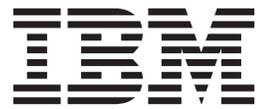IBM InfoSphere Master Data Management Collaboration Server
Version 11 Release 3

Installation Guide

IBM

IBM InfoSphere Master Data Management Collaboration Server
Version 11 Release 3

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Preface

IBM® InfoSphere® Master Data Management Collaboration Server is a product information management solution for building a consistent central repository. It links product, location, trading partner, organization, and terms of trade information, which is typically scattered throughout the enterprise.

About this publication

This installation guide provides information about how to install and configure InfoSphere MDM Collaboration Server.

Intended audience

This installation guide is intended for installers, system administrators, and IBM Professional Services personnel to successfully deploy the product in your environment.

Prerequisite and related information

Before using this installation guide, become familiar with the following information:

- InfoSphere MDM Collaboration Server product documentation
- Your application server documentation
- Your database software documentation

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other InfoSphere MDM Collaboration Server documentation, use the following form to send us your comments: http://www.ibm.com/software/data/rcf/

What's new in Version 11.0?

There are many new features and functions in IBM InfoSphere Master Data Management Collaboration Server Version 11.0.

InfoSphere MDM Collaboration Server is included in InfoSphere MDM Enterprise Edition and InfoSphere MDM Collaborative Edition.

InfoSphere MDM Collaboration Server enables companies to create a single, up-to-date repository of product information that can be used throughout their organization for strategic business initiatives.

Key changes to the product include:

Migration support for InfoSphere MDM Collaboration Server users
> The following topics document the new migration paths from previous InfoSphere MDM Collaboration Server versions to V11.0:
>
> - Migrating from V6.0.0 to V11.0.0
> - Migrating from V9.1.0 to V11.0.0

- Migrating from V10.0.0 to V11.0.0
- Migrating from V10.1.0 to V11.0.0

New Home Page Option (Workflow Dashboard)

The new workflow dashboard is designed to simplify the job of a typical business user and includes the following new features:

- Complete graphical view of currently assigned entries and tasks with priorities
- Intuitive portal to quickly navigate to workflows, workflow steps, or entries
- Ability to easily launch entries in single or multi edit views
- Dialogue to search across workflows and launch entries with a single click
- Capability to manage basic tasks such as reservations and delegations

For more information, see Enabling the business user workflow dashboard for business processes

Customizable Labels

The new customizable labels option includes the following new features:

- Customize "item" and "category" labels based on user preference
- Customize icons displayed in the left navigation, single edit, mulit-edit, and rich search screens

For more information, see Customizing labels and icons for items and categories and Error handling for domain entities.

Single Edit Screen Enhancements

The new single edit screen enhancements include the following new features:

- Customize the spacing of attributes both horizontally and vertically based on user preference
- Customize the width of attribute labels based on user preference
- New default attribute lengths based on attribute type
- Attribute field lengths grow from right to left based on user preference and percentage of usable screen
- New tab for viewing relationships and launching related entries

For more information, see User interface settings.

Multi Edit Screen Enhancements

The new multi edit screen enhancements include the following new features:

- Check boxes for selection
- Option to "Deselect All"
- Single click to select row
- Double click to edit cell
- Simplified save

Advanced Catalog Management (ACM) Enhancements

The new ACM enhancements include the following new features:

- Full export of attribute dictionary attributes
- Full export of catalog groups
- Selective export for catalog entry with defining attributes

- Selective export for catalog entry with descriptive attributes
- Add support for SAX XML Parser in data load
- Support for concurrent data load

For more information, see Integrating with IBM WebSphere® Commerce Server.

New APIs

The new APIs consist of the following:

- Public APIs for XML generation
- New API for opening a set of collaboration entries or categories based on query language criteria, in single or mult-edit screens

For more information, see IBM Javadoc Documentation.

Search Enhancements

The new search enhancements include the following new features:

- Administrators can create search templates that are shared across users and roles
- Users can leverage shared templates to create individual custom searches
- Utility to convert preexisting search bookmarks to new search templates (for customers migrating from a previous version)
- Search on location data for both indexed and non indexed attributes
- Search based on the date an entry entered a workflow step

For more information, see Transforming the search template .

z/Linux support

Specifically, InfoSphere MDM Collaboration Server supports:

- Added support for SuSE Linux version 11 on System z®
- Added support for RHEL version 6 on System z

For more information, see System requirements.

Unified Installer

The installer in InfoSphere MDM Collaboration Server version 11.0.0 include the following changes:

- Installation Manager is used in place of InstallShield.
- Standardized across different editions in MDM on a common installer

For more information, see Installing InfoSphere MDM Collaboration Server.

New serviceability features added to `pimsupport.sh` utility

Use the `pimSupport.sh` script for collecting diagnostic information if you encounter any issues with InfoSphere MDM Collaboration Server and need to share data with the technical support team. For more information, see pimSupport.sh script.

Stack upgrades

The following new stack upgrades are supported with InfoSphere MDM Collaboration Server:

- Removed support for RHEL version 5.x
- Added support for SuSE Linux version 11 on System z
- Added support for RHEL version 6 on System z
- Upgraded WebSphere Application Server to version 8.5.0.1
- Added support for Installation Manager version 1.6
- Removed support for Rational® Software Architect version 8.0.4

- Added support for Rational Application Developer version 8.5.1
- Upgraded WebSphee MQ to version 7.5

For more information, see System requirements.

Contacting IBM Software Support

IBM Software Support provides assistance with product defects, answering FAQs, and performing rediscovery.

After trying to find your answer or solution by using other self-help options such as technotes, you can contact IBM Support. Before contacting IBM Support, your company must have an active IBM maintenance contract, and you must be authorized to submit problems to IBM. For information about the types of available support, see the Support portfolio topic in the *Software Support Handbook*.

When contacting IBM Software Support it is important to understand what support is available through IBM:
- Specific product questions: If you have been trained on the product, you can submit specific questions or concerns.
- Defect support: The analysis and necessary work required to resolve a product defect or provide a workaround.
- Script operations: For questions regarding a script operation or for reporting a possible defect with a script operation, you must simplify your question or problem to approximately 5 lines of code or less.
  - IBM does not provide support for debugging and analysis of custom scripts.
- Enhancement requests: Requests for new functionality added to the product.

Requests that are not within the scope of IBM Software Support and require you to contact either your Sales or Professional Services representative:
- Miscellaneous work: Work or assistance that requires extensive IBM involvement during installation or the implementation process which includes complex installations or installation across multiple platforms.
- Support for untrained customers: Requests for step by step IBM help but do not have the required IBM product training. IBM Education offers customer training if additional staff training is needed. Check the IBM website for specific information about available courses.
- Custom scripts or scripting: No support is provided for scripts that you have written or require debugging. All customized scripts written by Professional Services become owned and maintained by you, the customer, after Service's work has been completed. Technical Support is not available for writing or debugging custom scripts.
- Data recovery: We strongly advise you to routinely back up your data.
- Performance or tuning assistance or recommendations that require customer data.
1. Determine if a technote already exists regarding your issue. For additional information on viewing technotes.
2. Determine whether a peer or your internal support team can provide assistance.
3. Define the problem, gather background information, and determine the severity of the problem. For help, see the "Before contacting IBM Software Support" in the *Software Support Handbook*.

Required background information
- All configuration settings and information.
- The expected behavior versus what the current behavior is.
- All changes or modification that you have recently implemented.
- Determine if the issue can be recreated.
- Define the steps that lead to the issues you are experiencing.

4. Gather your diagnostic information:
   - You can also use the IBM Support Assistant basic data collection feature to collect your critical log and configuration files, see www.ibm.com/software/support/isa/ for additional information.
   - Create your own IBM Support Assistant Lite collector tool through the workbench.
     a. Download the product add-on in the IBM Support Assistant workbench.
     b. Click **Collect and Send Data**. Three options display on the left.
     c. Choose **...Using IBM Support Assistant Lite**.
     d. Create the generated collector by completing each of the collector options:
        – Select a collector (if the installed product add-on does not display, it does not have a Must Gather document and cannot create an IBM Support Assistant Lite collector)
        – Specify the target directory
        – Specify the filename
        – Click the **Export** button
     e. Transfer the exported IBM Support Assistant Lite collector to a remote system using ftp or any other available file transfer protocol.
     f. Unzip the exported IBM Support Assistant Lite collector to your target location.
     g. Setup JAVA_HOME or ensure that Java™ is in your path statement.
     h. Run the **runISALite.bat** command for Windows or the **runISALite.sh** script for UNIX and LINUX from the tools IBM Support Assistant Lite directory on the remote system.
     i. Provide the appropriate responses to any collection prompts.
     j. Review the collected files or send them to IBM support.

5. Submit your problem to IBM Software Support in one of the following ways:
   - Online: (Recommended)
     a. Click **Open service request** given under the **Choose your task** section on the left-side navigation bar of the IBM InfoSphere Master Data Management Collaboration Server Support site.
     b. Click **ESR / SR** and follow the instructions provided on the ESR website.
        Use the following guidelines and tips for using ESR and submitting PMRs:
        – Attach documents directly to the PMR to make them available to IBM Support Services.
        – ESR manages a list of all PMRs that you have viewed so that you have immediate access to them to check on their status.
        – Use ESR to set up automatic PMR notifications.
        – Send updates for PMR's that you open to IBM Support Services directly from ESR.

– When submitting a PMR you must indicate a severity level in order to help us prioritize our resources with respect to other PMRs you open:

Severity 1

Critical business impact: This indicates that you are unable to use the program resulting in a critical impact on operations. This condition requires an immediate solution.

Note: Critical business impact typically means that your production system is down and in order for IBM Software Support to work outside of your business working hours, you must ensure that you have a contact available by phone 24x7 to facilitate inquiries by the investigating engineer, run tests in your production instance, etc.

Severity 2

Significant business impact: This indicates the program is usable but severely limited.

Severity 3

Some business impact: This indicates the program is usable with less significant features (not critical to operations) unavailable.

Severity 4

Minimal business impact: This indicates the problem causes little impact on operations or that a reasonable circumvention to the problem has been implemented.

– To open an Enhancement Request (a request for new general product functionality and is not related to a specific customization):

  - Open a PMR with severity 2, 3, or 4, (depending of the potential business gain of the request) and the request is sent to IBM Product Management for review. You will receive an Enhancement Request number for tracking purposes, which replaces the PMR number. Typically, your approval is required to close the PMR.

• By phone: For the phone number to call in your country, go to the Contacts page of the *Software Support Handbook*.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Software Support provides a workaround that you can implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the IBM Support website daily, so that other users who experience the same problem can benefit from the same resolution.

Chapter 1. Installing

IBM InfoSphere Master Data Management Collaboration Server provides a highly scalable enterprise Product Information Management (PIM) solution – middleware that establishes a single, integrated, consistent view of information about products and services both inside and outside of an enterprise.

This installation information is also available in the InfoSphere MDM Collaboration Server Installation Guide, which is available in book format in a PDF file. Right-click on the link, and select **Save Target As** to download the PDF file to your computer.

Translated versions of the *InfoSphere MDM Collaboration Server Installation Guide* can be found on the IBM Publication Center.

Installation of the InfoSphere MDM Collaboration Server products requires the following basic steps:

- Chapter 3, "Installing and setting up the database," on page 15
- Chapter 4, "Installing and setting up the application server," on page 45
- Chapter 5, "Installing the product," on page 47
- Chapter 6, "Configuring the product," on page 71
- Chapter 7, "Verifying the installation," on page 103

The following sections describe the product and how to install and configure it to your needs.

Installation requirements

Before you can install IBM InfoSphere Master Data Management Collaboration Server, ensure that you review all of the hardware and software requirements, team requirements, and the application server and database configurations requirements to run InfoSphere MDM Collaboration Server.

You must set up both a client system and one or more server systems. The application server, database server, and HTTP server can all be on the same server computer. They can be combined together on server computers, or they can each be on their own server computers. The HTTP server is recommended, but is optional.

InfoSphere MDM Collaboration Server can run on a computer that has a host name with a length of 63 characters.

System requirements for InfoSphere MDM

The system requirements describe the supported hardware and software requirements for InfoSphere MDM. Ensure that you are familiar with the minimum product levels that you must install before you open a problem report.

Important: These requirements represent the minimum system requirements. The product supports the specified version only and any subsequent fix packs, service packs, or service refreshes that are released for the specified version. Earlier or

later versions or releases are not supported. Your entitlement to support is dependent upon your license and maintenance agreements for InfoSphere MDM.

See http://www-01.ibm.com/support/docview.wss?uid=swg27035486 for the minimum system requirements for InfoSphere MDM.

The system requirements are only for InfoSphere MDM. If you run other applications on the same computer, make appropriate adjustments. InfoSphere MDM bundles some of the software that is required. You might need to apply certain fix packs to the version provided, as described in these detailed system requirements or in the product and support documentation.

The system requirements for InfoSphere MDM vary based on the scope and scale of your InfoSphere MDM solution. The exact configuration that you need to support your environment with satisfactory performance varies depending on multiple factors such as:
- server speed
- memory
- disk input and output
- data volumes
- network and server workload

Disk space values are only for the product installation and working space. The actual hard disk space varies, depending upon your installation.

The hardware requirements represent the minimum hardware requirements for a small InfoSphere MDM installation with less than 50,000 items that are supporting 10-20 concurrent users. IBM professional services can help determine the appropriate hardware requirements for your InfoSphere MDM installation.

