IBM InfoSphere Master Data Management
Version 11.3

Installation Cookbook: Oracle, WebSphere Default Messaging, and WebSphere Cluster

GI13-2677-00

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Note

Before using this information and the product that it supports, read the information in "Notices and trademarks" on page 39.

Edition Notice

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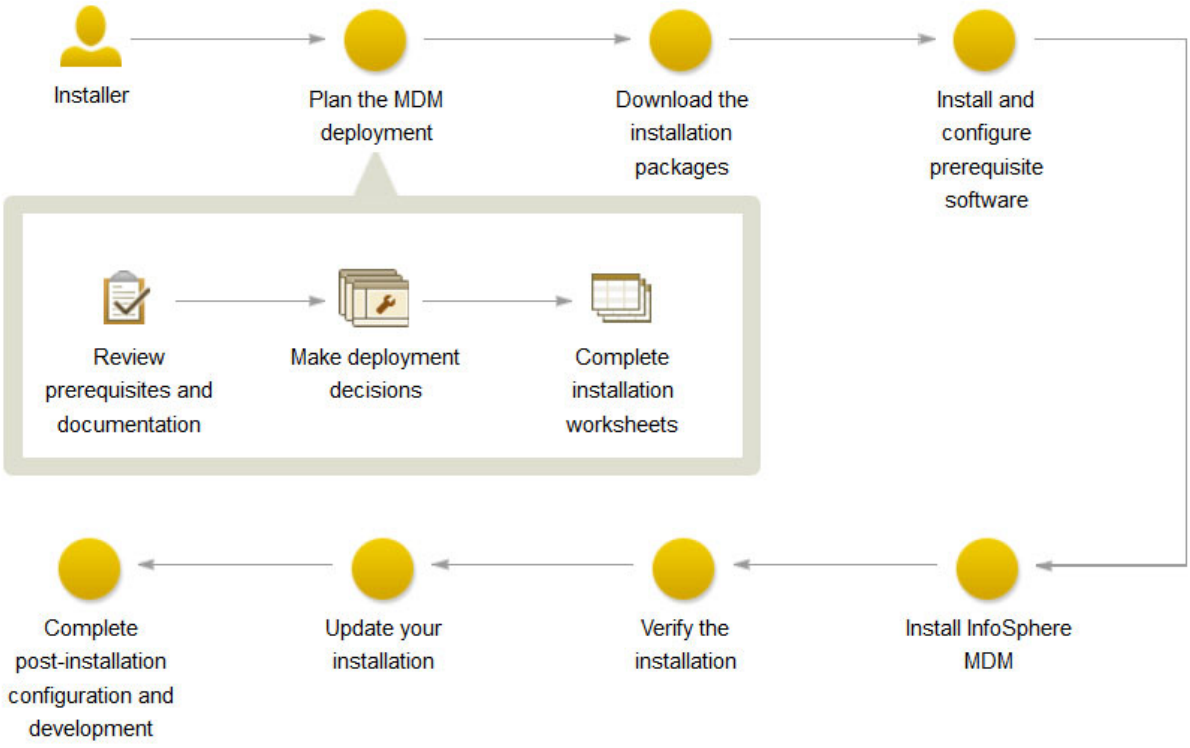
Chapter 1. Overview of custom installation

The scenario in this cookbook leads you through a custom installation of InfoSphere® MDM on a WebSphere® Application Server cluster with an Oracle database and WebSphere Default Messaging.

Important: Before you install the software in this scenario, you review the user accounts, directory structure, system requirements, and other requirements for any installation in the *InfoSphere MDM Installation Guide*. That guide also includes troubleshooting, fix pack, and client installation topics.

Restriction: This *limited* scenario does not cover every possible configuration and architecture. For details about other configurations, see the *InfoSphere MDM Installation Guide*. Some sentences mention the DB2 or Microsoft SQL Server databases and are included for reference only. You do not need to install or configure a DB2 or SQL Server database for the scenario that is described in this cookbook.



Scenario: Installing InfoSphere MDM on a WebSphere Application Server cluster, using an Oracle database and WebSphere Default Messaging

Use this scenario as a reference when planning and processing an InfoSphere MDM installation on a WebSphere Application Server cluster. This scenario uses an Oracle database and WebSphere Default Messaging.

This scenario is accomplished through three procedures.

1. Prepare your application server.

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2. Prepare your Oracle database.
3. Install InfoSphere MDM.

In this scenario, the topology is:

- Machine A:
  - WebSphere Application Server Deployment Manager
  - Oracle client software
  - IBM® Installation Manager and InfoSphere MDM
- Machines B, C, and D:
  - WebSphere Application Server managed nodes
  - Oracle client software
- Machine E:
  - Oracle database

Worksheets for installation and configuration

The installation worksheets list all of the values that you must specify during an InfoSphere MDM installation process. Completing the installation worksheets before you install the components can help you plan your installation, save time, and enforce consistency during the installation and configuration process.

Reuse the worksheets for each runtime environment that you plan to implement. For example, you might have a production environment, a test environment, and a training environment.

Use the worksheets for gathering key details about applications and components, including their base configuration settings that are defined within IBM Installation Manager. Any operational server, user application, or component configuration steps that are required outside of IBM Installation Manager are described in separate individual application or component topics.

Installation directory worksheet

Use this worksheet to record the root directory of the host on which you want to install InfoSphere MDM.

If you install more runtime environments later, they might not point to the same database as the one used for the initial environment. If you are installing multiple runtime environments, reuse the installation worksheet to define the unique directory values for each environment.

If you are installing on Microsoft Windows:

- You must be running in Administrator mode for IBM Installation Manager to write to the Windows registry. Administrator mode is not used for IBM AIX®, Linux, or Solaris.
- On a Microsoft Windows 7 operating system, you must install MDM into a directory that is not virtualized.

The parameters that are listed in the following table equate to prompts or fields that you see in IBM Installation Manager.

Table 1. InfoSphere MDM installation directory worksheet

Parameter	Description	Your value
Use the existing package group	Choose this option if you want the InfoSphere MDM components to be installed into an existing Eclipse shell or directory. You cannot modify the directory name if you choose this option. Do not choose this option if you previously installed other products by using IBM Installation Manager, such as IBM Rational® Application Developer. InfoSphere MDM Workbench must be installed into the same package group as IBM Rational Application Developer.	
Create a new package group	This option is the default setting. IBM Installation Manager creates a default `IBM/MDM` directory under the root directory that you choose. Or, you can name the directory as you want. For example *MDM_INSTALL_HOME*`/IBM/MDM_test` or *MDM_INSTALL_HOME*`/IBM/MDM_prod`	

Oracle data source worksheet

Use the Oracle data source worksheet to identify parameters for the data source to which your MDM operational server is connecting.

For InfoSphere MDM Standard Edition, all IBM AIX, Linux, or Solaris data source information is stored in an `odbc.ini` file in the *MDM_INSTALL_HOME*`/conf` directory.

When you define the names for your databases and user accounts, consider giving the associated database instance, user account, and data source configuration the same name. You might also want to include the InfoSphere MDM version in your name. Using this naming convention can help other members of your organization and IBM Software Support understand the mapping between instances, accounts, and databases.

The parameters that are listed in the following table equate to prompts or fields that you see in IBM Installation Manager.

Table 2. Oracle data source worksheet

Parameter	Description	Your value
Database type	Oracle is supported for all InfoSphere MDM editions.	
Database host name	Identify the fully qualified address of the host on which the database is installed. The default is `localhost`.	
Database port	Identify the database port or use the default port number provided. The Oracle default is `1521`.	

Table 2. Oracle data source worksheet (continued)

Parameter	Description	Your value
Database user name	The database user name must have DBA privileges. For Oracle, the DB user name and schema name must be the same. Restrictions on length and supported characters for user names and passwords are dependent upon any restrictions that might be imposed by your operating system.	
Database password	Provide a password for the database user name.	
Database name	Provide the database name.	
Database home	Provide the fully qualified directory where the database is installed. For example: Windows: `C:\App\oracle\product\11.2.0\db_1` IBM AIX, Linux, or Solaris: `/home/mdm/oracle/product/11.2.0/db_1`	
Installing MDM Database manually	If you are planning to install the physical MDM database manually, you can select the **Extract scripts for manual database installation** option. The installation application will extract the scripts that enable you to complete manual installation. Virtual MDM tables are installed even if this option is selected. This option is only available when the MDM database is being installed alone, without any other components.	
Tablespace names	If you have created your tablespaces ahead of time, then you must take note of their names so that you can specify them in the installation application. The following tablespaces are required (default names are in parentheses): • 4K tablespace *(TBS4K)* • 8K tablespace *(TBS8K)* • 16K tablespace *(TBS16K)* • IndexSpace *(INDEXSPACE)* • EME tablespace *(EMESPACE1)* • PME tablespace *(EMESPACE2)* • LongSpace *(LONGSPACE)*	

WebSphere Application Server installation worksheet

Use the IBM WebSphere Application Server configuration worksheet to identify parameters for the application server that is used to host your MDM operational server.

The parameters that are listed in the following table equate to prompts or fields that you see in IBM Installation Manager.

Table 3. IBM WebSphere Application Server installation worksheet

Parameter	Description	Your value
Deployment type	Specify the deployment type and note the IBM WebSphere Application Server profile name. Your options are **Network Deployment Edition** or **Base Edition (unmanaged)**. Network Deployment is used for server or cluster installations. A base deployment is typically used in workstation or demonstration installations. If you choose Network Deployment, the installer runs a sequence of commands against the IBM WebSphere Application Server deployment manager process to configure application servers and deploy applications. The deployment manager and node agents must be configured and running before the deployment can proceed. For example, use a profile name of `Dmgr01`. If you select Network Deployment, the installer can also run against an IBM WebSphere Application Server cluster. The installation program automatically detects the cluster. If the cluster is configured, the default is to deploy the applications on a cluster. You can select to deploy the applications on a single server instead.	
IBM WebSphere Application Server home	Specify the fully qualified directory in which IBM WebSphere Application Server is installed. The default on Linux and UNIX is `/opt/IBM/WebSphere/AppServer`. The default on Microsoft Windows is `C:\Program Files (x86)\IBM\WebSphere\AppServer`.	
IBM WebSphere Application Server profile home	If you are using a base deployment, specify the fully qualified path of the application server profile home directory. The default on Linux and UNIX is `/opt/IBM/WebSphere/AppServer/profiles`. The default on Microsoft Windows is `C:\Program Files (x86)\IBM\WebSphere\AppServer\profiles`.	
Federate into an existing Deployment Manager	If you want to federate a newly created managed node into an existing deployment manager, select the **Federate into an existing Deployment Manager** option.	
Deployment Manager profile name	Provide the deployment manager profile name. Ensure that the name is not already in use. This is only applicable if the deployment type is Network Deployment and the **Federate into an existing Deployment Manager** option is selected.	
Deployment Manager profile home	Specify the fully qualified path of the deployment manager profile home directory.	

