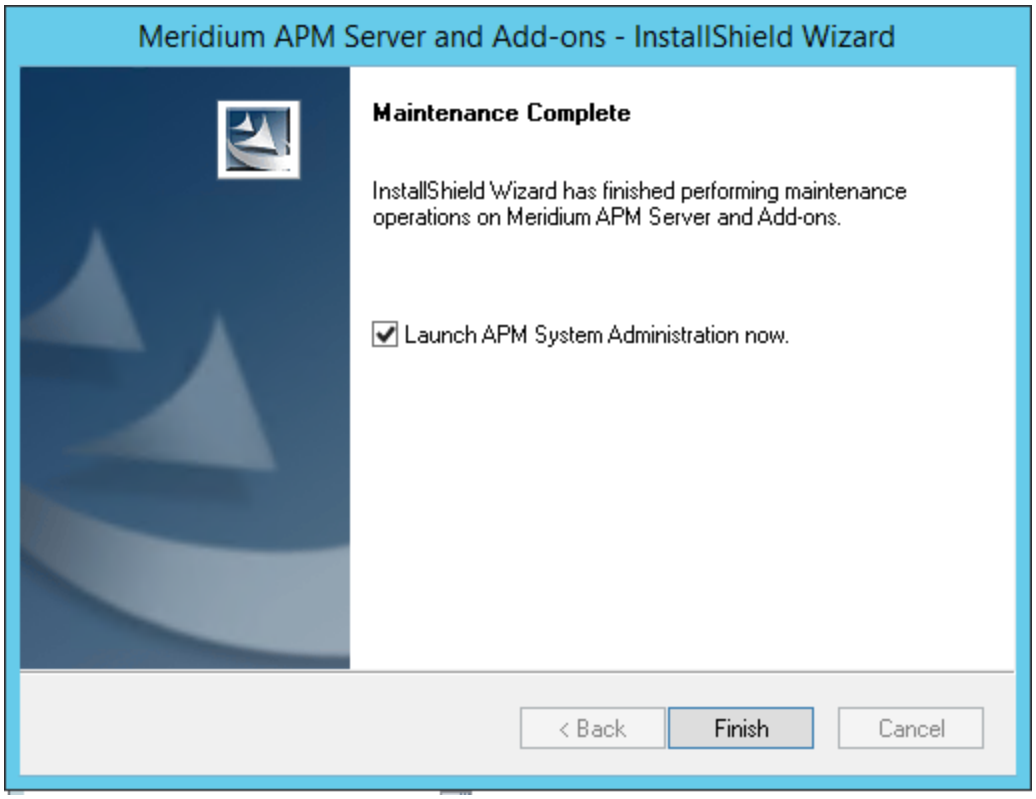

c. Select **Finish**.

   The Meridium APM Server and Add-ons installer closes. Additionally, if the **Launch APM System Administration now** check box was selected, the **APM System Administration** window appears.

-or-

If you selected the **Repair** option, the **Setup Status** screen appears, displaying a progress bar. After the server is configured, the **Maintenance Complete** screen appears.

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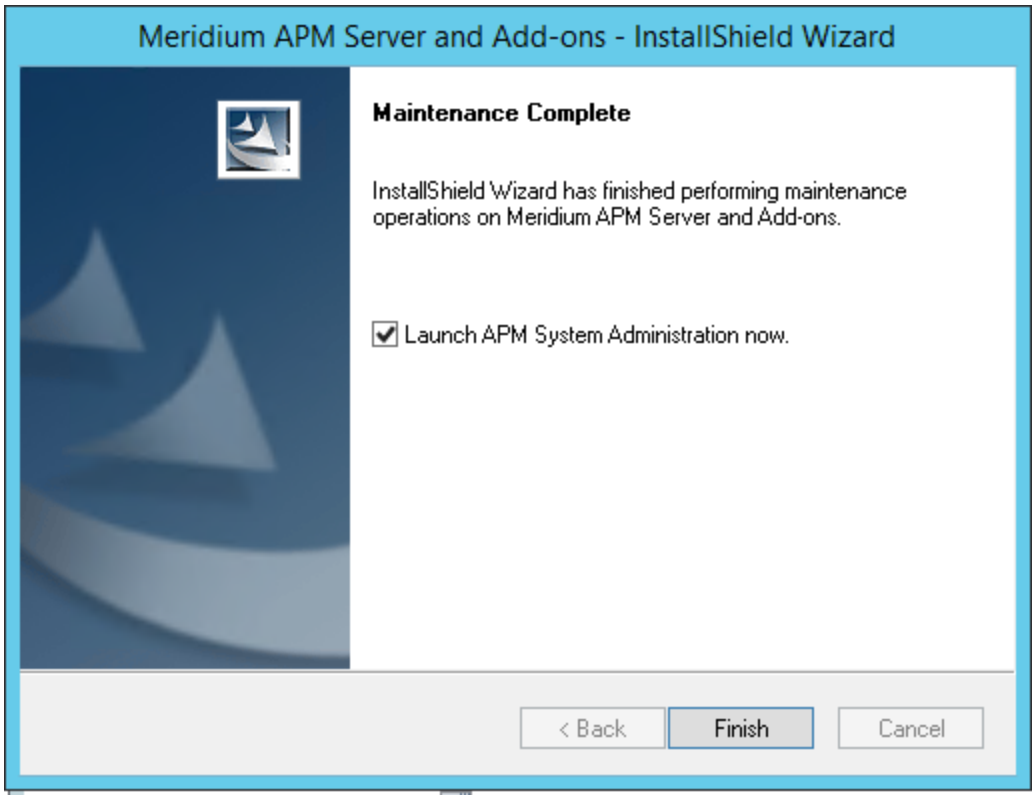


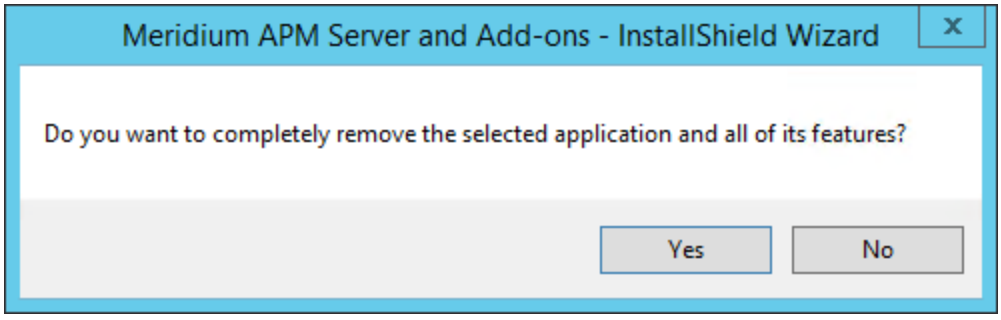
a. Select **Finish**.

> **Note:** If prompted to restart your computer, accept the selection **Yes, I want to restart my computer now**, and then select **Finish**.

The Meridium APM Server and Add-ons installer closes. Additionally, if the **Launch APM System Administration now** check box was selected, the **APM System Administration** window appears.

-or-

If you selected the **Remove** option, a message appears, asking if you want to remove the selected application and all of its features.



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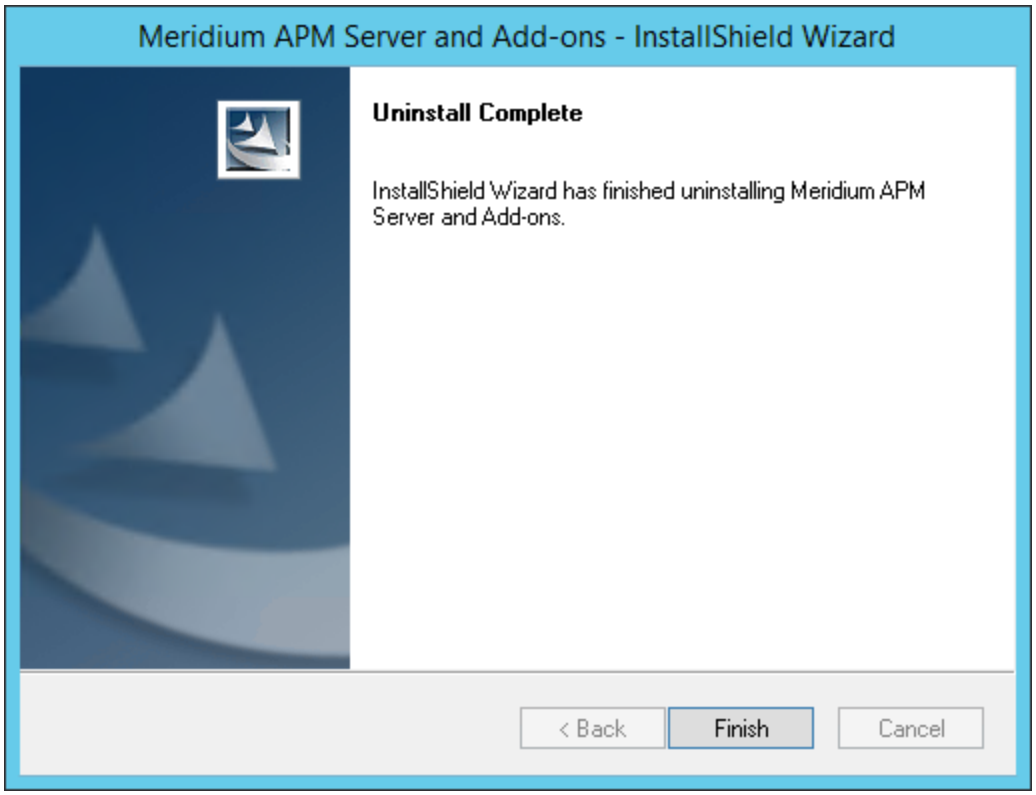
a. Select **Yes**.

The **Setup Status** screen appears, displaying a progress bar. After the application and all of its features are removed, the **Uninstall Complete** screen appears.



b. Select **Finish**.

The Meridium APM Server and Add-ons installer closes.

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GE Digital APM Database Server First-Time Installation Steps

This topic provides a list of all procedures related to first-time installation steps for a GE Digital APM Database Server, as well as links to the related concept and reference topics.

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Deploy the GE Digital APM Database Server for the First Time

The installation and configuration steps differ depending on whether you are connecting to an Oracle or SQL Server Database. Use the checklist appropriate to the type of database that you are using.

Oracle

The following checklist should be used to install and configure an Oracle Database Server, create the GE Digital APM schema, and configure the GE Digital APM Server for use with Oracle.

You should complete these steps in relatively the same order in which they are listed in the table.

Step	Task	Notes
1	Ensure that the GE Digital APM Database Server machine meets the system requirements.	This step is required.
2	On the GE Digital APM Database Server, install the Oracle Server software.	This step is required.
3	On the GE Digital APM Database Server, create and configure the Oracle database.	This step is required.
4	On the GE Digital APM Database Server, create the GE Digital APM Oracle schema.	This step is required.
5	On the GE Digital APM Server, ensure that the operating system is configured to allow network DTC access.	This step is required.
6	On the GE Digital APM Server, create an initial data source.	This step is required.
7	In GE Digital APM, build the search index.	This step is optional.

SQL Server

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The following checklist should be used to install and configure a SQL Server Database Server, create the GE Digital APM database, and configure the GE Digital APM Server for use with the SQL Server.

You should complete these steps in relatively the same order in which they are listed in the table.

Step	Task	Notes
1	Ensure that the GE Digital APM Database Server machine meets the system requirements.	This step is required.
2	On the GE Digital APM Database Server, install the SQL Server software.	This step is required.
3	On the GE Digital APM Database Server, create the SQL Server Database.	This step is required.
4	On the GE Digital APM Database Server, configure the SQL Server Database.	This step is required.
5	On the GE Digital APM Server, ensure that the operating system is configured to allow network DTC access.	This step is required.
6	On the GE Digital APM Database Server, ensure that the operating system is configured to allow network DTC access.	This step is required.
7	On the GE Digital APM Server, create an initial data source.	This step is required.
8	In GE Digital APM, build the search index.	This step is optional.

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About the GE Digital APM Database

The GE Digital APM database contains all the data that can be accessed through the GE Digital APM system, including tables that store records, metadata that defines information about items such as families and system codes, and objects that can be accessed through the GE Digital APM Catalog. In order to use GE Digital APM, you will need to create a GE Digital APM database.

GE Digital APM supports two types of database servers:

- Oracle
- SQL Server

The first step in creating the GE Digital APM database is to set up a GE Digital APM Database Server. You can use the preceding links to access generic information and guidelines for setting up each type of server. After the database server has been set up and properly configured, you will need to create the GE Digital APM database.

The content in the GE Digital APM database is segmented according to the license with which it is associated. Licensed content is versioned for each GE Digital APM release. Licenses must be activated before the associated module(s) can be used.

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Installation and Configuration Steps for an Oracle Database Server

This topic provides a list of all procedures related to first time installation steps for an Oracle Database Server, as well as links to the related concept and reference topics.

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Install the Oracle Server Software

Note: You need to complete this step *only if* you plan to use an Oracle Database Server to host the GE Digital APM schema.

The first step in setting up the database server for the GE Digital APM schema is to install the Oracle Server software on the database server machine. Instructions for installing the Oracle Server software exceed the scope of this documentation. For information on performing the installation, refer to the Oracle installation documentation that is specific to your database server platform. If you plan to create a database via the Oracle Universal installer, then, before proceeding, you should review the section in this documentation on creating and configuring the Oracle database.

What's Next?

- Create and Configure the Oracle Database

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Create and Configure the Oracle Database

Create the Oracle Database

Before you create the Oracle schema that will contain the GE Digital APM repository, you must install the Database Server software on the GE Digital APM Database Server machine. The creation of the Oracle database exceeds the scope of this documentation. For details on creating an Oracle database, consult the Oracle documentation that is specific to your database platform.

When the database is created, the database character set must be specified. If you are creating a Unicode database, use the character set AL32UTF8. This is the most recent and recommended Unicode database character set.

Configure the Oracle Database

After you have created the Oracle database, you will need to configure it. Details on configuring the Oracle database exceed the scope of this documentation. For details on configuring an Oracle database, consult the Oracle documentation that is specific to your database platform. Note, however, that the Oracle database must meet the following requirements:

The following database parameter values are recommended and must persist from one database startup to the next.

Database parameter value	Notes
dml_locks=5000	The *dml_locks* parameters should be set to a large value to avoid the possibility of waiting for a lock.
open_cursors=500	It is not uncommon for one GE Digital APM user to have multiple cursors open simultaneously. For this reason, you should set this value accordingly.

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Database parameter value	Notes
parallel_max_servers=0	The GE Digital APM schema is not configured for parallel query. Therefore, we recommend that you disable this feature. Enabling parallel query when the database and schema are not properly configured can severely degrade system performance.
parallel_min_servers=0	The GE Digital APM schema is not configured for parallel query. Therefore, we recommend that you disable this feature. Enabling parallel query when the database and schema are not properly configured can severely degrade system performance.
processes=500	None
query_rewrite_enabled=true	None
timed_statistics=true	Setting *timed_statistics* allows for minimum maintenance and enables reporting on internal wait events, which can be used to reconfigure your database.
Memory_target= 4G	Suggested minimum

Default values for database parameters that are not mentioned in the above list meet or exceed recommendations for a GE Digital APM database configuration. GE Digital recommends that you monitor the database so that changes can be made as necessary to accommodate the needs of your specific installations. For more information on these and other database parameters, consult the Oracle documentation.

What's Next?

- Create the GE Digital APM Oracle Schema on the GE Digital APM Database Server

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Create the GE Digital APM Oracle Schema on the GE Digital APM Database Server

The following instructions provide details on creating the GE Digital APM Oracle schema. After you have created the Oracle schema using these instructions, the schema will be referred to as the *GE Digital APM database* throughout this documentation.

To perform these steps, you will need Oracle DBA privileges on the GE Digital APM Database Server machine. These instructions assume that:

- You are logged in to your GE Digital APM Database Server machine with DBA privileges and have a connection to Oracle.
- You are familiar with running SQL scripts and the associated terminology.

Steps

1. On the GE Digital APM Server machine, in the GE Digital APM distribution package, navigate to the **Database** folder.
2. Open the file **MI_DB_MASTER_4030040.zip**, and then extract the contents of the file **4030040.zip** to a folder on the C: drive.
3. Open the file **4030040.zip**, and then open the subfolder **_Setup\NewInstall\Oracle**.

This folder contains the extracted files that will need to be run by the database administrator (via the remaining steps). The database administrator will need the following three files, as well as access to the remaining instructions in this topic:

- **CRT_MI_CONNECT_ROLE.SQL**
- **CRT_MI_USER.SQL**
- **MI_V4030040.DMP.ZIP**

a. Locate and run the script **CRT_MI_CONNECT_ROLE.SQL**. This script creates the GE Digital APM role (MI_CONNECT_ROLE), which contains several of the Oracle privileges that are necessary to run the GE Digital APM applications. This script does not require any parameters. You will need to run this script one time per database.

b. Locate and run the script **CRT_MI_USER.SQL**. This script creates the Oracle user, and then grants to the user the role MI_CONNECT_ROLE that you created in the preceding step.

The schema is created. For example, if you were to define the parameters through the command **SQL> @CRT_MI_USER MERIDIUM_PROD MERIDIUM_PROD 1000M Meridium_DATA**, it would automatically:

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- Create a user named *MERIDIUM_PROD*.
- Set the user's password to *MERIDIUM_PROD*.
- Set the user's default tablespace to *MERIDIUM_DATA*.
- Grant 1GB of quota on the default tablespace.

Note: This example assumes that the MERIDIUM_DATA tablespace already exists.

4. Import the Oracle schema that you created in the preceding steps. To do so:
   a. On the GE Digital APM Database Server machine, locate the file **MI_V4030040.DMP.ZIP**. Extract and import the contents.
   b. Update the schema statistics.

   The schema is imported. You should note and resolve any errors that appear in the import log. We recommend that you save a copy of the Oracle import log for future reference.
5. 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

   The spatial/geo index for the database is imported.

What's Next?

- Create an Initial Data Source

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Installation and Configuration Steps for a SQL Server Database Server

This topic provides a list of all procedures related to first-time installation steps for an SQL Server Database Server, as well as links to the related concept and reference topics.

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Install the SQL Server Software

If you will connect to a SQL Server database, the first step is to install the SQL Server software on the Database Server machine. This documentation assumes that your system meets Database Server system requirements. The installation of the SQL Server software exceeds the scope of this documentation. For information on performing the installation, refer to the SQL Server documentation that is specific to your database server platform.

When you prepare to install SQL Server on the Database Server, you should consider the following notes:

- GE Digital APM requires mixed-mode authentication for SQL Server installations. The documentation and scripts supplied by GE Digital assume that the SQL Server instance allows mixed-mode authentication.
- The GE Digital APM database *must* be owned by the SQL Server login referenced in the GE Digital APM data source. Being a member of the SQL Server **db_owner** role is not sufficient. GE Digital provides a script to properly configure the SQL Server database for use with GE Digital APM.
- The database supplied by GE Digital (via a .bak file) was created with the SQL Server collation **Latin1_General_CI_AS**.

What's Next?

- Create the SQL Server Database

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Create the SQL Server Database

The following instructions provide details on locating the files that are needed for creating and configuring the SQL Server database. To create the database, you will restore a backup file that is included in your GE Digital APM distribution package. For example, the restore database option in SQL Server Management Studio could be used to create the database. Specific instructions on creating the SQL Server database are not included in this documentation.

Steps

1. On the GE Digital APM Server machine, access the GE Digital APM distribution package, and then navigate to the **Database** folder.
2. Open the file **MI_DB_MASTER_4030040.zip**, and then extract the contents of the file **4030040.zip** to a folder on the C: drive.

   ⚠**IMPORTANT:** The name of the folder to which you extract the files must not contain any spaces.
3. Open the file **4030040.zip**, then open the subfolder **_ Setup\NewInstall\SQLServer**, and then locate the file **MI_4030040.BAK.ZIP**.
4. Unzip the BAK.ZIP file and place its contents in a location where it can be referenced by the SQL Server service.
5. To create the SQL Server database, on the Database Server machine, restore the file **MI_4030040_db.BAK**.

The GE Digital APM database is created.

What's Next?

- Configure the SQL Server Database

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Configure the SQL Server Database

The following instructions explain how to configure a SQL Server database for use by GE Digital APM. These instructions assume that the SQL Server database has already been created by restoring a backup file using SQL Server Management Studio or another third-party tool.

These instructions provide details on configuring the GE Digital APM SQL Server database using the script **MI_SQL_DB_Configure.sql**, which is included in your GE Digital APM distribution package. This script ensures that the database will be properly configured for use with GE Digital APM.

When you run the script **MI_SQL_DB_Configure.sql**, the following database settings will be configured automatically:

- The database will be set to read/write mode.
- The database will be configured to allow multiple users.
- The database will be set to Full recovery mode.
- A SQL Server login will be created, and this login will own the database.
- The SQL Server database name, SQL Server login name, and password will all match.

Steps

1. Open a SQL Server Management Studio query window that is connected via a privileged login.
2. Open the file **MI_SQL_DB_Configure.sql**, and then copy its contents into the SQL Server Management Studio query window.
3. Set the **@dbname** variable to the name of the GE Digital APM SQL Server database that you created.
4. Execute the edited script.
5. As needed, use SQL Server Management Studio to modify the password.

   ⚠**IMPORTANT:** These are the same login credentials that will be used when you create the GE Digital APM data source that will connect to this database.

6. Create the custom server-level error messages, which are required by the GE Digital APM system. These error messages must be created at the instance level. Creating them requires a privileged login assigned to either the System Administrator (sysadmin) or Server Administrator (serveradmin) fixed server roles. To create the GE Digital APM error messages:

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a. Make sure that you are connected to the Database Server with SQL Server Management Studio as a System Administrator or Server Administrator user.

b. Execute the stored procedure MI_ERRORS_CRT_ALL_MSGS. This procedure was supplied with the GE Digital APM database and can be executed by using the command **exec <databasename>..MI_ERRORS_CRT_ALL_MSGS**, where **<databasename>** is the name of the database you created in the preceding steps.

What's Next?

- Set the Local DTC Property Settings - GE Digital APM Database Server

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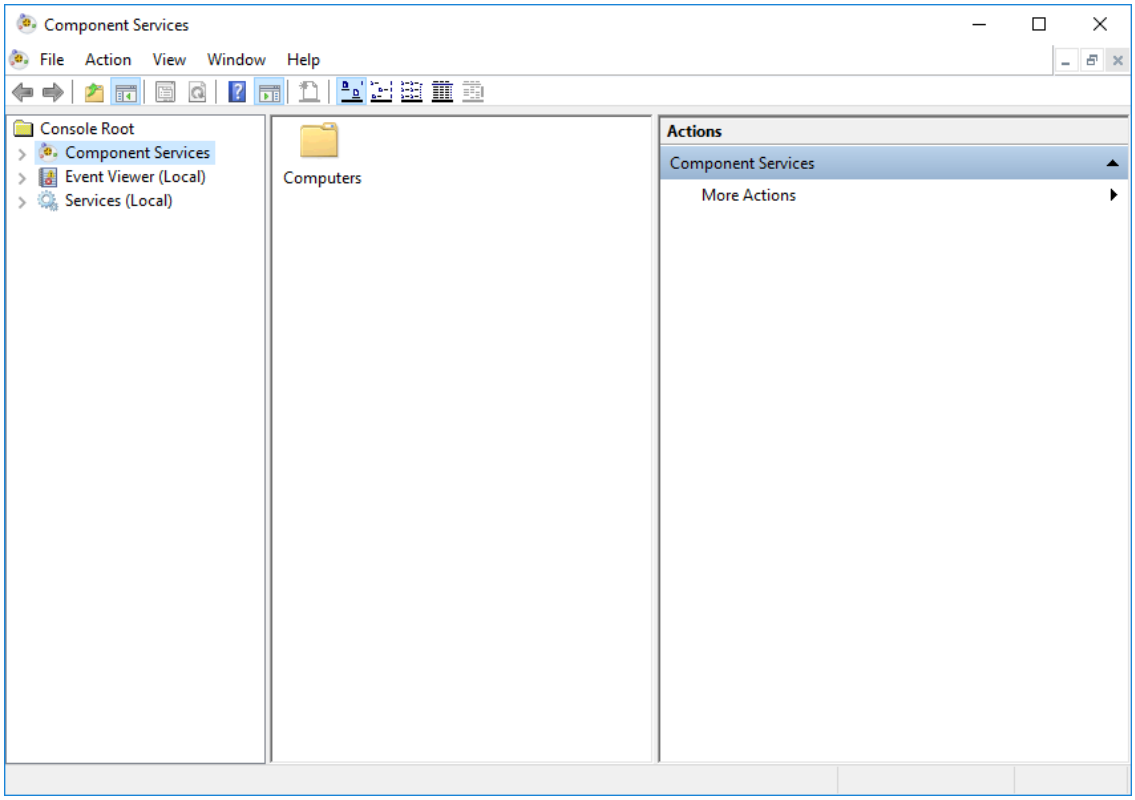
Set the Local DTC Property Settings - GE Digital APM Database Server

Note: The following settings apply to the Database Server machine if it is using SQL Server.

Steps

1. On the machine that will contain the GE Digital APM Database Server, in Server Manager, on the **Tools** menu, select **Component Services**.

   The **Component Services** window appears.



2. In the left pane, in the tree, expand the **Component Services** node down to the **My Computer** node.

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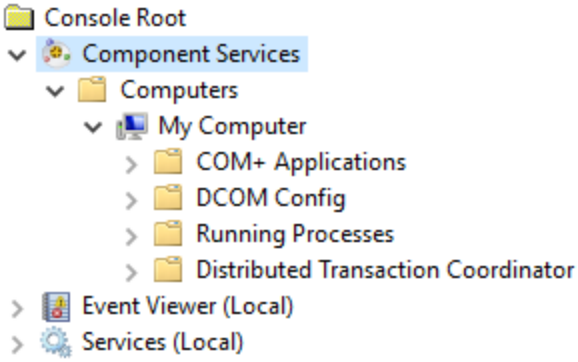
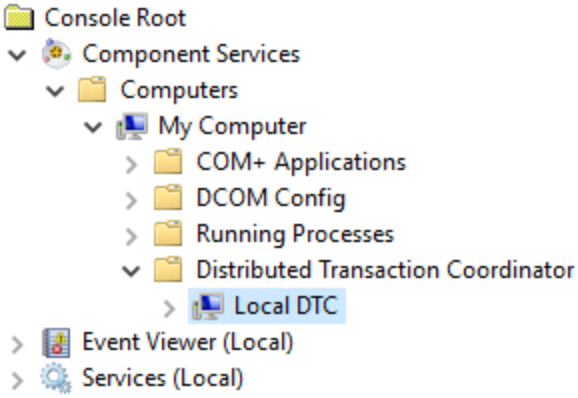


3. Expand the **Distributed Transaction Coordinator** node.



4. Select the **Local DTC** node, and then, on the menu above the tree, select (**Properties**).

   The **Local DTC Properties** window appears, displaying the **Tracing** section.

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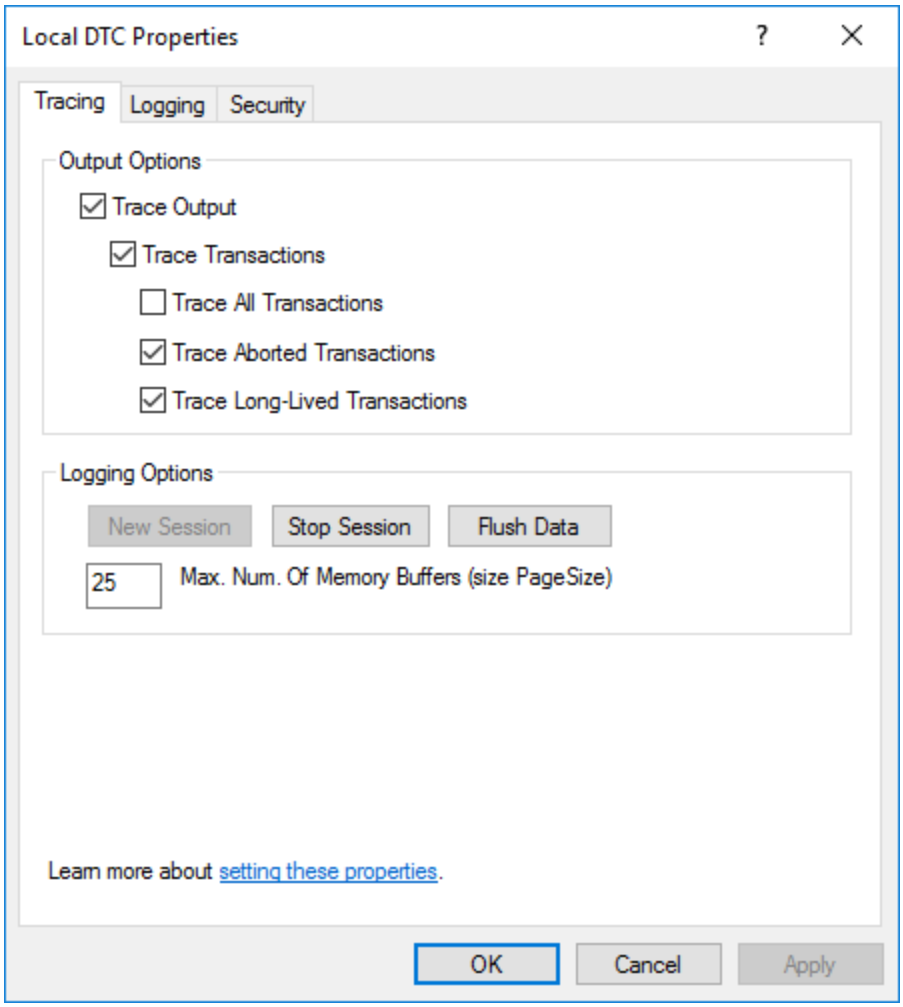

5. Select the **Security** tab.

   The **Security** section appears.

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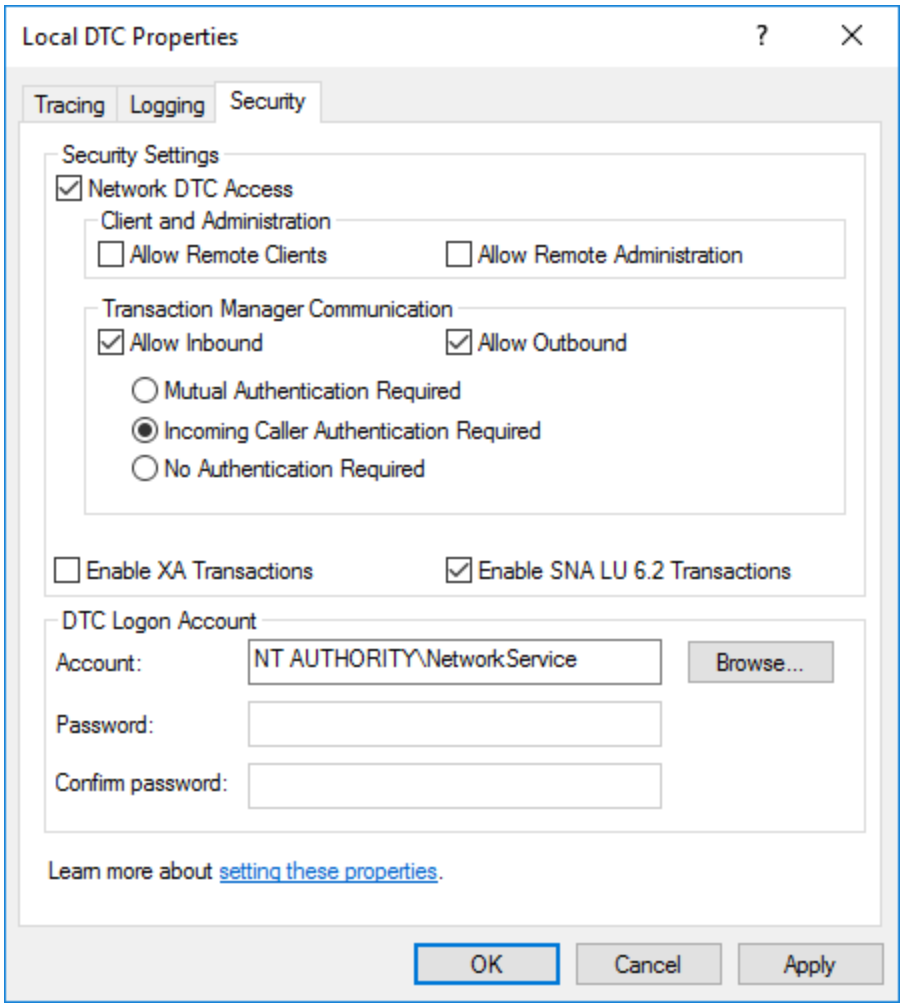

6. In this section, specify the settings as follows (and as shown in the preceding image):
   - In the **Security Settings** subsection, select the **Network DTC Access** check box.
   - In the **Client and Administration** subsection, clear the **Allow Remote Clients** and **Allow Remote Administration** check boxes.
   - In the **Transaction Manager Communication** subsection, select the **Allow Inbound** and **Allow Outbound** check boxes.
   - In the **Transaction Manager Communication** subsection, select the **Incoming Caller Authentication Required** option.
7. Select **OK**.