You cannot run the InfoSphere MDM Collaboration Server database or services on Microsoft Windows systems. The Microsoft Windows system is used only as a client to access the product user interfaces. Furthermore, Rational Software Architect plug-ins for Script workbench, which is supplied with the program also runs on Windows clients. You can also access the product documentation on the clients.

Installing Perl

InfoSphere MDM Collaboration Server requires Perl version 5.8, although version 5.10 is preferred. InfoSphere MDM Collaboration Server also requires several Perl modules.

Review the following flow chart for the steps that are involved in installing Perl.
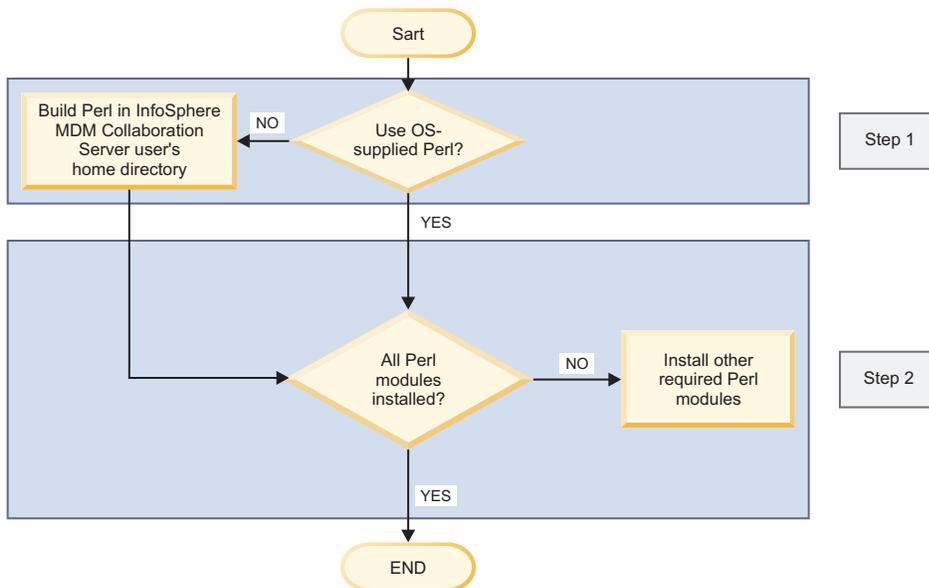
To install Perl successfully, you must complete these steps:

1. Select the source that you want to use for Perl. For more information about selecting your source for Perl, see "Sources of Perl."

2. If necessary, build and install Perl from the source.

3. Install any Perl modules that InfoSphere MDM Collaboration Server requires.

Sources of Perl

Consider these factors when you are deciding which version of Perl to install and use with InfoSphere MDM Collaboration Server.

You can use the Perl that is:

- typically installed by default with your operating system,
- a commercially distributed Perl such as ActiveState ActivePerl, or
- you can create a custom installation of Perl in the home directory for your IBM InfoSphere Master Data Management Collaboration Server user

Table 1. Choosing which version of Perl to install

Sources of Perl	Root access	C Compiler	Perl modules	Installation portability	Technical experience that is required
Perl that is supplied with the operating system	Required	Required if you are installing modules from source; specifically, the C compiler that is provided by the operating system is required. The full C compiler is not included as part of the operating system (except on Linux), and must be purchased separately. **Note:** Except for Linux, which includes the GCC C compiler, all other operating systems require you to purchase the C compiler separately: • AIX®: IBM xlc • HP-UX: HP ANSI/C • Solaris: Sun Studio C compiler	Required modules that are not installed by default.	Limited, must install within operating system	Minimal, because generally part of operating system
Commercially distributed Perl	Not required if you are installing in the home directory for theInfoSphere MDM Collaboration Server user	Not required	All required modules are installed by default.	Self-contained. Can be reinstalled on other servers.	Minimal, due to ease of installation
Perl that is installed in InfoSphere MDM Collaboration Server home directory	Not required for Perl, but is required temporarily for the GNU utilities.	Required, but built using the freely available GNU compiler. Can instead use the C compiler for the operating system, if you prefer.	All are included.	Self-contained. Can copy the installation directory to similar servers that have an identical PATH that is used on each server.	Moderate. Experience building from source is highly recommended.

Installing GNU utilities

Depending on your operating system and your choice for the source of Perl, you might need to install the freely available GNU utilities. If you plan to use the version of Perl that is supplied with your operating system, and you have the C compiler for your operating system that is installed on the server where you are installing InfoSphere MDM Collaboration Server, you do not need to install the GNU utilities.

You must have root access to install the GNU utilities.

Installing Perl requires the following GNU utilities: GNU C compiler (g), GNU autoconf, GNU automake, GNU m4, GNU libtool, and GNU make.

1. Download the GNU utilities for your operating system. Linux already includes the GNU utilities; you can download the GNU utilities for the other supported operating systems from these websites:

   IBM AIX
   > AIX toolbox, available at: http://www.ibm.com/systems/power/software/aix/linux/toolbox/download.html

   Sun Solaris
   > Sun Freeware, available at: http://sunfreeware.com

   HP-UX
   > HP-UX Porting and Archive Center, available at: http://hpux.connect.org.uk. GCC is available from the HP Developer & Solution Partner Program (DSPP).

2. Install the GNU utilities by following the information that is provided with the package that you downloaded.
3. Make sure that the directory that contains the GCC utility, the C compiler, is the first directory in the PATH statement. For example, if GCC is installed in `/usr/local/bin`, `/usr/local/bin` should be first in the PATH statement.

Building and installing Perl in the home directory of the InfoSphere MDM Collaboration Server user

You can install Perl in the home directory of the IBM InfoSphere Master Data Management Collaboration Server user.

- You have installed a C compiler
- Make sure that the PATH statement for the InfoSphere MDM Collaboration Server user includes the directory where the C compiler is installed.

1. Download the Perl source code from the following website: http://www.perl.com
2. Uncompress the Perl source code into a writable directory.
3. Change directories to the directory where you uncompressed the Perl source code.
4. Run the following command to configure the Perl build:

   `./Configure –des –Dprefix=<mdmpim_home>/perl –Dcc=gcc`

   mdmpim_home is the directory where InfoSphere MDM Collaboration Server is installed.
5. Run the `make` command.
6. Run the `make test` command. Do not proceed until this command completes successfully.

7. Run the `make install` command. This command copies the Perl interpreter and all standard modules into the directory that you specified earlier as the custom Perl installation directory for InfoSphere MDM Collaboration Server.

Make sure to pre-pend this Perl installation directory to the PATH statement for this user.

Modifying the PATH statement to include the Perl directory

If you installed Perl in the home directory for the IBM InfoSphere Master Data Management Collaboration Server user, you must pre-pend the `\bin` directory of the directory where you installed Perl to the PATH statement. This directory must be first on the PATH statement so that this installation of Perl is found before any other installation of Perl.

1. Edit the `.bashrc` file for the IBM InfoSphere Master Data Management Collaboration Server user.
2. Add the following statement to this `.bashrc` file:

   ```
   PATH={mdmpim_home}/perl/bin:$PATH
   ```

   Replace *mdmpim_home* with the home directory for the IBM InfoSphere Master Data Management Collaboration Server user.
3. Save the `.bashrc` file.
4. Update the current shell by running the same statement:

   ```
   PATH={mdmpim_home}/perl/bin:$PATH
   ```

   Replace *mdmpim_home* with the home directory for the IBM InfoSphere Master Data Management Collaboration Server user.

Sample .bashrc file

A .bashrc file is a system file for UNIX and Linux. This file sets up the initial execution environment for deploying and running a PIM instance on a UNIX and Linux server.

Sample .bashrc file in a WebSphere Application Server environment

The following sample .bashrc file is used in a WebSphere Application Server environment.

```
export TOP=<mdm4pim installdir>

# set Oracle specific settings
export ORACLE_HOME=/opt/oracle/instantclient_11_1
export LD_LIBRARY_PATH=${ORACLE_HOME}
export LIBPATH=${ORACLE_HOME}
export PATH=$ORACLE_HOME:$ORACLE_HOME/bin:$PATH

# set DB2 specific setting
. <db2 installdir>/sqllib/db2profile

export PERL5LIB=$TOP/bin/perllib
export JAVA_HOME=<WAS installdir>/java
export LANG=en_US
```

Perl modules

After you install Perl, you might need to install the Perl modules. If you are using the version of Perl provided by your operating system, you need to use the C compiler that was used to build Perl.

These Perl modules are freely available from http://www.cpan.org and can be installed directly from the Internet or downloaded and installed from the source code.

Installing Perl modules:

You can install Perl modules using the CPAN module while connected to the Internet. Alternatively, can you download Perl modules from the CPAN site and install them while disconnected from the Internet.

- If you are using the operating system installation of Perl, you must have root access.
- If you are using a custom installation of Perl, make sure that the Perl installation directory is the first directory in the PATH statement.

When you are configuring InfoSphere MDM Collaboration Server, your Perl installation is validated and any missing Perl modules are displayed.

You might want to download and use the `Devel::Loaded` module because it displays which modules you already have installed. After you install this module, enter the **pmall** command.

Note: If **pmall** is not in your PATH, it is located in the `\bin` directory in the root directory of your Perl installation. You can use the `which perl` command to find the location of the Perl interpreter in a Perl installation that is supplied by your operating system. The `which perl` command returns a `syslink` that points to the root of the Perl installation.

Currently, the following Perl modules are required:
- `Config::IniFiles` (included with InfoSphere MDM Collaboration Server, no need to install this module separately)
- `Config::Properties` (included with InfoSphere MDM Collaboration Server, no need to install this module separately)
- `File::Find`
- `Getopt::Long`
- `Net::Domain`
- `File::Copy`
- `File::Temp`
- `File::Basename`
- `IO::Handle`
- `File::Path`

Installing Perl modules with an Internet connection:

If you have an Internet connection for each of the servers in your IBM InfoSphere Master Data Management Collaboration Server installation, you can use the CPAN module that is part of your default Perl installation to download and install other Perl modules.

- If you are using the operating system installation of Perl, you must have root access.
- If you are using a custom installation of Perl, make sure that the installation directory is the first directory in the PATH statement.

1. Issue the CPAN command. To run CPAN in a shell environment where you can run commands and respond to prompts, type `cpan` and press Enter. Or, you can run the following command to install specific modules and any of its dependent modules:

   `perl –MCPAN –e'install <module_name>'`

2. If you are running CPAN for the first time, you must configure CPAN. Accept all the default values when prompted. When configuration is complete, you are either given a prompt to initiate an action or the action that you already specified is initiated.

Installing Perl modules without an Internet connection:

If you do not have an Internet connection for each of the servers in your IBM InfoSphere Master Data Management Collaboration Server installation, you can download the Perl modules from CPAN and then copy them to your servers for you to install.

- If you are using the operating system installation of Perl, you must have root access.
- If you are using a custom installation of Perl, make sure that the installation directory is the first directory in the PATH statement.

1. Download the Perl modules from http://search.cpan.org. You must review the dependencies for the modules and download all of those dependent modules that are not installed on your InfoSphere MDM Collaboration Server servers as well.

   Note: The home page of many modules on the CPAN site has a dependencies link that you can review to determine the dependencies of a module.

2. For each of the modules that you downloaded, complete the following steps:

   a. Unpack it into a writeable directory.

   b. Run the Perl configure command: `perl Makefile.pl`.

   c. Run the `make` command.

   d. Run the `make test` command. Do not proceed until this command completes successfully.

   e. Run the `make install` command.

Chapter 2. Product overview

Using IBM InfoSphere Master Data Management Collaboration Server, companies can manage, link, and synchronize information about items, locations, organizations, trading partners, and trade terms internally and externally.

PIM solutions using InfoSphere MDM Collaboration Server offer these features:

- A flexible, scalable repository to manage, and link information about products, locations, trading partners, organizations, and terms of trade
- Tools for modeling, capturing, creating, and managing information with high user productivity and information quality
- Methods of integrating and synchronizing information internally with classic systems, enterprise applications, repositories, and masters
- Workflow for business users to support multi-department and multi-enterprise business processes
- Methods of exchanging and synchronizing information externally with Business Partners
- Methods of accessing PIM information using many internal and external electronic and human interaction points

System architecture

IBM InfoSphere Master Data Management Collaboration Server has a scalable architecture that provides security, data archival capability, and operational redundancy (or high availability). *Data archiving* is the process of removing old data or information from the system and moving it to another system where it can be retrieved later.

For best performance, run InfoSphere MDM Collaboration Server on a dedicated system. Also, restrict access to the system to maintain security.

InfoSphere MDM Collaboration Server provides a PIM solution development platform with scheduler, business process management, event processing, queue management, and other common components. It supports SQL-like business data query, object-oriented scripting, Java API programming, web service development, and other PIM solution development features.

InfoSphere MDM Collaboration Server includes a web-based application with a three-tier architecture that consists of:

1. A web-based user interface for rendering PIM content in a browser, including static, dynamic, or cached data in the client side. This tier runs on a web browser.
2. A middle tier with the functional modules that process user requests and produce PIM content in the server side. This tier runs on an application server.
3. A database management system (DBMS) that stores the data that is required by the middle tier. This tier runs on a database server.

Information flow

The flow of information in IBM InfoSphere Master Data Management Collaboration Server is interdependent on several components.