Table 3. IBM WebSphere Application Server installation worksheet (continued)

Parameter	Description	Your value
Host name	Identify the fully qualified address of the host on which IBM WebSphere Application Server is installed. The default is `localhost`.	
SOAP port	Identify the SOAP port of the deployment manager on the remote computer, if you are using remote deployment. The default is 8879.	
User name	Identify the IBM WebSphere Application Server user name. The user must have administrative privileges.	
Password	The IBM WebSphere Application Server user password.	
Cell	Specify the IBM WebSphere Application Server cell where you want to deploy InfoSphere MDM. If you have IBM WebSphere Application Server already installed and configured, you can click **Retrieve Host Details** during the installation process and have IBM Installation Manager retrieve the information for Cell, Node, and Server.	
Node	Specify the IBM WebSphere Application Server cell where you want to deploy InfoSphere MDM. After you select the cell in IBM Installation Manager, all of the nodes within that cell are available in the list.	
Server	Specify the server where you want to deploy InfoSphere MDM. After you select the node in IBM Installation Manager, all of the servers that are available for that node show in the list. If you want to create a new server for deployment, you can specify the new name on the configuration panel and it is created in IBM WebSphere Application Server during the installation process.	
Managed node profile name	Provide the managed node profile name. Ensure that the name is not already in use. This is only applicable if the deployment type is Network Deployment.	
Managed node profile home	Specify the fully qualified path of the managed node profile home directory.	
Install MDM application on cluster	If you have an existing WebSphere Application Server cluster, this option is available on the configuration panel. Select this option if you want to install the InfoSphere MDM application in a clustered environment.	
Cluster	If you are installing in a clustered environment, select the cluster where you want to deploy your applications.	

InfoSphere MDM application configuration worksheet

Use the application configuration worksheet to identify parameters for the MDM operational server.

The parameters that are listed in the following table equate to prompts or fields that you see in IBM Installation Manager on the Application Configuration panel.

Table 4. MDM application installation worksheet

Parameter	Description	Your value
MDM application name	Specify the name of the MDM operational server. This name is used in IBM WebSphere Application Server. The default is `E001`.	
MDM user name	Specify the user name that this instance of InfoSphere MDM will use to log into the MDM client applications and user interfaces. **Note:** This user is not the WebSphere Application Server admin user who administers the InfoSphere MDM instance, and does not need to match that user name.	
MDM user password	Specify the password for the MDM user.	
RMI port	Specify the port on which the Remote Method Invocation (RMI) registry service listens for connections from other services. In a clustered environment, all nodes must use the same RMI port to communicate. The default is `9999`. **Note:** The MDM operational server uses RMI to receive and send transaction requests and responses.	
Matching style	Specify whether you want to use a probabilistic or deterministic matching style.	
Enable multiple time zone deployment	Select this option if your application is running across different time zones, or your data has time-sensitive values under different time zones.	
Default time zone	Select the client default time zone from the list. If a time zone is not specified, the application server time zone is used.	
Messaging	Specify the messaging type for your implementation. If you want to use the internal WebSphere messaging, select IBM WebSphere Default Messaging. Most virtual MDM configurations will select IBM WebSphere Default Messaging and install the Message Brokers feature.	

User applications installation worksheet

Use this worksheet to record parameters for the user applications that you are planning to install.

Reuse this worksheet for each user application or note any differences between applications in the worksheet.

The parameters that are listed in the following table equate to prompts or fields that you see in IBM Installation Manager.

Table 5. User application installation worksheet

Parameter	Description	Your value
Deployment type	Specify whether your IBM WebSphere Application Server deployment is Base or Network. Network deployment is used for server or cluster installations. A base deployment is typically used in workstation or demonstration installations.	
IBM WebSphere Application Server profile home	If you are using a base deployment, specify the fully qualified path of the application server profile home directory. The default is `/opt/IBM/WebSphere/AppServer/profiles`	
Host name	Specify the name of the IBM WebSphere Application Server where the MDM operational server server is deployed.	
SOAP port	Specify the port number for the MDM operational server or use the default of `8879`.	
User name	Specify the administrative user name for this application.	
Password	Specify the administrative user password.	
Cell	Specify the IBM WebSphere Application Server cell where you want to deploy the application. If you have IBM WebSphere Application Server already installed and configured, click **Retrieve Host Details** during the installation process to retrieve the information for Cell, Node, and Server.	
Node	Specify the IBM WebSphere Application Server node where you want to deploy the application.	
Server	Specify the IBM WebSphere Application Server server or servers where you want to deploy the application.	

Table 5. User application installation worksheet (continued)

Parameter	Description	Your value
Install MDM application on cluster	If you have an existing WebSphere Application Server cluster, this option is available on the configuration panel. Select this option if you want to install InfoSphere MDM application in a clustered environment.	
Cluster	If you are installing in a clustered environment, select the cluster where you want to deploy your applications.	

History installation worksheet

Use this worksheet to record parameters for your history trigger configuration.

History triggers are used by physical MDM operational servers.

There are two sets of triggers that generate data for physical MDM database history tables. The first set is for the core and domain tables. The second set is for the configuration management tables. Each set consists of history triggers and delete triggers.

The parameters that are listed in the following table equate to prompts or fields that you see in IBM Installation Manager.

Table 6. History installation worksheet

Parameter	Description	Your value
Industry	Specify the industry type that is supported in this implementation. You can specify only one type. There are four supported industry types. Each option installs the code tables and data for that industry type. • Insurance - Choose this option for lines of business such as Life, Health, Annuities, Pensions, Property and Casualty, and others. • Banking - Choose this option for lines of business such as Retail Banking, Commercial Banking, Credit Cards, Loans, and others. • Telecommunication - Choose this option for lines of business such as Wireless, Cable Television, Satellite Television, Internet, Telephone Services, and others. • Manufacturing - Choose this option for lines of business such as Precision Tools, Aerospace, Electrical, Heating, Mechanical, and others.	

Table 6. History installation worksheet (continued)

Parameter	Description	Your value
History triggers	There are three history trigger options. You can specify only one. • None. Choose this option if you do not want to install any triggers. Choosing this option prevents history from being stored in the database. • Simple. Choose this option to install only the update triggers. When a record is updated in the database, a copy of that record (before the update) is added to the history table. Past versions of the record are stored in the history table. • Compound. Choose this option if you want to install both insert and update triggers. When a record is added to the database, or when a record is updated in the database, a copy of the record is added to the history table. Copies of both the current and past versions of the record are stored in the history table.	
Case sensitive searches	By default, name searches for contracts, products, and categories are not case-sensitive. Check the **Enable case-sensitive searches** check box only if you want to place case-sensitive restrictions on your searches. Once this feature is activated, database objects are created and you cannot deactivate the option.	
Code table languages	Translated code table values used for predefined lists and error messages are included with the physical MDM operational server. English is the default language.	
Application resource language	Specify the corresponding language translations for the user interface to install.	

Chapter 2. Preparing for a custom deployment

Before you install InfoSphere MDM, make sure that you complete the planning steps and meet the prerequisites.

About this task

- Review the readme file for system requirements and potential issues that might affect your installation.
- Read the release notes for information about supported product features or enhancements to the release.
- Review and complete the installation worksheets.
- Set up your installation media.
- Use a different database user for each deployment of the offering.

In addition to these general prerequisites, there are other specific prerequisite tasks for installing InfoSphere MDM. These tasks are outlined in the following topics.

Acquiring and extracting the installation files

The installation media for installing InfoSphere MDM is available as downloadable installation image files.

About this task

Use the Download IBM InfoSphere Master Data Management page to help determine the parts that you need for your licensed edition and version. Use the information in the system requirements topic to determine the supported versions for WebSphere Application Server and fix packs.

Important: Before you begin installing InfoSphere MDM, ensure that you have downloaded all of the latest installation packages and fix packs required for your licensed edition and version.

Procedure

To obtain installation image files from IBM Passport Advantage®, download and extract the files into a directory called `MDM`. When you extract the files, they will be placed into a folder structure that reflects the parts that you have downloaded.

Prepare IBM Installation Manager

All components of the InfoSphere MDM editions are installed by using IBM Installation Manager.

IBM Installation Manager uses defined repositories to determine what packages are available for you to install. These repositories point to your installation media.

Offerings must be manually added to the IBM Installation Manager repositories.

Installing IBM Installation Manager

Use this procedure if IBM Installation Manager is not installed.

About this task

Do not install IBM Installation Manager in admin mode.

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Procedure

1. From the Passport Advantage page for your InfoSphere MDM version and edition, download the IBM Installation Manager package.
2. Extract the compressed file.
3. From a command prompt, run the command to install in non-admin mode:
   - On Microsoft Windows systems: `userinst.exe`
   - On Linux, AIX, or Solaris systems: `userinst`
4. Complete the installation wizard.

What to do next

Continue with adding offerings to IBM Installation Manager.

Adding offerings to IBM Installation Manager

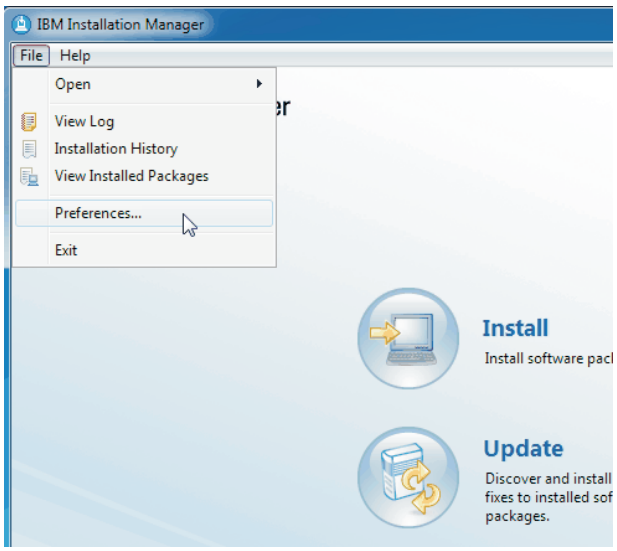
Use this procedure to add InfoSphere MDM to the list of offerings that are installed by IBM Installation Manager.