   A message appears, indicating that the MSDTC service will be stopped and restarted.

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8. Select **Yes**.

   A message appears, indicating that the MSDTC service has been restarted.

9. Select **OK**.

   The **Local DTC Properties** window closes, and your settings are saved. At this point, you can close the **Component Services** window.

What's Next?

- Create an Initial Data Source

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About Creating and Configuring the SQL Server Database

After you have installed the SQL Server software on the Database Server machine, you can create the GE Digital APM database by restoring a database backup file that is provided by GE Digital. For example, the restore database option in SQL Server Management Studio could be used to create the database. Specific instructions for creating the GE Digital APM database are not included in this documentation.

After you have created the database, you will need to configure it. To create and configure the GE Digital APM database, you must have access to:

- Microsoft SQL Server Management Studio.
- A privileged SQL Server account with *sysadmin* rights in the target instance.
- Two files from the GE Digital APM distribution package that will be extracted on the GE Digital APM Server:
    - **MI_4030040_db.BAK**, which is included in the file **MI_DB_MASTER_4030040.zip** in the GE Digital APM distribution package.

      -and-
    - **MI_SQL_DB_Configure.sql**, which was extracted from the GE Digital APM distribution package.

These instructions assume that you are familiar with SQL Server Management Studio or another third-party tool for running SQL scripts.

Note: If you do not have sufficient privileges to restore or configure the database, ask the person responsible for creating the database to create the database and complete the configuration steps. That person will need a copy of these instructions, the BAK file, and the **MI_SQL_DB_Configure.sql** script.

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Create an Initial Data Source

Before You Begin

Note: This procedure cannot be completed until you set up the GE Digital APM Database Server. If you have not yet done so, return to the GE Digital APM deployment workflow.

Steps

1. Access the GE Digital APM log in page.

   Note: If your system uses Data Guardian from Koingo Software and you use the Google Chrome browser, you may have to use the browser in Incognito mode to successfully access GE Digital APM.

   Tip: You can access the GE Digital APM log in page via the Apps interface on the GE Digital APM Server. To access the log in page, select the Windows start button, and then select the arrow icon in the lower-left corner of the screen. Then, under **Meridium APM Applications**, select **APM**.

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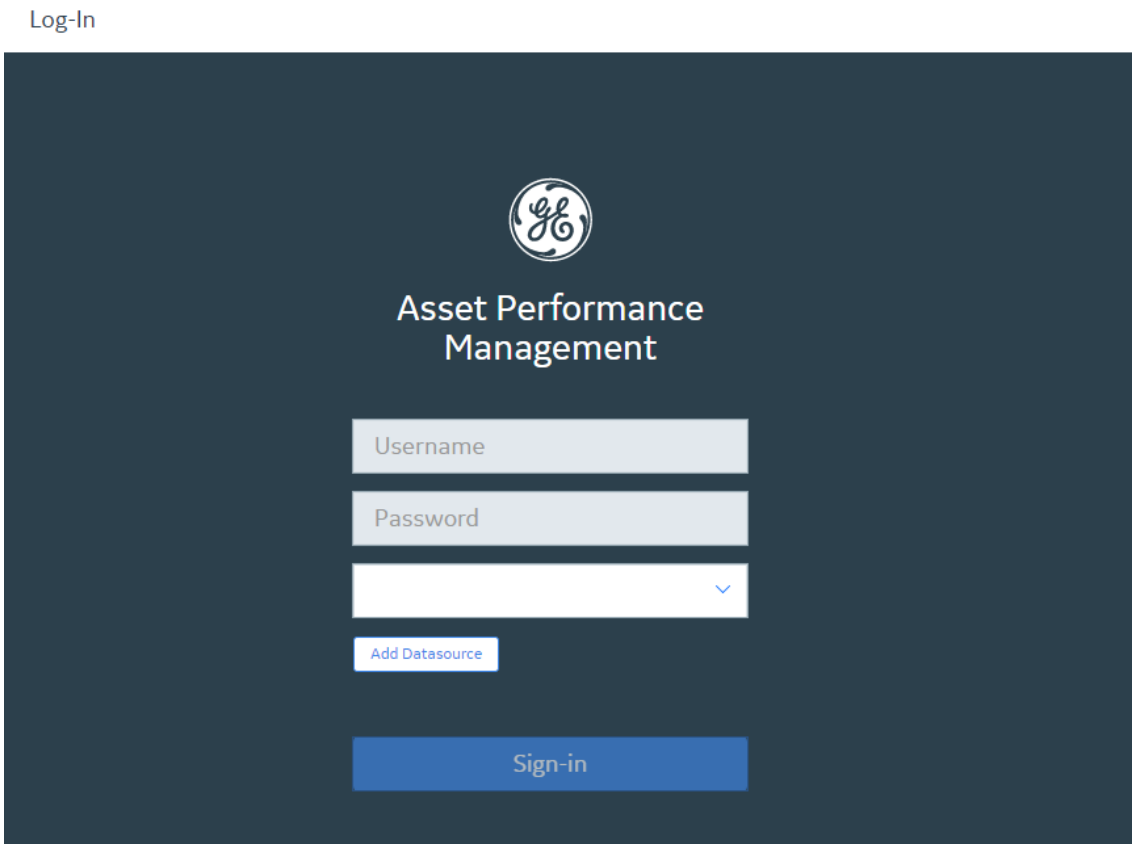

2. Select **Add Datasource**.

   The **Create Datasource** window appears.

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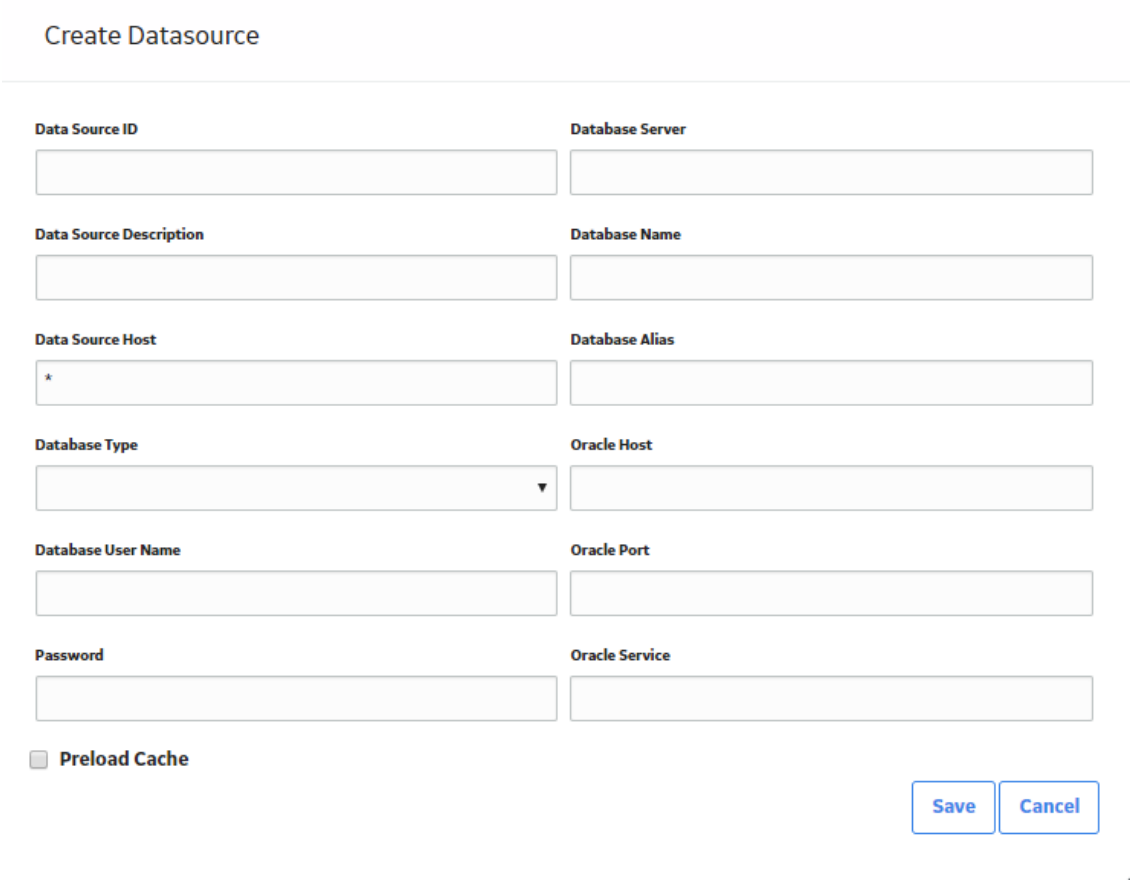

3. In the **Data Source ID** box, enter a name for the Data Source. This is required, and must be unique for the GE Digital APM Server. It cannot contain spaces or special characters aside from underscores.

   ⚠**IMPORTANT:** You cannot modify the ID after you save the Data Source.

4. In the **Data Source Description** box, enter a description of the Data Source.

   Note: The description of the Data Source will be displayed on the GE Digital APM **Welcome** page, in the list of available Data Sources.

5. In the **Data Source Host** box, if you are a GE Digital APM Now customer, enter the host name or address. Otherwise, the value in this box should be *.

6. In the **Database Type** list, select either **Oracle** or **SQL Server**.

   If you selected **Oracle**, the following boxes are enabled:

   - **Database Alias**
   - **Oracle Host**

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- **Oracle Port**
- **Oracle Service**

If you selected **SQL Server**, the following boxes are enabled:

- **Database Server**
- **Database Name**

7. If you selected **Oracle** in step 6, then either enter a value in the **Database Alias** box, or enter values in the **Oracle Host**, **Oracle Port**, and **Oracle Service** boxes.

   Note: A database alias, contained within a *tnsnames.ora* file, contains the Oracle host, port, and service information related to the database, and may have been set up by a database administrator to simplify access. To determine whether a database alias has been created, and to determine the appropriate values for the **Database Alias** box or **Oracle Host**, **Oracle Port**, and **Oracle Service** boxes, contact your database administrator.

   If you selected **Oracle** in step 6, then you *do not* need to enter values in the **Database Server** and **Database Name** boxes.

   -or-

   If you selected **SQL Server** in step 6, then enter values in the **Database Server** and **Database Name** boxes.

   Note: If you selected **SQL Server** in step 6, then you *do not* need to enter values in the **Database Alias**, **Oracle Host**, **Oracle Port**, and **Oracle Service** boxes.

8. In the **Database User Name** box, enter the user name or schema name for the database that you are defining.
9. In the **Password** box, enter the password for the associated database user name. The password must meet the criteria specified by the password policy.
10. If you want Microsoft IIS to load and cache this database on the GE Digital APM Server to improve performance, then select the **Preload Cache** check box.
11. Select **Save**.

    The GE Digital APM log in page appears, displaying the data source.

    Note: When initially logging in to GE Digital APM, both the user name and password are MIADMIN. These values are case-sensitive.

    Note: When logging in to GE Digital APM, a notification may appear, asking if you want to allow your machine to be used for additional local storage. This

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local storage is used to store log in information and preferences. Allowing this local storage is optional.

What's Next?

- Deploy the SQL Server Report Server for the First Time

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GE Digital APM SQL Server Report Server First-Time Installation Steps

This topic provides a list of all procedures related to first time installation steps for a GE Digital APM SQL Server Report Server, as well as links to the related concept and reference topics.

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Deploy the SQL Server Report Server for the First Time

Microsoft SQL Server Reporting Services is a third-party component that the GE Digital APM system uses to support its reporting functionality. After SQL Server Reporting Services has been installed, you will need to configure the Report Server and set it up to be used with GE Digital APM. Some of the configuration tasks that you must perform are standard SQL Server Reporting Services procedures that must be performed for any new installation of SQL Server Reporting Services. This documentation does not provide details on configuring standard aspects of the Report Server.

For information on setting up the Report Server, see the SQL Server Setup Help, which you can access on the Report Server via the Reporting Services Configuration Manager, which should have been installed when you installed SQL Server Reporting Services.

After the Report Server has been set up, you will need to complete various additional tasks to ensure the proper functioning of the Report Server with GE Digital APM. 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 SQL Server Report Server machine meets the system requirements.	This step is required.
2	Configure the SQL Server to use an execution account.	This step is required.
3	Create a domain user and add that user to Content Manager Role on the Home Folder of the SQL Server Report Server.	This step is required.
4	Install and configure GE Digital APM SSRS.	This step is required.
5	Configure GE Digital APM to use the SQL Server Report Server.	This step is required.

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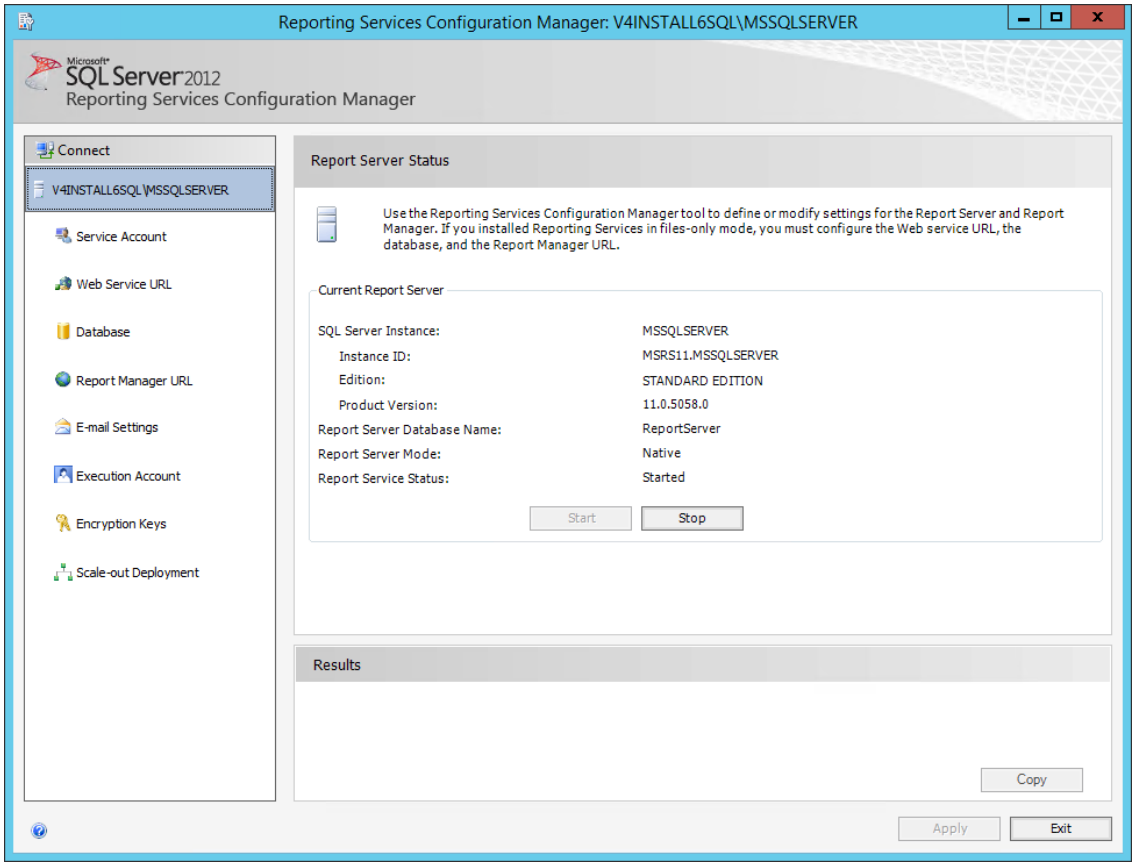
Configure the SQL Server Report Server to Use an Execution Account

ⓘ **Tip:** For more information on Execution Accounts, consult Microsoft's *Configure the Unattended Execution Account (SSRS Configuration Manager)* documentation.

Steps

1. On the machine that will serve as the SQL Server Report Server, access the Reporting Services Configuration Manager.

   The **Reporting Services Configuration Manager** window appears.



2. In the left pane, for the account that will be set as an execution account, select the **Execution Account** tab.

   The **Execution Account** section appears.

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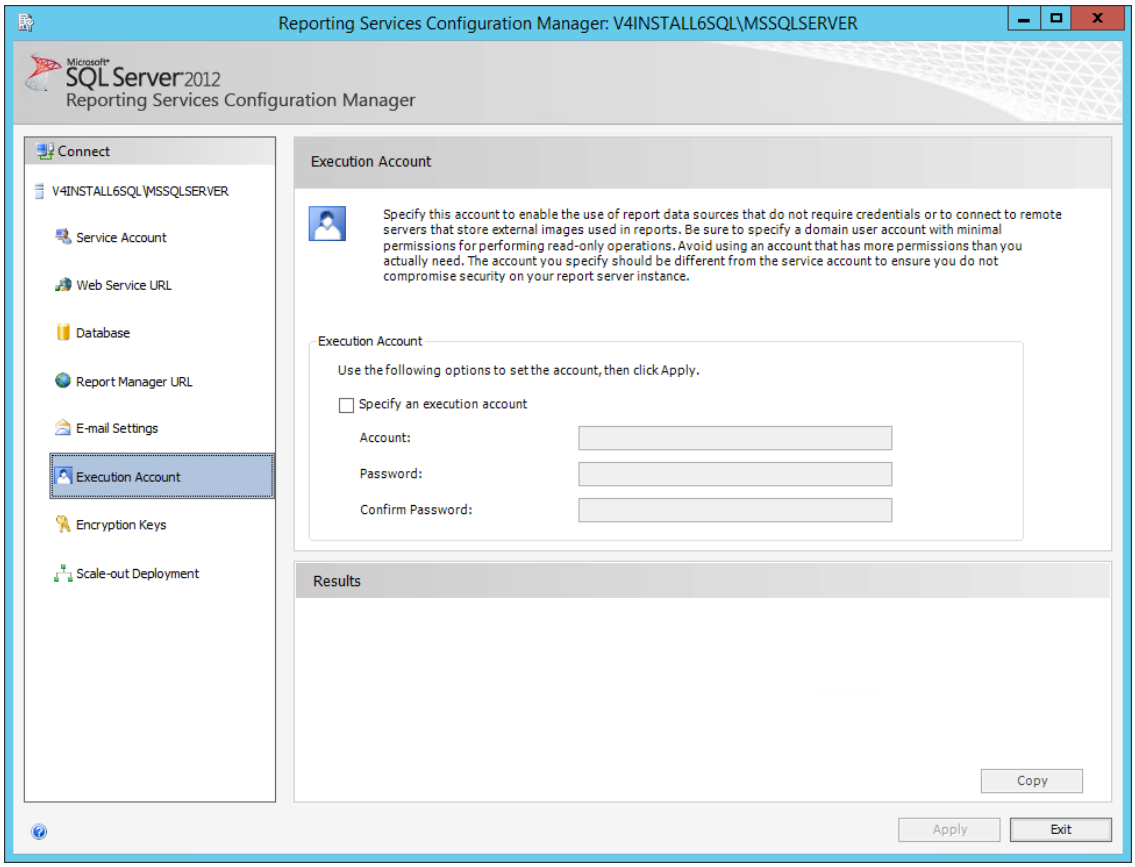

3. In the **Execution Account** section, select the **Specify as an execution account** check box, then enter values in the required fields, and then select **Apply**.

   The account is specified as an execution account.

What's Next?

- Create a Domain User and Add that User to Content Manager Role on the Home Folder of the SQL Server Report Server

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Create a Domain User and Add that User to Content Manager Role on the Home Folder of the SQL Server Report Server

Steps

1. Create a Windows/domain user with minimum privileges (e.g., *meridium_reports_user*). The user name requires minimum privileges to connect to the GE Digital APM Server to get data for reports. It is recommended that:
    - The password for this user should never expire.
    - The user should be restricted to change password.
    - The user should be restricted to log in to other servers (e.g., *meridium_reports_user*).
    - The user should also be part of IIS_IUSRS group on the SQL Server Report Server machine.
2. Open Reporting Services Configuration Manager.
3. Select the **Report Manager URL** tab.

   The **Report Manager URL** section appears.

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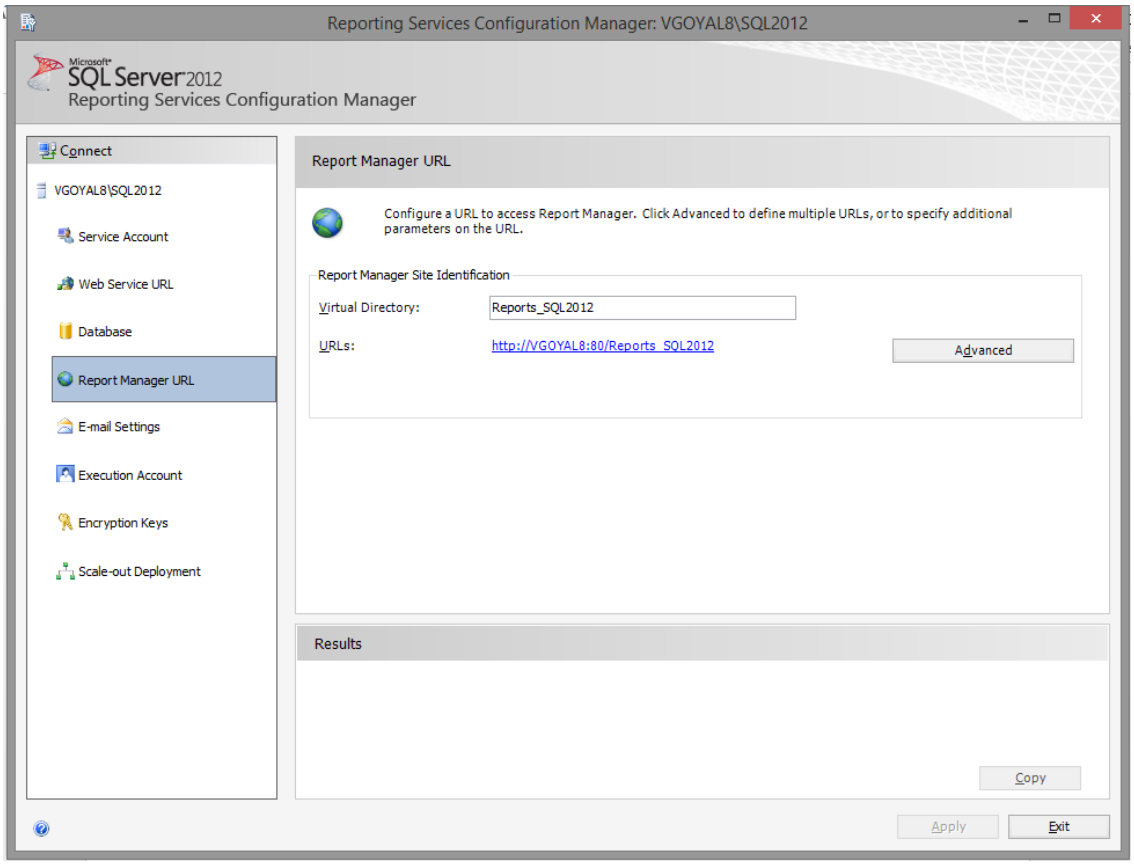

4. In the **Report Manager Site Identification** section, select the URL to open Report Manager.

   Report Manager opens in the default browser, displaying the Home folder.

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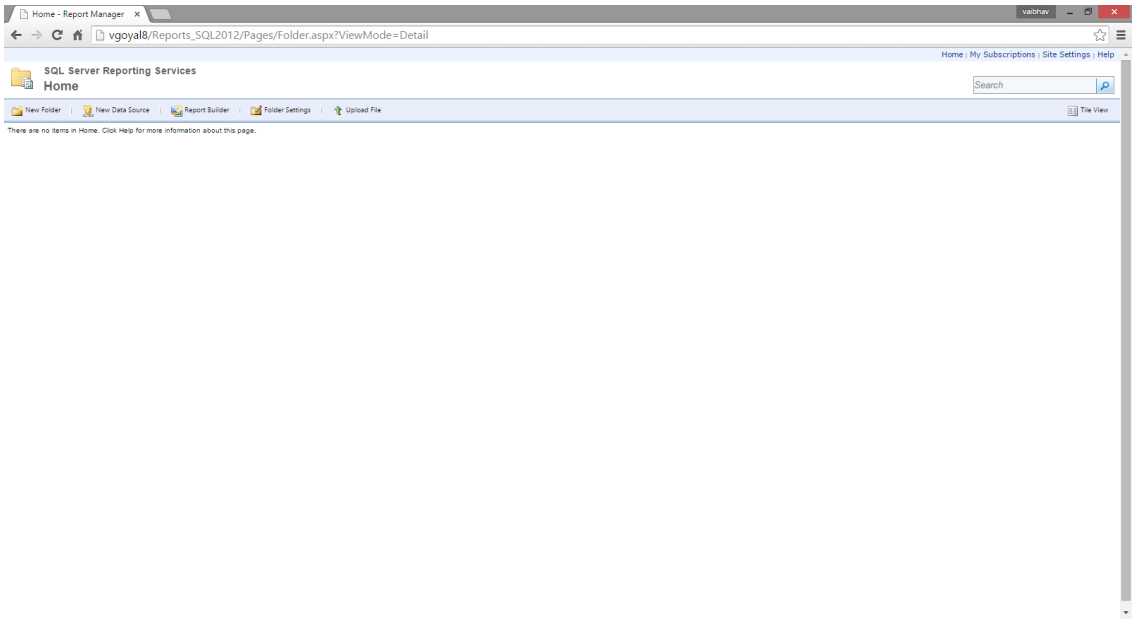
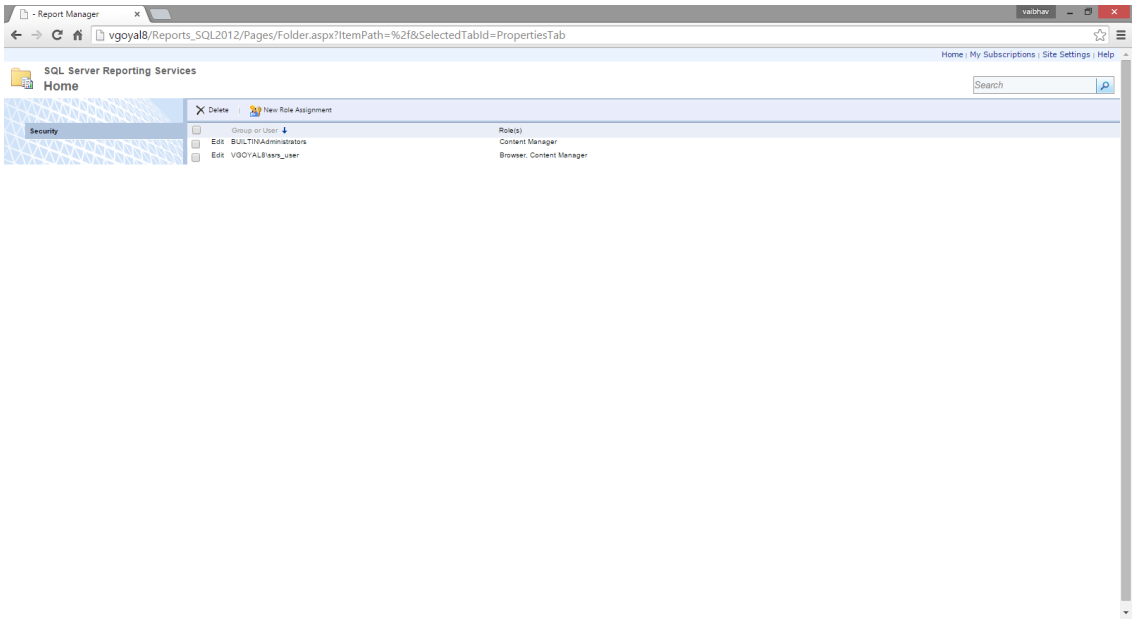


5. Select **Folder Settings**.

   A **Security** section appears.



6. Select **New Role Assignment**.

   The New Role Assignment form is displayed.

7. Enter the user name of the user that you created in step 1, and then select

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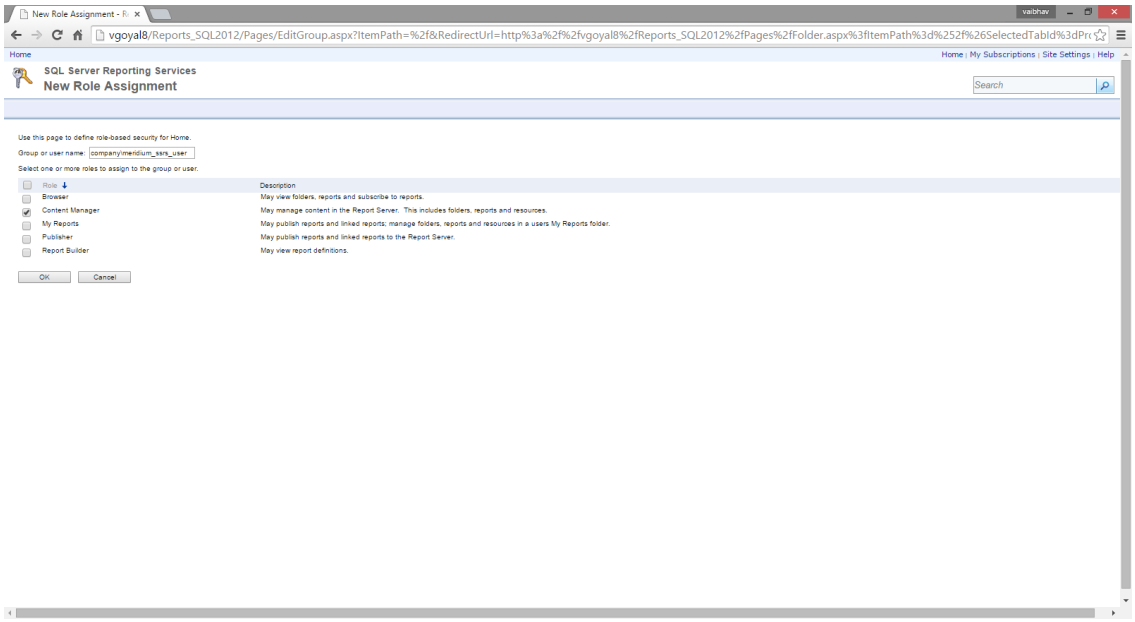
Content Manager.

The form will appear similar to the following image.



8. Select **OK**.

   The user is added to Content Manager role.