The following image provides an example of the flow of information between the client, web server, or application server (where InfoSphere MDM Collaboration Server is installed), and the database server.
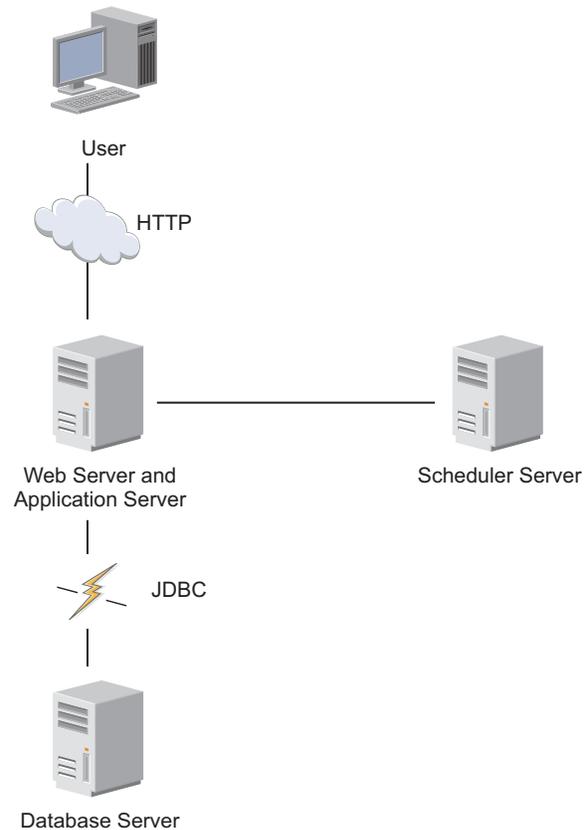
The scheduler service, which manages import and export jobs in the background, can be on the application server or on a separate server, depending on load requirements. If the scheduler is placed on a separate server, InfoSphere MDM Collaboration Server must bind the scheduler service to a specific Remote Method Invocation (RMI) port.

The following information flow is illustrated in this image:
- An application server handles HTTP requests from users.
- Services are started or stopped using RMI.
- The Scheduler service uses the same RMI port as the one used to control services.
- Application and scheduler servers communicate with the database server using JDBC.
- The scheduler can be run on a dedicated computer or on an application server.

  In this example, the first server runs every service except the scheduler, and the second server runs the RMI registry, admin process, and scheduler.

Product services

IBM InfoSphere Master Data Management Collaboration Server includes several components that are implemented as JVM services.

The six JVM services and the RMI (Java Remote Method Invocation) registry that is run concurrently in the product. The RMI registry registers all product services and must be running before starting all other services.

Table 2. JVM Services

JVM Service	Description
admin	The admin service starts and stops modules on remote computers.
appsvr	The application server service serves JavaServer Pages.
eventprocessor	The event processor service dispatches events between all the modules.
queuemanager	The queue manager service sends documents outside of InfoSphere MDM Collaboration Server.
scheduler	The scheduler service runs all scheduled jobs in the background. The scheduler provides a unified view to manage all jobs that are scheduled within InfoSphere MDM Collaboration Server. Through the Jobs Console, a job can be ran based on a defined timetable and monitored with status information. The scheduler service communicates with the application through the unified database server, file system and through the rmiregistry.
workflow	The workflow engine processes workflow events that are posted to the database.
rmiregistry	The RMI (Remote Method Invocation) registry service is a standard Java method that finds and starts methods or functions on remote systems. RMI is type of *RPC* (Remote Procedure Call). In Java, a *remote system* can be on another physical system or on the same computer but in a different JVM. The **rmiregistry** is a simple directory. Java objects connect to the registry and register how to connect to them and what methods or functions they have. Other services lookup the function they need in the registry to find out where it is, then call the remote object and run the method. An example is to shut down a service. The **RootAdmin** Java object looks up InfoSphere MDM Collaboration Server services in the registry, finds out how to contact them, and starts the shutdown method. As such, the **rmiregistry** service does not require a great deal of system resources.

Installation scenarios

You can install IBM InfoSphere Master Data Management Collaboration Server on a single computer or in a clustered environment on several computers.

Simple configuration

In the simple configuration, the product services that are run on a single computer.

The following image depicts a simple configuration of the product:

Single Application Server
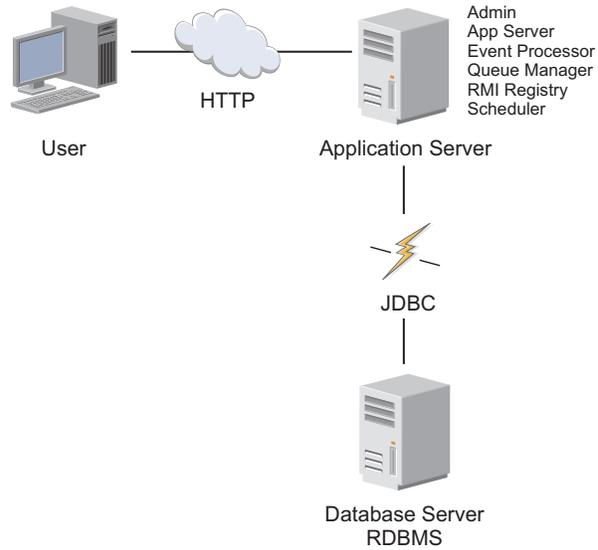
Complex configuration

In the complex configuration, the product services that are run in a cluster on several computers.

The following image depicts a complex configuration of the product:
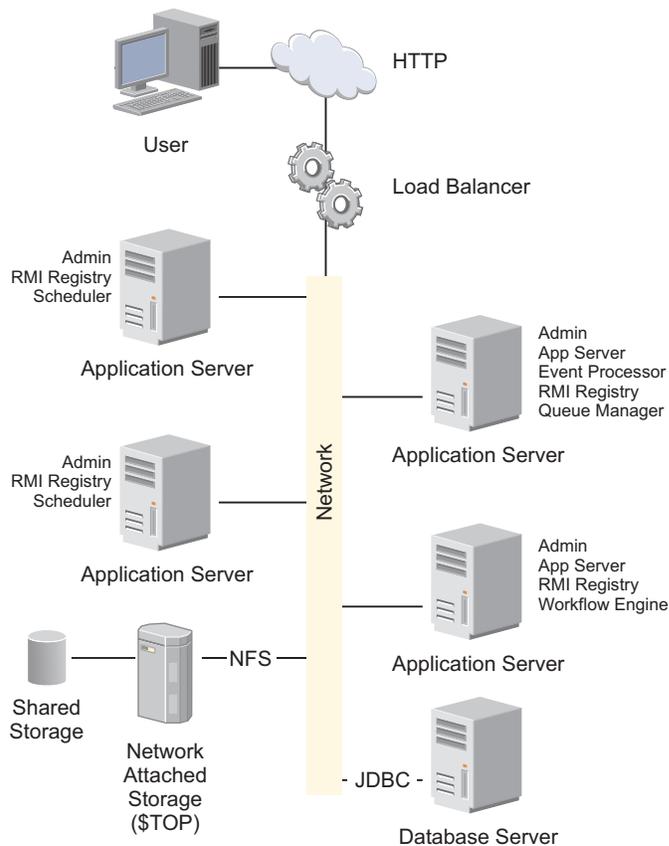
Performance planning

Ensure that you plan before you install IBM InfoSphere Master Data Management Collaboration Server. Your planning can greatly affect the performance of InfoSphere MDM Collaboration Server.

Adhere to the following common guidelines so that you avoid major performance problems:

- Testing, profiling and modifying the solution
  - For each line item, ensure that you set aside 20% extra time to complete testing, profiling and modifying the solution as needed. Include the 20% extra time before there are any known performance problems.
- Define all of your use cases
  - The use cases are performance sensitive. Ensure that you identify the requirements, dependencies, and required performance. Allow extra time for use cases that have a high potential for performance problems. For example, use cases that have a high potential for performance problems can include many specs, large amount of location data or large numbers of workflow steps. Test and profile the use cases as they are developed or as early as possible if there are any other dependencies. Ensure that you do *not* delay performance testing until the end of the project. You need to establish a baseline for the use cases and have them approved by the customer.
- Identify the hardware that is needed for testing
  - For hardware, ensure that you identify the hardware that is needed for performance testing and have it available early in the project. The hardware for performance testing should be a replica of the hardware that is planned for production. Performance testing and user acceptance testing should always be done on hardware that is identical to production.
- Allocate the size of the hardware
  - Allocating the correct hardware is critical to sustain performance of the solution. The correct size of the hardware that is required to effectively run the final solution depends on:
    - The volume of the activity on the system
    - The overall complexity of the solution

    Correct sizing can be done by working with the technical sales team, IBM services team, or the performance team.
- Tune the allocated hardware
  - Correctly sized hardware is only effective when it is properly tuned. The following two key areas that commonly appear as the cause of performance problems are:

    Latency and bandwidth between the application server and database
    The latency should be under `0.25 ms` between the application server and the database. It can be measured by running the **traceroute** command on most systems. The connection between the two should be a gigabit Ethernet capable of transferring large files at 25 MB/s through FTP.

    Number of open descriptors is too low
    Unexpected problems can be avoided by checking the number of open descriptors and verifying that they are set according to

WebSphere Application Server guidelines to 8000. The number of open descriptors can be checked using the **ulimit –a** command on most computers.

- Balance the load and allow for failover
  - An easy way to address potential overloading of the application server is to use a load balancer. Multiple instances of the scheduler can be started on one or more servers and various services of the scheduler load balance themselves automatically.

Chapter 3. Installing and setting up the database

You must set up the database to complete the IBM InfoSphere Master Data Management Collaboration Server installation.

To install and set up the database, refer to the documentation for your database. To configure the database for use with InfoSphere MDM Collaboration Server, refer to the following topics.

InfoSphere MDM Collaboration Server uses two kinds of connections to connect to the database:

- A native database client to run scripts for creating schema or companies
- A JDBC driver

Note: See the system requirements for details: http://www-01.ibm.com/software/data/infosphere/mdm_server_pim/requirements.html and http://www-01.ibm.com/support/docview.wss?uid=swg27035486 depending on your product version.

Setting up your DB2 database

If you plan to use a DB2® database with IBM InfoSphere Master Data Management Collaboration Server, you must install the supported version of DB2 before you install InfoSphere MDM Collaboration Server.

Supported DB2 versions are described in the system requirements on the product support site. Depending on your product version, see http://www-01.ibm.com/support/docview.wss?uid=swg27035486

After you install the database software, make sure that you apply the most current fix pack.

Use the DB2 database configuration guidelines in the following sections to set up your DB2 database.

Guidelines for setting up a DB2 database

To set up a DB2 database and its environment, you must use these guidelines to create the instance, database, buffer pools, and table spaces.

The following aspects must be considered when you set up the database:

Database instance

> Create a new, separate database for the InfoSphere MDM Collaboration Server schema. The example, *PIMDB* is used as the name of this new database. Because of the large amounts of data that InfoSphere MDM Collaboration Server manages, do not share an existing database, but instead create a new one. The database must be created using character encoding UTF-8.

> In most implementations, the InfoSphere MDM Collaboration Server database uses approximately 90% OLTP (online transaction processing) and

10% batch processing. OLTP causes lots of concurrent activity and single row updates during business hours and large batch processing activity during off-peak time.

To avoid that the DB2 system is not I/O bound it is important to use 10 - 15 spindles per processor and dedicated LUNs (Logical Unit Numbers) per database file system. It is also advisable to separate DB2 transaction logs and data on separate spindles and LUNs. Use file systems instead of raw devices and create one file system per LUN. Use RAID-10 for transaction logs and RAID-10 or RAID-5 for data LUNs. Set the *DB2_PARALLEL_IO* registry variable and set the *EXTENTSIZE* to the RAID stripe size. Use *AUTOMATIC* (the default) for *NUM_IOCLEANERS*, *NUM_IOSERVERS*, and *PREFETCHSIZE*.

Note: For more information about achieving balanced I/O for your DB2 system, seeIBM Information Management Best Practices .

Buffer pool requirements

Due to the large size of tables in InfoSphere MDM Collaboration Server, the page size that is used to create the buffer pools is 16 KB and 32 KB.

You must create the buffer pools, and stop and restart the DB2 instance, before you create the table spaces.

The following table lists the buffer pools that are needed for use by table spaces and the size for each buffer pool:

Table 3. Required buffer pools and sizes.

Buffer pool	Used by this table space	Size
USERSBP	USERS	Automatic
INDXBP	INDX	Automatic
BLOBBP	BLOB_TBL_DATA	Automatic
XML_DATA_BP	XML_DATA	Automatic
XML_LARGE_BP	XML_LARGE_DATA	Automatic
XML_INDX_BP	XML_INDEX	Automatic
ITA_DATA_BP	ITA_DATA	Automatic
ITA_IX_BP	ITA_IX	Automatic
ITM_DATA_BP	ITM_DATA	Automatic
ITM_IX_BP	ITM_IX	Automatic
ITD_DATA_BP	ITD_DATA	Automatic
ITD_IX_BP	ITD_IX	Automatic
ICM_DATA_BP	ICM_DATA	Automatic
ICM_IX_BP	ICM_IX	Automatic
LCK_DATA_BP	LCK_DATA	Automatic
LCK_IX_BP	LCK_IX	Automatic
TEMPUSRBP	user's temporary table space	Automatic
TEMPSYSBP	system's temporary table space	Automatic

Table 3. Required buffer pools and sizes. (continued)

Buffer pool	Used by this table space	Size
IBMDEFAULTBP	SYSCATSPACE This table space is automatically created when you create the database.	Automatic
The buffer pools **ITA_DATA_BP**, **ITA_IX_BP**, **ITD_DATA_BP**, **ITD_IX_BP**, **ITM_DATA_BP**, **ITM_IX_BP**, **LCK_DATA_BP**, and **LCK_IX_BP** are required for InfoSphere MDM Collaboration Server production instances.		