Before you begin

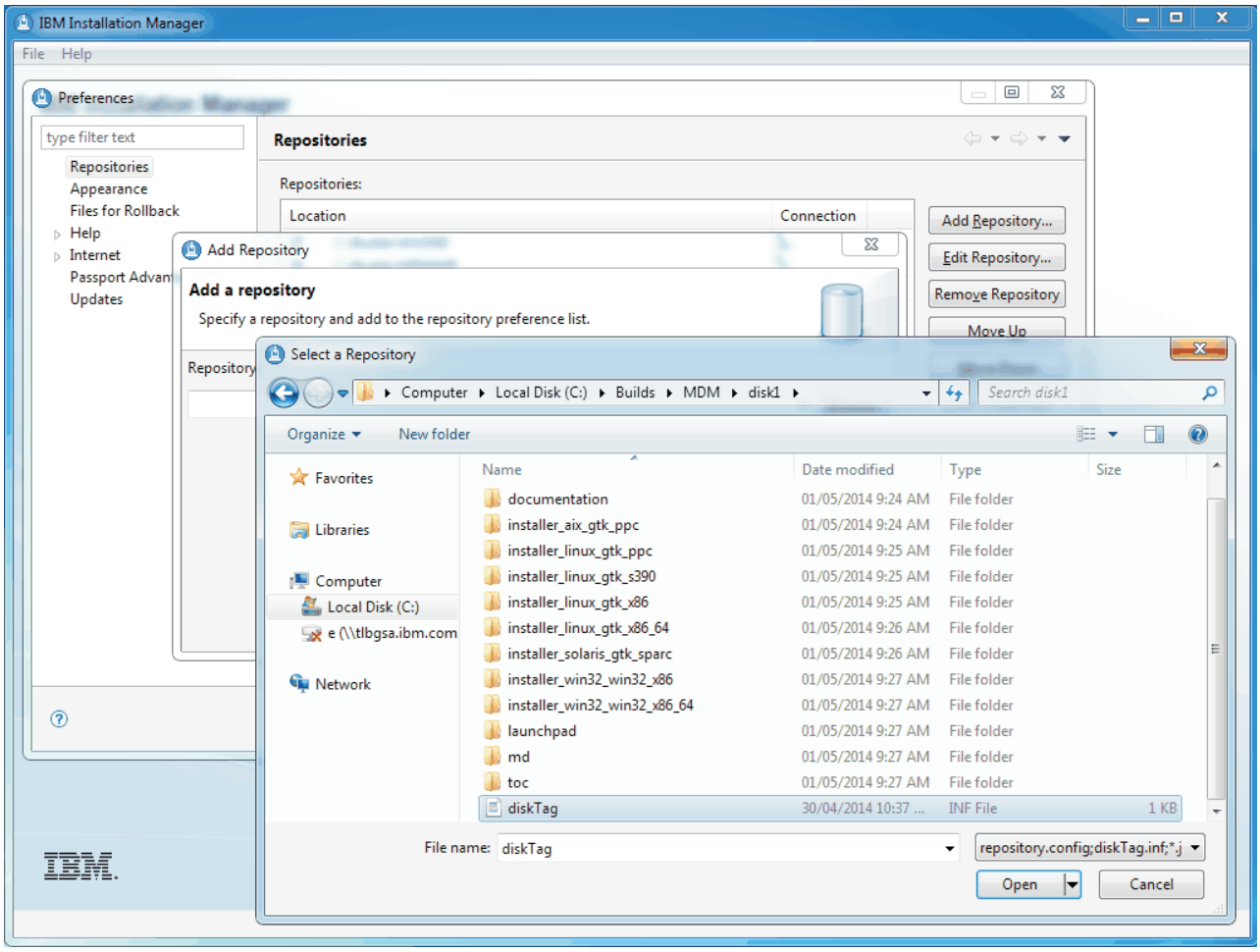
Make sure that you installed IBM Installation Manager and that you did not install it in admin mode.

Procedure

1. Start IBM Installation Manager.
2. Click **File** > **Preferences**.



3. On the Preferences dialog, select **Repositories** > **Add Repository**.
4. On the Add Repository dialog, click **Browse**.
5. Locate and select the InfoSphere MDM packages that you want to install. For example, *download_path*`/MDM/disk1/diskTag.ini`.



6. Add any additional offerings, such as the Installation Startup Kit, IBM WebSphere Application Server, IBM DB2®, or InfoSphere MDM Workbench.
7. On the Add Repository dialog, click **OK**.
8. On the Preferences dialog, click **OK**.

What to do next

Continue with preparing for and installing the MDM operational server and applications.

Installing the Installation Startup Kit

Install the Installation Startup Kit before you begin preparing your environment for installation.

About this task

The Installation Startup Kit contains scripts that are used to create databases and profiles that are needed to prepare your installation environment. The kit also includes a command line prerequisite checking tool that can help you to know when your environment is ready to begin the installation.

Procedure

1. Start IBM Installation Manager.
2. Add the Installation Startup Kit offering to the IBM Installation Manager repositories
   a. Open IBM Installation Manager.

b. Select **File** > **Preferences...**.
c. From the Repositories panel, choose **Add Repository**.
d. Click **Browse** and navigate to the location of the Installation Startup Kit package directory (*MDM_INSTALL_HOME**StartupToolkit*. Select `disk1.inf` and click **OK**.

3. On the IBM Installation Manager home screen, click **Install**.
4. On the Install Packages panel, select **IBM MDM Operational Server Installation Startup Kit** and click **Next**.
5. Continue through the panels, selecting the default package group and installation packages.
6. Click **Install**.
7. Click **Finish** when the installation is complete and close IBM Installation Manager.

Results

The Installation Startup Kit scripts and files are extracted to the directory that you define as the *STARTUPKIT_INSTALL_HOME*.

What to do next

You can use the Installation Startup Kit scripts and files to help you to prepare your database and application server.

Account prerequisites for custom installations

Before you begin a custom installation, you must have certain account prerequisites in place.

- You must be logged on with an account that owns the IBM WebSphere Application Server directories and binary files. The database JDBC drivers must be accessible by this account. The instructions in the preparation topics assume that you are doing the installation locally on the server.
- Install InfoSphere MDM as a non-root user:
  - For IBM WebSphere Application Server, use the *wasadmin* ID.
  - A different database user and schema must exist for each deployment of InfoSphere MDM. Different databases for each deployment are not required.
  - When you install on IBM WebSphere Application Server, ensure that no server named *server* or cluster named *cluster* is being used on IBM WebSphere Application Server. The names *server* and *cluster* are used by the InfoSphere MDM installation.

Installing and setting up the application server

If you are planning to install InfoSphere MDM by performing a custom installation, you must prepare an application server before you begin the installation process.

InfoSphere MDM components run inside WebSphere Application Server. The application server provides infrastructure for component-to-component communication, authentication, and logging.

You can choose to prepare a new application server or reuse an existing application server.

Review these prerequisites before you prepare the application server for InfoSphere MDM installation.

- Ensure that you installed any prerequisite software and that the correct environment is set up.
- Set the database utility for DB2 or Oracle to your system path. Microsoft SQL Server does not require this step.

- Review the application server configuration worksheet to understand the basic parameters that are requested during the installation process. Completing the worksheet ensures that you have the basic information necessary to complete the installation. For multiple instances, copy the worksheet and prepare a separate worksheet for each deployment.
- Use the `wasadmin` ID when you prepare the application server.
- Ensure that you set up the *WAS_HOME* and the *JAVA_HOME* Java™ path for IBM WebSphere Application Server.
- Ensure that there is no server named *server* or cluster named *cluster*.

Important: For custom installations, you must have the WebSphere Application Server deployment manager (Dmgr) JVM Heap size arguments set to 512MB and 1024MB. This is especially important if you plan to install the Product Maintenance UI. To increase the heap size:

1. Open the WebSphere Application Server Integrated Solutions Console and go to **System Administration** > **Deployment Manager**.
2. Under **Server Infrastructure**, expand **Java and Process Management**, then click **Process definition**.
3. Under **Additional Properties**, click **Java Virtual Machine**.
4. Set the **Initial heap size** to 512 MB and the **Maximum heap size** to 1024 MB.
5. Click **OK**, save your changes, and synchronize your changes with the nodes.

Preparing WebSphere Application Server Network Deployment for a managed server deployment

Set up IBM WebSphere Application Server Network Deployment for a managed server deployment.

About this task

This procedure assumes that you have IBM WebSphere Application Server already installed.

Procedure

1. Create a deployment manager (dmgr).
   a. Open a command prompt and browse to your IBM WebSphere Application Server installation directory.
   b. At the command-line prompt, run this command from the *WAS_HOME*\bin directory:

      For Microsoft Windows: `manageprofiles.bat -create -profileName dgmrName -profilePath WAS_PROFILE_HOME\dmgrName -templatePath WAS_HOME\profileTemplates\management -serverType DEPLOYMENT_MANAGER -enableAdminSecurity true -adminUserName userName -adminPassword password`

      For Linux or UNIX: `manageprofiles.sh -create -profileName dgmrName -profilePath WAS_PROFILE_HOME/dmgrName -templatePath WAS_HOME/profileTemplates/management -serverType DEPLOYMENT_MANAGER -enableAdminSecurity true -adminUserName userName -adminPassword password`
2. Start the deployment manager by running this command from the *WAS_HOME*\bin directory: Microsoft Windows: `startManager.bat -profileName dmgrProfileName` or Linux and UNIX: `startManager.sh -profileName dmgrProfileName`
3. Find out which ports are assigned for the deployment manager.
   a. Open the `profiles/dmgrProfileName/logs/AboutThisProfile.txt` file.
   b. Find the entry for the Management SOAP connector port and make note of this number.
   c. Find the entry for the Integrated Solutions Console (admin console) port and make note of this number.
4. Create a node that is attached to the deployment manager by running this command from the *WAS_HOME*\bin directory:

For Microsoft Windows: `manageprofiles.bat -create -profileName` *`profileName`* `-profilePath` *`WAS_PROFILE_HOME`*`\`*`profileName`* `-templatePath` *`WAS_HOME`*`\profileTemplates\managed -hostName` *`hostName`* `-nodeName` *`NodeName`* `-cellName` *`cellName`* `-dmgrHost` *`dmgrHost`* `-dmgrPort` *`dmgrPort`* `-dmgrAdminUserName` *`userName`* `-dmgrAdminPassword` *`password`*

For Linux or UNIX: `manageprofiles.sh -create -profileName` *`profileName`* `-profilePath` *`WAS_PROFILE_HOME`*`/`*`profileName`* `-templatePath` *`WAS_HOME`*`/profileTemplates/managed -hostName` *`hostName`* `-nodeName` *`NodeName`* `-cellName` *`cellName`* `-dmgrHost` *`dmgrHost`* `-dmgrPort` *`dmgrPort`* `-dmgrAdminUserName` *`userName`* `-dmgrAdminPassword` *`password`*