What's Next?

- Install and Configure GE Digital APM SSRS

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Install and Configure GE Digital APM SSRS

Note: The GE Digital APM System Administration tool is installed with the GE Digital APM Adapter for SSRS.

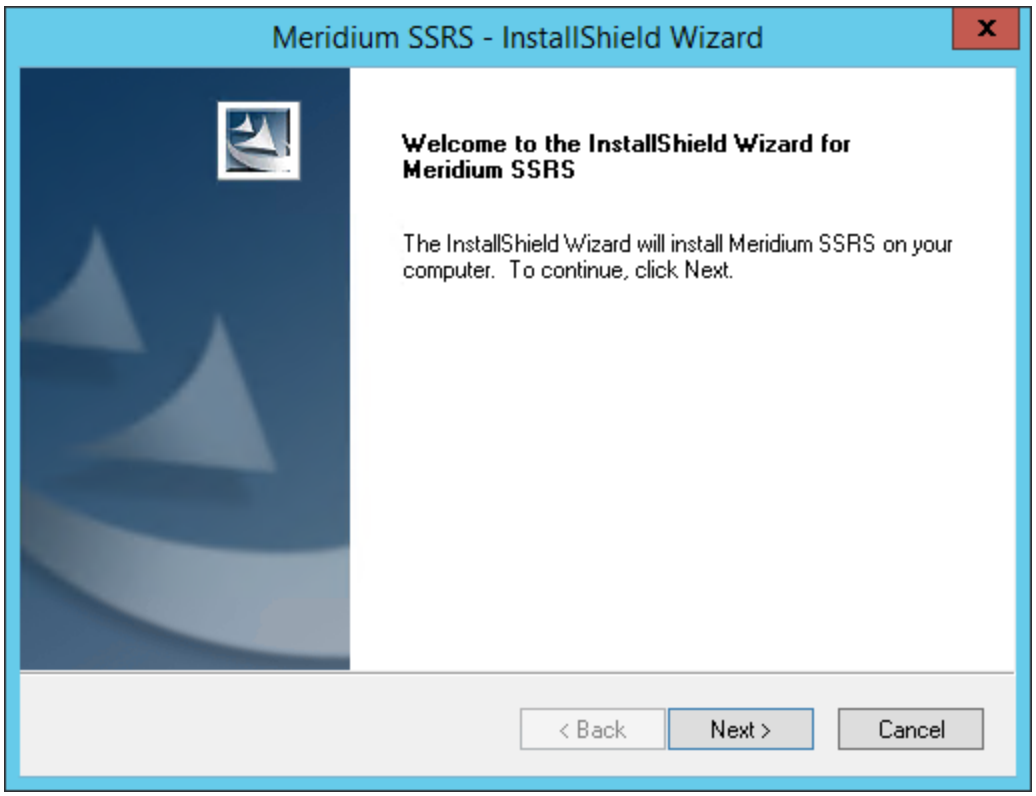
These instructions assume that the SQL Server Report Server meets the system requirements.

Steps

1. On the machine that will serve as the SQL Server Report Server, in the GE Digital 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.



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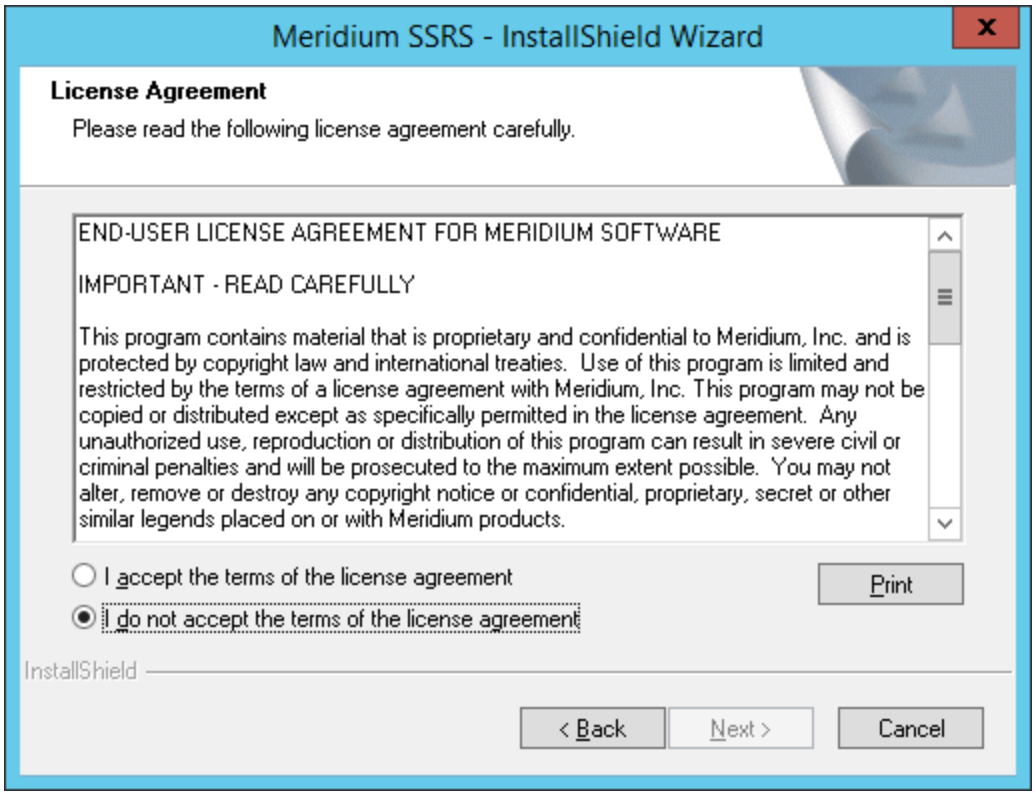
4. Select **Next**.

   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**.

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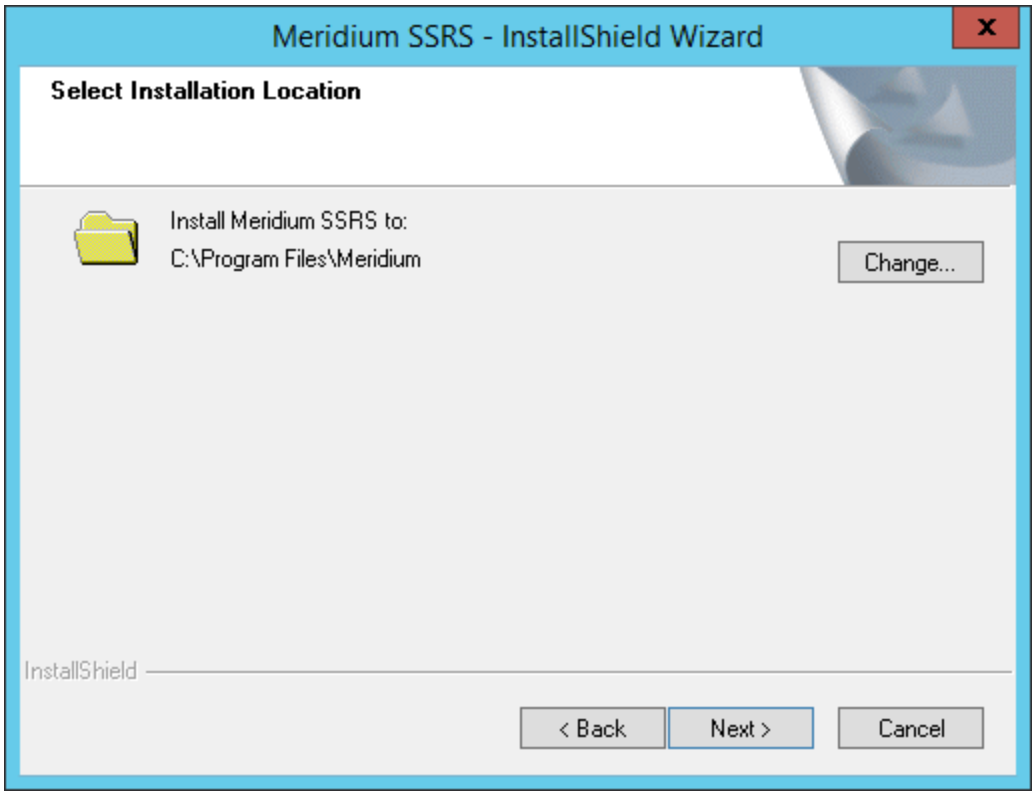

6. If you are satisfied with the default location where the software will be installed, select **Next**.

   -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.

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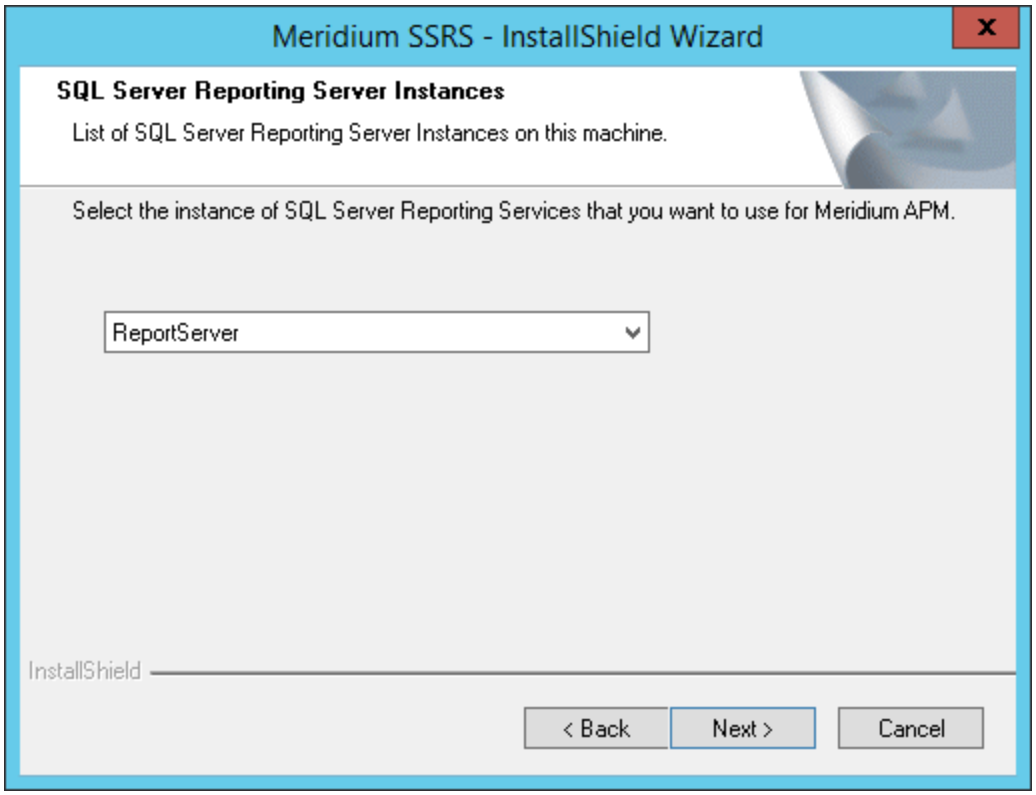

7. Select the instance of SQL Server Reporting Services that you want to use, and then select **Next**.

   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 GE Digital APM Server and Add-ons 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.

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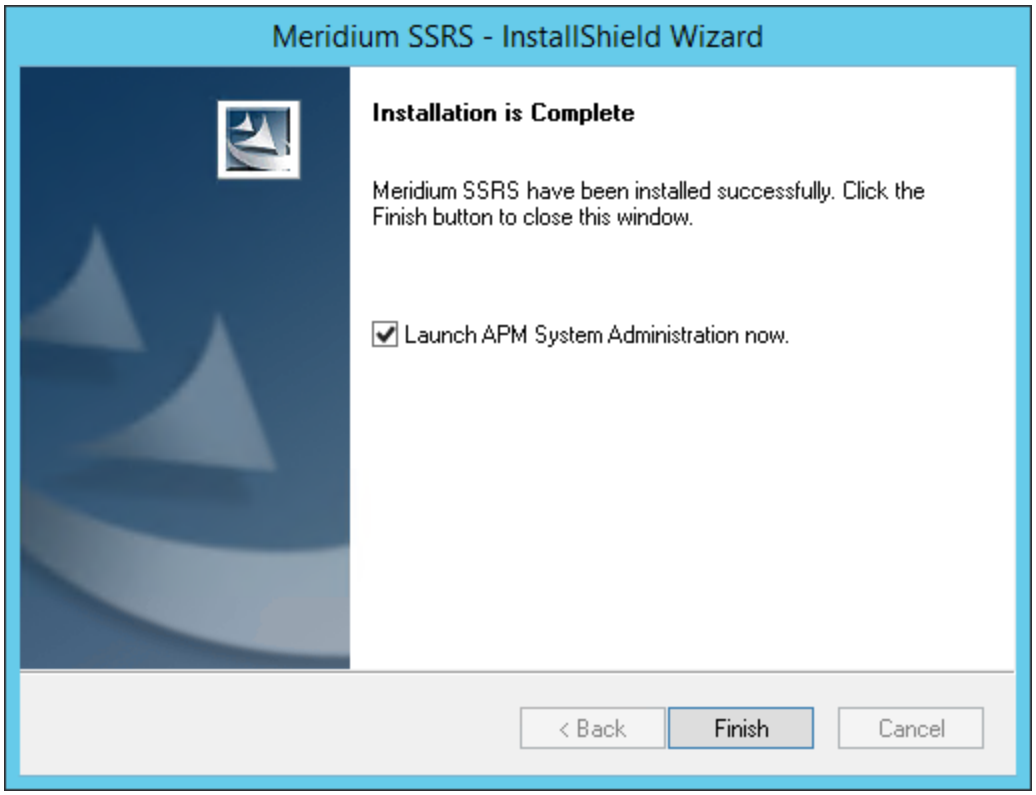

9. *Do not* clear the **Launch APM System Administration now** check box, and then select **Finish**.

   The Meridium APM SSRS installer closes, and the **APM System Administration** window appears.

10. On the **APM System Administration** window, select **Adapter for SSRS**.
11. In the **Server URL** box, change the content of the ServerURL to the web services address of the GE Digital APM Server (e.g., **http://{meridium.applicationserver}/meridium/api/**).
12. Select **Save**.

    The Meridium APM SSRS is installed and configured.

What's Next?

- Configure GE Digital APM to use the SQL Server Report Server

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GE Digital APM Upgrade Steps

This topic provides a list of all procedures related to upgrade steps for GE Digital APM.

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Upgrade or Update GE Digital APM to V4.3.0.4.0

Upgrading or updating and configuring GE Digital 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 V4.3.0.4.0.

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 V4.3.0.4.0, 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.

Update from version V4.3.0.0.0 through V4.3.0.3.0

If your current version is GE Digital APM V4.3.0.0.0 through V4.3.0.3.0, then updating the basic system architecture to V4.3.0.4.0 requires only that you complete the steps that are outlined in the table in this section.

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Step	Task	Notes
1	Create a backup of your database, and create a backup of any configuration files that exist in your pre-updated system.	This step is not mandatory, but is recommended by GE Digital. 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 GE Digital APM Server and Add Ons software on the GE Digital APM Server(s).	This step is required. This procedure includes updating your data sources for V4.3.0.4.0.

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Step	Task	Notes
3	If you want to activate non-English translations in GE Digital APM, then deploy translations.	This step is required only if you are deploying translations for the first time or if you want to utilize and redeploy updated translations.
4	As needed, configure one of the virtual machine to execute all the scheduled jobs.	This step is required only if you have deployed GE Digital APM in a clustered environment and you want to dedicate a virtual machine to run all the scheduled jobs.
5	As needed, deploy the GE Digital APM mobile application on mobile devices.	This step is required only if you are deploying the GE Digital APM mobile application on mobile devices.

Upgrade from a version prior to version V4.3.0.0.0

If your current version is a version prior to GE Digital APM V4.3.0.0.0, then updating the

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basic system architecture to V4.3.0.4.0 requires only that you complete the steps that are outlined in the table in this section.

Step	Task	Notes
1	Ensure that your system meets the hardware and software requirements for the basic GE Digital APM system architecture.	This step is required.

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Step	Task	Notes
2	On the server machine on which you will install Elastic Search, download and install Java V1.8.0_73 or higher, then set an environment variable, for the system, for JAVA_HOME=C:\Program Files\Java\jdk1.8.0_73, and then, echo %JAVA_HOME% to verify. **Notes:** • The JAVA HOME variable should match the Java version that you installed, and its installation location. • For additional information regarding Java support for Elastic Search, consult the official Elastic Search documentation.	This step is required. Ensure that you complete this step on the machine on which you will install Elastic Search. **Note:** For optimum system performance, GE Digital recommends that you install Elastic Search on its own, dedicated server that contains no GE Digital APM components. If you utilize this deployment, you will need to download Elastic Search V5.3.0 from the official website, and consult the documentation on that web-

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Step	Task	Notes
		site for configuration instructions. -or- You can install Elastic Search on a GE Digital APM Server. If you utilize this deployment, to improve system performance, GE Digital recommends that the server machine have a minimum of 24 GB RAM. ⚠ **IMPORTANT:** Any time you upgrade Java to a new version, you will need to reset this environmental variable.

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Step	Task	Notes
3	Ensure that all existing GE Digital APM Security Users have been assigned time zones. Refer to your pre-upgraded system's documentation for information on managing GE Digital APM Security Users.	This step is required. If there are GE Digital APM Security Users to whom time zones have not been assigned, a failure will occur during the database upgrade process.

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Step	Task	Notes
4	If you intend to upgrade the Production Loss Analysis (PLA) module from a starting version prior to V3.6.0.0.0, then import the required baseline rules.	⚠ **IMPORTANT:** This step is required *only if* you intend to upgrade the Production Loss Analysis (PLA) module from a starting version prior to Meridium Enterprise APM V3.6.0.0.0. If you intend to upgrade PLA in this manner, this procedure must be completed *before* upgrading the GE Digital APM Server and Add Ons software on the GE Digital APM Server(s). This procedure is part of the upgrade Production Loss Analysis workflow.

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Step	Task	Notes
5	Create a backup of any configuration files that exist in your pre-upgraded system which you may want to retain post-upgrade.	This step is required only if you want to retain customizations that you have made to your existing configuration files.
6	Upgrade the GE Digital APM Server and Add Ons software on the GE Digital APM Server(s).	This step is required. Consult the documentation on Redis for information about its incorporation into server configurations.

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Step	Task	Notes
7	Install Elastic Search on its own, dedicated server. -or- On the GE Digital APM Server on which you want to install Elastic Search, run the installer in modify mode. In that procedure, select the **Modify** check box, and then ensure that the **Meridium APM Application Server** and **Elastic Search** check boxes are selected.	This step is required only if you did not install Elastic Search on the GE Digital APM Server in the previous step. You must install Elastic Search on a server in your environment. **Note:** You must install Elastic Search on a server in your environment. For optimum system performance, GE Digital recommends that you install Elastic Search on its own, dedicated server that contains no GE Digital APM components. You can install Elastic

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Step	Task	Notes
		Search on a GE Digital APM Server by running the installer in modify mode. If you utilize this deployment, to improve system performance, GE Digital recommends that the server machine have a minimum of 24 GB RAM.
8	Upgrade the SQL Server Report Server.	This step is required.
9	Upgrade the GE Digital APM Database Server.	This step is required.
10	Modify the configuration file to remove notifications.	This step is required.

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Step	Task	Notes
11	If you want to activate non-English translations in GE Digital APM, then deploy translations.	This step is required only if you are deploying translations for the first time or if you want to utilize and redeploy updated translations.
12	As needed, configure one of the virtual machine to execute all the scheduled jobs.	This step is required only if you have deployed GE Digital APM in a clustered environment and you want to dedicate a virtual machine to run all the scheduled jobs.
13	As needed, deploy the GE Digital APM mobile application on mobile devices.	This step is required only if you are deploying the GE Digital APM mobile application on mobile devices.

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Step	Task	Notes
14	As needed, enable Same Sign-On for on-site or off-site authentication.	This step is required only if you are enabling Same Sign-On.

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Upgrade or Update the GE Digital APM Server and Add-Ons to V4.3.0.4.0

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

Steps

1. If you are upgrading from any version prior to V4.0.0.0:
    a. Uninstall the GE Digital APM Server and Add-ons Component.
    b. 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.
    c. Install the GE Digital APM Server Software and Add-ons Component.

    -or-

    If you are upgrading from any version V4.0.0.0 or later, or updating from version V4.3.0.0.0 through V4.3.0.3.0:
    a. Restart the machine containing the GE Digital APM Server instance that you want to upgrade or update.
    b. On the same machine, stop all GE Digital services and the Redis service. To do so:
        i. Access Task Manager, and then, on the **Windows Task Manager** window, select the **Services** tab.

            The **Services** section appears.
        ii. Select the heading of the **Description** column.

            The services are organized alphabetically according to their descriptions.
        iii. For each service whose description begins with *Meridium* and whose status is **Running**, right-click the service, and then select **Stop Service**.

            All GE Digital services are stopped.
        iv. Right-click the service whose description is *Redis*, and then select **Stop Service**.

            The Redis service is stopped.
    c. On the same machine, access the GE Digital APM distribution package, and then navigate to the folder **Setup\Meridium APM Server and Add-ons**.
    d. Open the file **Setup.exe**.

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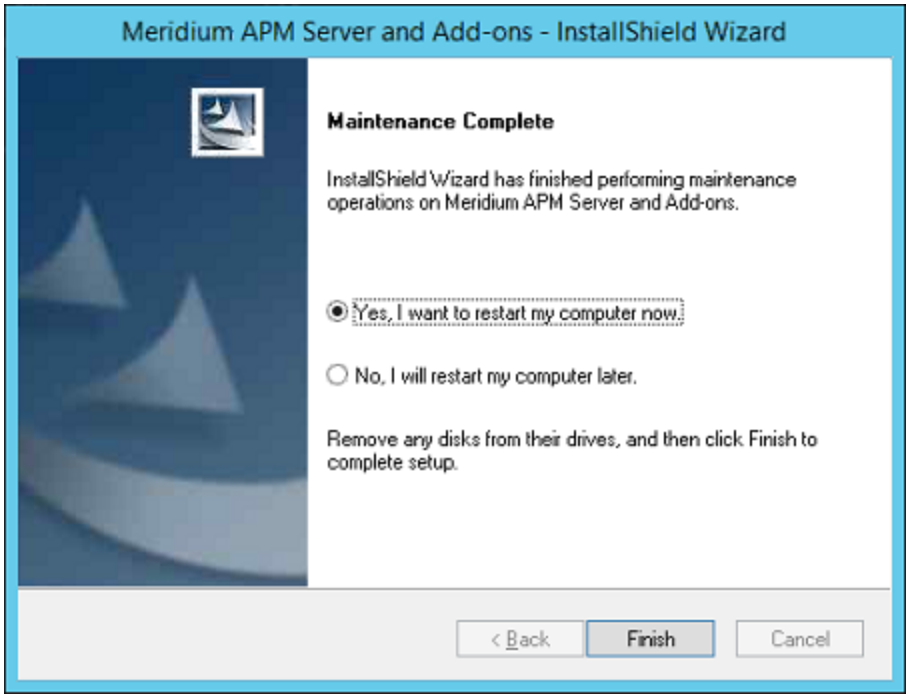
A message appears, asking if you want to allow the installer to make changes to your machine.

e. Select **Yes**.

The Meridium APM Server and Add-ons installer appears, displaying the **Preparing Setup** screen. When the setup is prepared, a message appears, asking if you want to upgrade your GE Digital APM Server.

f. Select **Yes**.

The **Setup Status** screen appears, displaying a progress bar. When the installation is complete, the **Maintenance Complete** screen appears.



g. Select **Finish**.

The Meridium APM Server and Add-ons installer closes, and your computer restarts.

Note: If you are updating from version V4.3.0.0.0 through V4.3.0.3.0, then, after the computer restarts, the **Meridium Package Deployer** window appears.

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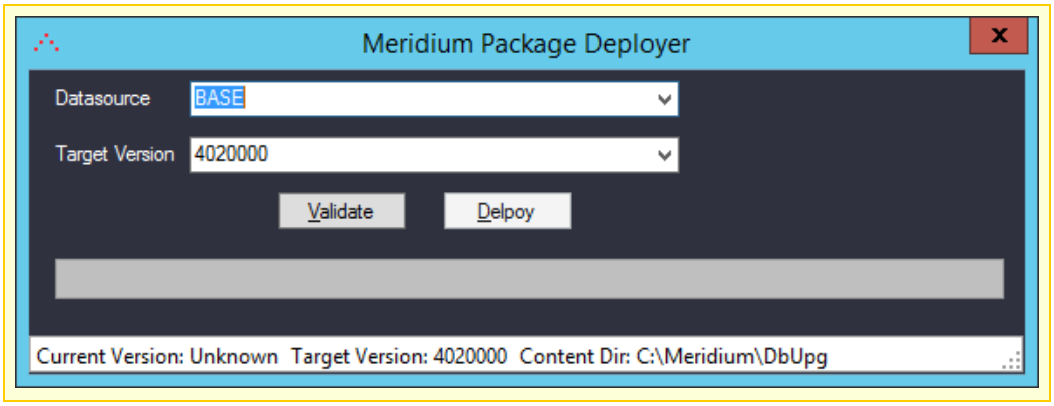

h. If you are *upgrading from any version prior to V4.3.0.0.0*, then you have successfully upgraded the GE Digital APM Server and Add-Ons to V4.3.0.4.0, and you should proceed to the next step in the upgrade section of the Upgrade or Update GE Digital APM to V4.3.0.4.0 topic.

-or-

If you are *updating from version V4.3.0.0.0 through V4.3.0.3.0*, then complete the following steps to update your data sources:

⚠**IMPORTANT:** After updating the GE Digital APM Server to V4.3.0.4.0, you must also update the data sources to which you want to connect to V4.3.0.4.0. This action can be completed via the **Meridium Package Deployer** window, which should have appeared automatically after completing step g. If you need to access this window manually, then navigate to the folder **C:\Program Files\Meridium\Upgrade\DBUpgrade**, and then open the file **Meridium.Package.Deployer.exe**.

i. In the **Target Version** box, select **4030040**.

ii. On the **Meridium Package Deployer** window, in the **Datasource** box, select the data source that you want to update to V4.3.0.4.0.

iii. Select **Validate**.

iv. Select **Deploy**.

Note: After you select **Deploy**, a message will appear, indicating that you should back up your database before proceeding. You should always back up the database before beginning any upgrade or update process. If any problems occur during the update, the database can then be restored to its original state from the backup copy.

Note: If the data source update fails, a message will appear, indicating that you should consult a log file. If this occurs, then, to update

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the data source to V4.3.0.4.0, you should follow the standard procedure to initiate the database upgrade process.

v. For each data source that you want to update to V4.3.0.4.0, repeat steps ii through iv.

When each data source has been updated to V4.3.0.4.0, then you have successfully updated the GE Digital APM Server and Add-Ons to V4.3.0.4.0, and you should proceed to the next step in the update section of the Upgrade or Update GE Digital APM to V4.3.0.4.0 topic.

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Upgrade the GE Digital APM Adapter for SSRS to V4.3.0.4.0

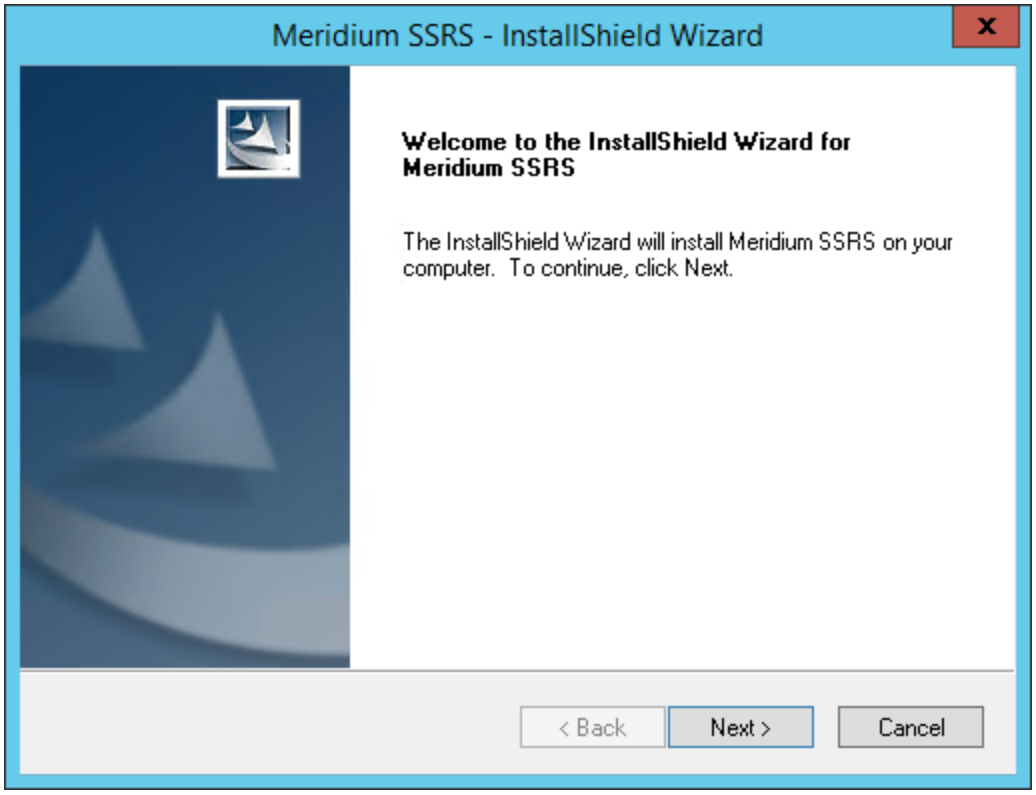
The following instructions assume that you were using the 64-bit GE Digital APM Adapter for SSRS in your previous version. If you were using the 32-bit GE Digital APM Adapter for SSRS, you will need to uninstall the older 32-bit version and install the new 64-bit version on a 64-bit SQL Server Report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

Steps

1. On the SQL Server Report Server, in the GE Digital 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**.

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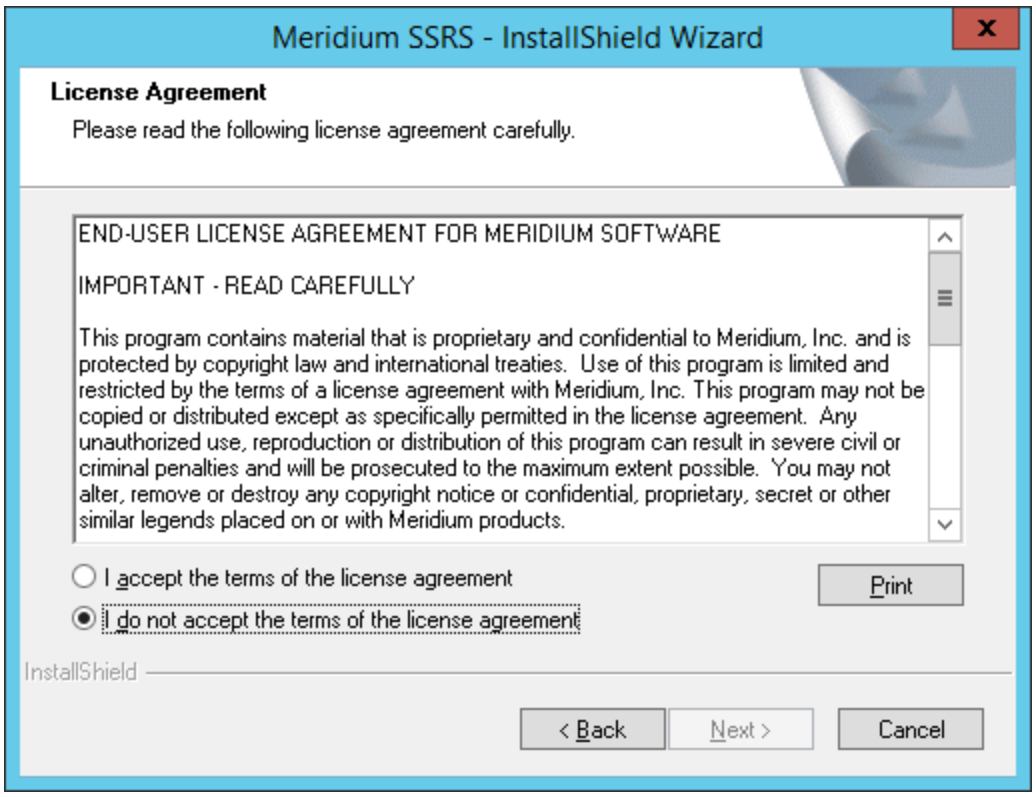
The **License Agreement** screen appears.