Table space requirements

The following table lists the storage type, buffer pool and the management type for the table spaces table space requirements.

Definitions

Only the USERS, INDX, BLOB_TBL_DATA, TEMP_USER and TEMP_SYSTEM table spaces are required for a default development environment. In a production environment, create all listed table spaces and buffer pools so highly used tables such as ITA, ITD, ITM, ICM, and LCK can be associated to separate table spaces when you run the `create_schema.sh` script.

Note: You must use a table space mapping file to use these additional table spaces and buffer pools. This file is described in the Create schema section.

Table 4. Table space, type, management, and buffer pool.

Table space	Type	Management	Buffer pool
USERS	REGULAR	Automatic or database-managed	USERSBP
INDX	REGULAR	Automatic or database-managed	INDXBP
BLOB_TBL_DATA	LARGE	Automatic or database-managed	BLOBBP
XML_DATA	REGULAR	Automatic or database-managed	XML_DATA_BP
XML_LARGE_DATA	REGULAR	Automatic or database-managed	XML_LARGE_BP
XML_INDEX	REGULAR	Automatic or database-managed	XML_INDEX_BP
TEMP_USER	USER TEMPORARY	Automatic or operating system-managed	TEMPUSRBP
TEMP_SYSTEM	SYSTEM TEMPORARY	Automatic or operating system-managed	TEMPSYSBP
ITA_DATA	REGULAR	Automatic or database-managed	ITA_DATA_BP
ITM_DATA	REGULAR	Automatic or database-managed	ITM_DATA_BP
ITD_DATA	REGULAR	Automatic or database-managed	ITD_DATA_BP

Table 4. Table space, type, management, and buffer pool. (continued)

Table space	Type	Management	Buffer pool
ICM_DATA	REGULAR	Automatic or database-managed	ICM_DATA_BP
LCK_DATA	REGULAR	Automatic or database-managed	LCK_DATA_BP
ITA_IX	REGULAR	Automatic or database-managed	ITA_IX_BP
ITM_IX	REGULAR	Automatic or database-managed	ITM_IX_BP
ITD_IX	REGULAR	Automatic or database-managed	ITD_IX_BP
ICM_IX	REGULAR	Automatic or database-managed	ICM_IX_BP
LCK_IX	REGULAR	Automatic or database-managed	LCK_IX_BP
TEMP_USER32	USER TEMPORARY	Automatic or operating system-managed	TEMPUSRBP32
TEMP_SYSTEM32	SYSTEM TEMPORARY	Automatic or operating system-managed	TEMPSYSBP32

There are two types of table space management:

Database managed space (DMS)
>   Space that is managed by DB2.

System managed space (SMS)
>   Space that is managed by the operating system.

The TEMP_USER and TEMP_USER32 table spaces are SMS user temporary table spaces that store the declared temporary tables after the application defines such tables. The use of temporary table space increases throughput of data while you run complex SQL queries that need extra space to process large amounts of data.

By creating intermediate tables that are used to process large amounts of data that is made available during the application connection, you reduce the need to rebuild these intermediate tables, improving the performance of the system.

The TEMP_SYSTEM and TEMP_SYSTEM32 are SMS system temporary table spaces that are used during SQL operations for internal temporary tables, for sorting, storing intermediate results, and for reorganizing tables and other transient data.

When you create physical and logical volumes for the table spaces, physically spread the table spaces in different disks to make use of parallel IO. Specifically, spread the **ITA_IX** table space into different high performance disks because it is a high-use and high-growth table space.

The table spaces that are listed need to be created with the *AUTORESIZE YES* option.

Instead of using database or operating system managed table spaces that you can also use *Automatic Storage* for all the table spaces. By using the *Automatic Storage* option, the database manager automatically manages the container and space allocation for the table spaces as you create and populate them. This is the default behavior when a new database is created.

Creating the DB2 instance

The first step in setting up DB2 for use with IBM InfoSphere Master Data Management Collaboration Server is to create a DB2 instance.

An instance is a logical database manager environment where you create databases and set the configuration parameters globally. You can have many databases in an instance, however, you need to have one instance with one database for your InfoSphere MDM Collaboration Server production environment.

For more information about how to create a DB2 instance, see the DB2 documentation or consult your DBA.

Creating the DB2 database

The second step in setting up DB2 for use with IBM InfoSphere Master Data Management Collaboration Server is to create a DB2 database.

It is assumed that you know how to create a DB2 database. For more information about how to create a DB2 instance, see the DB2 documentation or consult your DBA.

Create the DB2 database. When you create the database, make sure to use *CODESET UTF-8* option in the "CREATE DATABASE" statement.

Sample statement for creating a database:

```
CREATE DATABASE PIMDB AUTOMATIC STORAGE YES ON '/u01/db2inst1',
 '/u02/db2inst1' USING CODESET UTF-8 TERRITORY US
```

In this example, *PIMDB* is the database name /u01/db2inst1 and /u02/db2inst1 are the automatic storage paths on the DB2 server, change the storage paths appropriate to your server. Change the territory from *US* to your appropriate territory. Refer the DB2 documentation for supported values for territory

Creating buffer pools

The third step in setting up DB2 for use with IBM InfoSphere Master Data Management Collaboration Server is to create the buffer pools for use by DB2.

A buffer pool is memory that you use to cache table and index data pages as they are being read from disk or being modified.

For more information about how to create buffer pools, see the DB2 documentation or consult your DBA.

For information on buffer pool requirements for use with InfoSphere MDM Collaboration Server, see Buffer pool requirements.

Create the buffer pools.

Use the following statements for creating buffer pools in DB2:

Note: Some buffer pools have 32 K page size.
```
CREATE BUFFERPOOL USERSBP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL INDXBP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL BLOBBP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL TEMPUSRBP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL TEMPSYSBP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL TEMPUSRBP32 SIZE AUTOMATIC PAGESIZE 32K;
CREATE BUFFERPOOL TEMPSYSBP32 SIZE AUTOMATIC PAGESIZE 32K;
CREATE BUFFERPOOL XML_DATA_BP SIZE AUTOMATIC PAGESIZE 32K;
CREATE BUFFERPOOL XML_LARGE_BP SIZE AUTOMATIC PAGESIZE 32K;
CREATE BUFFERPOOL XML_INDX_BP SIZE AUTOMATIC PAGESIZE 32K;
```

All buffer pools are required for successful schema and product installation.

If you are using custom table spaces, then the following extra buffer pools are required.
```
CREATE BUFFERPOOL ITA_DATA_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ITA_IX_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ITD_DATA_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ITD_IX_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ITM_DATA_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ITM_IX_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ICM_DATA_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL ICM_IX_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL LCK_DATA_BP SIZE AUTOMATIC PAGESIZE 16K;
CREATE BUFFERPOOL LCK_IX_BP SIZE AUTOMATIC PAGESIZE 16K;
```

Creating table spaces

The fourth step in setting up DB2 for use with IBM InfoSphere Master Data Management Collaboration Server is to create the table spaces in a database that has automatic storage enabled.

For more information about how to create table spaces, see the DB2 documentation or consult your DBA.

For details on table space requirements for use with InfoSphere MDM Collaboration Server, see Table space requirements

Create the table spaces.

The following example provides sample statements for creating table spaces. Modify the container path /db/a1/db2inst1/ and /db/a5/db2inst1/ appropriate paths in your DB2 server.

Regular table spaces:
```
CREATE REGULAR TABLESPACE USERS PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL USERSBP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE INDX PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL INDXBP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE LARGE TABLESPACE BLOB_TBL_DATA PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL BLOBBP
FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE XML_DATA PAGESIZE 32K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL XML_DATA_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 100M;
```

```
CREATE LARGE TABLESPACE XML_LARGE_DATA PAGESIZE 32K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL XML_LARGE_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 100M;

CREATE REGULAR TABLESPACE XML_INDEX PAGESIZE 32K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL XML_INDX_BP
FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 100M;
```

If you are using custom table spaces, ensure that you include the following extra
table spaces:

```
CREATE REGULAR TABLESPACE ITA_DATA PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ITA_DATA_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ITM_DATA PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ITM_DATA_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ITD_DATA PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ITD_DATA_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ICM_DATA PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ICM_DATA_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE LCK_DATA PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL LCK_DATA_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ITA_IX PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ITA_IX_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ITM_IX PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ITM_IX_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ITD_IX PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ITD_IX_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE ICM_IX PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL ICM_IX_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;

CREATE REGULAR TABLESPACE LCK_IX PAGESIZE 16K MANAGED BY AUTOMATIC STORAGE
BUFFERPOOL LCK_IX_BP
NO FILE SYSTEM CACHING AUTORESIZE YES INCREASESIZE 1G;
```

Temporary table spaces:

```
CREATE USER TEMPORARY TABLESPACE TEMP_USER PAGESIZE 16K MANAGED
BY AUTOMATIC STORAGE
BUFFERPOOL TEMPUSRBP;

CREATE SYSTEM TEMPORARY TABLESPACE TEMP_SYSTEM PAGESIZE 16K MANAGED
BY AUTOMATIC STORAGE
BUFFERPOOL TEMPSYSBP;

CREATE USER TEMPORARY TABLESPACE TEMP_USER32 PAGESIZE 32K MANAGED
BY AUTOMATIC STORAGE
BUFFERPOOL TEMPUSRBP32;
```

```
CREATE SYSTEM TEMPORARY TABLESPACE TEMP_SYSTEM32 PAGESIZE 32K MANAGED
BY AUTOMATIC STORAGE
BUFFERPOOL TEMPSYSBP32;
```

Note: All table spaces are required for successful schema and product installation.

Adding database users and granting permissions

To install and use IBM InfoSphere Master Data Management Collaboration Server effectively, you must add a database user and grant the necessary permissions.

The InfoSphere MDM Collaboration Server database schema needs a database user that is authenticated at the server level.

The following database privileges are only required during the installation phase; before the **create_schema** command is run.

- BINDADD
- EXTERNAL
- ROUTINE
- IMPLSCHEMA
- NOFENCE

These privileges can be revoked after the **create_schema** command is run. These database privileges are *not* required during a Fix Pack installation or a new version migration.

1. Create a user at the operating system level.
    a. Create an operating system user. You must have root authority to create a user. If you do not have root authority to create a user, contact your DB2 server administrator for help.
    b. Set the password for the user. You can try to connect to the server by using the user ID to verify that the user can connect to the server.
    c. Set a new password for the user. With AIX, the password expires immediately after you log in to the server.
2. Create a database user `pim` and grant the permissions by using the instance owner login (the default instance owner login is db2inst1). You must grant these permissions:
    - DBADM
    - CREATETAB
    - BINDADD
    - CONNECT
    - CREATE_NOT_FENCED
    - IMPLICIT_SCHEMA
    - LOAD ON DATABASE

    Sample SQL:

    ```
    db2 CONNECT TO <databasename> user <Username> using <password>
    db2 GRANT DBADM, CREATETAB, BINDADD, CONNECT, CREATE_NOT_FENCED,
    IMPLICIT_SCHEMA, LOAD ON DATABASE TO USER PIM
    ```

3. Grant user permissions to use space on all the InfoSphere MDM Collaboration Server specific table spaces. You can grant user permissions by using the following SQL statements:

```
db2 GRANT USE OF TABLESPACE USERS TO PIM
db2 GRANT USE OF TABLESPACE INDX TO PIM
db2 GRANT USE OF TABLESPACE BLOB_TBL_DATA TO PIM
db2 GRANT USE OF TABLESPACE TEMP_USER TO PIM
db2 GRANT USE OF TABLESPACE XML_DATA TO PIM
db2 GRANT USE OF TABLESPACE XML_LARGE_DATA TO PIM
db2 GRANT USE OF TABLESPACE XML_INDEX TO PIM
```

4. Grant user permissions to any additional table spaces that you create for the InfoSphere MDM Collaboration Server production environment. You can grant user permissions by using the following SQL statements:

```
db2 GRANT USE OF TABLESPACE ICM_DATA TO PIM
db2 GRANT USE OF TABLESPACE ICM_IX TO PIM
db2 GRANT USE OF TABLESPACE ITM_DATA TO PIM
db2 GRANT USE OF TABLESPACE ITM_IX TO PIM
db2 GRANT USE OF TABLESPACE ITD_DATA TO PIM
db2 GRANT USE OF TABLESPACE ITD_IX TO PIM
db2 GRANT USE OF TABLESPACE ITA_DATA TO PIM
db2 GRANT USE OF TABLESPACE ITA_IX TO PIM
db2 GRANT USE OF TABLESPACE LCK_DATA TO PIM
db2 GRANT USE OF TABLESPACE LCK_IX TO PIM
```

5. Create a schema entitled PIM for the user PIM.

   Sample SQL as created by Control Center.

   `CREATE SCHEMA PIM AUTHORIZATION PIM;`

Repeat these steps if you want one more database schema user for another instance of InfoSphere MDM Collaboration Server. For example, if you want another test instance of InfoSphere MDM Collaboration Server, then create a database user and schema with the name pimtest in the database. This operation needs an operating system user with the name pimtest.

Important: You can share the database for InfoSphere MDM Collaboration Server with development or QA environments, but not with a production environment. Sharing the InfoSphere MDM Collaboration Server production database adversely affects production performance.