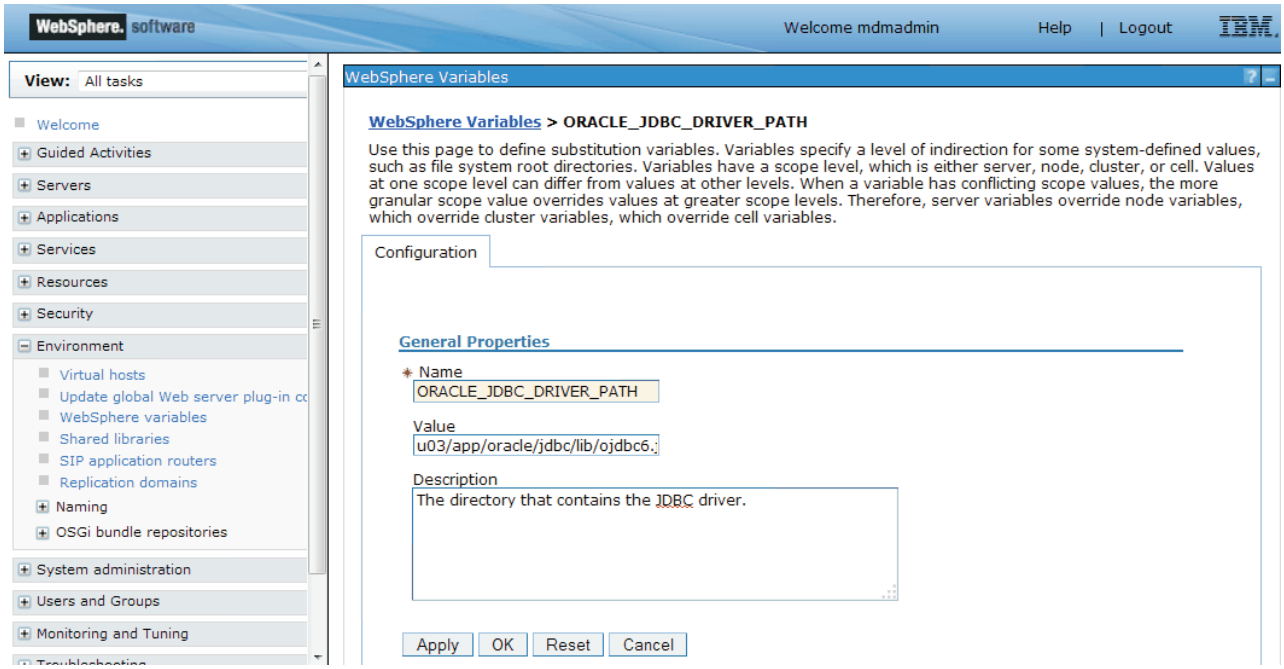
Where:

- *nodeProfileName* - is name of the node.
- *username* - is the user you specified in step 1.
- *password* - is the password you specified in step 1.
- *dmgrPort* - is the management SOAP connector port number from step 3b.

5. Start the node by running this command from the *`WAS_HOME`*`\bin` directory: Microsoft Windows: `startNode.bat -profileName` *`nodeProfileName`* or Linux and UNIX: `startNode.sh -profileName` *`nodeProfileName`*
6. Open IBM WebSphere Application Server Integrated Solutions Console and enable node synchronization.
   a. Open a browser and go to `https://localhost:`*`port`*`/ibm/console`. The port number is the Integrated Solutions Console port number from step 3c.
   b. If you encounter a warning that states that the connection is not trusted, you can ignore the message or add an exception as necessary for your browser.
   c. Log in using the credentials from step 1.
   d. Browse to **System administration** > **Console Preferences**.
   e. Select **Synchronize changes with Nodes** and click **Apply**.
7. Set the database driver path in the Integrated Solutions Console.
   a. Go to **Environment** > **WebSphere variables**.
   b. For each of the driver path entries that are named for your database type, click the entry. For example: **DB2_JDBC_DRIVER_PATH**, **ORACLE_JDBC_DRIVER_PATH**, or **MICROSOFT_JDBC_DRIVER_PATH**.
   c. Enter the path to the parent directory of your database client installation directory and click **OK**.

      Tip: Replace single slashes with double slashes. For example, if the path is `C:\IBM\SQLLIB`, then enter `C:\\IBM\\SQLLIB`.

      - For Oracle, use use *`ORACLE_HOME`*`/jdbc/lib`.



d. Select **Save directly to the master configuration**.

Setting an Oracle utility path

If you are using an Oracle database, you must set the database utility to your system path.

Procedure

At the command line, add the Oracle database utilities to the PATH variable on your system. For example:

```
export ORACLE_HOME=ORACLE_HOME
export PATH=$ORACLE_HOME/bin:$PATH
```

What to do next

You can also add the export lines to your user profile.

Installing and setting up the database

Prepare your database to support a custom installation of InfoSphere MDM. You must complete this procedure if you are running a custom installation.

About this task

When you define names for your databases and user accounts, consider giving the associated database instance, user account, and data source configuration the same name. You might also want to include the InfoSphere MDM version in the name. For example, you might name each of these elements `mdmprod_113` for the production database. Using this naming convention can help other members of your organization and IBM Software Support understand the mapping between instances, accounts, and databases.

Procedure

1. Complete the applicable database worksheets that are listed as related reference.

2. Install the database software and create database user accounts with appropriate permissions. Use the documentation provided by the database vendor to complete your installation. Review the database user accounts topic before installing the database software.
3. Optionally, install the Installation Startup Kit. This toolkit provides scripts that you can use to create the MDM database, but is not mandatory.

   Note: If you do not install the Installation Startup Kit, then the installation application will display a warning during InfoSphere MDM installation.
4. Create the MDM database using one of the following methods:
   - Run the Installation Startup Kit script that is applicable to your database type. The scripts automatically create the appropriate table spaces, buffer pools, and encoding specifications that are required for your InfoSphere MDM edition. For details about some of these settings, see the related reference topics.
   - Manually create the database using another method.

   Note: For details about the required database configuration and settings, see the related reference topics.

Database user accounts and connections

All installations require at least one database user account.

To bootstrap the database (which is typically done during installation), process an upgrade, define new entity types, or create implementation-defined segments, the database user account must have certain permissions. This primary user account must have permission to:

- Create table and drop table
- Create index and drop index
- Select, insert, update, and delete

After the database is bootstrapped and entity types and implementation-defined segments are configured, you can opt to restrict the user account if required. A restricted user account has only select, insert, update, and delete permissions.

Consider configuring a one-to-one relationship between the database user and the database so that users do not have access to multiple databases. This model provides a security layer that can prevent one database user from dropping the tables of another.

Record the database user account credentials; you need this information to complete the installation.

The database connection count is the sum of connections that are used by the operational server and by any entity managers that you plan to use. Some operational server or InfoSphere MDM Workbench processes also require more database connections, which are closed when the process is completed. Allow more connections for these processes in your configuration.

Preparing an Oracle database

Set up an Oracle database before beginning an installation of InfoSphere MDM.

Before you begin

- These steps assume that the database has already been installed.
- Optionally, install the Installation Startup Kit.
- To create the MDM database, you must be logged in to Oracle with the database administrator user account that you created when you installed Oracle.
- To install InfoSphere MDM with Oracle, your database user name and schema name must be the same.

Procedure

1. Verify that your character set is UTF-8. If it is not, create your database by using this command: **CREATE DATABASEdname...CHARACTER SET AL32UTF8**
2. Set the character length semantics for Unicode. The variable NLS_LANG_SEMANTICS must be set to CHAR (the default setting is BYTE). Run this command: **ALTER SYSTEM SET NLS_LENGTH_SEMANTICS=CHAR SCOPE=BOTH**
3. If you are using a non-wire connect driver with an Oracle client, you must set the NLS_LANG variable for the user that is connecting to the operational server. Set the variable to NLS_LANG=AMERICAN_AMERICA.AL32UTF8

Important: The remaining steps in this procedure are **optional**. If you do not wish to manually create the tablespaces, then you can skip the following steps, in which case the installation application will automatically create the tablespaces during installation.

4. Modify the create_schema_ora.sql script that is provided in the Installation Startup Kit.
   a. Go to *STARTUPKIT_INSTALL_HOME*/CoreData/Full/Oracle/Standard/ddl/ directory (where *STARTUPKIT_INSTALL_HOME* is the location of the installed kit).
   b. Open the create_schema_ora.sql file in a text editor. The file contains the following variables that must be replaced with appropriate values:
   c. If the database is being created on Microsoft Windows, replace the <*TABLESPACE_LOCATION*> variable with the location of the table spaces. The location value should follow the syntax <*ORACLE_HOME*>\<*DBNAME*>

      Attention: If you are creating a database on Microsoft Windows, you must also change all forward slash characters (/) in file paths to backslash characters (\).
   d. In the <*ORACLE_HOME*>/oradata folder, create an empty subfolder with a name that matches your <DBNAME> value.
   e. Set up the table space names:
      - To use the default table space values, replace the variables in the create_schema_ora.sql script with values as described at the top of the script. Variables are enclosed in angle brackets < >:
        - <*DBNAME*> - The database name.
        - <*NEWPASSWORD*> - The password for the database.
        - <*INDEX_SPACE*> - The table space name for index data. The installation application expects the value to be IDXSPACE.
        - <*LONG_SPACE*> - The table space name for CLOB and XML data types. The installation application expects the value to be LOBSPACE.
        - <*TABLE_SPPMD*> - The table space name for Probabilistic Matching Engine user table data. The installation application expects the value to be EMESPACE1.
        - <*TABLE_SPPMI*> - The table space name for Probabilistic Matching Engine index data. The installation application expects the value to be EMESPACE2.
        - <*TABLE_MDS4K*> - The table space name for 4K user table data. The installation application expects the value to be TBS4K.
        - <*TABLE_SPACE*> - The table space name for 8K user table data. The installation application expects the value to be TBS8K.
        - <*TABLE_SPMDS*> - The table space name for 16K virtual MDM user table data. The installation application expects the value to be TBS16K.
      - To use customized table space names:
        1) Create a database that uses your custom table space names.
        2) Create or edit an InfoSphere MDM installation input response file and modify the table space name variables so that your custom table space names are mapped to the InfoSphere MDM installer:

```
<data key='user.L2.long.space.ora,com.ibm.mdm.advanced' value='LOBSPACE'/>
<data key='user.L2.index.space.ora,com.ibm.mdm.advanced' value='IDXSPACE'/>
<data key='user.L2.eme.sppmd.space,com.ibm.mdm.advanced' value='EMESPACE1'/>
<data key='user.L2.eme.sppmi.space,com.ibm.mdm.advanced' value='EMESPACE2'/>
```

Attention: InfoSphere MDM provides sample installation input response files that you can modify to define customized table spaces. For more information about the sample input response files, see Silent installation .

3) Start the InfoSphere MDM installer in either GUI mode or silent mode, including the following argument in the startup command so that the installer uses parameters from your modified input response file: `IBMIM -input ./mdm_input.res` (where *mdm_input.res* is the name of the silent input response file).

5. Run the script `create_schema_ora.sql` to create the Oracle schema.

What to do next

If you omit the execution of the `create_schema_ora.sql` script, then you must alter the Oracle database system:

- Inside the `create_schema_ora.sql` script, make sure that the `ALTER SYSTEM SET open_cursors` statement is set as `ALTER SYSTEM SET open_cursors = 1500 SCOPE=BOTH;`
- Verify that the grants are done specifically as `GRANT CREATE SEQUENCE TO SCHEMA;`, replacing *SCHEMA* with the schema name.
- Configure the Oracle CURSOR_SHARING property to `CURSOR_SHARING=FORCE`.