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**.

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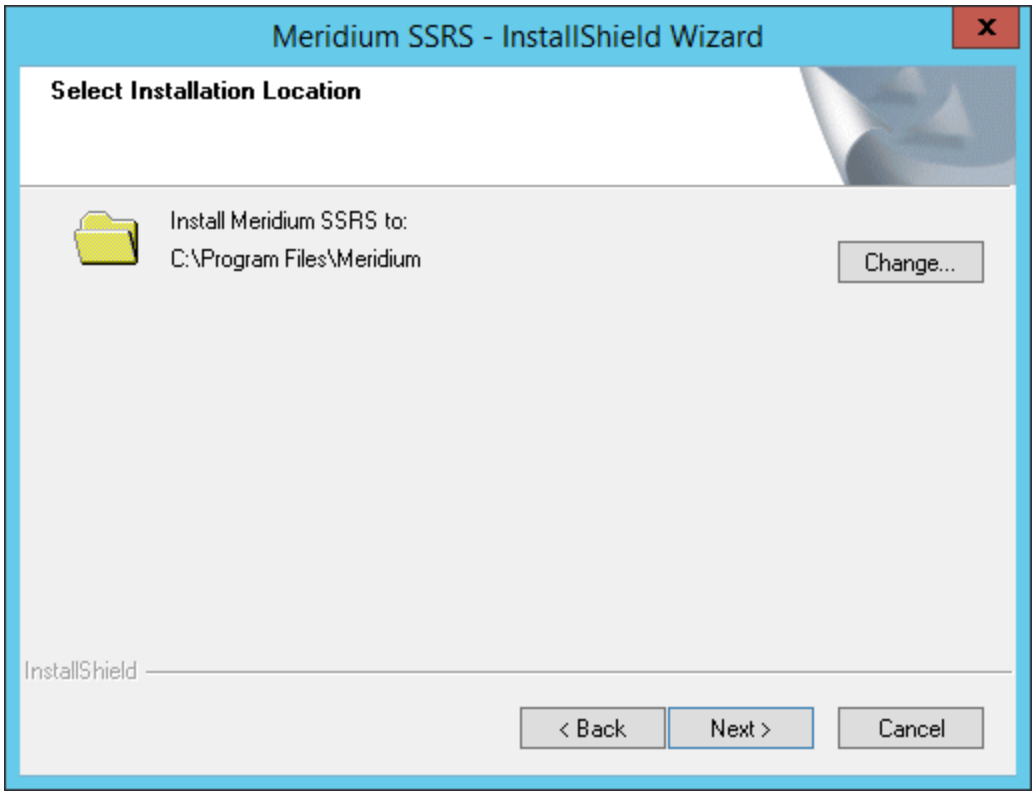

6. If you are satisfied with the default location where the software will be installed, select **Next**.

   -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.

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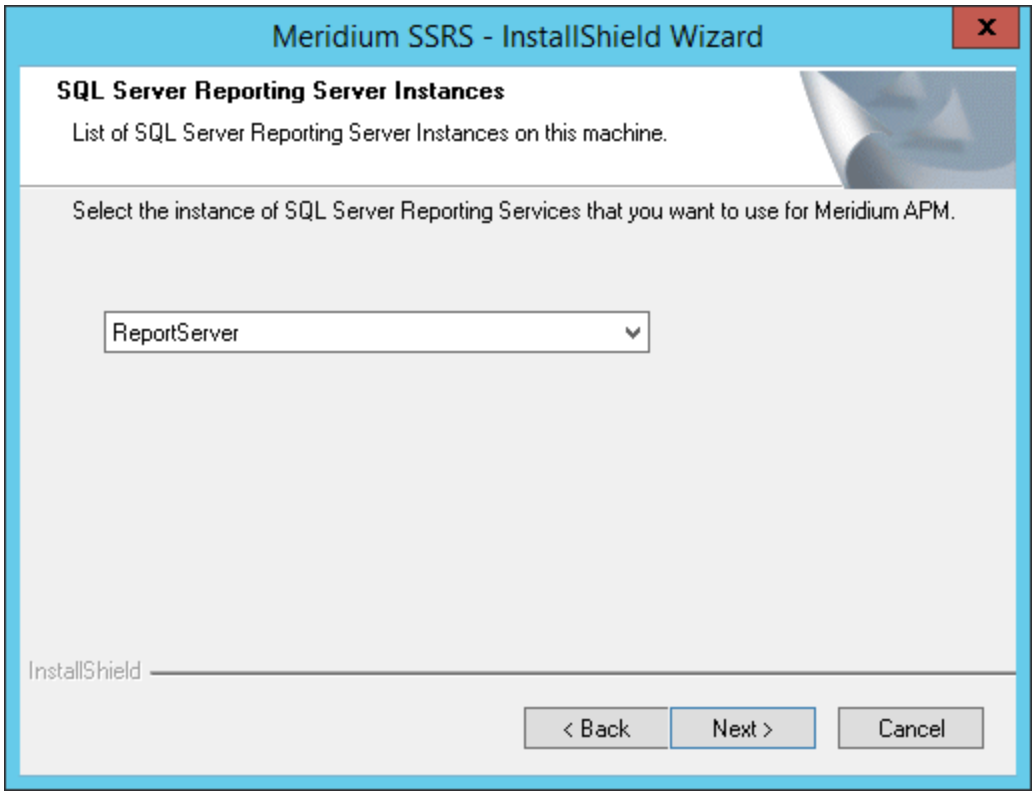

7. Select the instance of SQL Server Reporting Services that you want to use, and then select **Next**.

   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.

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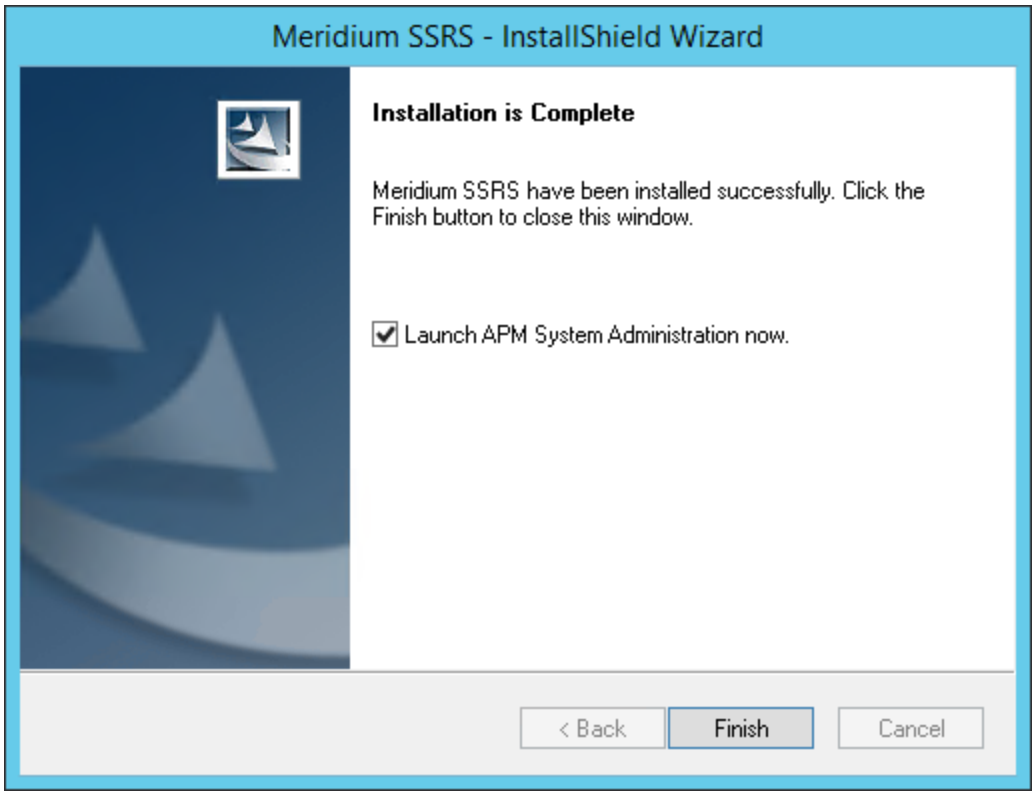

If you do not want the APM System Administration tool to be launched at this time, clear the **Launch APM System Administration now** check box.

9. Select **Finish**.

   The installer closes. Additionally, if the **Launch APM System Administration now** check box was selected, the **APM System Administration** window appears.

What's Next?

- Upgrade the GE Digital APM Database Server to V4.3.0.4.0

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Upgrade the GE Digital APM Database Server to V4.3.0.4.0

This topic provides a list of all procedures related to upgrade steps for the GE Digital APM Database Server, as well as links to the related concept and reference topics.

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Upgrade the GE Digital APM Database to V4.3.0.4.0

To upgrade your GE Digital APM database, you will use the GE Digital 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 GE Digital APM Server.

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

1. Replace all the baseline database content in your database with the updated baseline GE Digital APM database content.
2. Compare your public database content to the baseline GE Digital 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.

Upgrade workflow

The table in this section lists the prerequisite tasks that must be completed *before* you initiate the database upgrade process. These instructions assume that yourGE Digital APM Server and GE Digital APM Database Server machines meet the GE Digital 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 GE Digital Professional Services department.

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 GE Digital APM Database Server and may be necessary to successfully upgrade larger databases. The database upgrade executes

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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.

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Step	Task	Notes
1	Complete all steps before *Upgrade the Meridium Enterprise APM Database Server* in the upgrade GE Digital APM to V4.3.0.4.0 workflow.	This step is required. For example, if you are upgrading your system to V4.3.0.4.0, you should upgrade your dedicated GE Digital APM Server to V4.3.0.4.0 before attempting to upgrade your database to the V4.3.0.4.0 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 GE Digital APM database for the target database version.

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Step	Task	Notes
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.

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Step	Task	Notes
4	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.

5	If you are running SQL Server 2014 and you encountered the following timeout error when performing the upgrade in a test environment:
	`<date> - task C:\DBUMS\CONTENT\Versions\4030000\31_PostIEU_VerDepScripts\2070_ROUNDS_SEQ.MS.SQL has a staus of Failed`
	`<date> - Error: Microsoft.SqlServer.Management.Common.ExecutionFailureException: An exception occurred while executing a Transact-SQL statement or batch. ---> System.Data.SqlClient.SqlException: Timeout expired. The timeout period elapsed prior to completion of the operation or the server is not responding.`
	...you need to reset the database compatibility level. If you encountered this error, set the compatibility level to *110*.
		This step is required only if you are running SQL Server 2014 and you encountered the specified timeout error.

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Step	Task	Notes
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 GE Digital APM version V4.2.0.0 or later.

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Step	Task	Notes
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	If you reset the database compatibility level in the previous workflow step, revert the database compatibility level to the original value recorded in the previous step.	This step is required only if you are running SQL Server 2014 and reset the database compatibility level in the previous workflow step.

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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 GE Digital 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.

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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 GE Digital APM Default site was added to the Site Reference family during the database upgrade. If the GE Digital 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 GE Digital 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* GE Digital APM Default site.

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Step	Task	Notes
		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 GE Digital Professional Services department.

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Step	Task	Notes
		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*.

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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 GE Digital APM Default site was added to the Site Reference family. If the GE Digital 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 GE Digital APM Default site and one other site), then all users are assigned to the site that *is not* GE Digital APM Default site, and the site that *is not* GE Digital APM Default site is set as each user's default site.

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Step	Task	Notes
		If there are three or more sites in your Site Reference family (i.e., the GE Digital 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 GE Digital 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 GE Digital.
15	In GE Digital APM, build the search index.	This step is not mandatory, but is recommended by GE Digital.

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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 GE Digital APM database and are displayed in some form via the GE Digital 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 baselineGE Digital APM database. With the exception of rules and Catalog items, you cannot view baseline content in the GE Digital 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 GE Digital 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.

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Term	Definition	Examples
Baseline database content	The database content as it is developed and delivered to you in the baseline GE Digital APM database.	Query in the baseline Catalog folder Equipment family
Custom content	Database content that exists only in your database and not in the baseline GE Digital 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.

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About Customized Database Content Protection

In your GE Digital APM database, there is a baseline version and a public version of each item. The public version can be customized and is the version used by the product, while the baseline version *cannot* be customized. You cannot view the baseline version of most database content types via the GE Digital APM interface. However, the baseline version of your database content is used during the database upgrade process.

During the database upgrade process, the GE Digital APM system will compare each pre-upgrade baseline item in your database with the corresponding pre-upgrade public item in your database to determine whether you have customized a given item. Based on the outcome of that comparison, the database upgrade process will either replace or protect that item. With some exceptions, all your database content will be protected based upon the following criteria:

- If the pre-upgrade public version of an item is different from the pre-upgrade baseline version of that item, the GE Digital APM system:
  - Will *not* overwrite the public version of that item with the new baseline version of the item.

    -but-
  - *Will* overwrite the baseline version of that item in your database.
- If the pre-upgrade public version of an item *matches* the pre-upgrade baseline version, both the pre-upgrade public version and the pre-upgrade baseline version of that item will be overwritten with the new baseline version of the item.
- If only a public version of an item exists, it indicates that the item is custom content, and that content is not overwritten.

In other words, your baseline version of database content is always overwritten with the updated item that is delivered in the new baseline GE Digital APM database. After upgrading your database, you can also revert items to baseline.

Illustration of content protection

Consider a scenario where Datasheet A exists in the baseline GE Digital 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.

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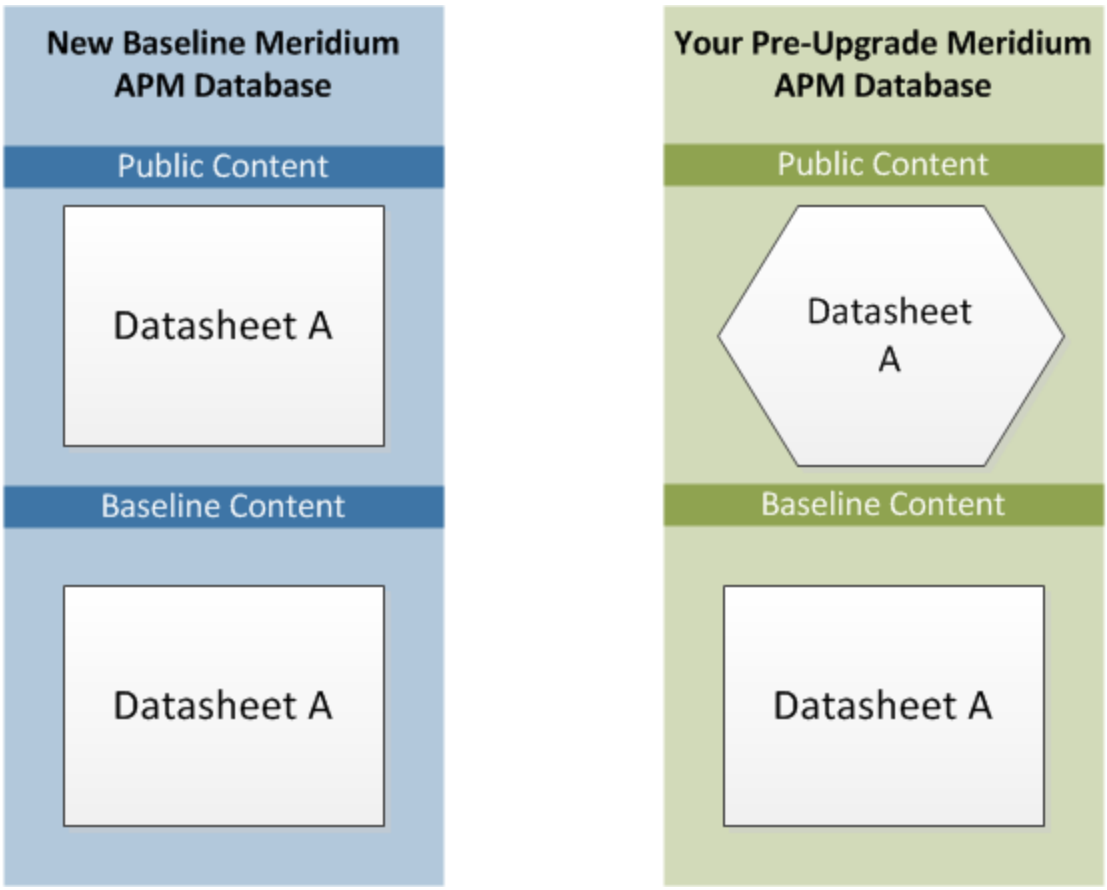

Note: As indicated by this illustration, in the baseline GE Digital APM database, the public and baseline versions of an item are always identical.

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.

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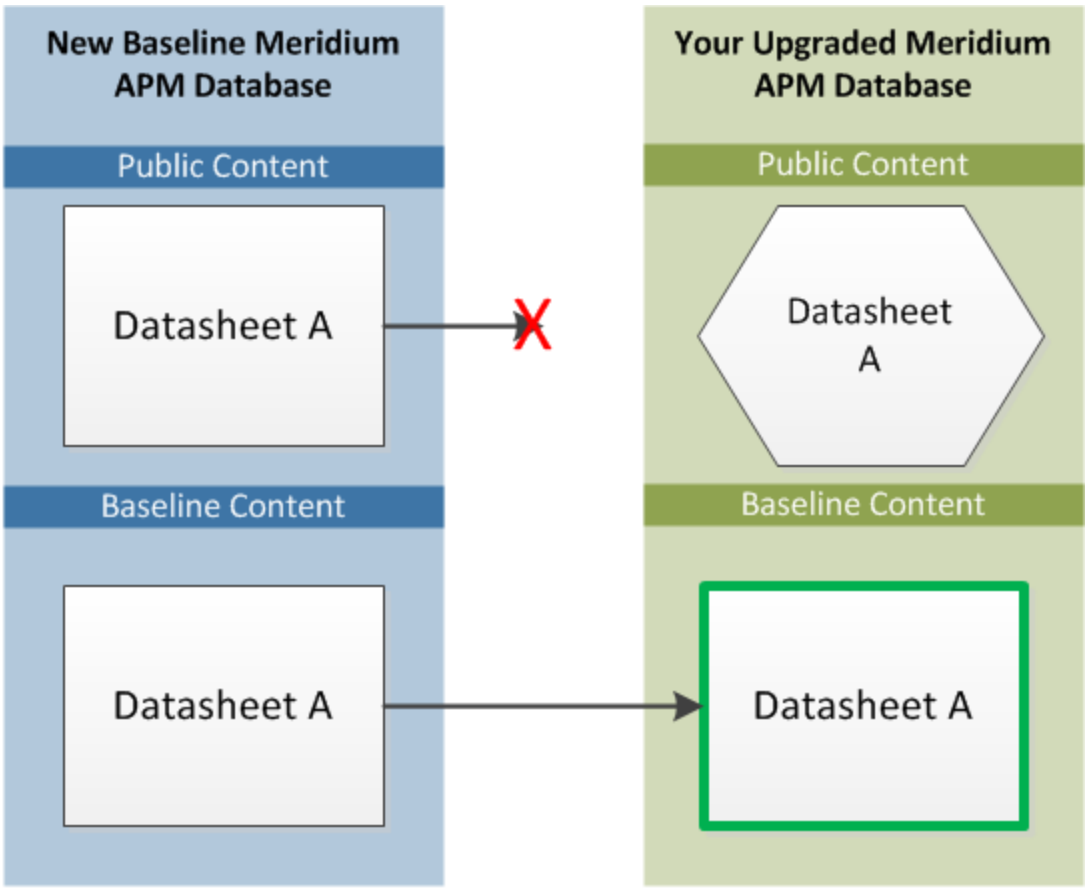

In this way, all your custom changes are retained. Likewise, however, your database will not contain the baseline changes that GE Digital delivers in a given release . For this reason, you will want to determine which database items will be retained in your database so that you can determine which baseline 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 GE Digital's changes

-or-

- Apply GE Digital'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 GE Digital delivers for that item in a given release. In other words, if GE Digital 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.

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Note: In a given release, there may be exceptions to the content protection criteria. These exceptions will be communicated via the GE Digital Release Notes for that version. For example, if GE Digital changes a baseline field caption, it is possible that GE Digital can choose to forcibly replace that field caption in your database even if you have customized that field caption already.

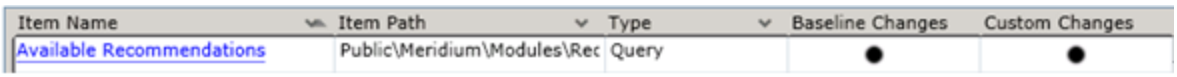
You can use the Database Comparison Tool (in pre-upgrade mode) to determine what content will be protected in your database. The output of this tool indicates:

- The baseline GE Digital APM database content that has been updated in the target version (i.e., content that includes new baseline changes from GE Digital).

  -and-

- Among the content that has been updated in the baseline GE Digital 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 GE Digital 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 GE Digital APM database for the target version and the same baseline query as it exists in your current version. For example, you could see that GE Digital 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

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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, GE Digital 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. GE Digital 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		

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Baseline Database Content Type	Protected?	Notes
• 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 GE Digital 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 auto-matically.
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
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		

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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 GE Digital 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

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Baseline Database Content Type	Protected?	Notes
		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.
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

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Baseline Database Content Type	Protected?	Notes
Preferences	Yes	None
UOMs and UOM Conversion Sets	Yes	None
Scheduled Items	Yes	None
Rules Library Projects	Yes	None

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Initiate the Database Upgrade Process

When you initiate the database upgrade process, the GE Digital 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 GE Digital APM Server already contains the version of the GE Digital 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 upon 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.

Steps

1. On the dedicated GE Digital APM Server machine, on the Start menu, expand the **Meridium APM Applications** folder.
2. Select **Database Upgrade Manager**.

   The **Meridium Database Upgrader** window appears.

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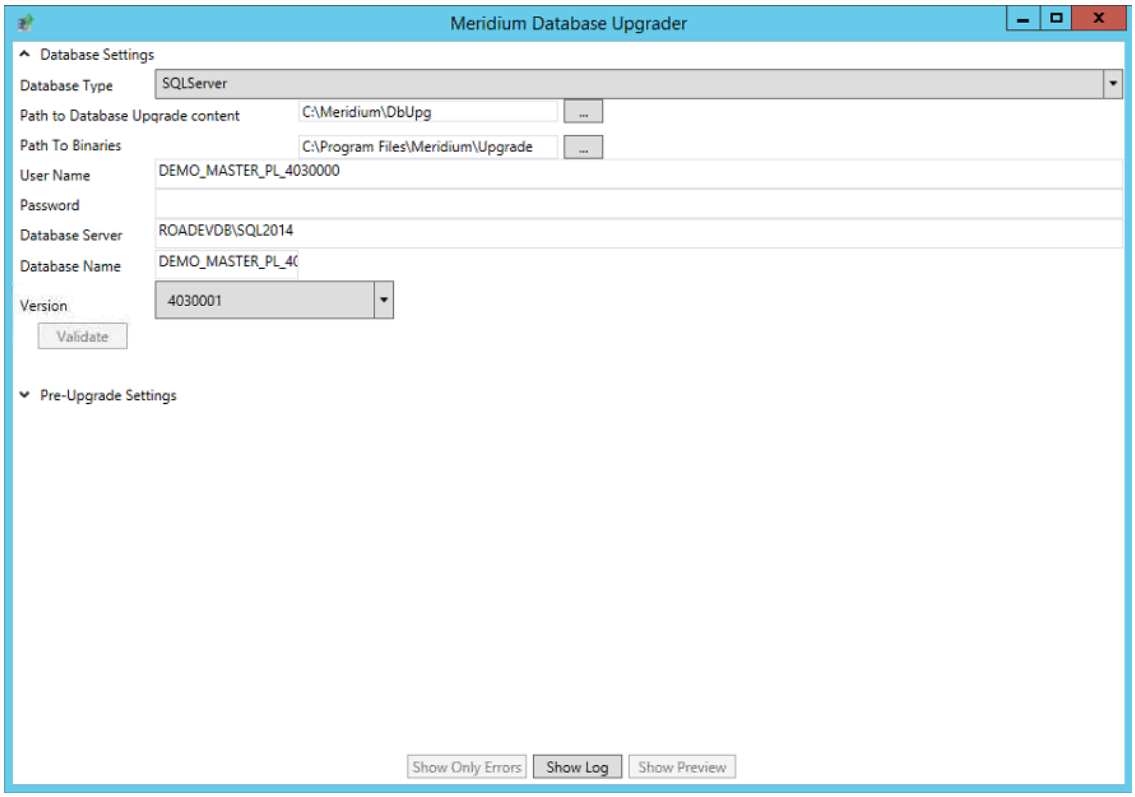

3. Enter the following information about the database that you want to upgrade to the new version:
    a. In the **Database Type** box, select the database type: *SQLServer* or *Oracle*.

       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 GE Digital 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.

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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.

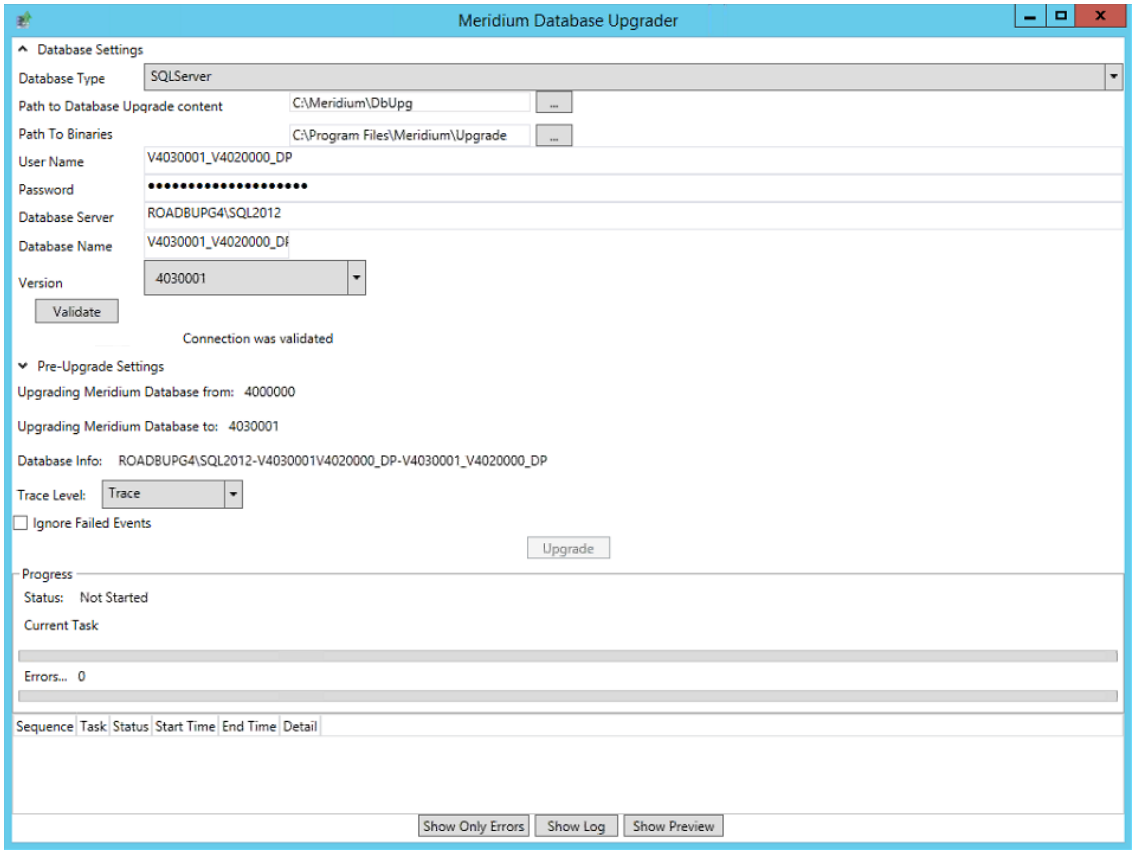
f. In the **Database Name** box, enter the name of the database that you want to upgrade. This step applies only to SQL Server database types. If you selected *Oracle* in the **Type** list, the **Database Name** box will be hidden.

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:

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

> **Note:** If the GE Digital 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 GE Digital 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 GE Digital. To do so:
   a. On the **Meridium Database Upgrader** window, select **Show Log**.

      The log appears in a new window.

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   b. Send the file to GE Digital. 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 GE Digital, restart the GE Digital APM Server.

What's Next?

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

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Configure the GE Digital APM Server for Oracle Components

When installing versions of Meridium APM prior to V4.0.0.0, you were instructed to modify the following files on the dedicated GE Digital 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.

Steps

1. On the GE Digital 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 (e.g., 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.

What's Next?

- Refer to the GE Digital APM Database Server upgrade workflow.

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Remove Database Notification Elements from the Database

After upgrading your GE Digital APM Database Server, GE Digital recommends that a Database Administrator manually remove database notification elements from the database.

Steps

- For an Oracle server, the Database Administrator should run the command REVOKE CHANGE NOTIFICATION FROM mi_connect_role.

  -or-

  For a SQL server, the Database Administrator should run the command ALTER DATABASE <db_name> DISABLE BROKER.

What's Next?

- Refer to the GE Digital APM Database Server upgrade workflow.

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Modify the Configuration File to Remove Notifications

Before You Begin

Modifying this configuration file is part of the GE Digital APM first time deployment workflow. Ensure that you have completed the preceding steps in that workflow before attempting to modify the configuration file.

Steps

1. On the GE Digital APM Server, navigate to the folder where the Notification Service files are installed. If you installed the software in the default location, you can locate these files in the folder **C:\Program Files\Meridium\Services**.
2. In an application that you can use to modify XML script (e.g., Notepad), open the file **Meridium.Service.Notification.exe.config**.
3. In the file, locate and delete the following line of code:

```
<!--<add key="thisTextIndexing" serverType="external" endPointName-
e="thisTextIndexingTcp" />-->
```

4. In the file, locate and delete the following line of code:

```
<!-- <endpoint name="thisTextIndexingTcp" address-
s="net.tcp://localhost/TextIndexingService/NotifyHandler" bind-
ing="netTcpBinding"
contract="Meridium.Core.Common.Contracts.INotificationService" />-->
```

5. Save and close the file.
6. Start or restart the Notification Service.

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Deploy Translations

Before You Begin

Deploying translations is part of both the GE Digital APM first time deployment workflow and the GE Digital APM upgrade workflow. Ensure that you have completed the preceding steps in the appropriate workflow before attempting to deploy translations.

Steps

1. If you have not already done so, activate the licenses for the translations that you have purchased.
2. On the GE Digital APM Server, run the file **Meridium.Version.EnableTranslations.exe**, which is located on that machine in the folder **C:\Program Files\Meridium\Upgrade**, against the database for which you have activated the licenses for the translations.

   Note: To run this file, open a command prompt window, and then enter and execute the following:

   C:\Program Files\Meridium\Upgrade\Meridium.Version.EnableTranslations.exe -d:<datasource name> -u:<username> -p:<password>

   ...where **<data source name>** is a valid data source name, **<username>** is the username of a GE Digital APM user with administrator privileges on the referenced data source, and **<password>** is the password for that user.
3. On the GE Digital APM Server, reset IIS.
4. You can now manage translations.