DB2 configurations

You can customize profile registry variables, database manager configuration parameters, and DB2 configuration parameters to optimize performance with IBM InfoSphere Master Data Management Collaboration Server.

IBM DB2 database profile registry updates

IBM InfoSphere Master Data Management Collaboration Server requires that certain profile registry values be updated for DB2.

The following profile registry variables are required for use by InfoSphere MDM Collaboration Server:

DB2CODEPAGE

> The *DB2CODEPAGE* registry variable is used to specify the character set that is used during export and import of data in DB2.
>
> Set the value to 1208.

DB2COMM

> The *DB2COMM* registry variable determines which protocol's connection managers are enabled when the database manager is started. You can set this variable for multiple communication protocols by separating the keywords with commas.

Set the value to `tcpip`.

DB2_PARALLEL_IO

The *DB2_PARALLEL_IO* registry variable changes the way DB2 calculates the input and output parallelism of a table space. You can enable input and output parallelism by providing the correct number of prefetch requests. You can enable input and output parallelism either implicitly, by using multiple containers, or explicitly, by setting DB2_PARALLEL_IO. Each prefetch request is a request for an extent of pages. For example, a table space has two containers and the prefetch size is four times the extent size. If the registry variable is set, a prefetch request for this table space is broken into four requests (one extent per request) with a possibility of four prefetchers that service the requests in parallel.

Set the value to "*" (asterisk).

Other Profile Registry variables are not required, but can be set if there is a specific requirement.

You can set the DB2 registry variables by using the following DB2 commands in DB2 server:

```
db2set DB2COMM=tcpip
db2set DB2_PARALLEL_IO=*
db2set DB2CODEPAGE=1208
```

If you are migrating from old releases of DB2, ensure that you set the following registry variables and their values:

```
DB2_SKIPDELETED=OFF
DB2_SKIPINSERTED=OFF
DB2_EVALUNCOMMITTED=NO
```

DB2 database manager configuration parameters

IBM InfoSphere Master Data Management Collaboration Server requires certain DB2 database manager configuration parameters to be set before you install and begin to use the product.

The following table shows the database manager configuration parameters and corresponding values that must be set for use with InfoSphere MDM Collaboration Server. In each case, the syntax of the command to update the parameter is

```
db2 update dbm cfg using <parameter> <value>
```

Table 5. DB2 database manager configuration parameters.

Parameter	Description	Value
MON_HEAP_SZ	The memory that is required for maintaining the private views of the database system monitor data is allocated from the monitor heap. Its size is controlled by the *mon_heap_sz* configuration parameter.	Automatic

Table 5. DB2 database manager configuration parameters. (continued)

Parameter	Description	Value
SHEAPTHRES	Private and shared sorts use memory from two different memory sources. The size of the shared sort memory area is statically predetermined at the time of the first connection to a database based on the value of *sheapthres*. The size must be at least two times the size of *sortheap* of any database hosted by the DB2 instance.	0 (Automatic)

Sample statements for updating database manager configurations:

```
update dbm cfg using MON_HEAP_SZ automatic
update dbm cfg using SHEAPTHRES 0
```

There is no requirement to update SHEAPTHRES for new installations as 0 is the default value.

DB2 database configuration parameters

IBM InfoSphere Master Data Management Collaboration Server requires certain DB2 configuration parameters to be set before you install and use the product.

The following table shows the database configuration parameters that must be set for use with InfoSphere MDM Collaboration Server:

Table 6. DB2 database configuration parameters

Parameter	Description	Value
DFT_QUERYOPT	The query optimization class is used to direct the optimizer to use different degrees of optimization when you compile SQL queries. This parameter provides more flexibility by setting the default query optimization class.	5

Table 6. DB2 database configuration parameters (continued)

Parameter	Description	Value
DBHEAP	There is one database heap per database, and the database manager uses it on behalf of all instances of InfoSphere MDM Collaboration Server connected to the database. It contains control block information for tables, indexes, table spaces, and buffer pools. It also contains space for the log buffer (*logbufsz*), and the catalog cache (*catalogcache_sz*). Therefore, the size of the heap is dependent on the number of control blocks stored in the heap at a given time. The control block information is kept in the heap until all instances of InfoSphere MDM Collaboration Server disconnect from the database. The minimum amount the database manager needs to get started is allocated at the first connection. The data area is expanded as needed up to the maximum specified by *dbheap*.	Automatic
CATALOGCACHE_SZ	This parameter indicates the maximum amount of space that the catalog cache can use from the database heap (*dbheap*).	5120
LOGBUFSZ	This parameter enables you to specify the amount of the database heap (defined by the *dbheap* parameter) to use as a buffer for log records before it writes these records to disk This parameter must also be less than or equal to the *dbheap* parameter.	4096
UTIL_HEAP_SZ	This parameter indicates the maximum amount of memory that can be used simultaneously by the **BACKUP**, **RESTORE**, and **LOAD** and load recovery utilities.	5120

Table 6. DB2 database configuration parameters (continued)

Parameter	Description	Value
LOCKLIST	This parameter indicates the amount of storage that is allocated to the lock list. There is one lock list per database and it contains the locks that are held by all instances of InfoSphere MDM Collaboration Server concurrently connected to the database. Depending on the size of the database, this parameter might require an increase.	Automatic
APP_CTL_HEAP_SZ	This parameter determines the maximum size, in 4 KB pages, for the application control shared memory. Application control heaps are allocated from this shared memory.	512
SORTHEAP	This parameter defines the maximum number of private memory pages to be used for private sorts, or the maximum number of shared memory pages to be used for shared sorts.	Automatic
STMTHEAP	The statement heap is used as a workspace for the SQL compiler during compilation of an SQL statement. This parameter specifies the size of this workspace.	Automatic
APPLHEAPSZ	This parameter defines the number of private memory pages available to be used by the database manager on behalf of a specific agent or subagent.	Automatic
STAT_HEAP_SZ	This parameter indicates the **maximum** size of the heap that is used in collecting statistics from running the **RUNSTATS** command.	Automatic
MAXLOCKS	Lock escalation is the process of replacing row locks with table locks, reducing the number of locks in the list. This parameter defines a percentage of the lock list that is held by an application that must be filled before the database manager performs escalation.	Automatic

Table 6. DB2 database configuration parameters (continued)

Parameter	Description	Value
LOCKTIMEOUT	This parameter specifies the number of seconds that InfoSphere MDM Collaboration Server waits to obtain a lock.	60
NUM_IOCLEANERS	This parameter enables you to specify the number of asynchronous page cleaners for a database. The page cleaners write changed pages from the buffer pool to disk before a database agent requires the space in the buffer pool.	Automatic
NUM_IOSERVERS	I/O servers are used on behalf of the database agents to perform prefetch I/O and asynchronous I/O by utilities such as backup and restore. This parameter specifies the number of I/O servers for a database.	Automatic
MAXAPPLS	This parameter specifies the maximum number of concurrent instances of InfoSphere MDM Collaboration Server that can be connected (both local and remote) to a database.	Automatic
AVG_APPLS	The SQL optimizer uses this parameter to help estimate how much of the buffer pool is available at run time.	Automatic
MAXFILOP	This parameter specifies the maximum number of file handles that can be open for each database agent.	640
CUR_COMMIT	This parameter controls the behavior of cursor stability (CS) scans.	ON
AUTO_MAINT	This parameter is the parent of all the other automatic maintenance database configuration parameters.	ON
AUTO_TBL_MAINT	This parameter is the parent of all table maintenance parameters.	ON
AUTO_RUNSTATS	This automated table maintenance parameter enables or disables automatic table RUNSTATS operations for a database.	ON

Table 6. DB2 database configuration parameters (continued)

Parameter	Description	Value
AUTO_STMT_STATS	This parameter enables and disables the collection of real-time statistics.	ON

Sample statement for updating database configurations:

```
update db cfg using SELF_TUNING_MEM ON
update db cfg using DFT_QUERYOPT 5
update db cfg using CATALOGCACHE_SZ 6000
update db cfg using LOGBUFSZ 4096
update db cfg using UTIL_HEAP_SZ 5120
update db cfg using BUFFPAGE 1024
update db cfg using APP_CTL_HEAP_SZ 512
update db cfg using LOCKTIMEOUT 60
update db cfg using MAXFILOP 640
update db cfg using AUTO_MAINT ON
update db cfg using AUTO_TBL_MAINT ON
update db cfg using AUTO_RUNSTATS ON
update db cfg using AUTO_STMT_STATS ON
```

You must not update the following parameters for new installations. The
parameters are already set with correct values, by default:

```
DBHEAP
LOCKLIST
MAXLOCKS
SORTHEAP
STMTHEAP
APPLHEAPSZ
STAT_HEAP_SZ
NUM_IOCLEANERS
NUM_IOSERVERS
MAXAPPLS
AVG_APPLS
```

Transaction log files for the database

Transaction log files provide you with the ability to recover your environment to a
consistent state and preserve the integrity of your data. Log file storage must be
optimized because log files are written sequentially, and the database manager
reads log files sequentially during database recovery.

Put the logs on a file system and they are placed on their own physical disks,
separate from the database table spaces and database software. The disks ideally
should be dedicated to DB2 logging to avoid the possibility of any other processes
that are accessing or writing to these disks. Ideal placement of the logs is on the
outer edge of the disk where there are more data blocks per track. It is
recommended to protect the log against single disk failures by using a RAID 10 or
RAID 5 array.

Table 7. Transaction log files and parameters

Parameter	Description
NEWLOGPATH	This parameter is used to change the log path to create the transaction log files on a separate partition/volume than the default volume or the one used for database table space containers.
	Set it to a directory that is the destination of log files. Make sure that the directory is created before you set it. Make sure that there is enough space on the destination before you set the new log path.
	For example: `update db cfg for PIMDB using NEWLOGPATH /u02/db2data/logs`
LOGFILSIZ	This parameter defines the size of each primary and secondary log file. The size of these log files limits the number of log records that can be written to them before they become full and a new log file is required. Set it to 30000 if it is a development/test database otherwise set it to 60000. The size is number of pages each of size 4 KB.
	For example: `update db cfg for PIMDB using LOGFILSIZ 60000`
LOGPRIMARY	The primary log files establish a fixed amount of storage that is allocated to the recovery log files. This parameter enables you to specify the number of primary log files to be pre-allocated. Set it to 20 if it is a development database otherwise set it to 40.
	For example: `update db cfg for PIMDB using LOGPRIMARY 40`
LOGSECOND	This parameter specifies the number of secondary log files that are created and used for recovery log files (only as needed). When the primary log files become full, the secondary log files (of size *logfilsiz*) are allocated one at a time as needed, up to a maximum number as controlled by this parameter. Set its value to 2.
	For example: `update db cfg for PIMDB using LOGSECOND 2`

Restart the database after you make the db configuration changes with **db2stop** and **db2start** commands:

```
db2stop force
db2start
```

The following table has information about values of different configuration parameters that influence the transaction log size and numbers for small, medium, and large InfoSphere MDM Collaboration Server database implementations:

Table 8. Values of different configuration parameters

Parameter	Small	Medium	Large
LOGFILSIZ	30000	60000	70000
LOGPRIMARY	30	40	50
LOGSECOND	2	2	2
Total Space Required	3.7 GB	9.6 GB	13.8 GB

Setting up the DB2 client on InfoSphere MDM Collaboration Server

You must set up the DB2 client on InfoSphere MDM Collaboration Server.

Before you set up the DB2 client on the operating system running InfoSphere MDM Collaboration Server, you must:

- Ensure that the system or database administrator has installed DB2 Admin/Developer/Run-Time Client on the operating system.
- Get the DB2 client home directory on the operating system.
- Get the host name, port number, and database name for the DB2 database server from the database administrator.

1. Add the following line to the `.bash_profile` file in the home directory of the user ID that is used for installing InfoSphere MDM Collaboration Server.

   ```
   . <DB2 client home>/sqllib/db2profile
   ```

   Where you replace `<DB2 client home>` with the DB2 client home directory. For example: `. /opt/db2inst1/sqllib/db2profile`

2. Log out and back in again in to the operating system. Ensure that the DB2 libraries are added by checking for the `. <DB2 client home>/sqllib/bin` directory in the *$PATH* variable.

3. Set up DB2 server information in the DB2 client using the following commands:

   ```
   db2 "catalog tcpip node <nodename> remote <dbhostname>
   server <sname/port#>"
   db2 terminate
   db2 "catalog database <dbname> as <dbname> at node <nodename>"
   db2 terminate
   ```

   Where you replace the following variables:

   <nodename>
   > The name for the remote instance.

   <dbhostname>
   > The host name or IP address of the database server.

   <sname/port#>
   > The service name or port number for the connection port of the DB2 instance.

   <dbname>
   > The database name.

IBM DB2 database setup checklist

Use this checklist to verify your IBM DB2 setup before installing IBM InfoSphere Master Data Management Collaboration Server.

You can also run the `perl $TOP/bin/perllib/db_checklist.pl` script to check the DB2 parameters and configuration. Run the `perl $TOP/bin/perllib/db_checklist.pl` script to verify that the DB2 settings are correctly set for InfoSphere MDM Collaboration Server.