Preparing your Oracle database to use InfoSphere MDM in a clustered environment

Set up your Oracle database to support installing InfoSphere MDM in a clustered environment.

Procedure

1. Install the Oracle client on every machine.
2. Point the TNS entry to the database server machine.
3. Create an `ORACLE_JDBC_DRIVER_PATH` WebSphere Application Server environment variable that points to the Oracle database home that is present locally on that machine for every node in the cluster.

ODBC drivers installed with Standard Edition

The ODBC drivers that are applied by the installation application when installing InfoSphere MDM Standard Edition are determined by the database type that you define.

A wire driver enables an operational server that supports a virtual MDM configuration to communicate with the database and write data to the schema. In this case, the operational server host requires installation of the applicable database client to enable bulk load operations.

The operational server includes the following ODBC drivers. Other drivers are not supported.

- Oracle Wire
- Oracle Net
- IBM DB2 Wire (DB2 and DB2 for z/OS®)
- Microsoft SQL Server Wire

For Oracle databases, the properties passed to the **madconfig** utility during the installation process determine whether to install the Oracle Wire or Oracle Net driver. If empty values are passed for the database host, the Oracle Net driver is installed, which requires installation of the Oracle client on the operational server host.

Tip: When installing on a Microsoft Windows platform, if you want to manually create a separated ODBC data source rather than creating it through the installation application, you must invoke the command `madconfig.bat register_odbc` to ensure that the ODBC driver is registered successfully.

WebSphere Application Server embedded messaging configuration

The InfoSphere MDM application uses Message Driven Beans (MDBs) that, on startup of the enterprise bundle archive (EBA), look for their associated activation specifications and a JMS provider.

If a JMS provider does not exist, the MDBs timeout and fail to start. To simplify the installation and configuration process, the InfoSphere MDM installation automatically configures a JMS provider and engine.

If you have an existing WebSphere Application Server embedded messaging (message bus) already configured, or if you are installing InfoSphere MDM on z/OS, there are some steps that you must complete before you begin the installation.

If you are installing on z/OS and you do not have an existing messaging bus, then there are steps that you must complete after you install InfoSphere MDM. Post installation configuration is not required for non-z/OS operating systems.

Preparing an existing WebSphere Application Server messaging bus for InfoSphere MDM installation

If you are installing on an operating system other than z/OS, the installer can successfully create the SIB tables because special permission is not required. If you are pointing your existing messaging bus to an instance of InfoSphere MDM, ensure that the messaging data source and the schema name in the message store are pointing to the InfoSphere MDM schema.

About this task

Use this procedure to point the messaging schema to the InfoSphere MDM schema before you begin installation.

Procedure

1. Open the WebSphere Application Server Integrated Solutions Console (admin console).
2. Go to **Service Integration** > **Buses** > ***your application bus*** > **Bus Members**.
3. On the bus members page, click ***your application bus member*** > ***your application SIB server*** > **Message Store**.
4. Verify that the **Schema Name** points to your InfoSphere MDM schema. If not, change the schema name.
5. Click **Apply** and then click **Save directly to the master configuration**.
6. Synchronize your nodes and restart the application server.

Preparing an existing WebSphere Application Server messaging bus for InfoSphere MDM installation on z/OS

If you are installing InfoSphere MDM on z/OS, the database user for the InfoSphere MDM installation must have permission to create tables and table spaces. If they do not, the WebSphere Application Server might not successfully create the Service Integration Bus (SIB) tables.

About this task

If you have an existing WebSphere Application Server messaging bus and you are installing with a user that does not have table and table space creation permissions, you must complete these steps before you begin the InfoSphere MDM installation.

If you do not have an existing messaging bus, then proceed with first installing InfoSphere MDM and then completing the steps in Configuring your message bus on z/OS after installation .

Procedure

1. Open WebSphere Application Server Integrated Solutions Console (admin console).
2. Go to **Service Integration** > **Buses** > ***your application bus*** > **Bus Members**.
3. On the bus members page, click ***your application bus member*** > ***your application SIB server*** > **Message Store**.
4. Clear the **Create tables** option to prevent WebSphere Application Server from attempting to create the SIB tables.
5. Verify that the **Schema Name** points to your InfoSphere MDM schema. If not, change the schema name.
6. Click **Apply** and then click **Save directly to the master configuration**.
7. Stop the application server.
8. Create the SIB tables for your instance by modifying the `ZSIB.sql` file for your schema, prefix, and database owner. In the file, replace <*SCHEMA*> with your schema name, <*PREFIX*> with your three character prefix, and <*DBA ACCOUNT*> with your database owner. Run the SQL as DB Owner.
9. Synchronize your nodes and start the application server.

Set the locale and character encoding on target computers

Globalization settings are automatically set for physical operational servers during installation. For operational servers with virtual configurations, there are some settings that you must manually make after installation.

Unicode settings are made when you run the create database script applicable for your database type. Language settings are made during the installation. Use this procedure to set any additional settings for operational servers if you plan to implement a language other than US English.

Log files that are created by the operational server are in ASCII encoding. Code points that are not encompassed by ASCII are in the standard Unicode form of U+XXXX.

Ensure that the following Unicode items were set by the create database script:

- Oracle: CREATE DATABASE *dname*...CHARACTER SET AL32UTF8. You must also set the character length semantics for Unicode. Set the variable NLS_LANG_SEMANTICS to CHAR (the default setting is BYTE). Use the command:
  ```
  ALTER SYSTEM SET NLS_LENGTH_SEMANTICS=CHAR SCOPE=BOTH
  ```
  If you are using a non-wire connect driver with an Oracle client, you must also set this variable for the user who is connecting to the operational server. (A non-wire connect driver uses Oracle client libraries.)
  ```
  NLS_LANG=AMERICAN_AMERICA.AL32UTF8
  ```

After you install the MDM operational server, you must manually set the MAD_ENCODING variable for your virtual MDM configuration. This variable is set in the `com.ibm.mdm.mds.jni.cfg` configuration file.

Translated strings are stored in the `/smt` directory. These files, such as `fr_FR.smt` or `en_US.smt`, contain the interaction messages that are returned to clients. To set the language for the translated strings, you must

also set the MAD_SMTLIST environment variable in the com.initiate.server.system.cfg configuration file. This variable points to the appropriate *.smt file. If you use multiple languages, you can separate the languages with a comma in the variable property.

When the MAD_SMTLIST option is set to multiple languages (smtcode), the operational server can potentially load multiple languages (strings) at one time. However, the InfoSphere MDM components display the strings for only one language at a time. For example, the same operational server is configured to send a French client French messages and an English client English messages.

If client software is not configured to use an alternative language, only operational server level information is returned in the chosen language. Translation or globalization of the data that is stored in the MDM database, such as dates, are not converted when displayed in user applications. Rather, this information displays in the locale in which it was received from the source.

Chapter 3. Installing InfoSphere MDM into a clustered environment

Use this procedure to run a custom installation of InfoSphere MDM into a clustered environment.

Before you begin

Make sure that you meet these prerequisites:

- You have completed all of the installation preparation tasks, including preparing your IBM WebSphere Application Server and database.
- You have installed IBM Installation Manager and added the necessary repositories.
- Your IBM WebSphere Application Server deployment manager and node are started.
- Your database is started.
- You have installed IBM Rational Application Developer if you are installing InfoSphere MDM Workbench on a workstation.
- Optionally, you have installed the Installation Startup Kit, which includes scripts and other tools to help with your installation and configuration. If the Installation Startup Kit is not installed, then the installation application will display a warning.

If you are installing on Microsoft Windows:

- You must be running in Administrator mode for IBM Installation Manager to write to the Windows registry. Administrator mode is not used for IBM AIX, Linux, or Solaris.
- On a Microsoft Windows 7 operating system, you must install MDM into a directory that is not virtualized.

Important: For custom installations, you must have the WebSphere Application Server deployment manager (Dmgr) JVM Heap size arguments set to 512MB and 1024MB. This is especially important if you plan to install the Product Maintenance UI. To increase the heap size:

1. Open the WebSphere Application Server Integrated Solutions Console and go to **System Administration** > **Deployment Manager**.
2. Under **Server Infrastructure**, expand **Java and Process Management**, then click **Process definition**.
3. Under **Additional Properties**, click **Java Virtual Machine**.
4. Set the **Initial heap size** to 512 MB and the **Maximum heap size** to 1024 MB.
5. Click **OK**, save your changes, and synchronize your changes with the nodes.

About this task

Tip: Review the installation scenarios before you begin a clustered installation. While the scenarios might not exactly fit your environment, they can offer a guideline for installation.

Procedure

1. Review the prerequisites listed earlier in this topic and ensure that you have completed all of the necessary preparation steps. These steps are not optional.
2. Verify that these items are completed for your application server:
   a. WebSphere Application Server is installed on each required machine in your cluster.
   b. The necessary clusters are created in WebSphere Application Server.
   c. If you are using a DB2 or Oracle database, you must set the JDBC_DRIVER_PATH environment variable.