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Configure the Virtual Machine for all the Scheduled Jobs

In a load-balanced or clustered environment, you can dedicate a virtual machine (VM) to execute only the scheduled jobs.

Suppose that you have three virtual machines, VM1, VM2, and VM3. When a user accesses GE Digital APM, depending on the traffic, the load balancer redirects the request to the appropriate VM. The primary purpose of having a load balancer is to utilize the VM that is least loaded, but if there are multiple scheduled jobs that are consuming a high percentage of the resources of all the VMs, then the VM will slow down the response of the other requests. To overcome this issue, you can dedicate a single VM (e.g., VM1) to run all the scheduled jobs. The other machines (VM2 and VM3) can be put to standby mode for the purpose of accessing other GE Digital APM requests.

Steps

1. On the GE Digital APM Server machines that you want to put in standby mode, navigate to the folder **C:\Program Files\Meridium\ApplicationServer\api**.
2. Access the file **Web.config**.
3. Set the key *AllowToRunBackgroundJobs* value to *false*. See the following example of the modified line of code:

   ```
   <add key="AllowToRunBackgroundJobs" value="false"/>
   ```

   Note: By default, the value of the key *AllowToRunBackgroundJobs* is set to *true*.

4. Save the file.

   The VM is configured for all the scheduled jobs.

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Install Elastic Search on a Dedicated Server

1. On the server machine on which you want to install Elastic Search, access the GE Digital APM distribution package, and then navigate to the folder **3rd_Party_Software\ElasticSearch**.
2. Extract the contents of the file **elasticsearch-5.3.0.zip** to the folder **C:\ElasticSearch**.
3. In the extracted files, navigate to the folder **C:\ElasticSearch\elasticsearch-5.3.0\elasticsearch-5.3.0\config**, and then access the file **elasticsearch.yml**.
4. In the **elasticsearch.yml** file, uncomment the following properties and modify the values to match those shown here.

   ```
   cluster.name: apm-cluster
   node.name: ${COMPUTERNAME}
   path.data: /ProgramData/Meridium/ElasticSearch
   path.logs: /ProgramData/Meridium/Logs
   bootstrap.memory_lock: true
   network.host: 0.0.0.0
   http.port: 9200
   action.destructive_requires_name: true
   ```

5. Save and close the **elasticsearch.yml** file.
6. Select the Windows Start button, then navigate to and right-click **Command Prompt**, and then select **Run as administrator**.

   A command prompt window appears.
7. In the command prompt window, enter the following command:

   ```
   cd C:\ElasticSearch\elasticsearch-5.3.0\bin
   ```

8. In the command prompt window, enter the following command:

   ```
   elasticsearch-service install
   ```

   Elastic Search is installed.
9. Access the Services console (services.msc), and then test and modify the following Elastic Search properties:
   - Verify that the service runs as Local System.
   - Modify the startup to be Automatic.
   - Start the service to verify installation and configuration.
10. On the Elastic Server machine, ensure that Elastic Search is running by navigating to http://localhost:9200/ on your preferred web browser. You should receive a

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response similar to the following:

```
{
"name" : "apm-node",
"cluster_name" : "apm-cluster",
"cluster_uuid" : "58cS6NyzQJOLZ8Xr1e3vkg",
"version" : {
"number" : "5.3.0",
"build_hash" : "3adb13b",
"build_date" : "2017-03-23T03:31:50.652Z",
"build_snapshot" : false,
"lucene_version" : "6.4.1"
},
```

11. On the GE Digital APM Server machine, ensure that Elastic Search is running by navigating to http://[elastic-search-server]:9200/ on your preferred web browser.

    You should receive a response similar to that seen in the previous step.

12. On the GE Digital APM Server machine, navigate to **C:\ProgramData\Meridium**, and then access the file **MeridiumAppSettings.xml**.

13. In the file **MeridiumAppSettings.xml**, modify the following values as needed:

```
<!-- Search and Elastic Services -->
<add key="searchServiceUrl" value="http://localhost:9199" />
<add key="elasticServiceUrl" value="http://<name of Elastic Search server-
>:9200" />
```

14. On the GE Digital APM Server, restart the following services:

    - Meridium Search Service
    - Redis service
    - Reset IIS (optional)

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Deploy the GE Digital APM Mobile Application

This topic provides a list of all procedures related to deploying the GE Digital APM mobile application.

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Install the GE Digital APM Mobile Application on Mobile Devices

Steps

You must install the GE Digital APM mobile application on any mobile devices that your company plans to use. The method that you use for installing the GE Digital APM mobile application will differ depending upon the type of operating system that your mobile devices use.

- If your mobile devices use an iOS operating system, you must sign the app using your Enterprise Developer Credentials.

  -or-

- If your mobile devices use an Android operating system, you can install the GE Digital APM mobile application using your standard mobile device management tool. The .APK file is located on the GE Digital APM Server, in the folder **<root>\ApplicationServer\distribution**, where **<root>** is the location in which GE Digital APM is installed (e.g., **C:\Program Files\Meridium**).

  -or-

- If your mobile devices use a Windows operating system:
  a. On the GE Digital APM Server, navigate to the folder **<root>\ApplicationServer\distribution**, where **<root>** is the location in which GE Digital APM is installed (e.g., **C:\Program Files\Meridium**), and then copy the contained file **Meridium.zip** to the device on which you want to install the GE Digital APM mobile application.
  b. On the device on which you want to install the GE Digital APM mobile application, extract the content of the copied .ZIP file to a local folder.
  c. Depending on how you want to install the application, run one or more of the following scripts. To do so, in the folder into which you extracted the .ZIP file content, press and hold the appropriate file, and then select **Run as an Administrator:**
     - **Install_current_user.bat**: Installs the app on the device for only the Windows user account that is currently logged in.
     - **Install_all_current_users.bat**: Installs the app on the device for each Windows user account that exists on the device.

       Note: For each Windows user account on the device, the installation will run in the background the next time that user logs in to the device.

     - **Install_all_future_users.bat**: Installs the app on the device for each Windows user account that exists on the device, and will be installed for any new Windows user accounts on the device when they are created.

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Note: The following scripts, which can be used to cancel installations of or uninstall the GE Digital APM mobile application, are also available:

- **Cancel_current_users_install.bat**: Cancels future installations for Windows user accounts on a device.
- **Uninstall.bat** (located in **Meridium/installer/install_scripts**): Uninstalls the app and cancels future installations for Windows user accounts on a device.

The GE Digital APM mobile application is installed on the Windows device.

This documentation assumes that you are familiar with installing apps on your mobile devices, so specific instructions for installing the GE Digital APM mobile application are not provided.

IMPORTANT: Any management policy applied to mobile devices must be set up to allow the required permissions for the GE Digital APM mobile application. If restrictions are placed on iOS, Android, or Windows devices by a global policy or mobile device management system, then device storage, scanning, photography, location services, and other functionality may be disabled.

If you are using a Windows device, ensure that Windows App Store access is enabled.

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About Installing the GE Digital APM Mobile Application on iOS Devices

GE Digital provides an iOS app, but there are specific steps that must be taken for an organization to install the GE Digital APM mobile application on iOS devices. Before the application can be installed, a developer's license must be purchased. The Developer Credentials that this license contains must be used to *sign* each installation that is performed on an iOS device. You can apply to the iOS Developer Enterprise Program using the website https://developer.apple.com/programs/ios/enterprise/.

Various tools can be used to sign a the GE Digital APM mobile application installation, such as iResign.

For more information on iOS GE Digital APM mobile application installation, contact GE Digital.

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System Administration

This topic provides a listing of all topics related to deployment and upgrade System Administration.

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Redis

This topic provides a list of the all the procedures related to Redis, as well as links to the related concept and reference topics.

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About Configuring the Redis Server

The configuration settings for the Redis server are controlled through the *conf* file that is specified when installing the service. You can change settings by modifying the file and restarting the service to apply the changes. You can also use the CONFIG GET and CONFIG SET commands from a Redis client to view or alter the server configuration.

Note: The *conf* file does will not be updated with the changes settings that occur at run time. After making changes to the *conf* file, be sure to restart the service.

Configure Server and Ports

By default, the Redis server runs on **TCP Port 6379**.

- If the GE Digital APM server and the Redis server are on *same* machine, then connections are allowed from the local server.
- If the GE Digital APM server and the Redis server are on *different* machines, then Port 6379 must be accessible between the Client and the Server. Any firewalls between the systems must be configured to support traffic over this port. The default port is changed in the *conf* file to 6379 by adjusting the *port* value.

Configure Secure Access

It is recommended to always use Redis in an environment in which the network and the Redis server are secured.

- If the GE Digital APM server and the Redis server are on *same* machine, then Redis can be secured by blocking external access to the network port (port 6379), allowing connections only from the local server.
- If the GE Digital APM server and the Redis server are on *different* machines, you can secure the access by:
  - Configuring Redis to use a password.

    Note: By default, Redis is configured without a password.

    When using a password on the Redis server, you must configure the connection string to include the password.

    a. On the GE Digital APM Server, access the folder **C:\ProgramData\Meridium**, and then, in an application that you can use to modify XML script (e.g., Notepad), open the file **MeridiumAppSettings.xml**.

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b. Within the **<cacheServiceUrl>** setting, change the default value **localhost** to **localhost,password=<Redis password>**, where **<Redis password>** is the password for the Redis server.

Note: The password in the .XML file can be encrypted by running **MeridiumCachePasswordUtility.exe** from a command prompt, passing in **C:\ProgramData\Meridium\MeridiumAppSettings.xml** as a command line parameter.

- Setting up the firewall on the Redis server to only allow connections from the GE Digital APM servers.

Note: If Redis is configured on a separate sever and network transmissions are across an unsecured/open network, then it is recommended to use third-party software (e.g., Stunnel) to enable SSL communication between systems.

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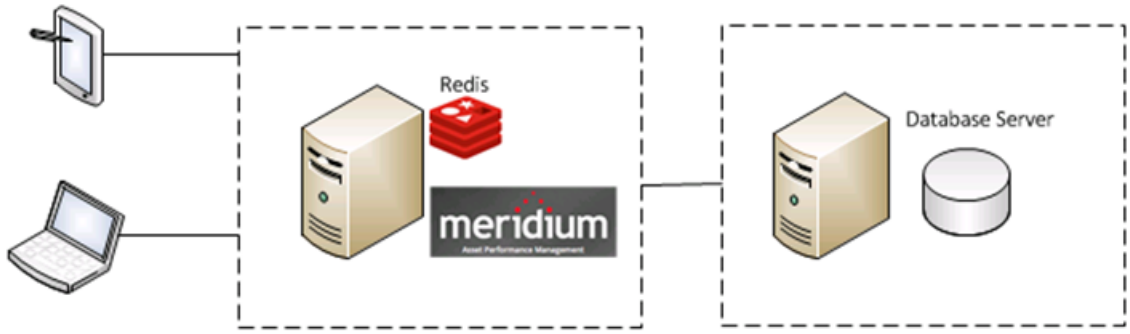
Standard Deployment Architecture

By default, the standard single system deployment architecture includes the Redis server on the same system as the GE Digital APM Server.



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Set Up the GE Digital APM Server - Medium Cache Configuration

GE Digital APM Servers are set up either using a medium cache configuration or a high availability configuration.

Note: In a standard deployment, the Redis server is on the same system as the GE Digital APM Server.

Steps

To configure GE Digital APM servers using medium cache configuration:

1. On the GE Digital APM Server machine, navigate to the folder **C:\ProgramData\Meridium**.
2. Open the file **MeridiumAppSettings.xml** in an application that you can use to modify XML script.

```
<?xml version="1.0" encoding="utf-8"?>
<configuration>
  <appSettings>
    <!-- Meridium web api -->
    <add key="baseUrl" value="http://{0}/Meridium" />

    <!-- session timeout values, in minutes. -->
    <add key="sessionTimeout" value="20" />

    <!-- query timeout values, in minutes. -->
    <add key="commandTimeout" value="360" />

    <!-- query timeout values, in minutes. -->
    <add key="transactionTimeout" value="5" />

    <!-- Cache Service  -->
    <add key="cacheType" value="redis" />
    <add key="cacheServiceUrl" value="localhost" />
    <add key="cacheTimeout" value="1440" />

    <!-- Notification Service -->
    <add key="notificationServiceUrl" value="net.tcp://{0}/Meridium/Service/Notification" />
  </appSettings>
</configuration>
```

3. Within the **<Cache Service>** tag, make changes to the following Redis-specific settings.
   - The **cacheType** value should equal **"redis"**.

     Note: The **cacheType** value **"redis"** is supported for any customer implementations.

   - The default value for **cacheServiceUrl** is **"localhost"**. If Redis is configured on

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different server using a non-default port, values should contain a comma separated set of values.

- The default value for **cacheTimeout** is 1 day, or 1440 minutes.

Note: The system will first check whether these settings are configured in the executable or web config file and, if they are not, it will then load them from the **MeridiumAppSettings.xml** file. GE Digital's recommendation is to use the **MeridiumAppSettings.xml** file to ensure consistency across the installation and to give you the ability to change the settings for all of the services and websites in one place per server.

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Install Redis - High Availability Configuration

GE Digital APM Servers are set up either using a medium cache configuration or a high availability configuration.

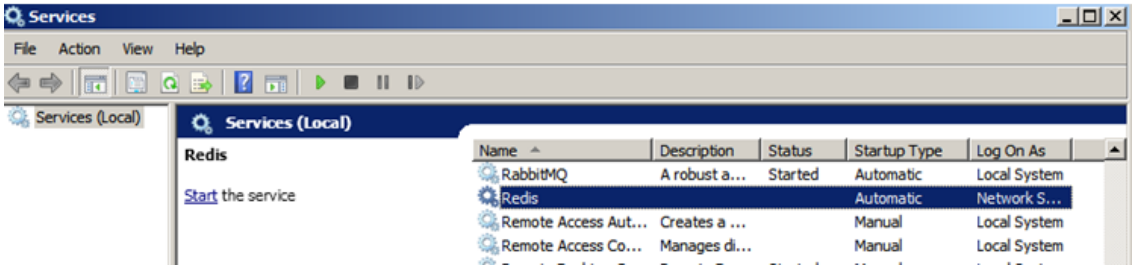
Steps

Note: By Default, GE Digital APM Installer performs these steps automatically for a standard install.

1. On the GE Digital APM Server machine, login as an administrator.
2. Open a command prompt window.
3. In the command prompt window, change to the directory where the file was copied.
4. Enter the following command in the window: `redis-server --service-install redis.windows.conf`
5. Press Enter on the keyboard.

   Redis is installed as a service.
6. On the Windows Start menu, enter **Services.msc** in the **search** box.
7. Press Enter on the keyboard.

   The **Services** window appears.



8. Double-click on Redis service.

   The Redis service is now running on the GE Digital APM Server machine.

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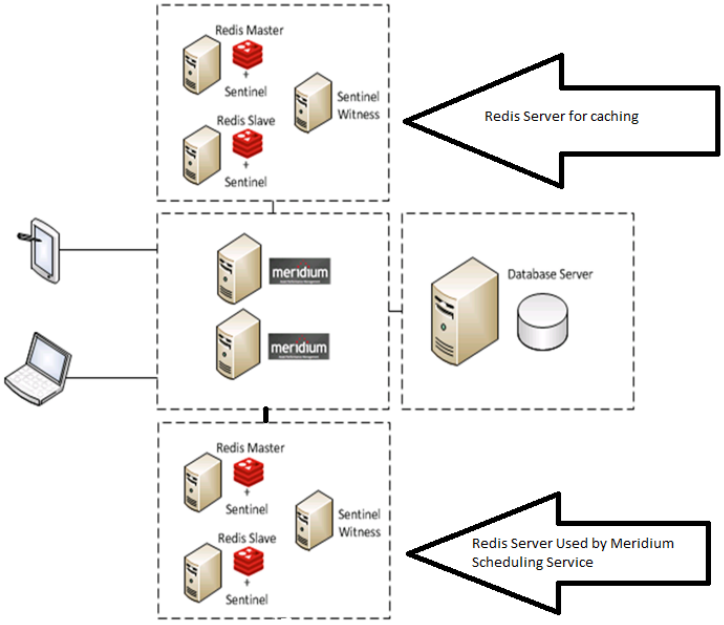
Setup GE Digital APM Server - High Availability Configuration

If GE Digital APM Servers are set up in a load-balanced configuration, then *two* Redis servers should be running, each on a separate system, with each GE Digital APM server-/service configured to point to the separate systems. Redis servers can be configured either by Replication only Setup *or* by Automatic Fail-Over monitoring.

The first Redis server setup is used for caching. The second Redis server setup is used by GE Digital APM Scheduling Service to broadcast events to instances of GE Digital APM.



The following image illustrates how the Redis server setup used by GE Digital APM Scheduling Service communicates with instances of GE Digital APM over web socket protocol.

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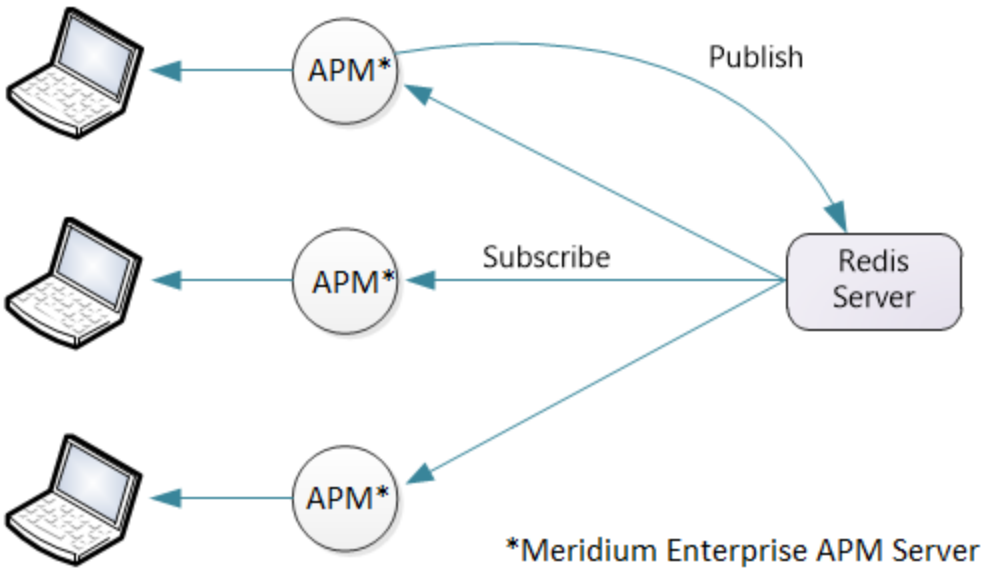

Replication only Setup

Redis can be configured with replication only. Replication only setup means that Redis will replicate data automatically to any configured slaves but in the event of a failure, an administrator must login and manually change a server to be master instead of slave.

A number of changes are needed in the Redis configuration file. To enable the Redis master-slave configuration:

Steps: Changes to the Master

1. Configure the save intervals.

   save 900 1

   save 300 10

   save 60 10000

2. Configure the directory for the persisted data.

   heapdir "c:\\path_to_where_data_is_stored\\"

3. Enable peristence.

   persistence-available yes

Steps: Changes to the Slave

1. Configure the slave to point to the master IP address.

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slaveof <masterip> <masterport>

2. Configure the slave priority to a lower value than the master.

   slave-priority 1

   Note: The default priority is 100. You should configure the first slave and set the priority to 1, then set the priority of the second slave to 2, and so on.

Steps: Automatic fail-over monitoring and configuration

In this type of setup, the setup will automatically replicate any data changes from the master to the slave. Sentinel will then automatically detect a failure and re-configure the Redis slave to be the master in the event of a failure.

Note: It is is recommended that Redis be configured in a master/slave setup with Sentinel.

1. Install Sentinel using the Redis server executable file.
2. Make changes to the Sentinel "Conf" file:

   redis-server --service-install sentinel.windows.conf --loglevel verbose --service-name Sentinel --sentinel

3. Configure the port in the Sentinel "conf" file.

   Note: By default, the Redis server runs on **TCP Port 6379**. If using in a non-secure network then the port should be blocked from external access but be accessible from all other sentinels and all Redis servers. Sentinels should be 1 more than the number of slaves.

4. To use GE Digital APM, Redis, and Sentinel in a High Availability Configuration:
   a. On the GE Digital APM Server machine, navigate to the folder **C:\ProgramData\Meridium**.
   b. Open the file **MeridiumAppSettings.xml** in an application that you can use to modify XML script (e.g., Notepad).
   c. Within the **<Cache Service>** tag, make changes to the following setting:
      - **cacheServiceUrl**- This should contain connection details to *the Redis server setup that will be used for caching*. The servers are separated by a comma at the beginning of the connection string and should include the port number, if non-default ports are used.
   d. Within the **<appSettings>** tag, make changes to following settings:

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- **useRedisBackplane :** This should be set to **true**.
- **redisBackplaneUrl :** This should contain connection details to *the Redis server setup that will be used by GE Digital APM Scheduling Service*. The servers are separated by a comma at the beginning of the connection string, and, if non-default ports are used, should include the port number.

e. For each GE Digital APM Server in the high-availability configuration, repeat steps a through d.

Note: All servers (GE Digital APM, Redis, and Sentinel) in a High Availability configuration must use the same password.

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About Redis

Redis is a high-performance, NoSQL key-value database typically used for caching data to scale high-traffic websites. GE Digital APM uses Redis for caching purposes and to ensure a consistent shared cache among the various servers and services that make up a GE Digital APM installation.

If GE Digital APM servers are set up in a load-balanced configuration, then a separate Redis server is also used as an intermediate to broadcast events from the Meridium Scheduling Service to instances of GE Digital APM that are connected to different GE Digital APM Servers using the WebSocket protocol.

Redis is an open source software component licensed under the Three Clause BSD License.

More Details

Redis provides a basic Pub-Sub messaging infrastructure that allows the server to notify subscribed clients of changes or various events that occur on the server. The GE Digital APM uses this feature to notify servers/services when cached data has changed, caches expire, or caches are removed. This feature, along with the Meridium Notification Service, is used for change notification. Redis events specifically handle cached/static data such as metadata, while the Meridium Notification Service handles more dynamic changes such as Entity inserts/updates. Redis is used as an in-memory cache to store user session information, various types of metadata (e.g., family definitions, field definitions, security groups, etc.), and Catalog data.

Meridium Scheduling Service runs on each GE Digital APM Server in a load-balanced configuration. For a user session, an instance of GE Digital APM connects to one of the GE Digital APM Servers using the Websocket protocol, but the background job can run on any server in a load-balanced configuration. Meridium Scheduling Service sends the message to the Redis server, and the Redis server then relays the message to all GE Digital APM Servers. Finally, the GE Digital APM Server sends this message to the GE Digital APM instance connected using the WebSocket protocol.

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Manage the GE Digital APM Database Comparison Tool

This topic provides a list of all procedures related to managing the GE Digital APM Database Comparison Tool, as well as links to the related concept and reference topics.

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About the GE Digital APM Database Comparison Tool

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

Variable	Purpose of Comparison	When to Perform Comparison
The content of the *baseline* GE Digital APM database for the source version.	Allows you to see the changes that GE Digital 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 GE Digital 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 GE Digital 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.

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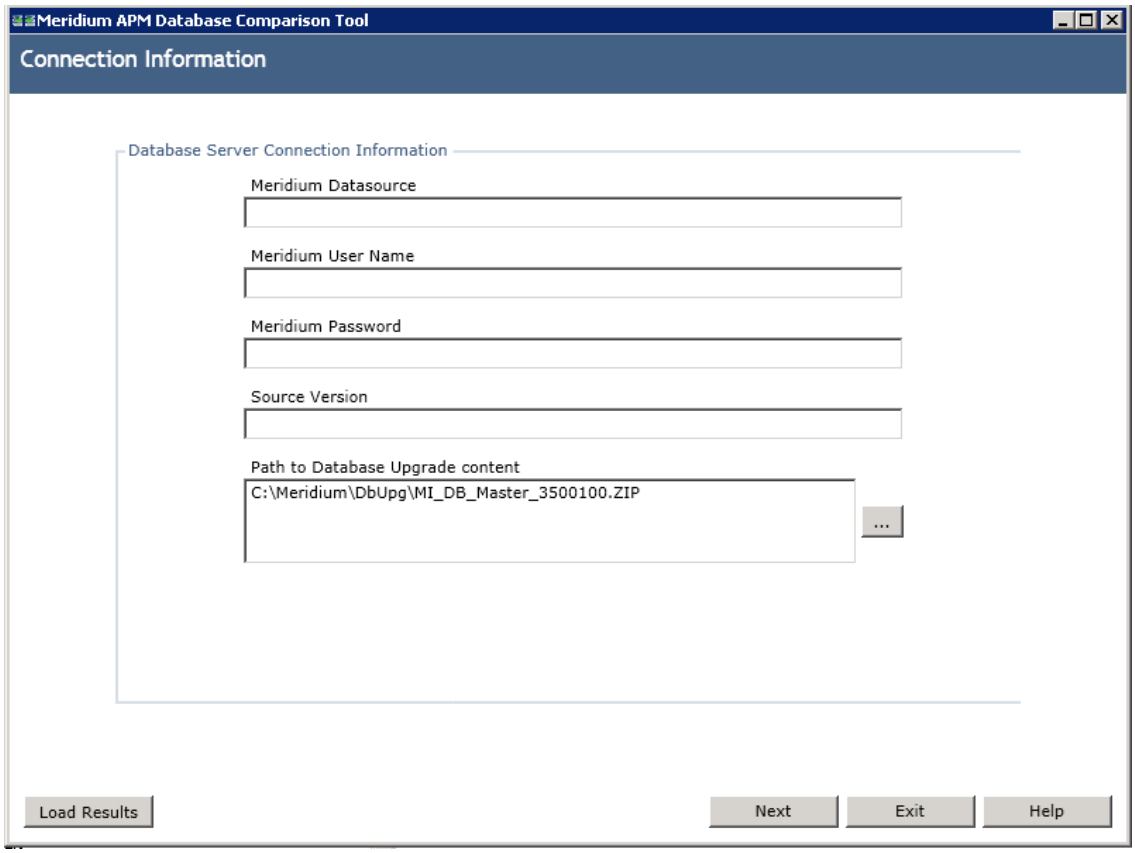

- **Comparison Details:** Lets you run the comparison to identify the differences between the content of the two databases that you are comparing.

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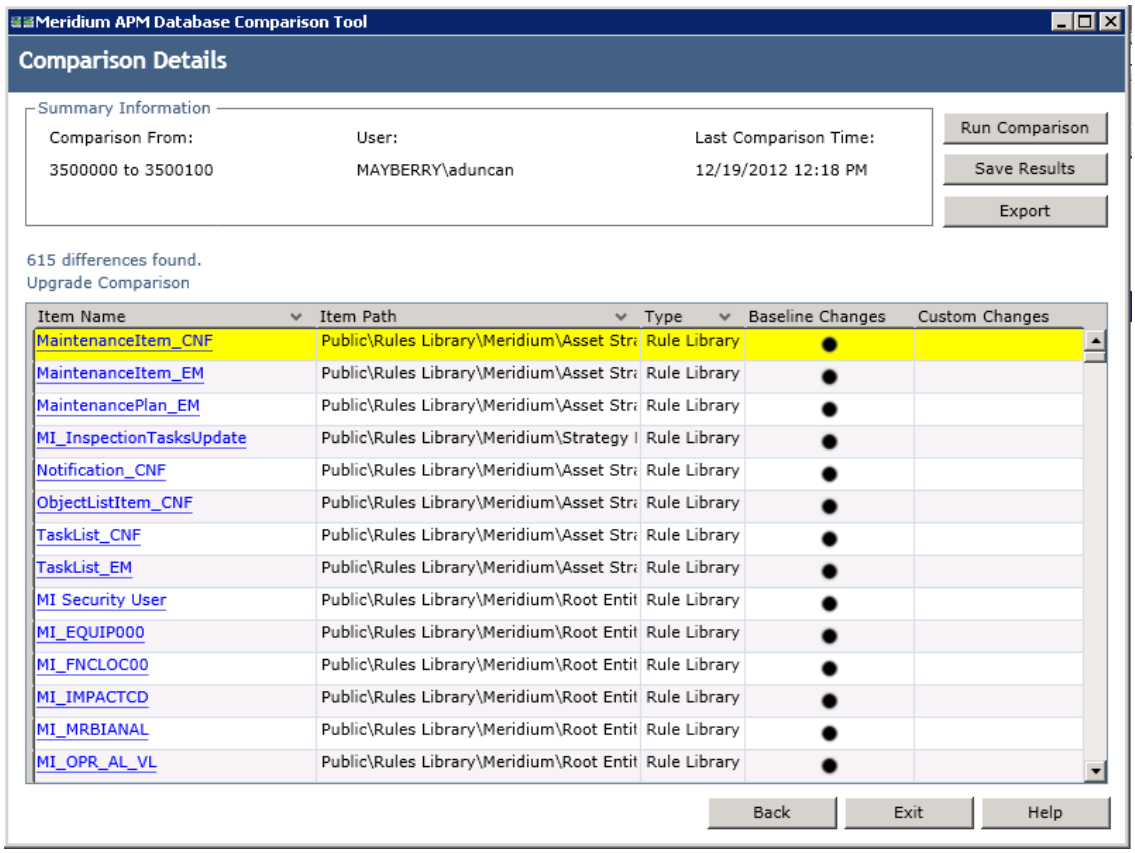

On this screen, you can also:

- 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.

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Run the Comparison Against a Pre-Upgraded Database

These instructions assume that you want to compare the content of your current, pre-upgraded GE Digital source database against the baseline content of a newer version of the GE Digital database.

⚠**IMPORTANT:** The comparison process can last *an hour or longer*, depending upon the size of the database 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 may continue working in other windows while the process is running.