Table 9. IBM DB2 setup checklist

Setting	Description
Check the IBM DB2 server release.	The version of the DB2 server should be the version that is identified in the system requirements, see: http://www-01.ibm.com/support/docview.wss?uid=swg27035486
Check the database code set.	The character set and national character set should be UTF8. On the database server that is logged in as instance owner: `$db2 get db cfg for <database name>` This should have |Database code set| set to UTF-8
Check the parameter file entries.	Follow the DB2 configuration sections provided to make sure that you have made required parameter changes for the DB2 registry variables, database manager, and the database.
Check the table spaces setup.	Make sure that the required table spaces are set up in the database.
Check the transaction logs setup.	Make sure that the transaction logs are created on a separate partition.
Check the database user setup.	View the database user name and password in the `$TOP/bin/conf/env_settings.ini` file and make sure that the database user is created and all required privileges are granted to the user.
Check the connectivity to the database server.	The database server and the database server node must be cataloged on the application server and the database must be accessible from the application server. Check the database connectivity with the following script: `$TOP/bin/test_db.sh`

Setting up your Oracle database

If you plan to use an Oracle database with IBM InfoSphere Master Data Management Collaboration Server, you must install the supported version of Oracle before you installInfoSphere MDM Collaboration Server.

Supported Oracle versions are described in the system requirements on the product support site. See the system requirements for details: http://www-01.ibm.com/support/docview.wss?uid=swg27035486

After you install the database software, make sure that you apply the most current fix pack.

Use the Oracle database configuration guidelines in the following sections to set up your Oracle database.

Updating operating system settings for Oracle

There are several settings for system semaphores and shared memory that Oracle recommends. Refer to the Oracle documentation specific to your platform for configuration information.

Disk considerations for the database

The preparation for optimal workload distribution is a significant consideration when you set up the database for IBM InfoSphere Master Data Management Collaboration Server.

In most of the customer implementations, the InfoSphere MDM Collaboration Server database processing workload is shared in the following way:
- 90% OLTP (Online Transaction Processing)
- 10% Batch Processing

Distributing the workload in this manner means that concurrent activity and single row updates are done during peak business hours and large batch processing is done during off-peak-time. You must understand the type of workload your database is expected to perform so that you can lay out the physical database most effectively.

To achieve a balanced I/O, the InfoSphere MDM Collaboration Server DBA team would like for you to use a greater number of relatively low-capacity disks that are allocated for the database rather than fewer high-capacity disks. A minimum of 6 to 10 disks per processor is ideal for optimal performance. Having too few large disks can cause database to wait on disc I/O and impact performance.

RAID 10 provides excellent performance and availability. If overall cost is a concern, use RAID 5 with Fast Write Cache. If cost is not a concern, then RAID 10 is ideal for the storing data.

The InfoSphere MDM Collaboration Server DBA team would prefer physically separating data, index, and UNDOTBS1 table space on the disks when you create table spaces and add data files.

Creating a database

Set up a separate database for use with IBM InfoSphere Master Data Management Collaboration Server.

For more information about how to create an Oracle database, see the Oracle documentation or consult your DBA.

Create a database after you are certain that the installation and set up prerequisites are met.

Create an Oracle database.

Important: InfoSphere MDM Collaboration Server uses AL32UTF8 character set. Therefore, the database character set must be set to AL32UTF8 and the national character set must be set to AL16UTF16 at the time you create the InfoSphere MDM Collaboration Server database.

If you already have a UTF8 database that is created for any InfoSphere MDM Collaboration Server application schema that is not an InfoSphere MDM Collaboration Server 5.3 schema, and if you are upgrading the InfoSphere MDM Collaboration Server to V5.3, then you can reuse the same UTF8 database. You do not have to create a separate AL32UTF8 database.

Oracle setup for high availability

For high availability and scalability, Oracle provides the Transparent Application Failover (TAF) feature that is a part of Real Application Clusters (RAC). TAF enables IBM InfoSphere Master Data Management Collaboration Server to be available continuously in the event of database server failure.

The Oracle TAF feature supports failover of *read* transactions only; write transactions during database failure are rolled back. InfoSphere MDM Collaboration Server continues to run when there is a database failure. However, InfoSphere MDM Collaboration Server users are required to resubmit the transaction after failure. Unsaved data is lost and users are required to reenter the data. Because Oracle will not load balance the existing database connections between all the nodes after the failover, it is recommended that you restart InfoSphere MDM Collaboration Server after the failover to use all the database server nodes.

For installation and configuration of Oracle database with RAC, refer to the Oracle documentation. It is recommended that you set up the server-side TAF service on the Oracle server.

1. Configure the Oracle client for TAF.

   a. Configure the TAF parameters along with the Oracle RAC nodes in the tnsnames.ora file of the Oracle client. The following sample shows the tnsnames entry:

```
ibm.world =
(DESCRIPTION_LIST =
 (FAILOVER = yes)
 (LOAD_BALANCE = yes)
 (DESCRIPTION =
  (ADDRESS =
   (PROTOCOL = TCP)
   (HOST = fresno1)(PORT = 1521)
   (HOST = fresno2)(PORT=1521)
  )
  (CONNECT_DATA =
   (SERVICE_NAME = ibm.world)
   (SERVER = dedicated)
   (FAILOVER_MODE =
    (BACKUP=ibm.world.bkp)
    (TYPE=select)
    (METHOD=preconnect)
    (RETRIES=20)
    (DELAY=3)
   )
```

```
)
 )
  )
```

The `FAILOVER_MODE` section of the `tnsnames.ora` file lists the failover parameters and their values:

BACKUP=ibm.world.bkp
> This parameter names the backup service name that takes over failed connections when a node crashes. In this example, the primary server is `fresno1` and TAF reconnects failed transactions to the `fresno2` instance in case of server failure.

TYPE=select
> This parameter tells TAF to restart all read-only in-flight transactions from the beginning of the transaction.

METHOD=preconnect
> This parameter directs TAF to create two connections when the transactions start: one to the primary `fresno1` database and a backup connection to the `fresno2` database. If instance failure, the `fresno2` database is ready to resume the failed transaction.

RETRIES=20
> This parameter directs TAF to retry a failover connection up to 20 times.

DELAY=3
> This parameter tells TAF to wait 3 seconds between connection retries.

2. Configure InfoSphere MDM Collaboration Server to use the OCI driver when you are using TAF. See "Setting Oracle parameters" on page 76 for setting up OCI driver.

   a. After the configuration is complete, you must manually modify the `db_url` property in the `common.properties` file. The `db_url` property should use the `tnsnames.ora` entry with TAF parameters similar to parameters as shown in the following example: `db_url=jdbc:oracle:oci:@ibm.world`

Oracle parameter file settings

Oracle uses configuration parameters to locate files and specify runtime parameters common to all Oracle products.

When an Oracle program or application requires a translation for a particular configuration variable, Oracle consults the associated parameter. All Oracle parameters are stored in the registry.

The following parameters are set for the use with IBM InfoSphere Master Data Management Collaboration Server:

Table 10. Oracle parameters

Parameter	Description	Required value
SGA_TARGET	SGA_TARGET specifies the total size of all SGA components. If the SGA_TARGET is specified, then the following memory pools are automatically sized: • Buffer cache (**DB_CACHE_SIZE**) • Shared pool (**SHARED_POOL_SIZE**) • Large pool (**LARGE_POOL_SIZE**) • Java pool (**JAVA_POOL_SIZE**) • Streams pool (**STREAMS_POOL_SIZE**)	50% of your physical memory on the DB server, assuming you are using the DB server for Oracle only and Oracle DB is used for InfoSphere MDM Collaboration Server only.
DB_BLOCK_SIZE	The parameter sets the size (in bytes) of an Oracle database block. This value is set at the database creation, and cannot be changed later. DB BLOCK SIZE is critical for the InfoSphere MDM Collaboration Server schema and must be at least 8192. Schema creation fails if the *db_block_size* is too small.	Required Value: 8192
QUERY_REWRITE_ENABLED	Used to enable or disable query rewriting for materialized views.	Required Value: TRUE
PROCESSES	The parameter specifies the maximum number of operating system user processes that can simultaneously connect to an Oracle Server.	Required value: 200
OPEN_CURSORS	The parameter specifies the maximum number of open cursors a session can have at once, and constrains the PL/SQL cursor cache size, which PL/SQL uses to avoid reparsing statements re-executed by a user.	Required value: 600
MAX_ENABLED_ROLES	Specifies the maximum number of database roles that a user can enable, including subroles.	Required value: 60
LOG_BUFFER	Specifies the amount of memory, in bytes, that are used to buffer redo entries before they are written to a redo log file by LGWR. Redo entries keep a record of changes made to database blocks.	Required value: 5242880
OPTIMIZER_INDEX_CACHING	Adjusts the cost-based optimizer's assumptions for what percentage of index blocks are expected to be in the buffer cache for nested loops joins. This affects the cost of running a nested loop join where an index is used. Setting this parameter to a higher value makes nested loops join look less expensive to the optimizer. Range of values is 0 - 100 percent.	Required value: 90

Table 10. Oracle parameters (continued)

Parameter	Description	Required value
`OPTIMIZER_INDEX_COST_ADJ`	Used to tune optimizer performance when too few or too many index access paths are considered. A lower value makes the optimizer more likely to select an index. That is, setting it to 50 percent makes the index access path look half as expensive as normal. Range of Values is 1 - 10000.	Required value: 50

Oracle table space settings

These table spaces must be created in the IBM InfoSphere Master Data Management Collaboration Server database.

If you want to prepare DB2 to store, retrieve and process data, you must create table spaces. Because of the large size of the tables in the InfoSphere MDM Collaboration Server, you must use a page size of 16 KB when you create the table spaces.

Required table spaces

Only the **USERS**, **INDX**, **BLOB_TBL_DATA**, **TEMP_USER**, and **TEMP_SYSTEM** table spaces are required for a default development environment. The table spaces **ITA_DATA**, **ITA_IX**, **ITD_DATA**, **ITD_IX**, **ITM_DATA**, **ITM_IX**, **LCK_DATA** are **LCK_IX** are required for InfoSphere MDM Collaboration Server production instances. You should use table space mapping file that is described in the section Running schema creation scripts, to use these table spaces.

Table 11. Required table spaces

Table space	Definition	Recommended size
ICM_DATA	This table space is used to store **TCTG_ICM_ITEM_CATEGORY_MAP** table data.	A minimum size of 1 GB space with auto-resize.
ICM_IX	This table space is used to store **TCTG_ICM_ITEM_CATEGORY_MAP** index data.	A minimum size of 1 GB space with auto-resize.
ITM_DATA	This table space is used to store **TCTG_ITM_ITEM** table data.	A minimum size of 1 GB space with auto-resize.
ITM_IX	This table space is used to store **TCTG_ITM_ITEM** index data.	A minimum size of 1 GB space with auto-resize.
ITD_DATA	This table space is used to store **TCTG_ITD_ITEM_DETAIL** table data.	A minimum size of 5 GB space with auto-resize.
ITD_IX	This table space is used to store **TCTG_ITD_ITEM_DETAIL** index data.	A minimum size of 5 GB space with auto-resize.
ITA_DATA	This table space is used to store **TCTG_ITA_ITEM_ATTRIBUTES** table data.	A minimum size of 10 GB space with auto-resize.
ITA_IX	This table space is used to store **TCTG_ITA_ITEM_ATTRIBUTES** index data.	A minimum size of 10 GB space with auto-resize.
LCK_DATA	This table space is used to store **TUTL_LCK_LOCK** table data.	A minimum size of 1 GB space with auto-resize.
LCK_IX	This table space is used to store **TUTL_LCK_LOCK** index data.	A minimum size of 1 GB space with auto-resize.

Table 11. Required table spaces (continued)

Table space	Definition	Recommended size
SYSTEM	This is the default table space that is created automatically in the Oracle database. System table space is used to store the data dictionary and the objects that are created by system user. This is a permanent table space.	A minimum size of 300 MB for the system table space with auto resize.
USERS	This table space is used to store all the InfoSphere MDM Collaboration Server database tables except tables that are used to store large objects (LOBs). This is a permanent locally managed table space.	A minimum size of 15 GB for the users table space with auto resize.
INDX	This table space is used to store all the InfoSphere MDM Collaboration Server database indexes. This is a permanent locally managed table space.	A minimum size of 30 GB for the **indx** table space with auto resize.
BLOB_TBL_DATA	This table space is used to store InfoSphere MDM Collaboration Server database tables that contain large objects like Catalogs, Images. This is a permanent locally managed table space.	A minimum size of 1 GB for the **blob_tbl_data** table space with auto resize.
XML_DATA	This table space is used to store InfoSphere MDM Collaboration Server database tables that contain XML documents. This is a permanent locally managed table space.	A minimum size of 1 GB space for the **XML_DATA** table space with auto resize.
XML_INDEX	This table space is used to store InfoSphere MDM Collaboration Server database indexes on XML documents. This is a permanent locally managed table space.	A minimum size of 1 GB space for the **XML_INDEX** table space with auto resize.
UNDOTBS1	This is the undo table space.	A minimum size of 15 GB for the **undotbs1** table space with auto resize.
TEMP	This table space is used to store objects temporarily for database operations like sorting and grouping. This is a temporary table space.	A minimum size of 6 GB for the temp table space with auto resize.

Oracle table space information

Table 12. Oracle table space information

Table space	Minimum Size	Recommended storage parameters
SYSTEM	400® MB	Default
USERS	5 GB	EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO
INDX	20 GB	EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO
BLOB_TBL_DATA	1 GB	EXTENT MANAGEMENT LOCAL LOCAL SEGMENT SPACE MANAGEMENT AUTO
XML_DATA	1 GB	EXTENT MANAGEMENT LOCAL LOCAL SEGMENT SPACE MANAGEMENT AUTO

Table 12. Oracle table space information (continued)

Table space	Minimum Size	Recommended storage parameters
`XML_INDEX`	1 GB	EXTENT MANAGEMENT LOCAL LOCAL SEGMENT SPACE MANAGEMENT AUTO
`UNDOTBS1`	10 GB	UNDO TABLE SPACE LEAVE DEFAULT VALUES
`TEMP`	5 GB	TEMPORARY TABLE SPACE LEAVE DEFAULT VALUES

Sample statements for creating Oracle table spaces

You must change the `datafile` path from `<database_folder>` to the appropriate path in your file system. You can also modify the *maxsize* parameter to a set limit.