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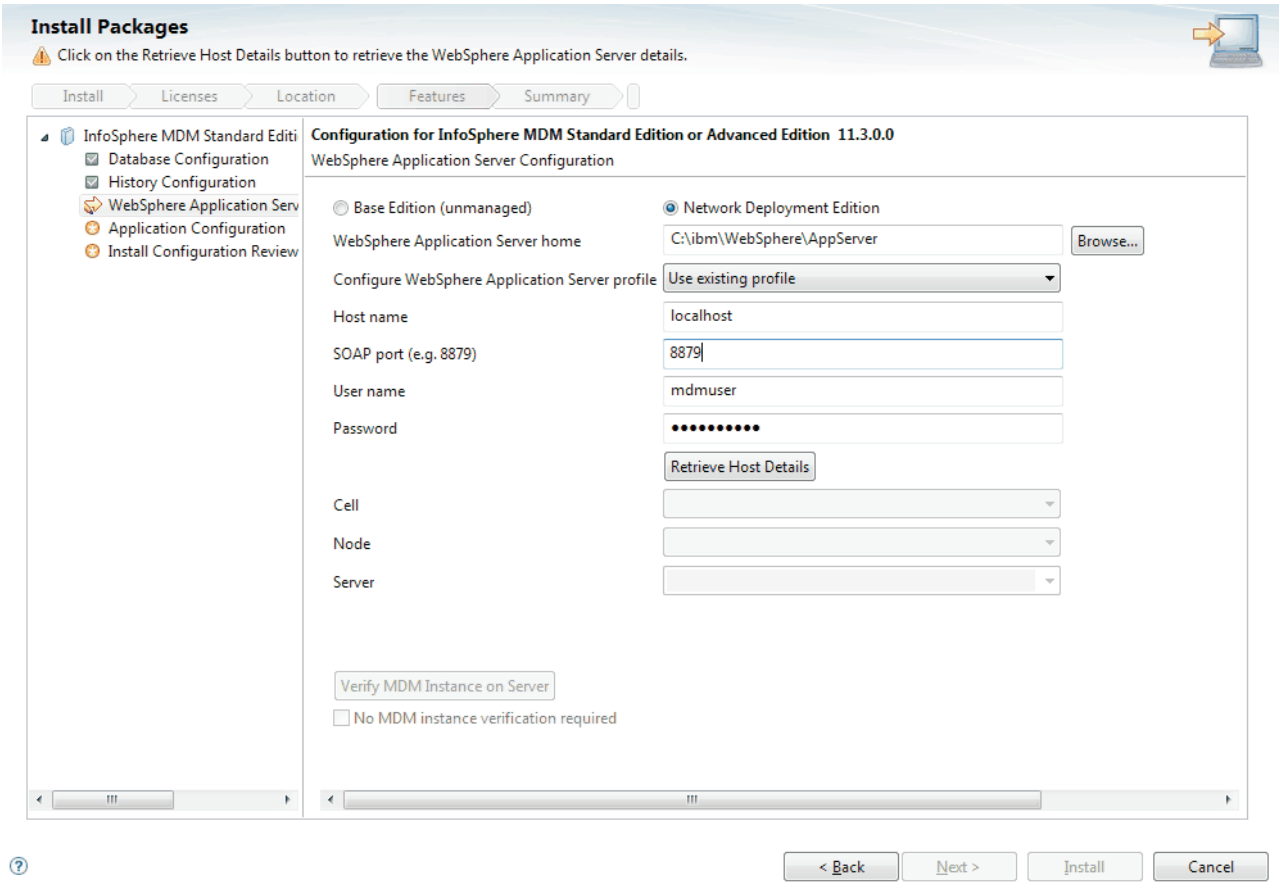
d. Synchronize all managed nodes.
e. Note the WebSphere Application Server host name and port in your installation worksheet.

3. Verify that your database and database client software are installed on the necessary machines, and that the database is started.
4. Open IBM Installation Manager and click **Install**.
5. On the Install Packages panel, select the edition and click **Next**.
6. Continue through the prompts to accept the license agreement, select an installation location, and select languages.
7. Configure your InfoSphere MDM installation details:

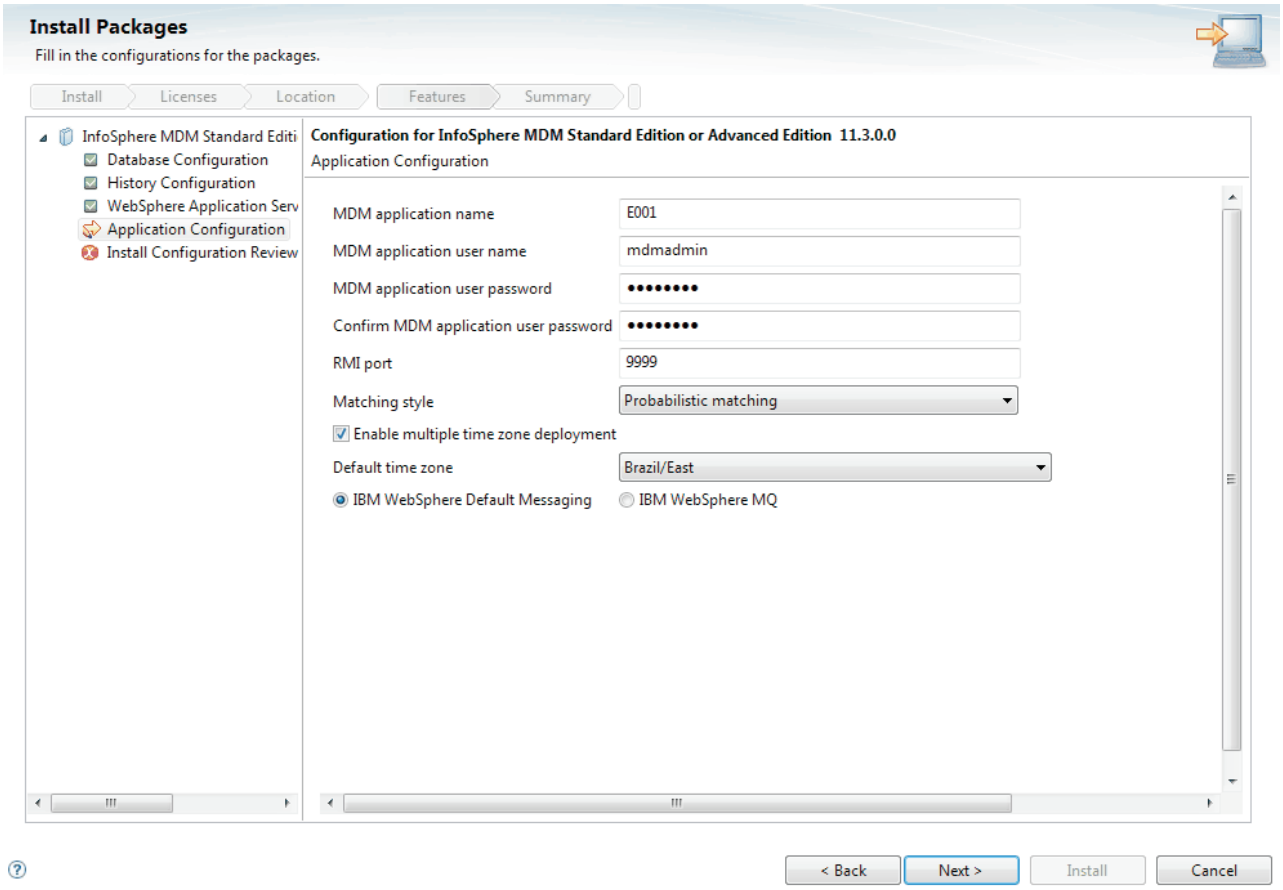
   Tip: Use your completed installation worksheets for guidance. As you move through each of these configuration panels, the screen displays a green checkmark or red x to indicate whether the panel has been completed successfully.

   a. On the Database Configuration panel:
      - Enter the database details. If your database home value is valid, then the **Test Connection** button becomes active.
      - Click **Test Connection**. The database must be accessible and running for the test to be successful.
      - After a successful connection test, you can set up tablespaces. Select either **Use existing tablespaces** or **Create new tablespaces**. If you choose to create new tablespaces, then you must define the new names.

   b. On the History Configuration panel, select the industry, triggers, and language options necessary for your business requirements.
   c. On the WebSphere Application Server Configuration panel:
      - Enter the information that you used to set up your application server.
      - Select **Retrieve Host Details** to obtain your cell, node, and server information. Use each drop down list to select the retrieved cell, node, and server. If you need to provide a different value, you can type it in the field.
      - Click **Verify MDM Instance on Server**.

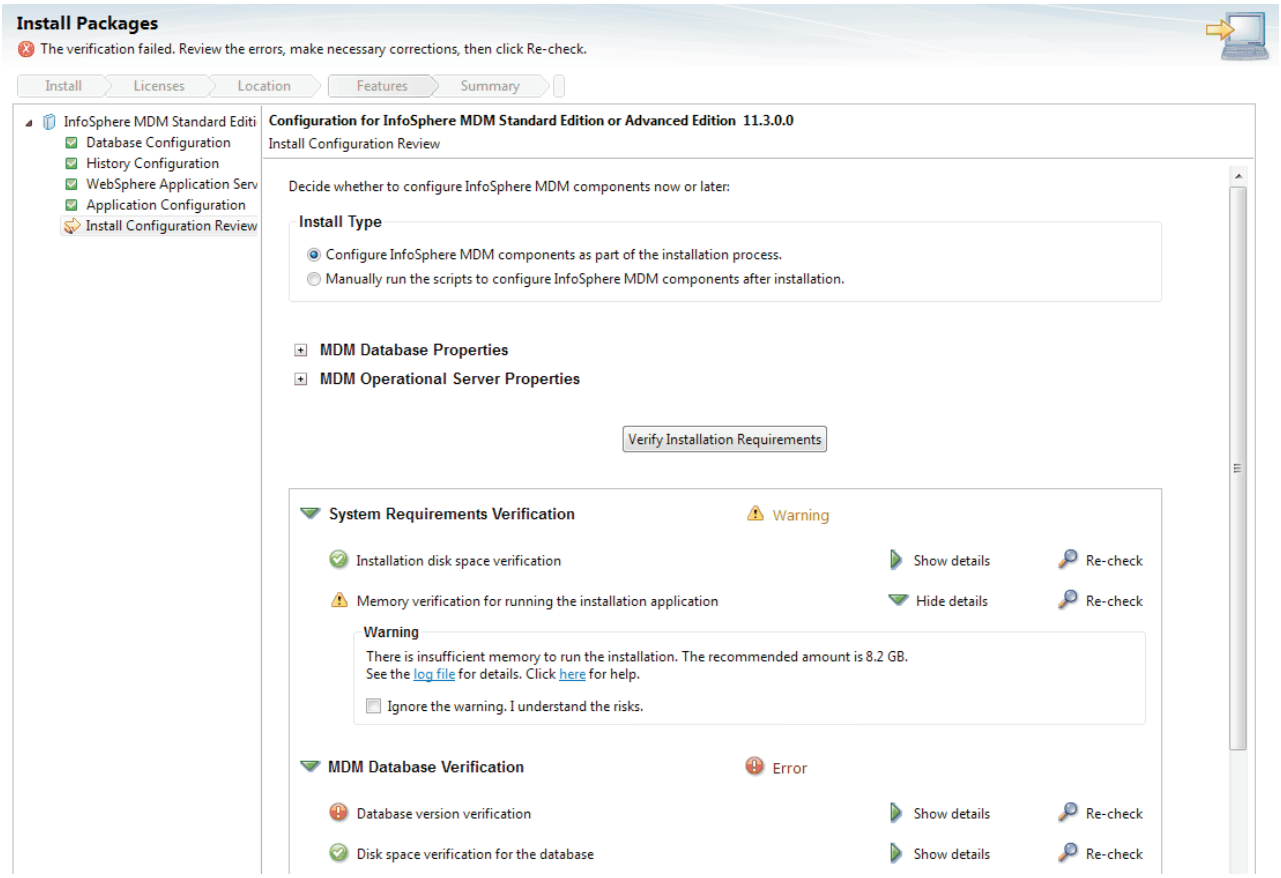


d. On the Application Configuration panel:
   - Provide the new application name, user password, and RMI port. The installation application will use these details to set up InfoSphere MDM.
   - Select either **Probabilistic matching** or **Deterministic matching** for your matching style.
   - If your application is running across different time zones or your data has time-sensitive values under different time zones, select **Enable multiple time zone deployment** and select a **Default time zone**.
   - Select the messaging type to use for this installation.



e. On the Install Configuration Review panel:
   - Select the install type. You can either choose to automatically configure the application components as part of the main installation process or run scripts after the main installation to configure them later.
   - Expand the Properties headings to review the details that you have configured for this installation.
   - Click **Verify Installation Requirements** to run a number of prerequisite checks. The checks will help you to confirm that your environment and configuration is sufficient to successfully complete the installation.
   - Review the prerequisite validation test results. Click **Show details** to see more information of for each test, and follow the provided links to view the log file and help for each result.