Before You Begin

1. On the GE Digital 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 GE Digital APM Server. You must then complete the following additional steps.

   a. On the GE Digital 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>
```

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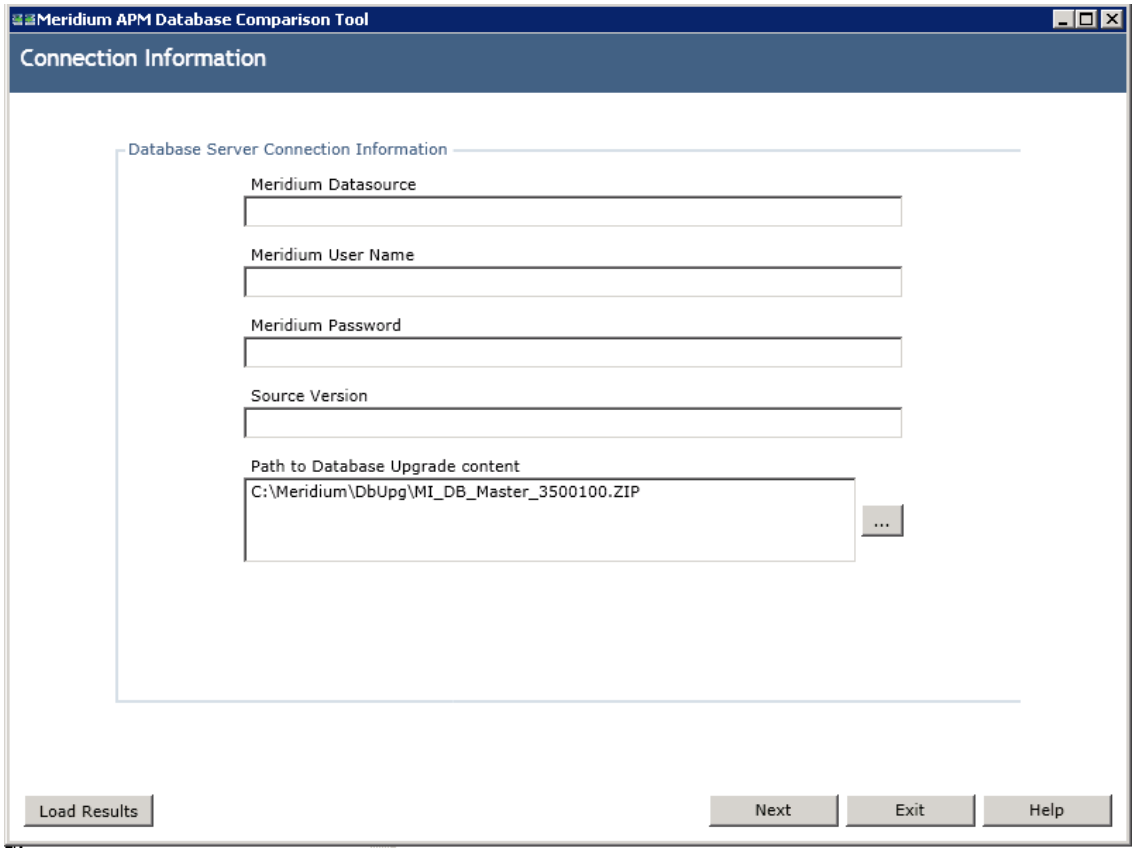
d. Save the file, and then close it.

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

Steps

1. On the GE Digital APM Server, navigate to the folder **C:\Program Files\Meridium\Client\100.0.0.0.0**, and then open the file **DatabaseReport.exe**.

   The GE Digital 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.

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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:

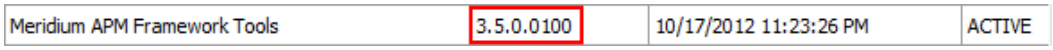
   - **vvv** is a three-digit number representing the main version.
   - **mm** is a two-digit number representing the maintenance release version, if applicable. If the maintenance release version is a single digit, you must prepend zero (0) to it. If there is no maintenance release version, you must enter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

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.

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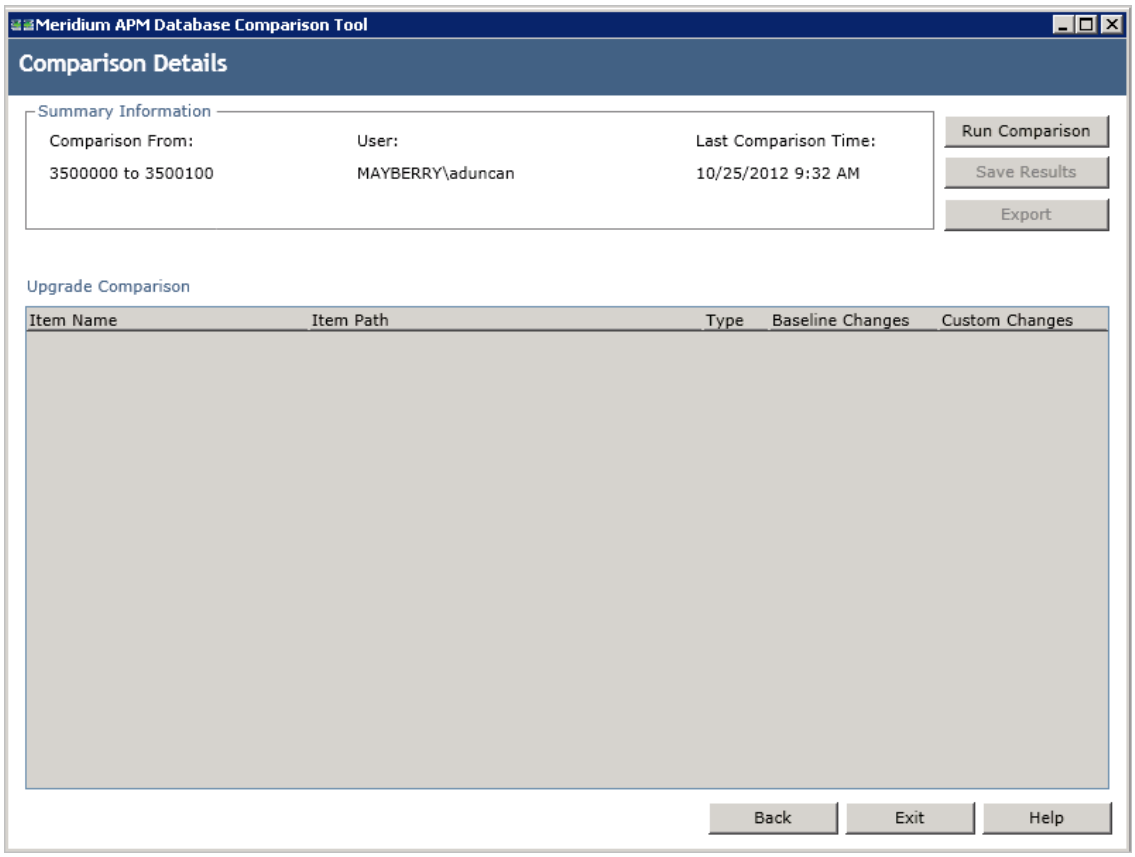

The following information appears in the **Summary Information** section:

- **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.

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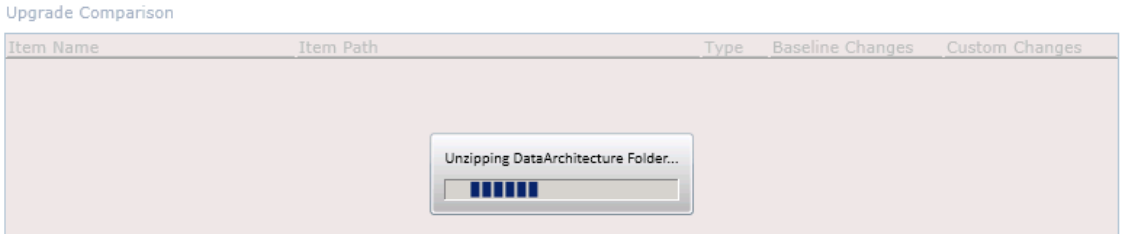
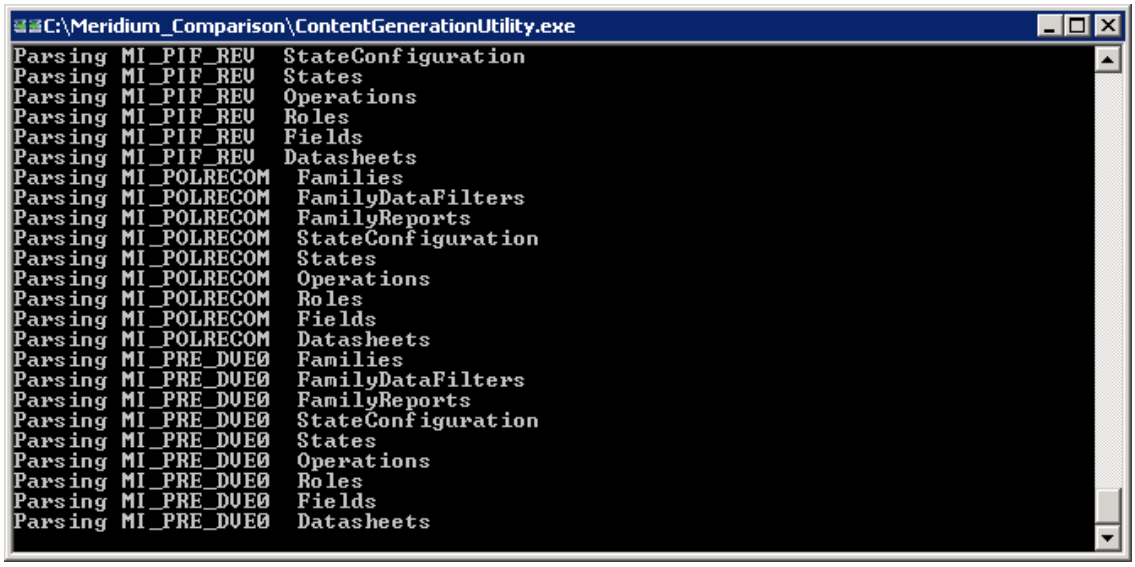


Eventually, a command prompt window will appear, displaying the progress of the various comparison stages.



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.

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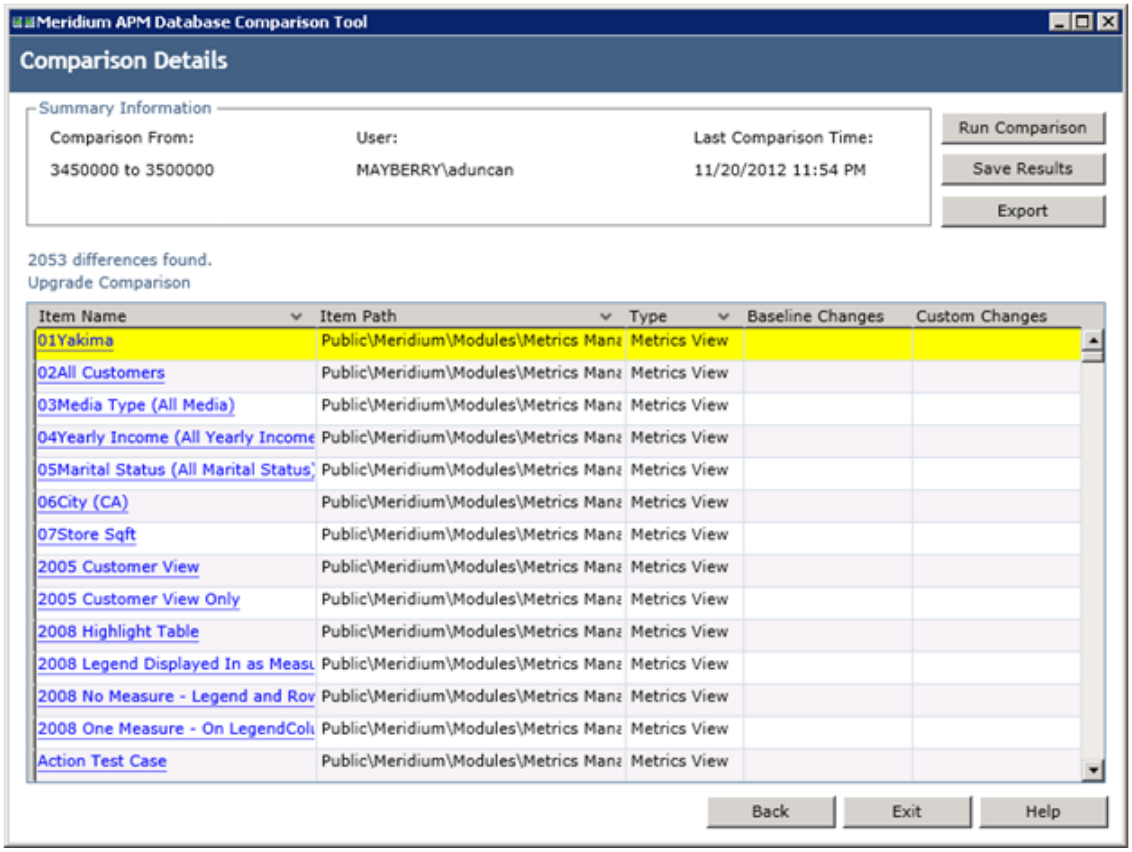

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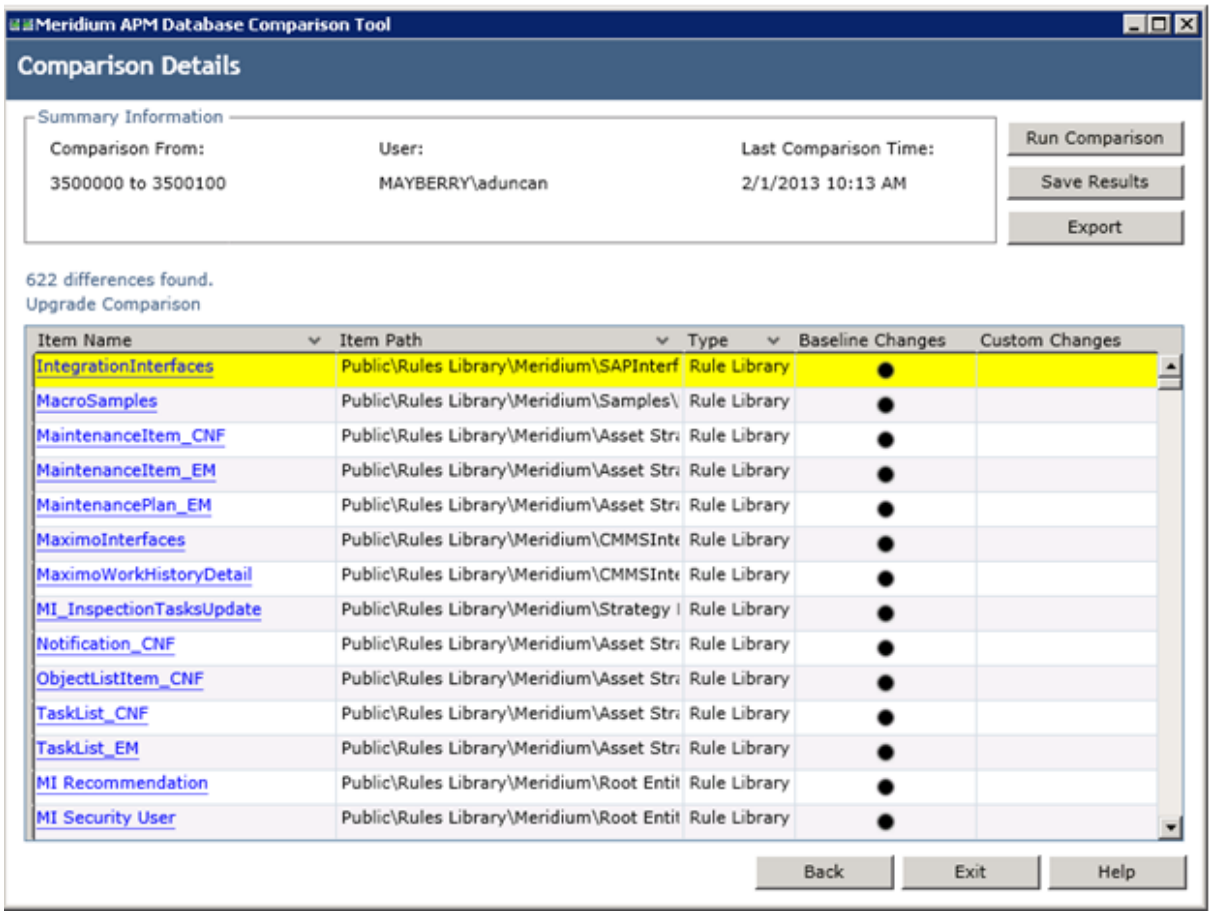
About the Pre-Upgrade GE Digital APM Database Comparison Tool Comparison Results Grid

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

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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.

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Baseline Changes	Custom Changes	Explanation	Example
	✓	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.

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Baseline Changes	Custom Changes	Explanation	Example
✓	✓	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.

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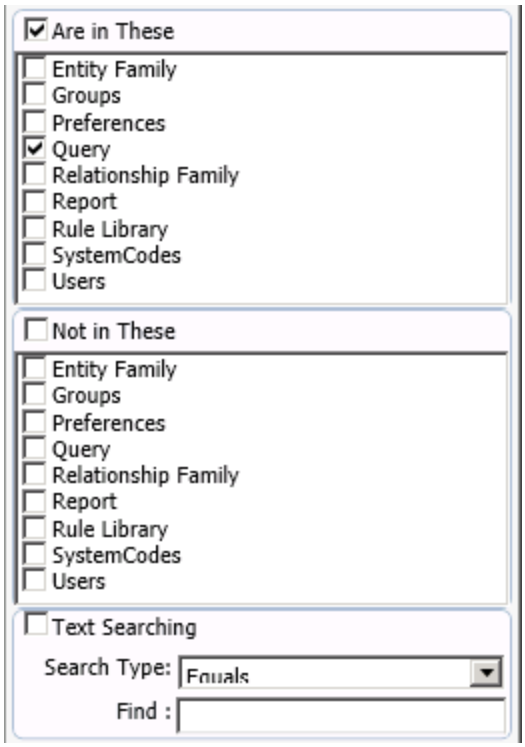
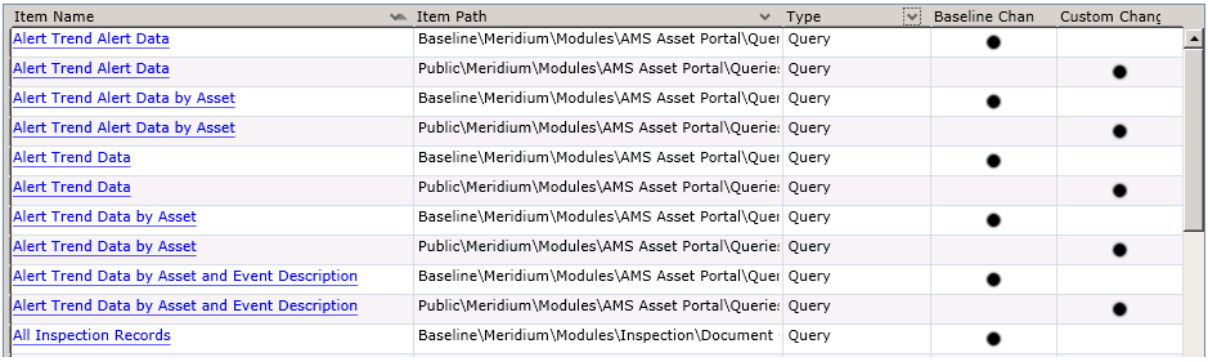
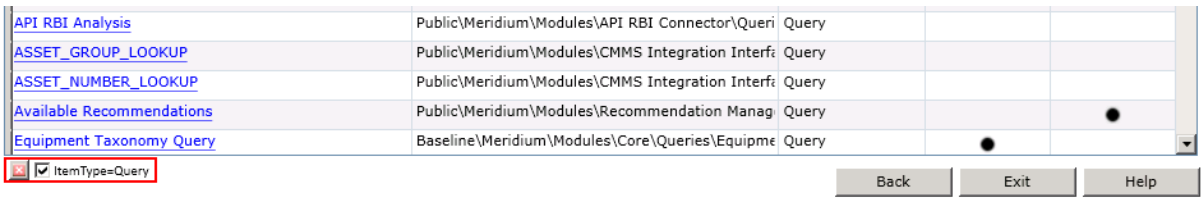


The result would then contain only queries, as shown in the following image.



Item Name	Item Path	Type	Baseline Chan	Custom Chang
Alert Trend Alert Data	Baseline\Meridium\Modules\AMS Asset Portal\Quer	Query	●	
Alert Trend Alert Data	Public\Meridium\Modules\AMS Asset Portal\Queries	Query		●
Alert Trend Alert Data by Asset	Baseline\Meridium\Modules\AMS Asset Portal\Quer	Query	●	
Alert Trend Alert Data by Asset	Public\Meridium\Modules\AMS Asset Portal\Queries	Query		●
Alert Trend Data	Baseline\Meridium\Modules\AMS Asset Portal\Quer	Query	●	
Alert Trend Data	Public\Meridium\Modules\AMS Asset Portal\Queries	Query		●
Alert Trend Data by Asset	Baseline\Meridium\Modules\AMS Asset Portal\Quer	Query	●	
Alert Trend Data by Asset	Public\Meridium\Modules\AMS Asset Portal\Queries	Query		●
Alert Trend Data by Asset and Event Description	Baseline\Meridium\Modules\AMS Asset Portal\Quer	Query	●	
Alert Trend Data by Asset and Event Description	Public\Meridium\Modules\AMS Asset Portal\Queries	Query		●
All Inspection Records	Baseline\Meridium\Modules\Inspection\Document	Query	●	

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	●	

You can remove a filter by selecting below the grid.

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Run the Comparison Against an Upgraded Database

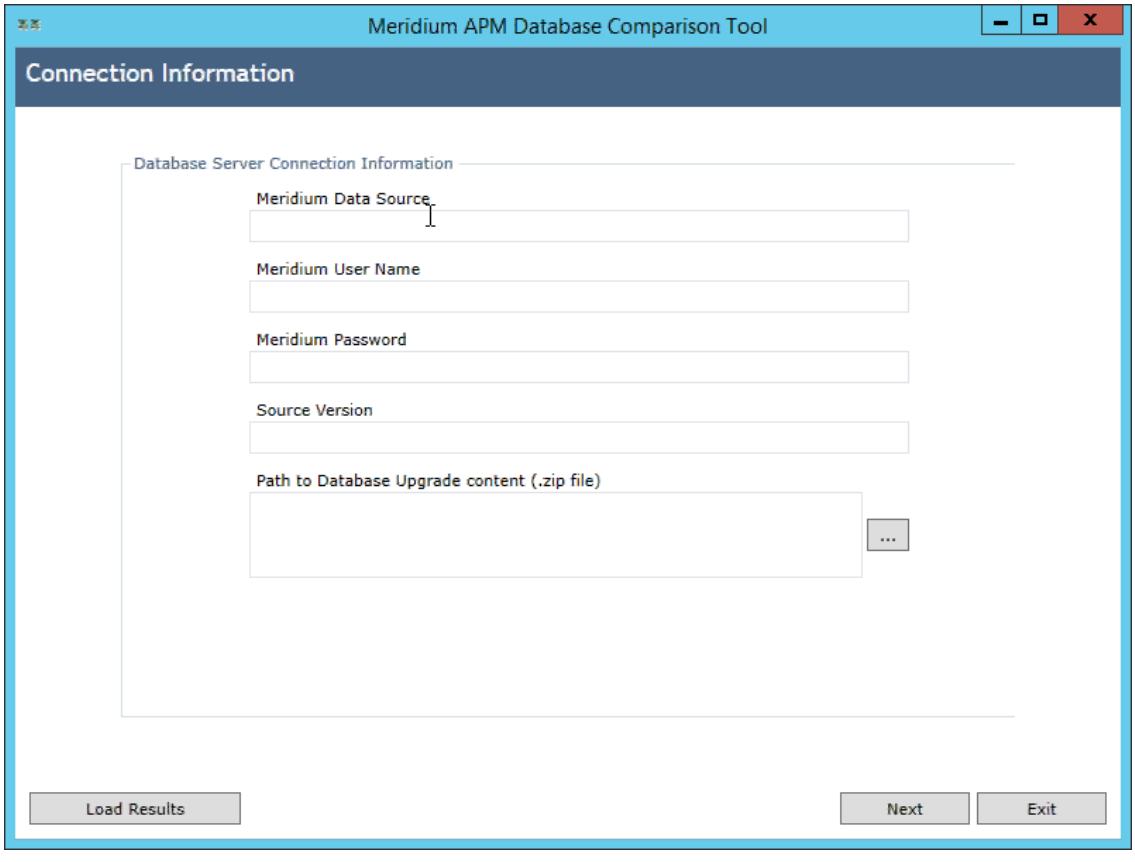
These instructions assume that you want to compare your upgraded database to the baseline version.

⚠**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.

Steps

1. On the GE Digital 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.



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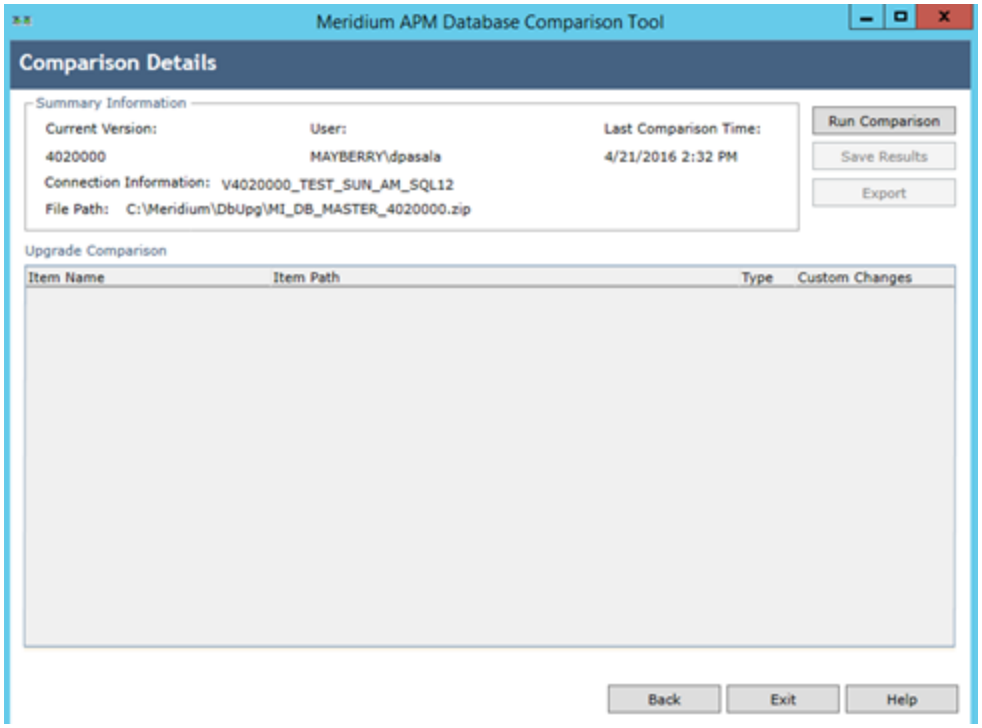
2. In the **Meridium Data Source** box, enter the predefined data source that points to your upgraded GE Digital APM database.
3. Enter the name of a GE Digital APM Security User defined in your database.
4. Enter the password for that Security User.
5. Enter the version of the upgraded source database. 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 GE Digital APM Server and Add-ons installer when GE Digital 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>

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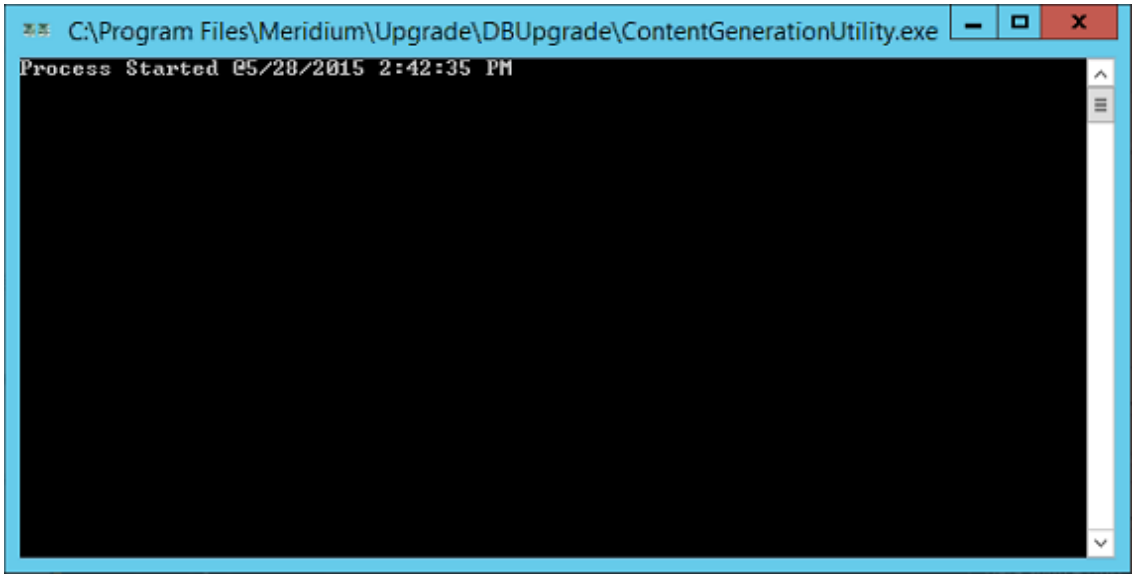
...where

- <source version> is the version of the source database that you are comparing against. The source version on the left should match **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 GE Digital APM Database Comparison Tool.

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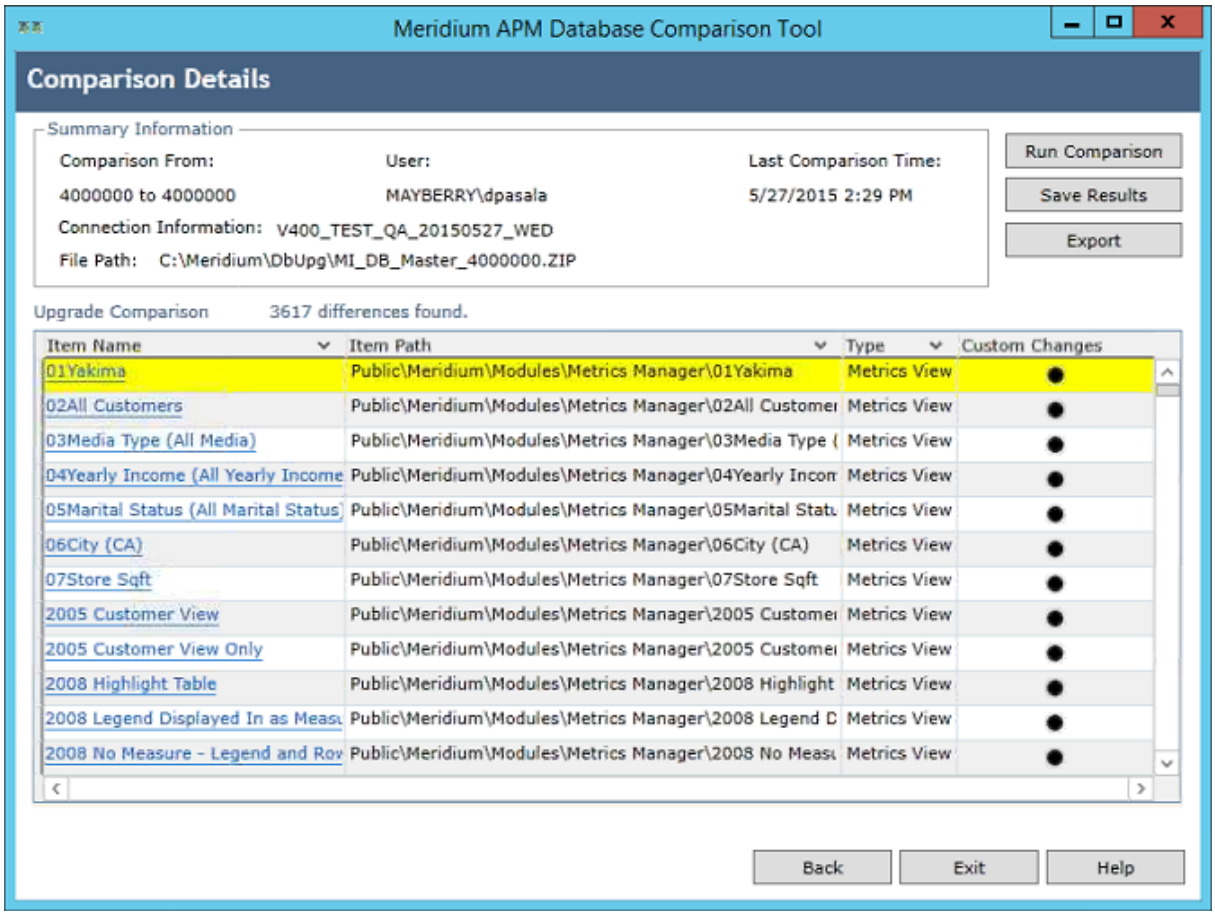
About the Post-Upgrade GE Digital APM Database Comparison Tool Comparison Results Grid

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

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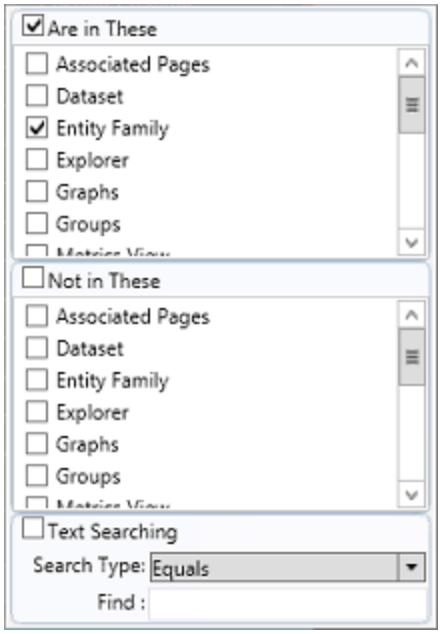
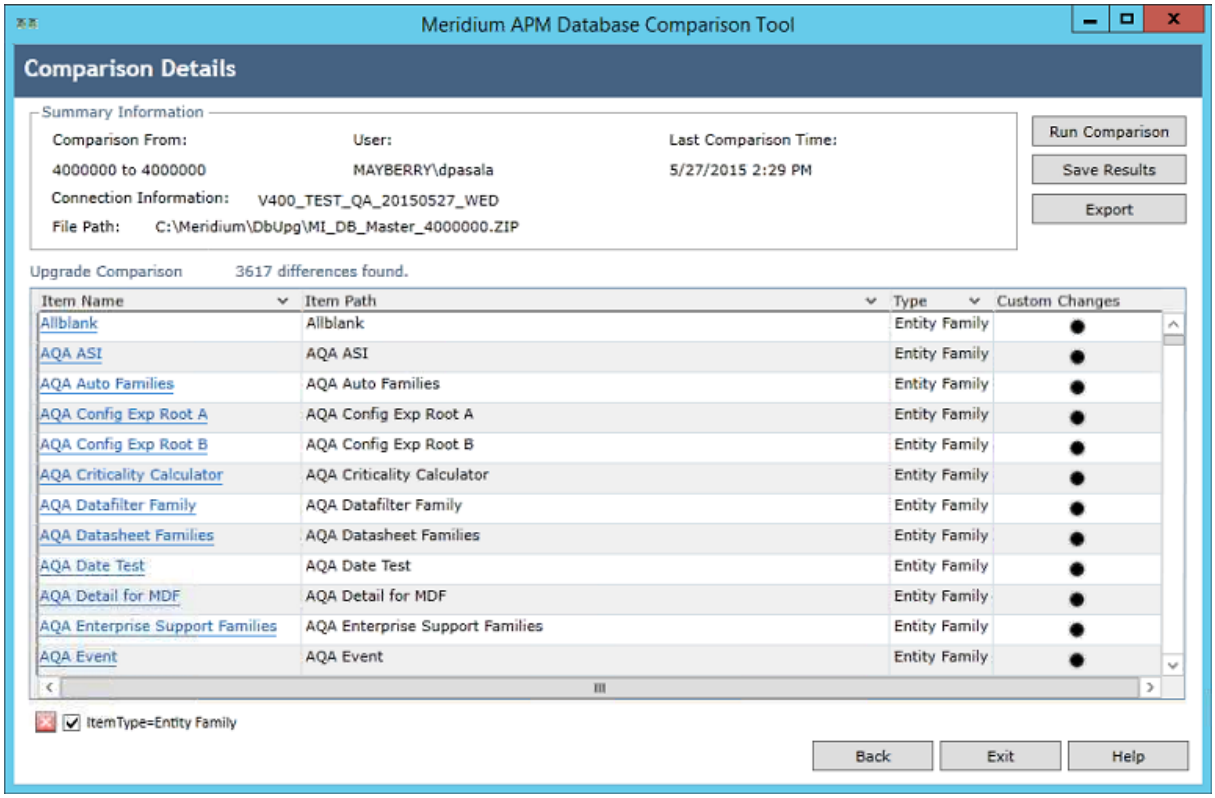
value by which you want to filter the results. For example, to see only items that are in Entity Families in the results, you would select in the **Type** column heading, and then select the **Are in These** and **Entity Family** check boxes, as shown in the following image.



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



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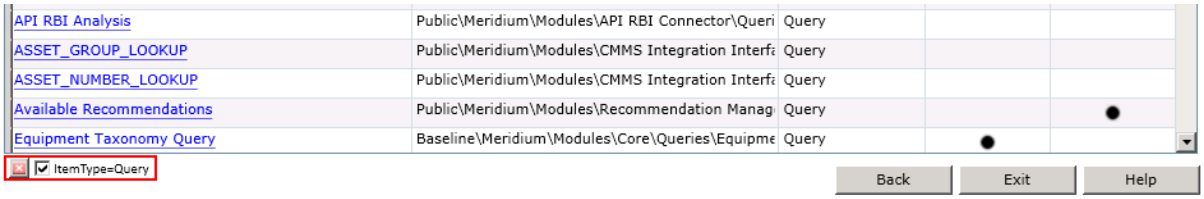
After you apply a filter, it will be displayed below the results, as outlined in red in the following image.



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

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Revert Items to Baseline

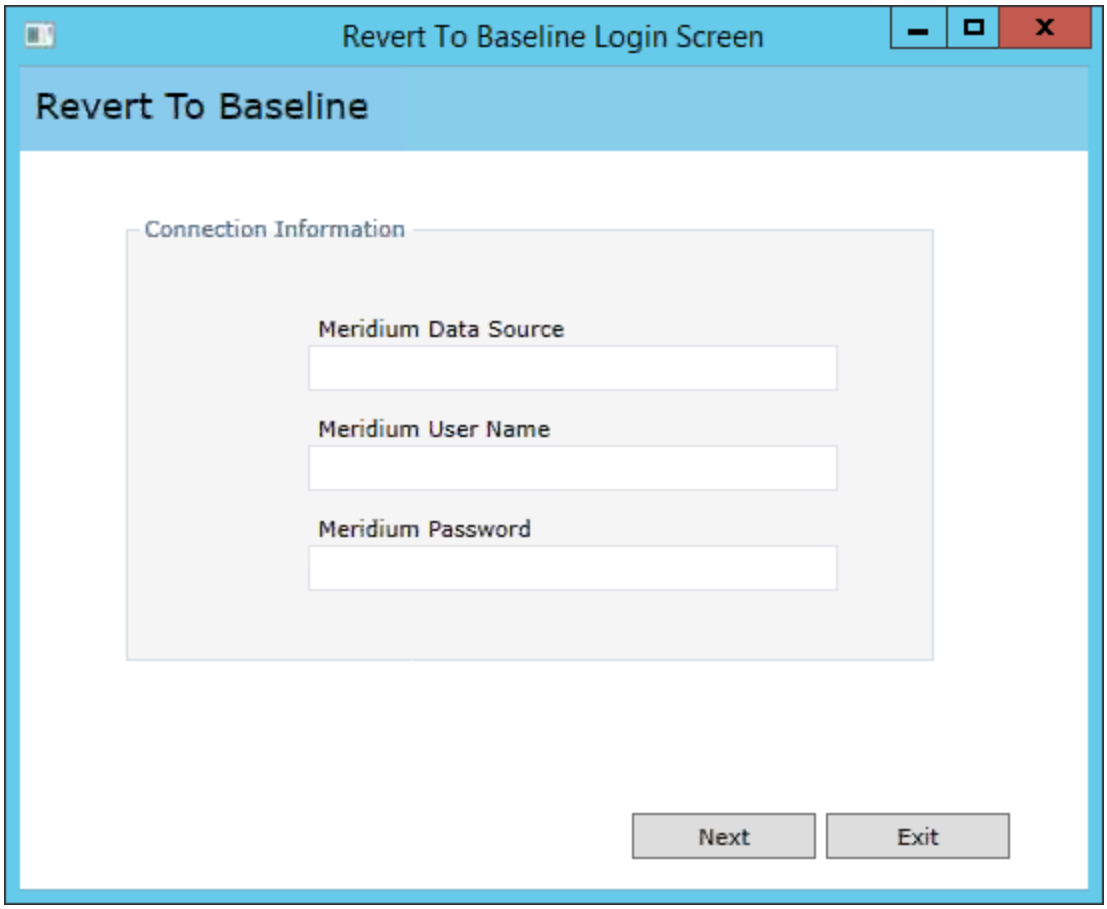
Before You Begin

- Create a data source.

Steps