Note: A single gigabyte (1G) of space is enough to maintain around 3 million records. Ensure that you verify your space requirement according to your capacity.

```
CREATE TABLESPACE "USERS"
 LOGGING
 DATAFILE '<database_folder>/users1.dbf' SIZE 1G REUSE
  AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "INDX"
 LOGGING
 DATAFILE '<database_folder>/indx1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "BLOB_TBL_DATA"
 LOGGING
 DATAFILE '<database_folder>/blob1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "ICM_DATA"
 LOGGING
 DATAFILE '<database_folder>/icm_data1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "ICM_IX"
 LOGGING
 DATAFILE '<database_folder>/icm_ix1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "XML_DATA"
 LOGGING
 DATAFILE '<database_folder>/xml_data1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "XML_INDEX"
 LOGGING
 DATAFILE '<database_folder>/xml_index1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "XML_LARGE_DATA"
 LOGGING
 DATAFILE '<database_folder>/xml_lrgdata1.dbf' SIZE 1G REUSE
 AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

CREATE TABLESPACE "ITM_DATA"
```

```
      LOGGING
      DATAFILE '<database_folder>/itm_data1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "ITM_IX"
      LOGGING
      DATAFILE '<database_folder>/itm_ix1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "ITD_DATA"
      LOGGING
      DATAFILE '<database_folder>/itd_data1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "ITD_IX"
      LOGGING
      DATAFILE '<database_folder>/itd_ix1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "ITA_DATA"
      LOGGING
      DATAFILE '<database_folder>/ita_data1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "ITA_IX"
      LOGGING
      DATAFILE '<database_folder>/ita_ix1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "LCK_DATA"
      LOGGING
      DATAFILE '<database_folder>/lck_data1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;

    CREATE TABLESPACE "LCK_IX"
      LOGGING
      DATAFILE '<database_folder>/lck_ix1.dbf' SIZE 1G REUSE
      AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED;
```

Setting up transaction logs

Oracle relies on *online redo log files* to record transactions. Each time a transaction takes place in the database, an entry is added to the redo log files.

Database performance can be increased by correctly tuning the size of the redo log files. Uncommitted transactions also generate the redo log entries.

Some important considerations when you create redo logs:
- Place all the redo log groups on one disk without any other files. That means separate the redo log files from data files.
- Use the fastest of available disks for redo logs if possible.
- Consider availability: members of the same group can be on different physical disks and controllers for recoverability purposes.
- Avoiding the use of RAID 5 for redo logs. See "Disk considerations for the database" on page 33 for information on optimal disk allocations.
- Separate redo logs from archived redo logs by creating them on separate disks.

Redo log files are written sequentially by the Log Writer (LGWR) process. This operation can be made faster if there is no concurrent activity on the same disk. Dedicating separate disks to redo log files usually ensures that LGWR runs

smoothly with no further tuning necessary. If your system supports asynchronous I/O, but this feature is not currently configured, then test to see whether this feature is beneficial.

1. Create six redo log groups with files of size 300 MB each.
2. Multiplex (mirror) the redo logs by creating two members in each redo log group.

   Important: No two members of the same group can be on the same disk.

Creating database schema users

Oracle database schema users must be set up for use with IBM InfoSphere Master Data Management Collaboration Server.

Before you can create database schema users, you need the following user information:

- Default table space: users.
- Temporary table space: temp.
- Authentication: Password.
- Status: Unlocked.
- Roles to be granted: Connect, and Resource.
- System Privileges to be granted: unlimited table space, select any dictionary, query rewrite, and create any synonym.

You can create a database user for InfoSphere MDM Collaboration Server that is referenced in the `common.properties` file using SQL commands.

Run these SQL commands at the SQL prompt:

- `SQL> Create user PIM identified by PIM default tablespace users temporary tablespace temp;`
- `SQL> Grant connect, resource, unlimited tablespace, select any dictionary, query rewrite, create any synonym to PIM;`

Setting up Oracle on the application server

After you create a database, set the character sets, created the table spaces, transaction logs, and database schema users, you are ready to install Oracle 11 Client on the application server.

The file `tnsnames.ora` can be found in the `$ORACLE_HOME/network/admin` directory. Check connectivity between the application server and database server using **tnsping** or **SQLPlus** on the application server.

Note: See the system requirements for details: http://www-01.ibm.com/support/docview.wss?uid=swg27035486

Install Oracle 11 Client on the application server. Make sure that you have an entry of the database in `tnsnames.ora` file on the application server where the Oracle client is installed.

Installing Oracle XML DB component

You need to install Oracle XML DB component to store XML documents in the database.

The Oracle XML DB component is required for IBM InfoSphere Master Data Management Collaboration Server. This component enables the efficient processing and storage of XML documents in the database. You can perform these steps for manually installing this component. You can also use Oracles database configuration assistant for installation. Refer to Oracle documentation at http://docs.oracle.com/cd/E11882_01/appdev.112/e23094/appaman.htm#ADXDB5700.html for more information.

1. Change directory to `$ORACLE_HOME/rdbms/admin` in the Oracle database server.
2. Log on to SQLPlus using SYS or SYSDBA user sqlplus `"/as sysdba"`
3. Run the `catqm.sql` script with the following parameters:
   - xdb_password is the password for XML DB repository
   - xdb_ts_name is the table space to use for Oracle XML DB, it must be XML_DATA
   - temp_ts_name is the temporary table space, example TEMP
   - secure_file_for_repo is NO (if you want to use SecureFile LOB then XML_DATA table space can use Oracles Automatic Storage Management).

   For example:
   @catqm.sql pass4xdb XML_DATA TEMP NO
4. Ensure that XML DB installation is successful.

   Note: XML DB protocol access is not required for InfoSphere MDM Collaboration Server.
5. In the Oracle initialization parameter file, add the following parameter or ensure that the existing value for the compatible parameter is 11.2.0.1. Restart Oracle after changing the parameter value to compatible = 11.2.0.1.

Oracle setup checklist

You can check your installation of Oracle against this checklist.

You can also run the `perl $TOP/bin/perllib/db_checklist.pl` script to check the Oracle parameters and configuration. Run the `perl $TOP/bin/perllib/db_checklist.pl` script to verify that the Oracle settings are correctly set for InfoSphere MDM Collaboration Server.

Table 13. Setup check list

X	Oracle Setup Check List	
	Check the Oracle database server release.	The version of the Oracle server can be the version that is identified in the system requirements, see http://www-01.ibm.com/software/data/infosphere/mdm_server_pim/requirements.html and http://www-01.ibm.com/support/docview.wss?uid=swg27035486 depending on your product version.
	Check the database character set.	The character set and national character set can be AL32UTF8. Connect as system user and check the character set of the database. SQL> `select * from nls_database_parameters where PARAMETER in (NLS_CHARACTERSET, NLS_NCHAR_CHARACTERSET);`

Table 13. Setup check list (continued)

X		Oracle Setup Check List
	Check the **init** parameter file entries.	Run the SQLs found in `$TOP/bin/db_checklist/oracle_checklist.sql` to verify all the **init** parameter file entries are set correctly according to InfoSphere MDM Collaboration Server recommendations.
	Check the table spaces setup.	Make sure that the required table spaces are set up in the database.
	Check the redo log files.	Make sure that there is enough redo log files that are created in the database. To get information about existing redo log files in the database, connect as a system user and run the following query: `select * from v$log;`
	Check the database user setup.	View the database user name and password in `$TOP/etc/default/common.properties` file and make sure that the database user is created and all required privileges are granted to the user. For more information, see Adding database users and granting permissions
	Check the `tnsnames.ora` file entry for the database.	Make sure that there is an entry of the database in the `tnsnames.ora` file on the application server where the Oracle client is installed. The `tnsnames.ora` file can be found in the following directory: `$ORACLE_HOME/network/admin directory`. **Note:** Due to a limitation in the schema installation, the service name in `tnsnames.ora` must match the SID of the database; in other words, OCI utilities such as **sqlplus** must be able to connect using a service name, which is the same as the SID.
	Check the listener on the database server.	The database must be accessible from the application server.

Chapter 4. Installing and setting up the application server

Before IBM InfoSphere Master Data Management Collaboration Server runs correctly, you must set up the application server.

Exporting and importing LTPA tokens between WAS domains

If you use more than one server in your environment, and single sign-on is required, all of the WAS servers must share the same LTPA key in order to validate and create the LTPA tokens.

You need to use LTPA keys in order for WAS to digitally sign LTPA tokens.

1. Log into the local instance admin console.
2. Click **Security > Secure administration, applications, and infrastructure**.
3. Click **Authentication mechanisms and expiration** under Authentication.
4. In the **Cross-cell single sign-on** section, provide the following:
   - A password in the **Password** and **Confirm Password** fields. This password encrypts and decrypts the LTPA keys that are contained in either an imported or exported property file.
   - A qualified key file name. Ensure that the value is a fully qualified file name that points to the properties file that you are export the LTPA keys to. For example, /opt/IBM/MDM/mdmkeys.properties
   - Click **Export keys** to export the LTPA keys to the fully qualified key file name.
5. Copy the mdmkeys.properties file to the remote server.
6. Log into the remote instance admin console and repeat Step 2 and Step 3.
7. Provide the fully qualified key file name and password of the LTPA keys.
8. Click **Import keys** to import the LTPA keys from the fully qualified key file name.

Setting up WebSphere Application Server

Before you can install IBM InfoSphere Master Data Management Collaboration Server, you must set up your WebSphere Application Server. To set up WebSphere Application Server, you must install the deployment manager.

InfoSphere MDM Collaboration Server can be deployed to an existing WebSphere Application Server node. Refer to the following topic on: WebSphere Application Server product documentation

If you plan to use the clustering and workload management features of WebSphere Application Server, you must install the deployment manager, as shown in the following figure.
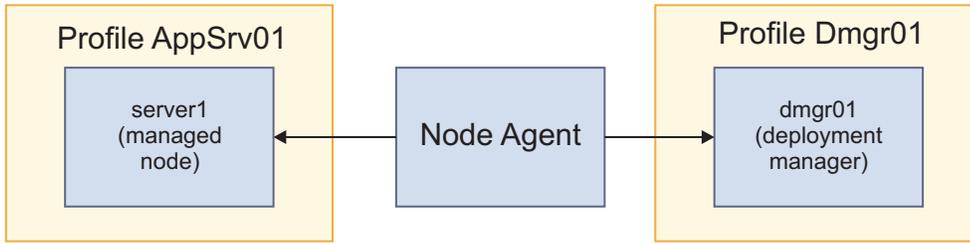
Figure 1. Installing WebSphere Application Server

The previous figure shows the following two profiles:

1. Dmgr01 – with dmgr01 for deployment manager
2. AppSrv01 – with server1 for a managed node, for example, `mdmpimNode01`.

Chapter 5. Installing the product

Depending upon your environment, you can perform the installation in interactive or silent mode. The instructions for each deployment type are the same for all editions.

Make sure that you meet these prerequisites:

* Your environment meets the hardware and software requirements for components you plan to install
* You completed the installation worksheets
* You have access to the IBM InfoSphere Master Data Management offering
* You completed the preparation steps for the database and IBM WebSphere Application Server

If you want to install IBM InfoSphere MDM Standard or Advanced Edition, refer to Installing MDM Standard and Advanced Editions.

Attention: Known issue in the InfoSphere MDM Collaboration Server installer: If you use one of the following locales when installing InfoSphere MDM Collaboration Server, the `default_locale` value in the `common.properties` file is not set correctly. Do not have the installer create the database tables.

* de_DE
* el_GR
* es_ES
* fr_FR
* it_IT
* ja_JP
* ko_KR
* pl_PL
* pt_BR
* ru_RU
* tr_TR
* zh_CN
* zh_TW

After completing the installation, you need to update the `etc/default/common.properties` file and correct the `default_locale` value. Then, issue the **create_schema.sh** command to create the database tables to be used by InfoSphere MDM Collaboration Server. In order for the scripts to start and stop the services to use the correct locale, the `default_locale` value in the `common.properties` file also needs to have the correct value. To correct the problem, stop the services using the **stop_local.sh** command and start the services after the `common.properties` file has been updated with the correct `default_locale` value.

1. If you use DB2 as the database manager, in a UNIX shell, export the environment variable *DB2_HOME* and source the DB2 profile. For Oracle, export the environment variable *ORACLE_HOME*.
2. Ensure the Perl library is defined in the *PATH* variable.

3. In the Eclipse directory in the IBM Installation Manager install directory, issue the **./IBMIM** command to invoke IBM Installation Manager.

4. Add the necessary repositories to IBM Installation Manager.

5. Install InfoSphere MDM Collaboration Server.

Preparing to install

Before you install IBM InfoSphere Master Data Management Collaboration Server, make sure that you complete the planning steps and meet the prerequisites.