     Tip: You can ignore warnings by clicking **Show details**, then selecting **Ignore the warning. I understand the risks.** Errors cannot be ignored.
   - If necessary, take any corrective action to address any warnings or errors, then click **Recheck Status**.
   - When the checks pass successfully, click **Install**.



The installation application will install InfoSphere MDM. Depending on your configuration, the installation process can take a significant amount of time.

8. On the final IBM Installation Manager panel, click **View Log Files** if you want to open the log file viewer.
9. Click **Finish**, then close IBM Installation Manager.

Results

A success message on the final installer panel indicates that the verification tests were automatically run as part of the installation process. You can also view the log files to verify a successful installation. If the installation is not successful, view the log files and use the information in the troubleshooting topics to assist you.

What to do next

After installation, if you want to add or remove a feature (for example, add an application or another language translation), or modify any of your configuration settings, you can run IBM Installation Manager again and select **Modify**.

Installing on Oracle RAC

Use this procedure if you are using virtual MDM and installing on Oracle Real Application Clusters (RAC).

Before you begin

Make sure that you meet these prerequisites:

- You have completed all of the installation preparation tasks, including installing and preparing your IBM WebSphere Application Server and database.
- You have installed IBM Installation Manager and added the necessary repositories.
- The IBM WebSphere Application Server (deployment manager and node) and database are started.

Procedure

1. Start IBM Installation Manager and click **Install**.
   a. On the Install Packages panel, select the edition and click **Next**.
   b. Continue through the prompts to accept the license agreement, select an installation location, and select languages.
   c. Select the **MDM Database** and **MDM Operational Server** features and click **Next**.
   d. Complete the configuration panels and click **Next**.
   e. Click **Install**. The installation application creates the ODBC data source with the SID, and runs the **madconfig bootstrap_datasource** target to create all virtual MDM tables.

   Tip: Refer to the parent topic of this task for details about completing the preceding substeps.
2. Open the WebSphere Application Server Integrated Solutions Console (admin console) and select **Resources** > **JDBC** > **Data sources**.
   a. On the Data sources page, click the name of your MDM data source.
   b. On the next Data sources page, click **Custom properties**.
   c. Remove the SID by selecting it and clicking **Delete**.
   d. Click **New** and add a new custom property **Name** for `serviceName` and the **Value**.
   e. Click **OK**.
3. Run the following commands from the `native.war/scripts` directory. For a clustered deployment of InfoSphere MDM, you must run these commands on each machine in the cluster.
   - `madconfig remove_datasource -Dmad.db.dsn=`*`DB_NAME_MDM_INSTANCE_ID`*
   - `madconfig create_datasource -Dmad.db.type=oracle -Dmad.db.host=`*`DB_HOST`*
     `-Dmad.db.port=`*`DB_PORT`* `-Dmad.db.service=`*`SERVICE_NAME`* `-Dmad.db.dsn=`*`DB_NAME_MDM_INSTANCE_ID`*

     When running this command, you are prompted to enter the SID. Leave the prompt blank and press Enter.

What to do next

Always review the installation logs to verify that the process completed successfully.

If you determine that the virtual data did not load successfully after you review the logs, you can use the **madconfig** utility to either reload the data or run a bootstrap.

Enabling support for Oracle non-wired driver

If you are using a virtual MDM and plan to use a non-wired Oracle database driver, complete these steps after you install the InfoSphere MDM database and features.

Before you begin

Complete the steps in "Deploying the MDM Native Component feature on remote Windows server" on page 31.

Procedure

1. On the machine where you installed the native Oracle client and drivers and deployed the native EAR file:

a. Configure the operating system environment variable as: ORACLE_HOME=*PATH_TO_ORACLE_HOME*.
b. Configure the operating system environment variable as:
   - For Microsoft Windows: LIB=*PATH_TO_ORACLE_HOME*/lib
   - For IBM AIX: LIBPATH=*PATH_TO_ORACLE_HOME*/lib
   - For other operating systems: LD_LIBRARY_PATH=*PATH_TO_ORACLE_HOME*/lib

2. Go to the native.war/scripts directory and run these commands:
   a. madconfig remove_datasource -Dmad.db.dsn=*DB_NAME_MDM_INSTANCE_ID*
   b. madconfig create_datasource -Dmad.db.type=oracle -Dmad.db.dsn=*DB_NAME_MDM_INSTANCE_ID*-Dmad.db.server=*TNS_NAME*

      The **create_datasource** command prompts you to enter a database host. You can leave that prompt blank and press Enter.
3. If you have a clustered environment, repeat the steps on each cluster member.

Deploying the MDM Native Component feature on remote Windows server

The Master Data Management Native Component feature is the ODBC data source that virtual MDM configurations require to operate successfully. If you are planning to install the MDM operational server and implement a virtual MDM configuration on a WebSphere Application Server cluster and a Microsoft Windows operating system, there are steps that you must take after you install your operational server.

About this task

The installer automatically runs the **madconfig create_datasource** target to create an ODBC data source on a remote server by using an Ant agent. However, the Ant agent does not have permission to modify the Windows registry.

If you are running IBM Installation Manager and WebSphere Application Server deployment manager on machine A and must deploy your operational server and virtual configuration to managed nodes on other machines (for example B, C, and D), use this procedure. This procedure manually creates the ODBC data source on each of the remote Windows servers after you first run IBM Installation Manager to install your operational server.

Procedure

1. Run IBM Installation Manager on machine A and install the MDM operational server.
2. On machine B, go to your *WAS_PROFILE_HOME*\installedApps*YOUR_CELL_NAME**MDM-native-IDENTIFIER*.ear\native.war\scripts directory.
3. Open a command-line prompt.
4. Type this command: madconfig.bat register_odbc.
5. Type this command: madconfig.bat create_datasource -Dmad.db.type=*DBTYPE* -Dmad.db.name=*DBNAME* -Dmad.db.port=*DBPORT* -Dmad.db.host=*DBHOST* -Dmad.db.dsn=*DSN*

   Where:
   - *DBTYPE*: is your database type; specify DB2, ORACLE, or MSSQLU on machine B
   - *DBHOST*: is your database host name or IP address on machine B
   - *DBPORT*: is your database port on machine B
   - *DBNAME*: is your database name on machine B, for example mdmins11
   - *DSN*: the data source name; DSN naming convention is *DB_NAME_MDM_INSTANCE_IDENTIFIER*. *MDM_INSTANCE_IDENTIFIER*. must match the **MDM application name** value that you entered on the Application Configuration panel during installation on machine A.

6. Repeat steps 2 - 5 for each additional machine in your cluster (for example, C and D).

Prerequisite checks for custom installations

The InfoSphere MDM installer application runs tests to ensure that certain prerequisites are in place before each custom installation begins.

The prerequisite checking tool helps to prevent you from beginning an installation that will be unable to successfully complete due to any missing prerequisites.

Tip: Run the prerequisite checks from within Installation Manager from the Installation Configuration Review panel by clicking **Verify Installation Requirements**.

When running a custom installation, the installation application runs the following prerequisite checks.

Table 7. System checks

Prerequisite check	Description	Resolution
Installation disk space verification	This check validates that there is sufficient disk space to install InfoSphere MDM in the *MDM_INSTALL_HOME* directory.	Ensure that there is at least 2 GB of disk space available in the *MDM_INSTALL_HOME* location.
Memory verification for running the installation application	This check validates that there is sufficient memory to run the installation. This message is a warning only.	Ensure that the system that you are installing on has at least 8 GB of RAM. **Note:** You can choose to ignore this warning, but the installation may fail.

Table 8. Database checks

Prerequisite check	Description	Resolution
Database version verification	This check validates that the database version is supported.	Ensure that the database for this installation is one of the database versions listed in the InfoSphere MDM system requirements.
Disk space verification for the database	This check validates that there is sufficient disk space available for the MDM database in the default database location (the database home folder).	Ensure that there is at least 6 GB of disk space for the database. **Note:** This requirement only considers the basic disk space requirements for database creation.
Database parameters verification	This check validates that all of your database connection credentials (such as host, port, user, and password) are correct by attempting to connect to the database.	Ensure that the specified database user can connect to the database using the host name, port, and specified database credentials. Each of these parameters must be correct, and the required JARs must be available to connect the client to the database server. For details about the specific reasons that this check failed, refer to the log file.
Database buffer pools verification	This check determines whether the database buffer pools meet the InfoSphere MDM system requirements.	Ensure that the database buffer pools meet the InfoSphere MDM system requirements. For details about the specific reasons that this check failed, refer to the log file.

Table 8. Database checks (continued)

Prerequisite check	Description	Resolution
Database user permission verification	This check validates that the specified database user exists and has the required permissions.	Ensure that the database user being used for the installation has all of the required permissions. For details about the specific reasons that this check failed, refer to the log file. MDM database users must have the ability to create and edit tablespaces, tables, triggers, functions, views, procedures, and sequences. For details about the required database permissions, install the InfoSphere MDM Startup Toolkit and refer to the operations run by the database setup scripts: • Oracle: *STARTUP_TOOLKIT_HOME*\database\CoreData\Full\Oracle\Standard\ddl\create_schema_ora.sql **Note:** Permissions are specific to DB2 and Oracle.
Tablespace definition verification	This check validates that the required database tablespaces are present in the database.	Ensure that the tablespaces are correct. Refer to the log file for information about the missing tablespaces. **Note:** Tablespaces are specific to DB2 and Oracle.
ODBC datasource verification	This check determines whether an ODBC datasource exists in a Microsoft Windows registry. This check will fail with an error if an ODBC datasource already exists. **Note:** For non-Windows systems, this check will always pass.	If an ODBC datasource exists in your Windows registry, remove the datasource: 1. Open the Windows Registry Editor by running the command `regedit`. 2. Find the entry HKEY_LOCAL_MACHINE\SOFTWARE\ODBC\ODBC.INI. 3. Expand ODBC.INI, locate the ODBC datasource entry, then right-click it and select **Delete**. 4. Under ODBC.INI, select the ODBC Data Sources entry. In the display pane, all of the subentries are shown. 5. Locate the ODBC datasource entry in the list of subentries. Right-click the entry and select **Delete**.
Database state verification	This check validates that there are no preexisting MDM data tables in the database schema. If the schema is already populated, then a warning message is displayed. **Tip:** Do not attempt to install InfoSphere MDM into a database that is already populated with MDM data. Installing over an existing database can result in the data being lost if there is an installation failure.	Ensure that your database starts with an empty schema before installing InfoSphere MDM. The installation will create the MDM tables. If you intend to perform an upgrade installation, refer to the *Upgrading from a previous version* topic (see the related links at the end of this topic). **Note:** You can choose to ignore this warning, but data may be lost if the installation fails.