1. On the GE Digital 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.

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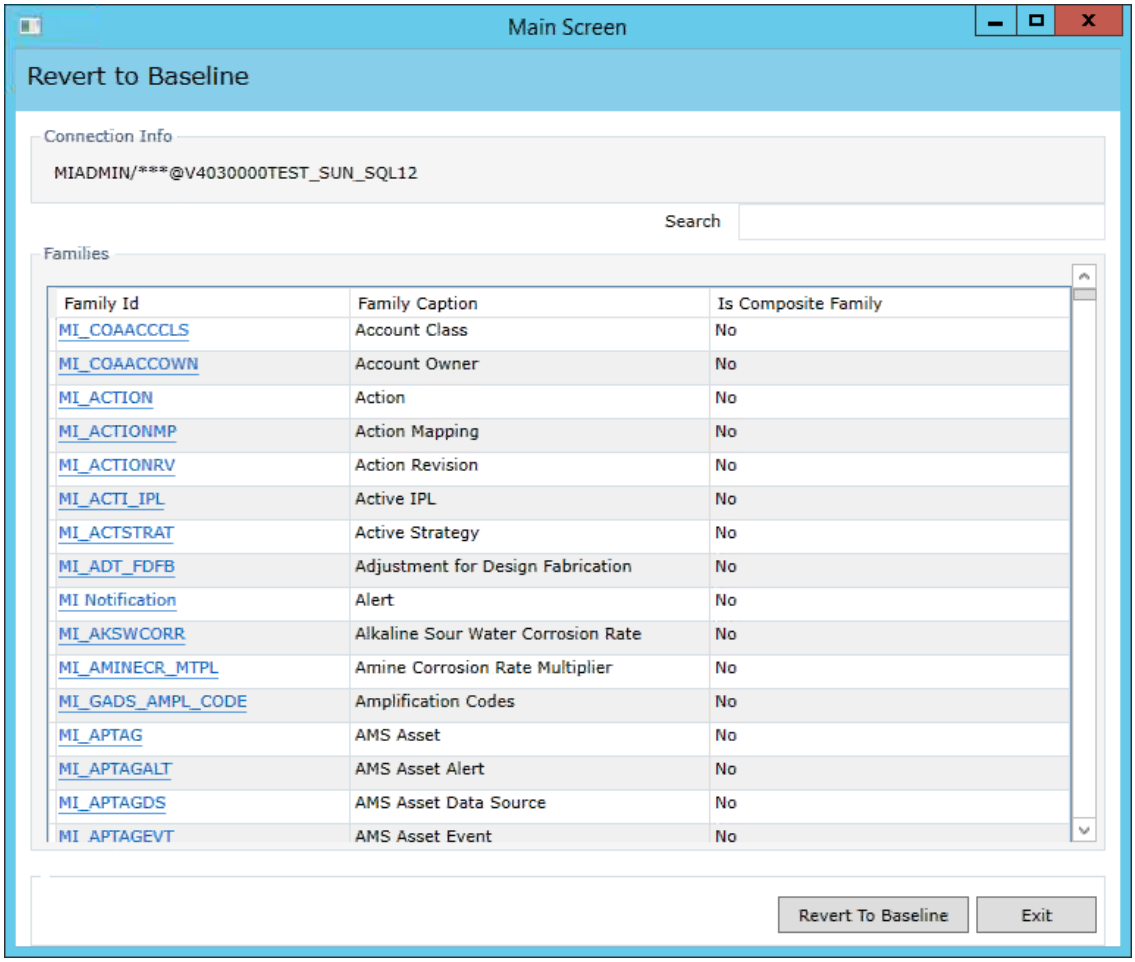
The **Revert To Baseline** screen appears, displaying the families that you can revert to baseline.



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.

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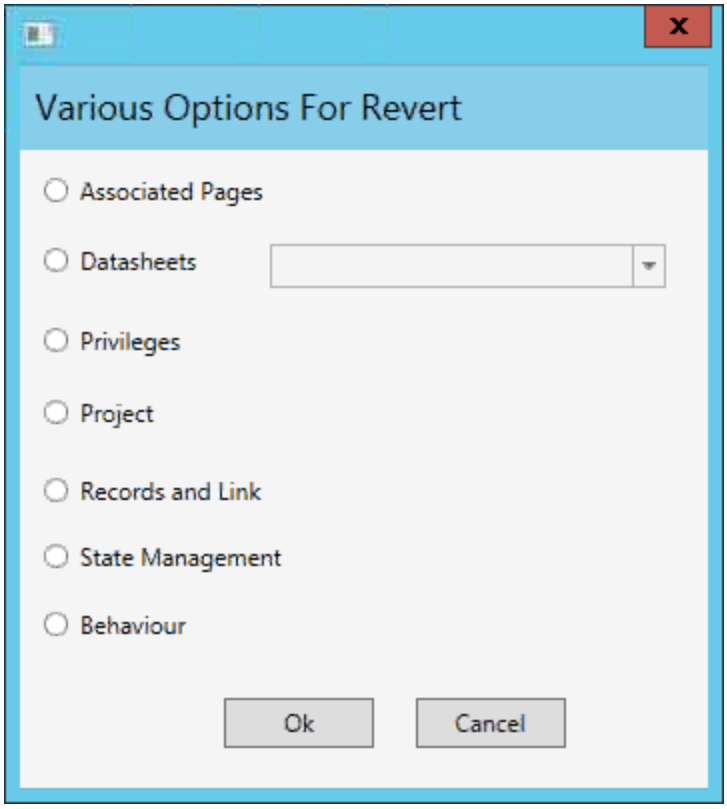
Child Family to Revert	Parent Family to Select
MI_STRMAPP	MI_STMPCNFG
MI_RRSKMDT	MI_RRSKMAP
MI_CLMND_PR MI_MPPG_QRY	MI_DATA_GRP
MI_PROTDEFI MI_RISKTHRE MI_PROBDEFI MI_CONSDEFI MI_RISKCATE	MI_RISKMATR

The **Various Options For Revert** window appears.



4. Select the check box for the revert to baseline action that you want to execute, and

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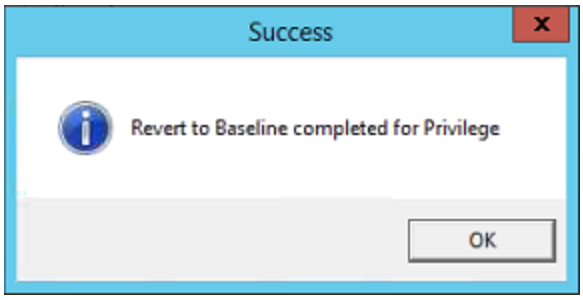
then select **OK**.

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.

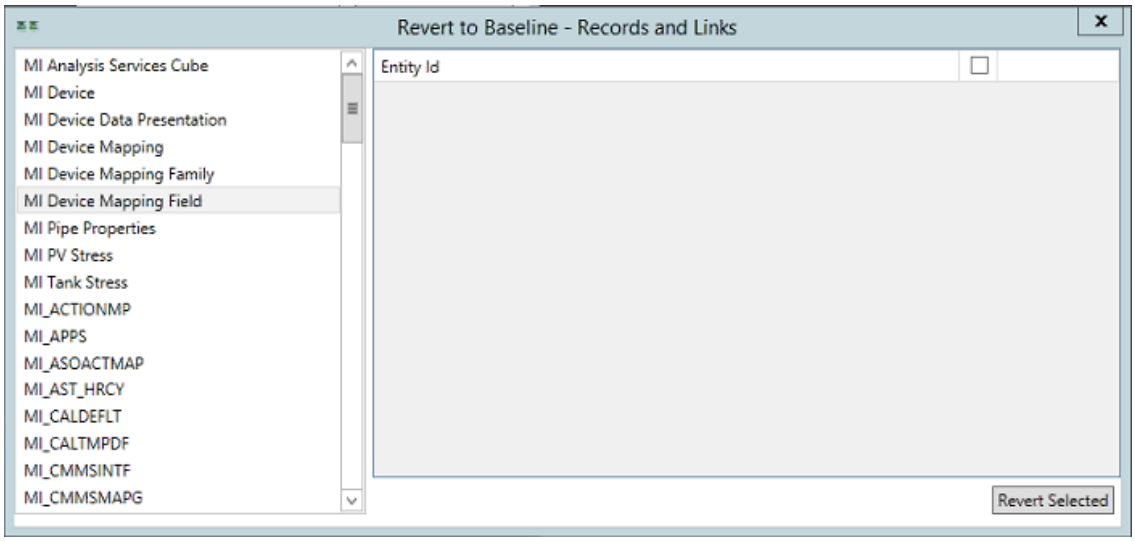


a. Select **OK**.

   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.



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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.

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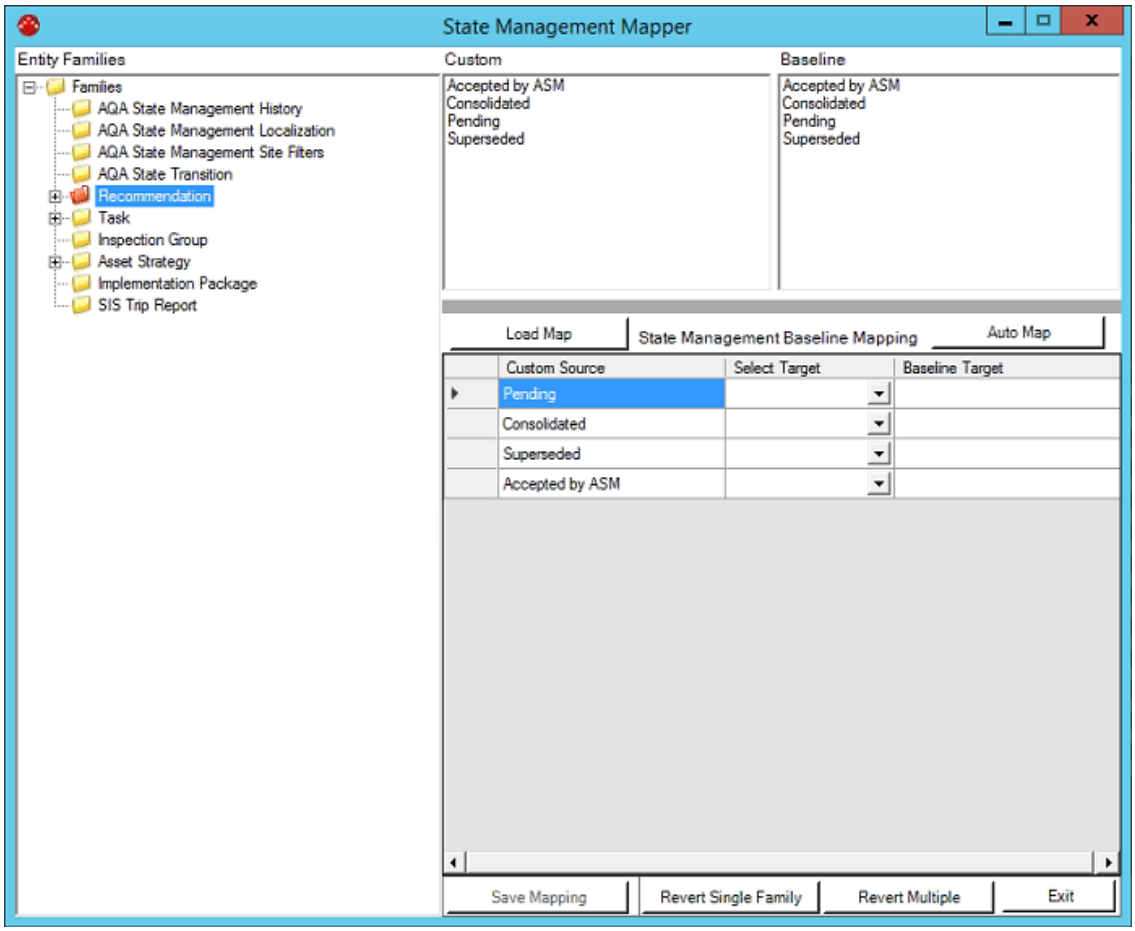

The family of the item that you selected in the Comparison Results grid is highlighted in the tree in the **Entity Families** section of the **State Management Mapper** window. In the **Custom** section, a list of the customized states for the family appears. In the **Baseline** section, a list of the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

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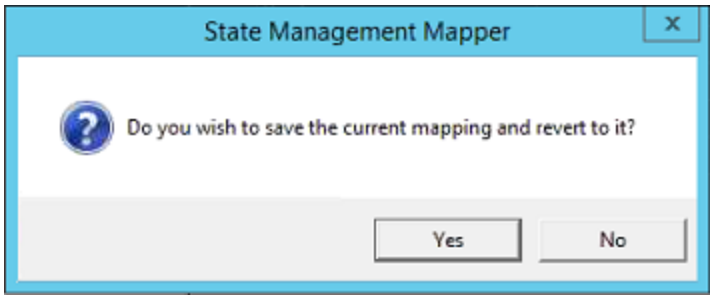
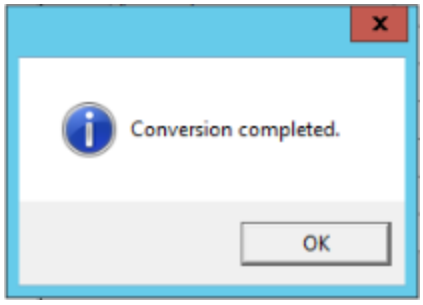
b. Select **Revert Single Family** or **Revert Multiple**.

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.

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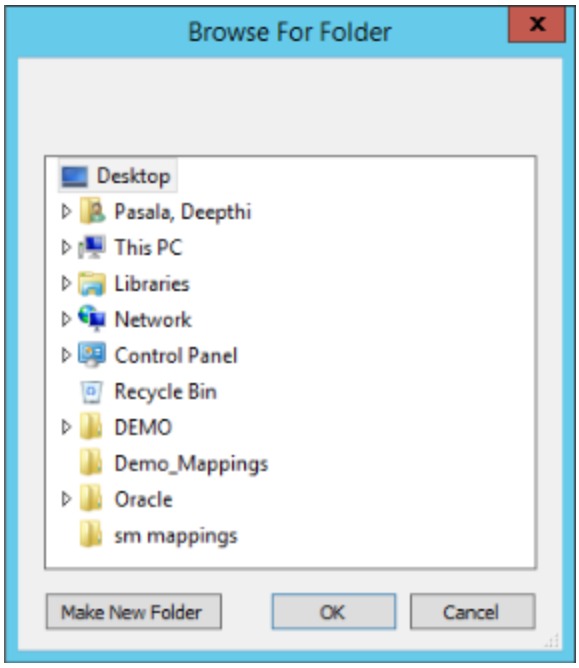
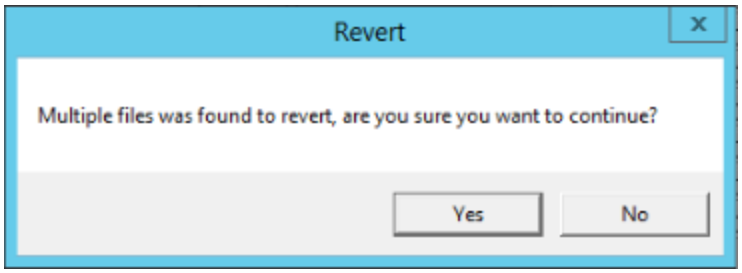


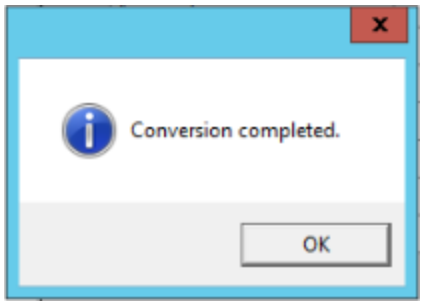
i. Navigate to the folder containing all of the families whose states you want to convert, and then select **OK**.

   A message appears, asking you to confirm that you want to continue.



ii. Select **Yes**.

   A confirmation message appears.



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iii. Select **OK**.

The selected states are converted.

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

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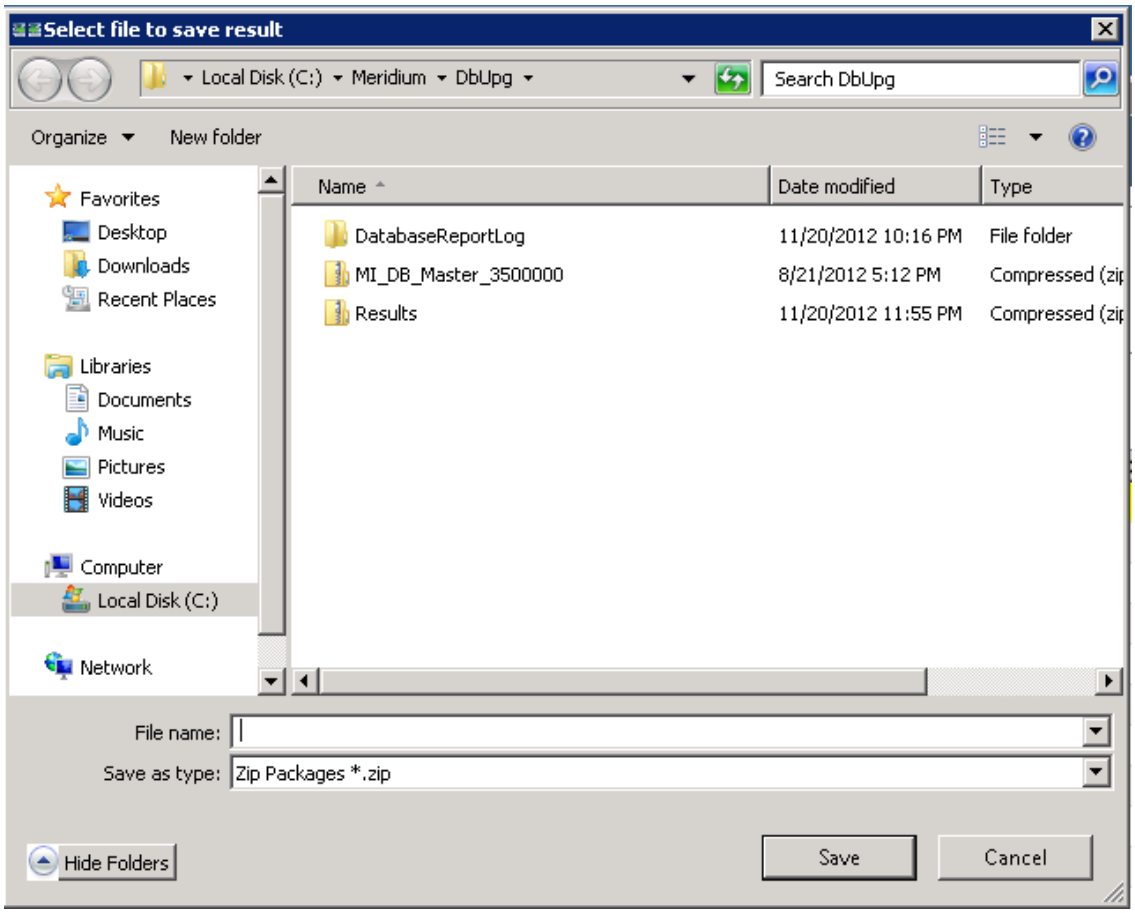
Save the Results to a .ZIP File

After running the pre- or post-upgrade version of the GE Digital 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 GE Digital APM Database Comparison Tool.

Steps

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**.

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The results are saved to the .ZIP file with the specified name in the specified location.

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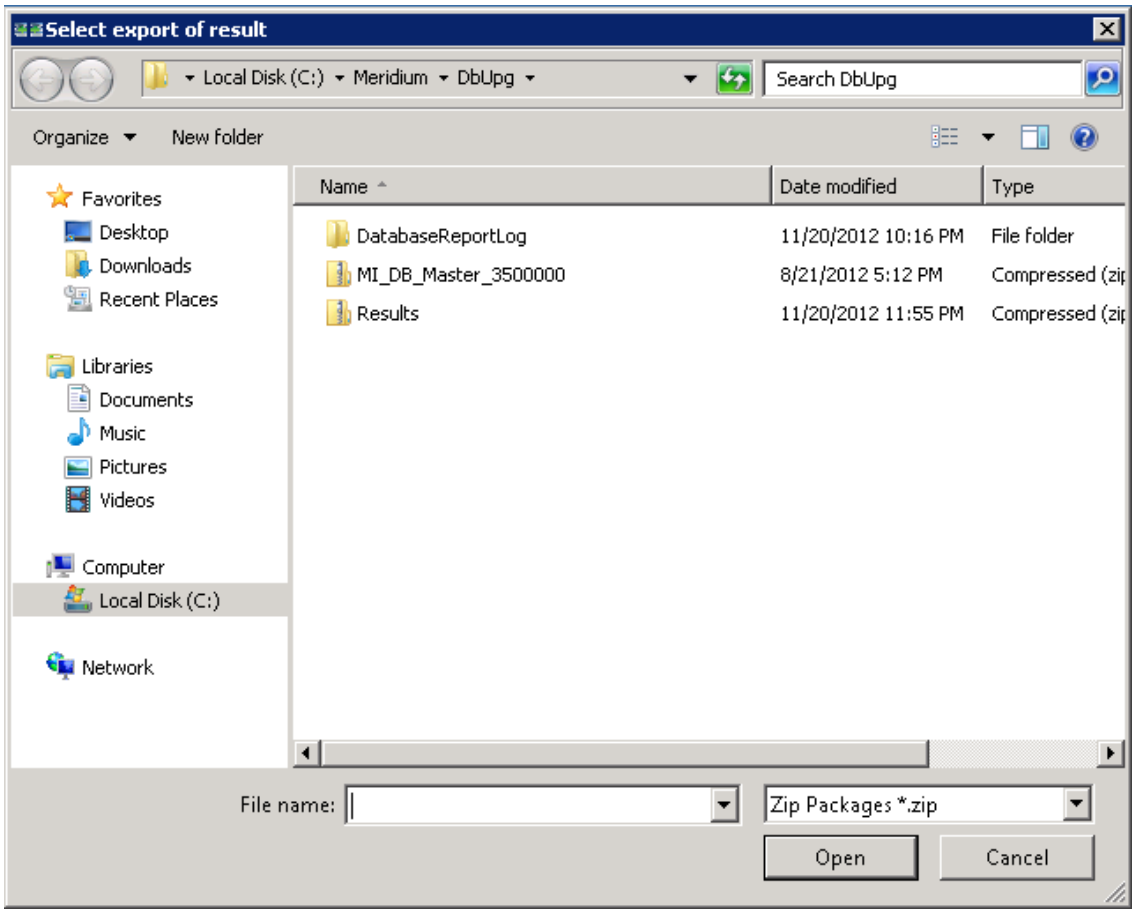
Reload Previous Comparison Results

Using the pre- or post-upgrade version of the GE Digital 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 GE Digital APM Database Comparison Tool.

Steps

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.

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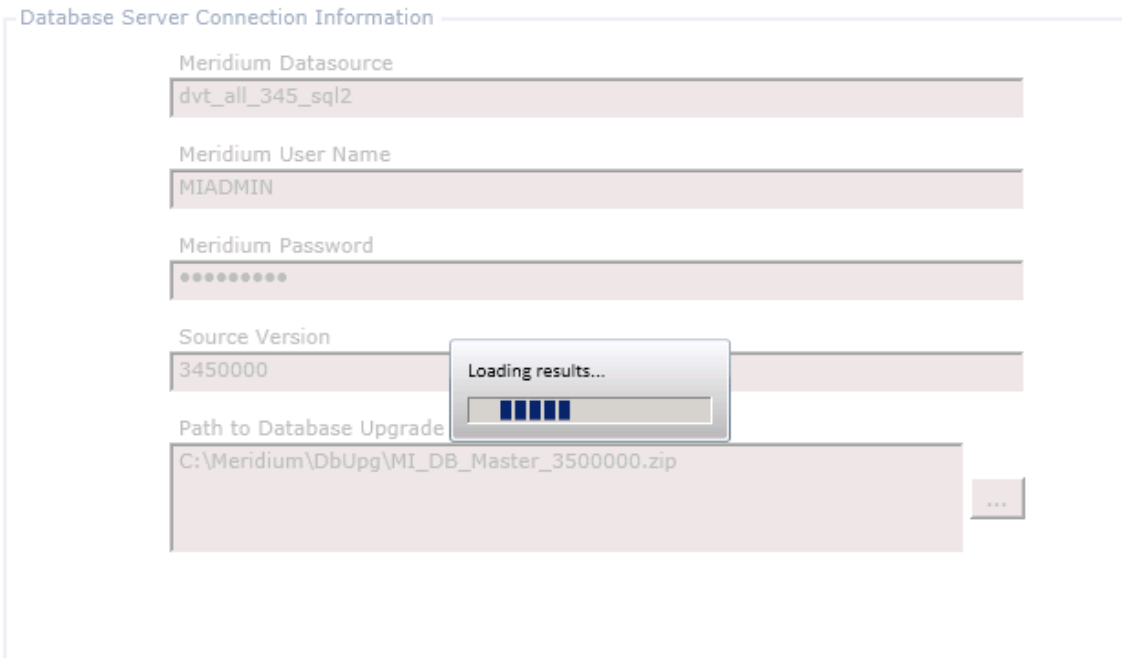
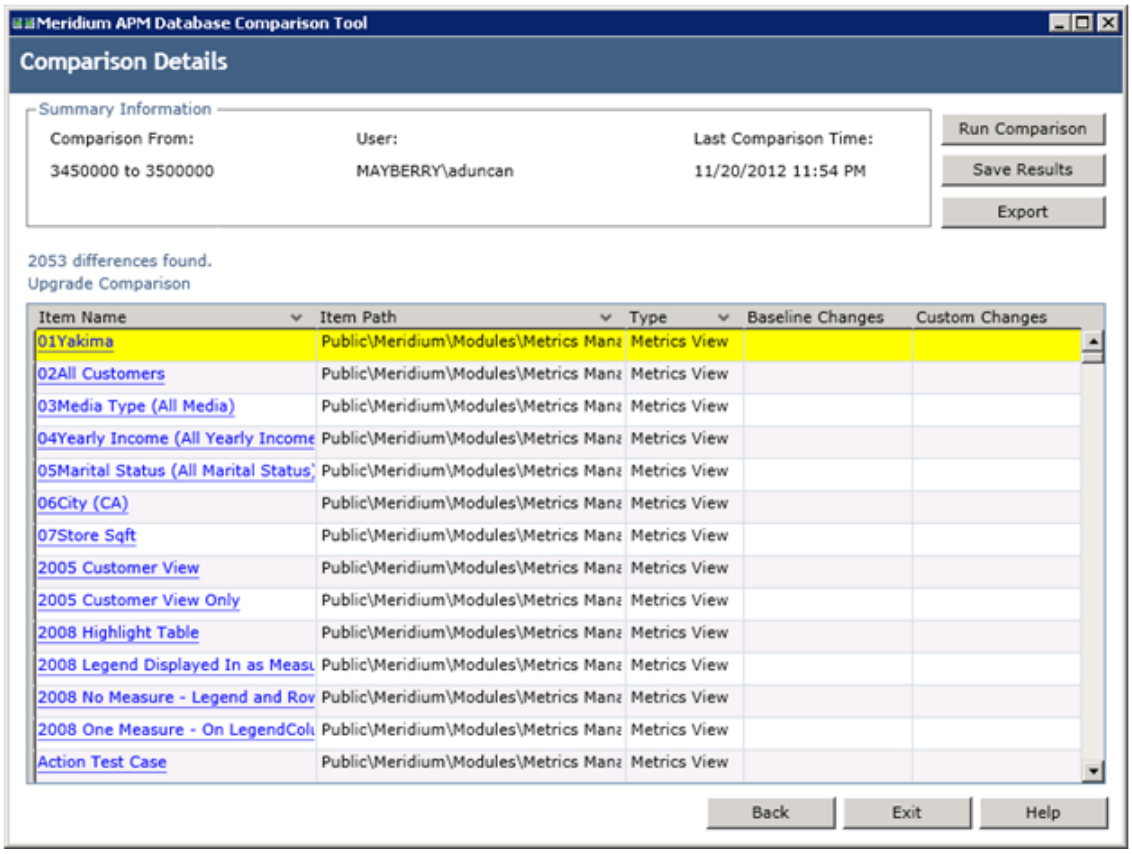


When the process is complete, the comparison results appear on the **Comparison Details** screen.



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Export Comparison Results to an Excel File

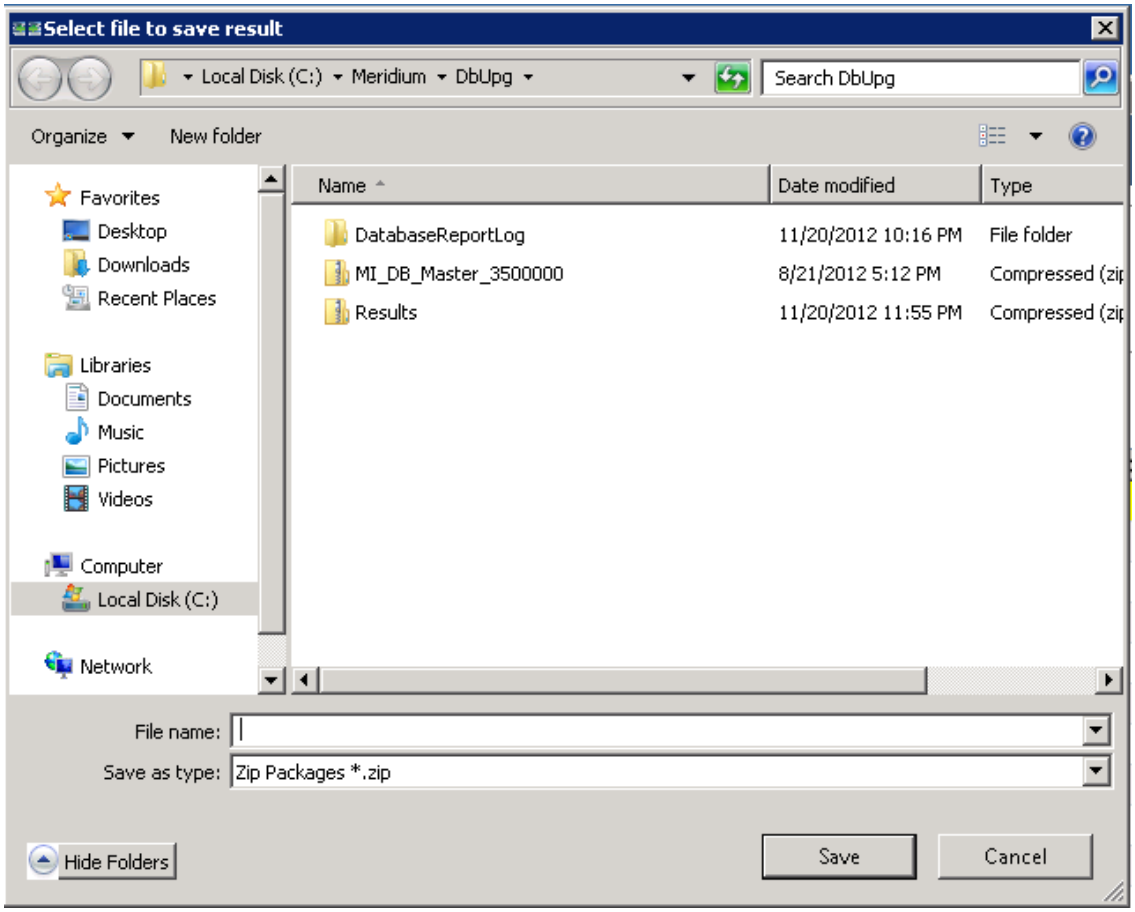
If you have run a database comparison using the pre- or post-upgrade version of the GE Digital APM Database Comparison Tool and want to make the result available to users who do not have access to the GE Digital APM Server, you can save the results to a Microsoft Excel file. The Excel file will contain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

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

Steps

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**.



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

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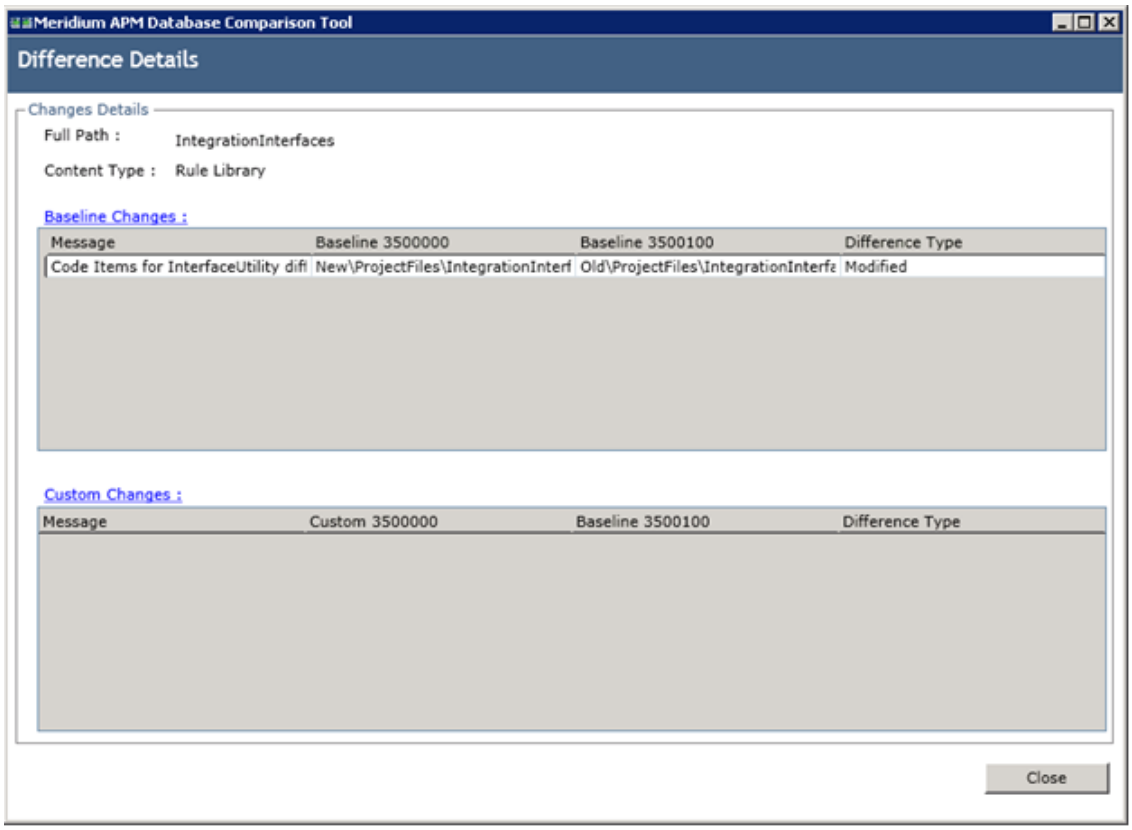
View Detailed Differences in WinMerge

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 GE Digital APM documentation, but can be found in the WinMerge Help system.

Steps

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**.

   -or-

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

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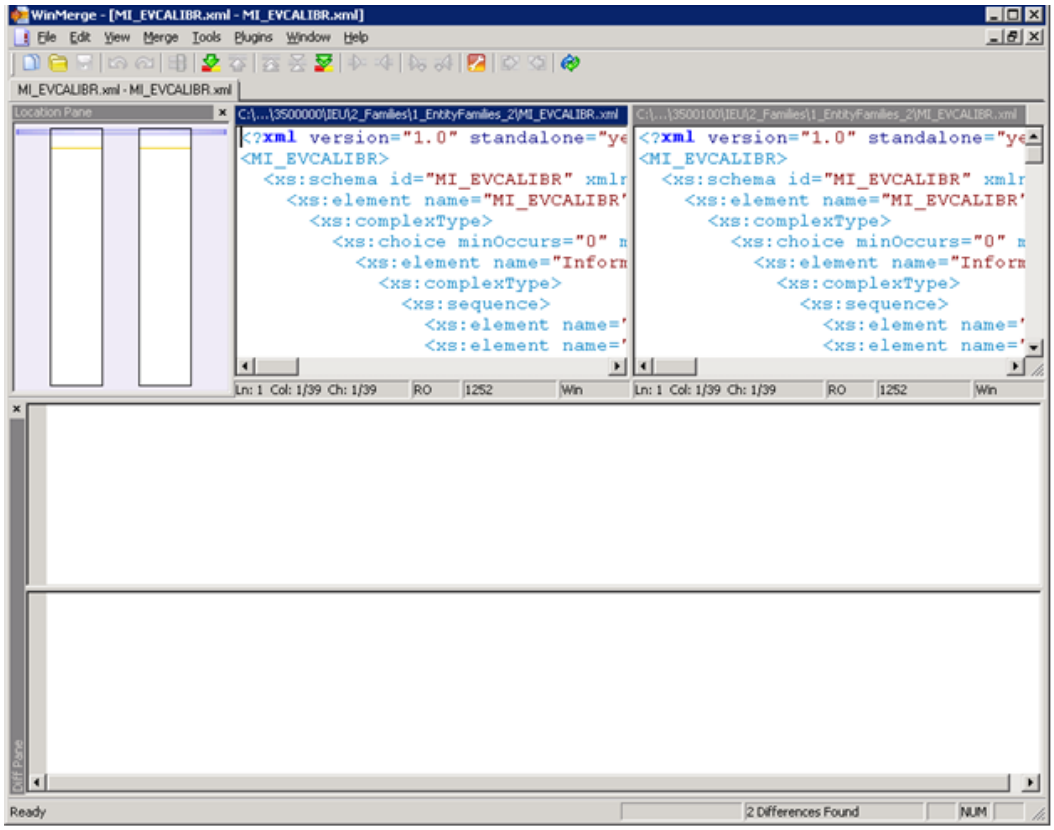
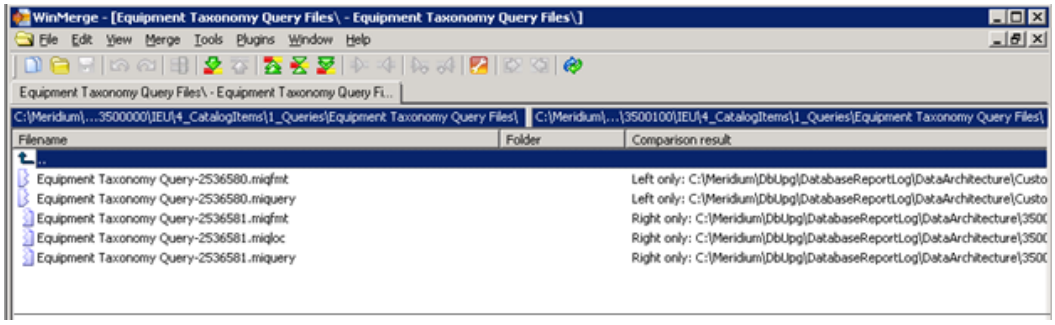
The sections shown in the following images can be accessed via the appropriate tabs:

- 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**.

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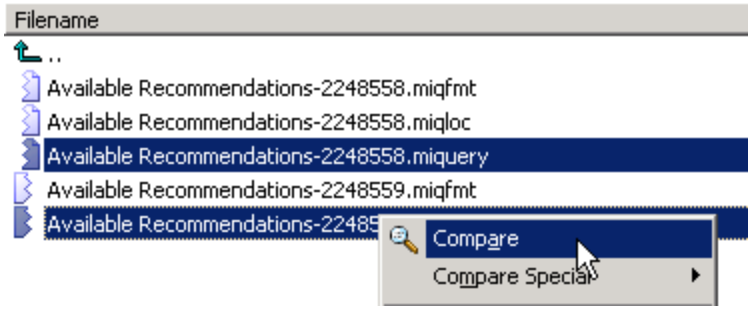
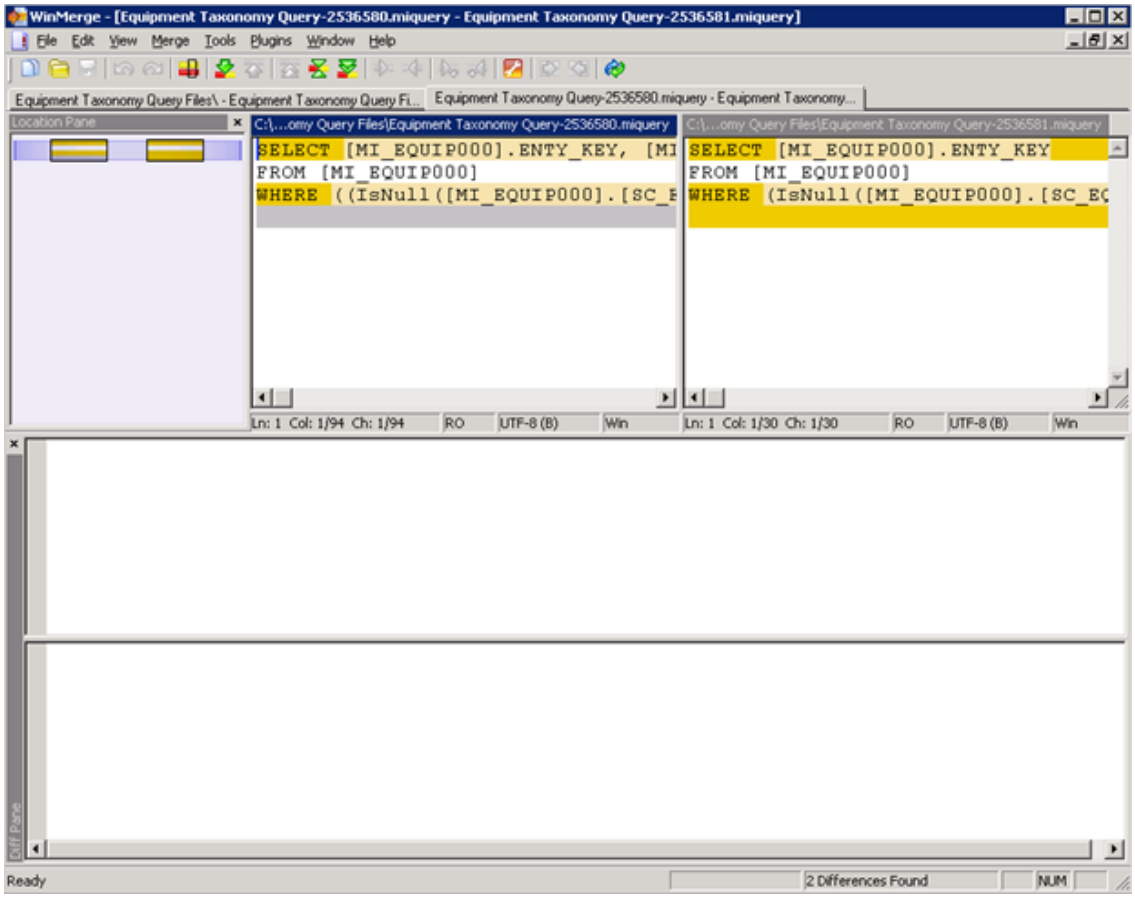


WinMerge appears, displaying the results of the comparison.



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Manage the GE Digital APM System Administration Tool

This topic provides a list of all procedures related to managing the GE Digital APM System Administration Tool, as well as links to the related concept and reference topics.

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About the GE Digital APM System Administration Tool

The GE Digital APM System Administration tool is an interface that lets you configure settings that exist in configuration files that are used by GE Digital APM components.

You can interact with the GE Digital APM System Administration tool via the **APM System Administration** window, which contains the following sections:

- **Configuration:** A menu that contains only the configuration items that exist for the components that are installed on the machine on which you are working. When you select a configuration item in this menu, the contents of the configuration file appear in the workspace.
- **Workspace:** Displays settings that are available in the file that is selected in the **Configuration** menu. The settings that are displayed for each file do not represent a comprehensive view of the file. Instead, only the settings that require modifications or entries are displayed. Above the file settings, the file path to the underlying configuration file is displayed. This provides the location and the name of the file.