Table 9. Operational server checks

Prerequisite check	Description	Resolution
WebSphere Application Server version verification	This check validates that the correct version of WebSphere Application Server is installed and available. There are two potential failure scenarios for this validation: • *Not connected* - The installation verification tool cannot connect to WebSphere Application Server. • *Old version* - The WebSphere Application Server version is not supported.	If the failure message indicates that the validation check cannot connect, double-check the connection details that you specified. The log file indicates the reasons that the connection failed. If the failure message indicates that the version is not supported, then you must install the correct version of WebSphere Application Server. The log file indicates both the detected version and the required version.
Disk space verification for the profile	This check validates that there is sufficient disk space to install the InfoSphere MDM operational server in the *MDM_INSTALL_HOME* location. A failure of this validation prompts a warning.	Ensure that there is enough disk space available in the *MDM_INSTALL_HOME* location. The required amount of disk space varies depending on the features that you choose to install. For details about the specific requirements for your installation, refer to the log file. **Note:** You can choose to ignore this warning, but the installation may fail.
SOAP connection timeout verification	This check validates that the `soap.client.props` file is present and that the SOAP connection timeout value (`com.ibm.SOAP.requestTimeout`) is sufficient. A failure of this validation prompts a warning.	If the warning message indicates that the `soap.client.props` file is not found, then refer to the log file for details. If the warning message indicates that the SOAP connection timeout value is not long enough, set the value of `com.ibm.SOAP.requestTimeout` to one of the following values: • a number greater than or equal to 1800 • 0, which indicates that there will be no timeout **Note:** You can choose to ignore this warning, but the installation may fail.
WebSphere Application Server status verification	This check validates that WebSphere Application Server is running.	Ensure that WebSphere Application Server is running. Refer to the log file for details about the reason that this check failed.

Chapter 4. Verifying the base installation

The IBM Installation Manager automatically runs a verification routine to test the installation by running three physical transactions to add a person, an organization, and a contract, and one virtual transaction. If these transactions are successful, then the installation completes successfully.

Additionally, you can use the Test Client to run test transactions to ensure that InfoSphere MDM is installed correctly.

Verifying the installation with the Test Client on WebSphere Application Server

Verify your installation with the application server Test Client, which completes a number of preset test cases.

About this task

The Test Client only supports DB2 and Oracle databases.

Procedure

1. In the `TestClient.properties` file in the *MDM_INSTALL_HOME*`/IVT/properties` folder, enter the user name at `user=` and the password at `password=` if application security is enabled.
2. Edit any other required properties to create the parameters for the test you want to run. For information about the properties you can edit, see the test client properties topic.
3. Go to the *MDM_INSTALL_HOME*`/IVT` directory:
4. Clear the data by following the steps for your installation type:
   - Run the following script at the command line to clear the data if you installed InfoSphere MDM on Oracle:

     ```
     sqlplus <DB_USER>/<DB_PASSWORD>@TNS@./sql/clearOperationData.sql
     ```
5. From the command line, to run the test cases, run the script:

   `TestClient.sh` *TEST_CHANNEL XML_FOLDER* [*USER_NAME PASSWORD*] where:
   - *TEST_CHANNEL* is the method to send the test cases to the server, either:
     - For RMI, enter `rmi`
     - For HTTP, enter `soap`
     - For JMS, enter `jms`
   - *XML_FOLDER* is the folder that contains the XML test cases that you want to run, either:
     - For TCRM test cases, enter `./testCases/xml`
     - For virtual MDM test cases, enter `./testCases/xml_virtual`
     - For admin test cases, enter `./testCases/xml_admin`
     - For TCRM composite test cases, enter `./testCases/xml_composite`
     - For a messaging test case, enter `./testCases/xml_msg`
   - If security is enabled, enter the user name to log on to the system at *USER_NAME*
   - If security is enabled, enter the password for the user name at *PASSWORD*

   For example, to run the admin test cases on WebSphere Application Server through HTTP with security not enabled, enter

   ```
   TestClient.sh soap testCases/xml_admin
   ```
6. When the test is complete, you can see the results in the following directories:

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- To see the responses that were created by the tests, check the `./response` folder for each test case (such as `./testCases/xml/response`).
- To see the logs, the list of test cases run, and their statuses, check the log files in *MDM_INSTALL_HOME*`/IVT/logs`.

Example

The following table shows the tests, with corresponding command lines, that you can run:

Table 10. Installation verification tests

To run the test:	Use the command:
To provide a request file to run single TCRM test case	`TestClient.sh rmi ./testCases/xml/TCRMaddPerson.xml`
To run JMS test cases	Provide the queue connection factory, request queue name, and response queue name in the `TestClientJMS.properties` file, then run `TestClient.sh jms ./testCases/xml`
To run messaging test cases	• For Oracle: 1. Run `@./sql/Oracle/update_event_active.sql` to activate an event 2. Restart WebSphere Application Server 3. Run `TestClientWL.sh rmi ./testCases/xml_msg`
To run the admin test cases	`TestClient.sh rmi ./testCases/xml_admin`

Test Client properties

You can edit the entries in the `TestClient.properties` file in the *MDM_INSTALL_HOME*`/IVT/properties` folder to set the parameters for the test.

Table 11. Properties that can be set in the Test Client properties file

To set the parameter for:	Set the following parameter to:
To run test cases without sorting	sort=
To sort the test cases by directory. See regex=for sort criteria	sort=d
To sort the test cases. See regex=for sort criteria	sort=f
To sort directories and test cases. See regex=for sort criteria	sort=d|f
To extract the first match as sorting comparison key. The sort order is based on the key. The default is to extract the last digital number from request file.	regex= [0-9]*[0-9]$
To sort by string order	regex=
To add a user name	user=
To add a password	password=
To test the extracted value by using a regular expression	java -cp ./lib/TestClient.jar -regex tcrmtest_001
For information about using Java to run test cases	java -cp ./lib/TestClient.jar ?
To use the MDM JMS adapter, enter the queue connection factory name	QueueConnectionFactory=
Enter the request queue destination name	RequestQueue=
Enter the response queue destination name	ResponseQueue=

Installation logs

There are two types of logs that are created during the installation process. One set logs IBM Installation Manager related information and the other logs InfoSphere MDM related information.

The location of IBM Installation Manager logs depends on how the application was installed. If IBM Installation Manager was installed in admin mode (root user on UNIX), the logs are in `/var/ibm/InstallationManager/logs`. If the application was not installed in admin mode, the logs are in `$HOME/var/ibm/InstallationManager/logs`.

You can also specify a location for the IBM Installation Manager logs by updating the Agent Location variable (`cic.appDataLocation`) in the `config.ini` file. The `config.ini` is in the *InstallationManager_INSTALL_HOME*`/eclipse/configuration` directory.

InfoSphere MDM logs are in the *MDM_INSTALL_HOME*`/logs/database` directory.

The following directories contain logs that are created when the physical MDM database SQL scripts are run (by manual installation and by the installer):

- *MDM_INSTALL_HOME*`/logs/database/DomainData`
- *MDM_INSTALL_HOME*`/logs/database/CoreData`
- *MDM_INSTALL_HOME*`/logs/database/CMData`

Log files that are created by bootstrapping a virtual MDM database that uses ODBC are in *MDM_INSTALL_HOME*`/logs/database/Virtual`

Viewing Installation Manager log files

The IBM Installation Manager application creates log files during the installation process. These logs can be viewed through a browser.

Before you begin

You must have a browser available in which to view the log files. If you are on a server that does not have a browser, copy the logs to a workstation.

About this task

The logs contain messages with INFO, DEBUG, WARNING, or ERROR labels. If the installation is successful, all messages have an INFO or DEBUG label. Messages that are identified as WARNING or ERROR must be reviewed.

Procedure

1. Go to the `./InstallationManager/logs` directory.
2. Open the `index.xml` file.
3. From the **All Log Files** table, click a link that corresponds to the IBM Installation Manager session that installed InfoSphere MDM.
4. Locate the following link: **Custom operation MDM Operational Server, verifying install location in unit mdmv.app.set.install.location**.

   That link, and subsequent links, show installation process messages.
5. Look for messages that are identified as WARNING or ERROR. The messages must be reviewed to identify potential problems with your installation.
6. Click a link to view native log file representations of an installation process segment.

Such processes can include running custom Java code to manage InfoSphere MDMfiles, to run the **madconfig** utility Ant-based tool that in turn runs SQL scripts, and to implement the WebSphere Application Server MBean API that deploys InfoSphere MDM deployment archives like EBA and EAR files, and other actions.

Results

If you have messages that are identified as WARNING or ERROR, try to determine the cause of the issue by searching for Java or Ant exception errors. If you locate a workaround for the WARNING or ERROR, attempt to fix the installation or contact IBM Software Support.

Viewing the InfoSphere MDM installation logs

During the installation process, logs are created in the *MDM_INSTALL_HOME*/logs/database directory. Use these logs to help you when troubleshooting or verifying your installation.

About this task

Logs are stored in .xml files with the date and time of the installation as the file name. For example, a file with the name 20130312_1101.xml, indicates the installation occurred on March 12, 2013 at 11:01. You can access the logs in two different ways.

Procedure

- On the final IBM Installation Manager panel after the installation is complete, click **View Log File**.
- Go to the *MDM_INSTALL_HOME*/logs/database directory and open the .xml file.

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Contacting IBM

You can contact IBM for customer support, software services, product information, and general information. You also can provide feedback to IBM about products and documentation.

The following table lists resources for customer support, software services, training, and product and solutions information.

Table 12. IBM resources

Resource	Description and location
Product documentation for InfoSphere MDM	You can search and browse across all the InfoSphere MDM documents at http://www.ibm.com/support/knowledgecenter/SSWSR9_11.3.0.
Product documentation for InfoSphere MDM Custom Domain Hub, including InfoSphere MDM Reference Data Management	You can search and browse across all the InfoSphere MDM Custom Domain Hub documents at http://www.ibm.com/support/knowledgecenter/SSLSQH_11.3.0.
IBM Support Portal	You can customize support information by choosing the products and the topics that interest you at www.ibm.com/support/.
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Training and certification	You can learn about technical training and education services designed for individuals, companies, and public organizations to acquire, maintain, and optimize their IT skills at www.ibm.com/software/sw-training/.
IBM representatives	You can contact an IBM representative to learn about solutions at www.ibm.com/connect/ibm/us/en/.

Providing feedback

The following table describes how to provide feedback to IBM about products and product documentation.

Table 13. Providing feedback to IBM

Type of feedback	Action
Product feedback	You can provide general product feedback through the Consumability Survey at https://www.ibm.com/survey/oid/wsb.dll/studies/consumabilitywebform.htm.
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