  Below the file settings, the following options appear:

  - **Open File:** Opens the underlying configuration file in the appropriate application (e.g., Notepad).
  - **Save:** Saves your changes to the underlying configuration file.
  - **Exit:** Closes the **APM System Administration** window. If you select this button and have unsaved changes, a message will appear, asking if you want to save those changes.
  - **Help:** Displays the GE Digital APM Help system.

The following image shows an example of what the GE Digital APM System Administration tool looks like. Keep in mind that the links on the **Configuration** menu will vary depending upon the components that are installed on the machine where you access the tool.

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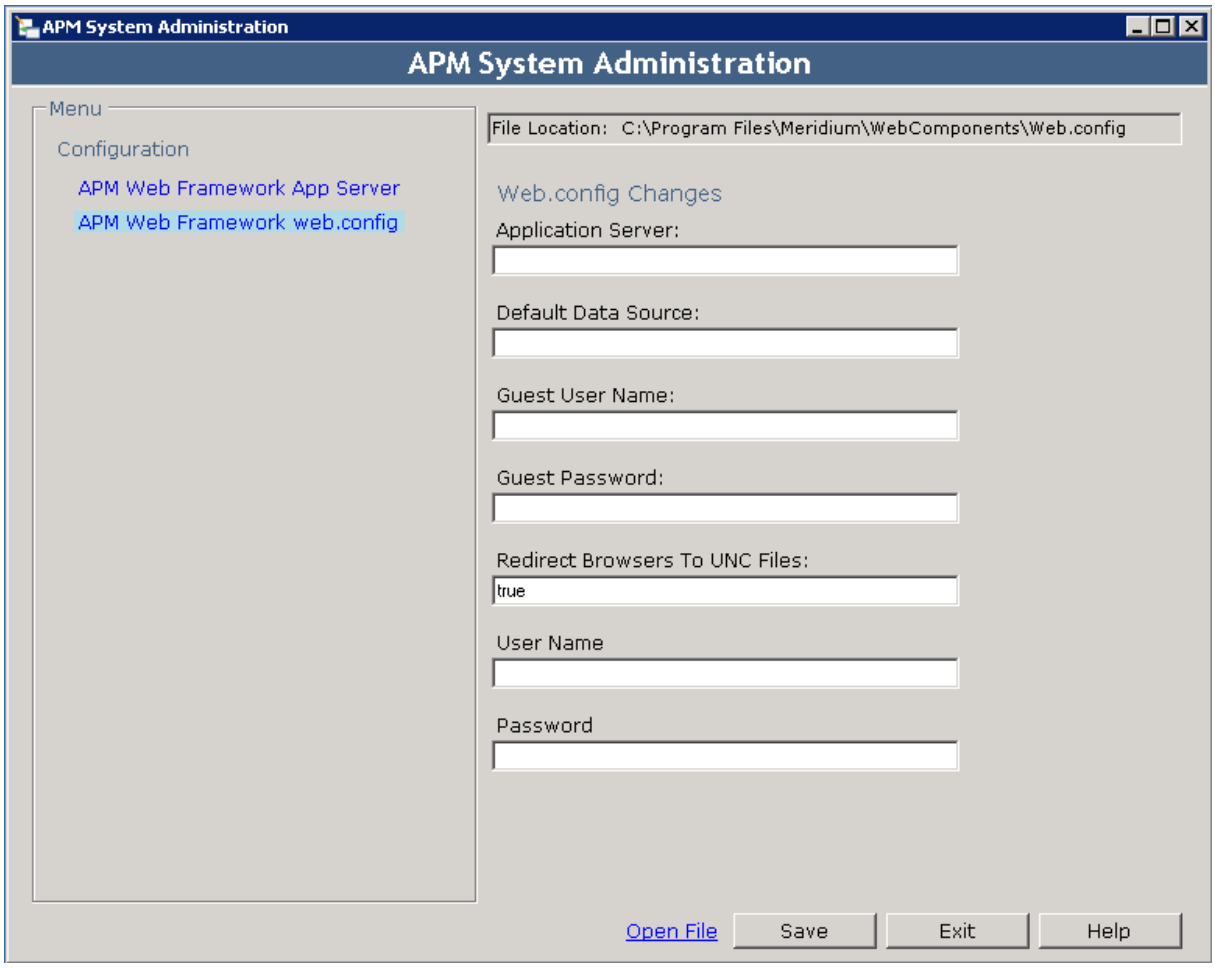

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Access the GE Digital APM System Administration Tool

The GE Digital APM System Administration Tool is installed by the GE Digital APM Server and Add-ons installer when you install any GE Digital APM Server or add-on component. You can use the GE Digital APM System Administration Tool to modify settings in configuration files that support GE Digital APM components.

You can access the GE Digital APM System Administration Tool in the following ways:

- *Automatically from the GE Digital APM Server and Add-ons installer.* On the last screen of the installer, a check box appears that allows you specify whether or not you want to launch the GE Digital APM System Administration Tool when the installer closes. If the check box is selected, when the installer closes, the GE Digital APM System Administration Tool will open automatically.
- *Manually* by selecting the icon on the Start menu on a machine where the GE Digital APM Server or Add-ons component is installed.

The following image shows what the GE Digital APM System Administration Tool looks like when you access it. Keep in mind that the items on the **Configuration** menu will vary depending upon the components that are installed on the machine where you access the tool.

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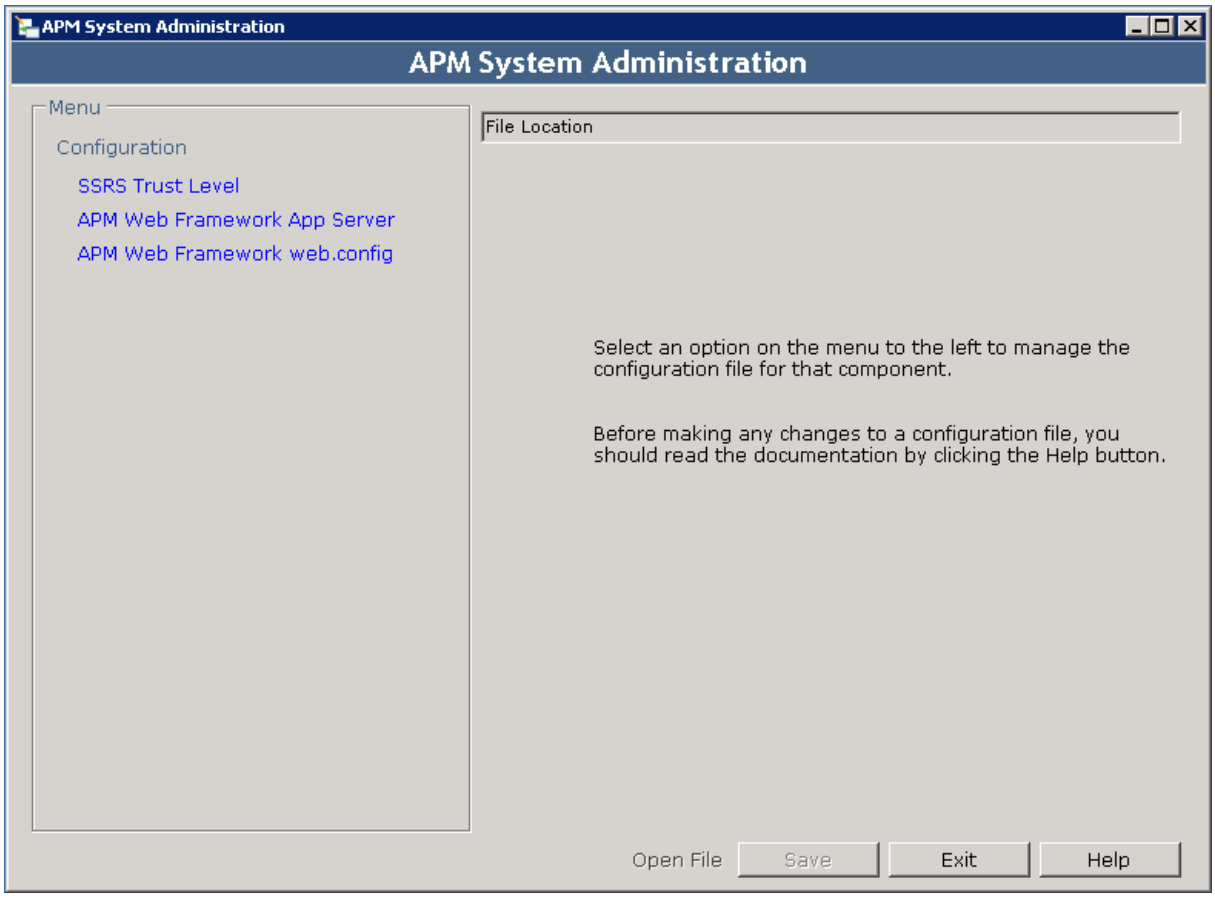

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Notifications

This topic provides a list of the all the procedures related to managing notifications, as well as links to the related concept and reference topics.

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Configure Notifications

In order for the service to work correctly in GE Digital APM, you must configure the Notification Service by modifying the file **Meridium.Service.Notification.exe.config** on all GE Digital APM Servers.

Steps

1. On the GE Digital APM Server, navigate to the folder where the Notification Service files are installed. If you installed the software in the default location, you can locate these files in the folder **C:\Program Files\Meridium\Services**.
2. In an application that you can use to modify XML script (e.g., Notepad), open the file **Meridium.Service.Notification.exe.config**.
3. Depending on the type of server to which you want to relay the messages, modify the script within the **<notification>** and the **<system.serviceModel>** tags.

   Note: The complexity of a Notification Service lies in its configuration. Notification Servers can relay messages to two types of servers - **apm server** (web server) and **external server**. The entire configuration of the external service needs to be represented by an **end point**, and the **end point name** needs to have a wcf end point configuration.

4. Save and close the file.
5. Start or restart the Notification Service.

- Configure the Meridium Notification Service for PDI
- Configure the Meridium Notification Service for AHM

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About Notifications

A notification is a message exchange pattern in which a requestor sends a request message to a replier system. The replier system receives and processes the request. It is an effective and powerful messaging pattern configured to relay messages.

Notifications provides an automated means of triggering notices about subscribed services and objects across different messaging channels. Messages are triggered when the application services and objects to which a user has subscribed change.

Whenever the GE Digital APM user logs in to the application and makes any change to the metadata, the change triggers the API to send a message or a notification to the notification service. The notification service then looks up the targets who need to be notified of this change and sends the notification in the protocol of their choice. The primary idea of a notification is to inform other services that there is a change. It does not have any control over what services do with that information. Notification service also knows the contents of the message relayed.

The notification process proceeds as follows:

1. When a GE Digital APM Server is configured and made available to users, in the file **Web.config**, the URL `<add key="notificationServiceUrl" value-e="net.tcp://{0}/meridium/Service/Notification" />` informs the website of the location of its notification service.
2. GE Digital APM comes up or opens, in the Web.config file, it replaces `{0}` parameter in the URL above by the server name of the local host. notification service has to be read in on physical server of every web application.
3. The GE Digital APM installation installs the service **Meridium Notification service**. Notification service is then configured to replicate and relay any messages.

For example, assume that, in GE Digital APM, we have configured a notification service that sends out a notification whenever a change is made to any entity. If a change is made to the Security Groups Information and the changes are saved, then the web service sends a message to the notification service that an entity is updated. Then, the notification service relays that message to any other servers that are configured to receive the message.

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