- Review the readme file for system requirements and potential issues that might affect your installation.
- Read the release notes for information about support product features or enhancements to the release.
- Review the installation scenarios (graphical or silent) and determine the installation approach that you are going to use.
- Review and complete the installation worksheet and decide the various point numbers to use in the installation.
- Set up your installation media.
- Note the following items if you plan on using an IBM DB2 database:
  - For installation purposes, set up one or more restricted users on a system for database schema users. Because DB2 uses the operation system to authenticate a new user, use a user ID such as mdmdb1 with a restricted shell. This user is not required to be a member of any DB2 groups.
  - You can also do a simple installation by using a single ID for both DB2 installation ID and the schema ID. The default ID is db2inst1. For more information, see your DB2 documentation.
- In addition to these general prerequisites, there are other specific prerequisite tasks for installing InfoSphere MDM Collaboration Server. These tasks are outlined in the following topics.

Installation and configuration worksheets

The installation worksheets list all of the values that you must specify during an InfoSphere MDM Collaboration Server 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.

If you install the product using the graphic mode, default values are used and you are not prompted for input.

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

The worksheets are used for applications and components with 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 Collaboration Server.

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

While installing:
- Your installation directory path (for both `MDM_INSTALL_HOME` and `IBMIMShared` directories) must not contain any spaces.
- Your installation directory must not contain a directory name that begins with a lowercase letter that follows a forward slash /a, for example, `/opt/MDM/collaborative`.

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

Table 14. IBM Installation Manager user prompts and fields for the installation directory worksheet

Parameter	Description	Your value
Use the existing package group	Choose this option if you want the InfoSphere MDM Collaboration Server 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 (RAD).	
Create a 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`	

IBM DB2 data source worksheet

Use this data source worksheet to identify parameters for the IBM DB2 data source to which your InfoSphere MDM Collaboration Server is connecting.

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 Collaboration Server 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 user prompts or fields that you see in IBM Installation Manager.

Table 15. IBM Installation Manager user prompts and fields for the DB2 data source worksheet

Parameter	Description	Your value
Database type	InfoSphere MDM Collaboration Server supports DB2.	
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 DB2 default is `50000.`	
Database user name	The database user name must have DBA privileges. 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.	
Local database name	Provide a name that identifies the MDM database. The default is `MDMDB.` The name must consist of twelve (12) or fewer alphanumeric characters. Underscore (_) characters can be used in the name. Other characters are not supported. A physical MDM implementation uses the DB2 local client to run database scripts and requires a local database name.	
Remote database name	Provide a name that identifies the remote MDM database. The default is `MDMDB.`	
Database home	Provide the parent directory of SQLLIB. For example, IBM AIX, Linux or Solaris: `/home/db2inst1/sqllib`	
Database schema	Specify the database schema name. By default the schema name is the same as the database application user.	

Oracle data source worksheet

Use the Oracle data source worksheet to identify parameters for the data source to which your InfoSphere MDM Collaboration Server is connecting.

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 Collaboration Server 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 user prompts or fields that you see in IBM Installation Manager.

Table 16. IBM Installation Manager user prompts and fields for the Oracle data source worksheet

Parameter	Description	Your value
Database type	InfoSphere MDM Collaboration Server supports Oracle.	
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.	
Database user name	The database user name must have DBA privileges. 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.	
TNS	Specify the name of the service that is used to connect to the Oracle database. This parameter is required as this service can also be used to connect to the remote database.	
Database home	Provide the fully qualified directory where the database is installed. For example: IBM AIX, Linux or Solaris: `/home/mdm/oracle/product/ 11.2.0/dbhome_1`	

Table 16. IBM Installation Manager user prompts and fields for the Oracle data source worksheet (continued)

Parameter	Description	Your value
SID	Provide the database system ID (SID).	

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 InfoSphere MDM Collaboration Server.

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

Table 17. IBM Installation Manager user prompts and fields for the 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 federated or stand-alone. Federated is used for server or cluster installations. A stand-alone deployment is typically used in a workstation or demonstration installations. If you choose federated, 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 federated, 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. If you choose stand-alone, then the operational server is deployed on server1 of the IBM WebSphere Application Server Base. The installer runs a sequence of commands against server1 to configure the application server and deploy applications. Make sure that server1 is running before you proceed with the deployment. For example, use a profile name of `AppSrv1`.	

Table 17. IBM Installation Manager user prompts and fields for the WebSphere Application Server installation worksheet (continued)

Parameter	Description	Your value
IBM WebSphere Application Server home	Specify the fully qualified directory in which IBM WebSphere Application Server is installed. The default is `/opt/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 is `/opt/IBM/WebSphere/AppServer/profiles`	
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 Collaboration Server. 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.	

Parameter	Description	Your value
Node	Specify the IBM WebSphere Application Server node where you want to deploy InfoSphere MDM Collaboration Server. 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 Collaboration Server. After you select the node in IBM Installation Manager, all of the servers that are available for that node show up 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.	
Virtual host name	Specify the IBM WebSphere Application Server virtual host where you want to deploy InfoSphere MDM Collaboration Server.	

Application configuration worksheet

Use the application configuration worksheet to identify parameters for the InfoSphere MDM Collaboration Server.

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

Table 18. IBM Installation Manager user prompts and fields for the Application configuration worksheet

Parameter	Description	Your value
Perl Directory	Provide the Perl home directory. Either enter the directory or click **Browse** to choose the Perl home directory. For example, if **which perl** command returns /usr/bin/perl, the Perl directory will be /usr. The default is /opt/Perl.	

Table 18. IBM Installation Manager user prompts and fields for the Application configuration worksheet (continued)

Parameter	Description	Your value
JDK Path	Provide the JDK home directory. Either enter the directory or click **Browse** to choose the JDK home directory. For example, the Java directory in the WebSphere installation. The default is `/opt/IBM/WebSphere/ AppServer/java`.	
Locale	Specify the language to be used by InfoSphere MDM Collaboration Server application and code tables. You can select only one language as the application resource language. The default is English.	
Cache Multicast Address	Provide the cache multicast address. It ranges from `239.1.1.1` to `239.255.255.255`. The default is `239.1.1.1`.	
Cache Multicast TTL	Provide the cache multicast TTL. `0` for single-system installation and `1` for clusters. The default is `0`.	
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 `17507`.	
Application Server HTTP port	Specify the Hypertext Transfer Protocol (HTTP) port on which the InfoSphere MDM Collaboration Server application will run. The port should not be already in use. The default is `7507`.	
Create database tables to be used by the product	Select the option to create database tables to be used by the product along with the application installation.	

Preparing 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.

You can manually add your offerings to IBM Installation Manager.

Ensure that the *Display* variable is exported for the user interface mode of installation. Then, go to the IM directory and issue the **./IBMIM** command to start IBM Information Manager.

Accessing IBM Installation Manager

You can use this procedure to obtain IBM Installation Manager to be used in the product installation.

Depending on the situation applicable to you, you can use one of the following ways to get access to IBM Installation Manager. It is recommended that you use IBM Installation Manager version 1.6.0 or higher. With an earlier version of IBM Installation Manager, the 64-bit Architecture may not be selected by default. In such case, select it manually before proceeding to the next step in the installation procedure.

- If you have access to the product disks of the InfoSphere Master Data Management Advanced Edition or Standard Edition, you can use the IBM Installation Manager on disk 1 for the installation of InfoSphere MDM Collaboration Server. Unpack the IBMIM archive file (file extension is zip) for the platform of the system you plan to install InfoSphere MDM Collaboration Server.

  Note: Do not use the launchpad executable on the disk to invoke the Installation Manager. Use the IBMIM executable to start the Installation Manager.

- If you do not have access to the product disks of the InfoSphere Master Data Management Advanced Edition or Standard Edition, you can use the IBM Installation Manager from WebSphere Application Server Network Deployment distributed with InfoSphere MDM Collaboration Server.

- Download IBM Installation Manager from http://www-01.ibm.com/support/docview.wss?uid=swg27025142.

Installing IBM Installation Manager

Use this procedure if IBM Installation Manager is not installed.

If you want to install IBM Installation Manager as non-root, do not install IBM Installation Manager in admin mode.

1. From your installation media or from Passport Advantage®, download IBM Installation Manager version 1.6.
2. Extract the IBM Installation Manager compressed file. The name of the compressed file is dependent upon your operating system, for example for Linux the compressed file is called agent.installer.linux.gtk.x86_1.6.0.20120831_1216.zip.
3. Edit the install.ini file and replace Admin with nonadmin.
4. Ensure that the *Display* variable is exported for the user interface mode of installation.
5. Open a command prompt.
6. Issue the **./install** command and complete the installation wizard.

Continue with adding offerings to the IBM Installation Manager.

Setting up the installation media

The installation media for installing IBM InfoSphere Master Data Management Collaboration Server is available either as physical CDs or as downloadable installation image files from Passport Advantage.

1. If you obtained InfoSphere MDM Collaboration Server in the form of physical CDs, check that you have all of the installation disks.
2. If you downloaded installation image files for InfoSphere MDM Collaboration Server from Passport Advantage, uncompress the installation image files into the wanted installation directory.

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.

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

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 InfoSphere MDM Collaboration Server.

   Note: The location is where InfoSphere MDM Collaboration Server package provides the `repository.config` file.
6. On the Add Repository dialog, click **OK**.
7. On the Preferences dialog, click **OK**.

Continue with preparing for and installing InfoSphere MDM Collaboration Server.

Preparing for high availability

To support installation of InfoSphere MDM in high-availability environments, you can configure multiple instances on multiple host severs. By doing so, if one server or instance goes down, the others can continue to process traffic.

The MDM operational server uses an IBM WebSphere Application Server container and can be deployed on single server or on a cluster as configured in the container. The cluster can be pre-configured on the server. The installer can detect a clustered environment and deploy to that environment by using a custom installation.

Review the installation scenarios (graphical or silent) before you begin the installation to better understand how to support high availability and clustered environment requirements.

For more information about cluster configuration, see Configuring a cluster environment

Account prerequisites for installing InfoSphere MDM Collaboration Server

Before you begin an 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.

- For best results, install InfoSphere MDM as a non-root user:
  - For IBM WebSphere Application Server, use the wasadmin ID. This ID must own a DB2 client or a DB2 instance and be a member of the mqm management group.
  - For DB2:
    - The suggested installation method is to set up one or more restricted users on a system for database schema users. Because DB2 uses the operating system to authenticate to a new user, a user ID such as mdmdb1 with a restricted shell is the best choice. This user is not required to be a member of any of the DB2 groups.
    - You can also do a simple installation by using a single ID for both the DB2 installation ID and the schema ID. The default ID is db2inst1. For more information about IBM DB2, see the product documentation.
  - 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 that is named cluster is being used on IBM WebSphere Application Server. The names server and cluster are used by the MDM installation.

Default port numbers

During the installation of IBM InfoSphere Master Data Management Collaboration Server, ensure that you are aware of the following default port numbers that are used by the product.

InfoSphere MDM Collaboration Server default port numbers

In the env_settings.ini file, the product uses the following three default port numbers:

Table 19. InfoSphere MDM Collaboration Server default port numbers

Port	Description	Default property	Default port number
RMI registry port	The Remote Method Invocation (RMI) registry port.	rmi_port	17507
InfoSphere MDM Collaboration Server	The InfoSphere MDM Collaboration Server application server port.	[appserver.appsvr] port	7507
Global Data Synchronization feature	The Global Data Synchronization feature is an optional port.	[appserver.appsvrgds] port	7527

DB2 default port numbers

To identify the DB2 default port numbers, ensure that you perform the following steps:

1. From the DB2 server using the instance owner ID, type the following command:

   ```
   db2 get dbm cfg |grep SVCE
   ```

You receive output similar to the following:

```
TCP/IP Service name (SVCENAME) = ldap2svcids
```

You will either receive a number, such as, 60000, or text. The number is the port number that should be used in the db_url property. If you receive text, perform the next step.

2. Type the following command:

```
grep <text> /etc/services
```

For example:

```
grep ldap2svcids /etc/services
ldap2svcids 3700/tcp
ldap2svcidsi 3701/tcp
```

3700 is the port number to use in the db_url property. You cannot connect to the DB2 server remotely if neither text or a number is specified.

Default port numbers for the product services

InfoSphere MDM Collaboration Server services that are run in WebSphere Application Server. The WebSphere Application Server admin console port number is set by the WebSphere Application Server product installation. See Port number settings in WebSphere Application Server versions for default port numbers.

If you start any of the InfoSphere MDM Collaboration Server services in a debug mode, the following default port numbers are used:

```
appsvr service:       (7507 + 30000 = ) 37507
scheduler service:    (7507 + 31000 = ) 38507
admin service:        (7507 + 32000 = ) 39507
evenprocessor service:   (7507 + 33000 = ) 40507
workflowengine service:   (7507 + 34000 = ) 41507
queuemanager service:    (7507 + 35000 = ) 42507
```

Graphical or silent installation

You can install InfoSphere MDM Collaboration Server in graphical mode or silent mode. Consider which installation method works best for your environment.

Graphical mode

If the computer on which you are running InfoSphere MDM Collaboration Server can render a graphical user interface, then graphical mode is the preferred option. IBM Installation Manager displays a series of screens that walk you through the selection of features, basic parameter configuration, and provides a summary of the options that you selected before the installation began.

Silent mode

If you are planning identical installations on multiple computers, you might consider the silent option. A silent installation is started from the command line and uses a response file. This option does not require you to specify the installation options. Instead, the installation options are read from a response file.

You can create a response file manually or by using the graphical installation wizard. A response file can be created without installing any software or during an installation. The steps that are taken in the installation process and errors that are encountered are logged to a file.

Installing the product in graphical mode (extracting the product files)

You can use IBM Installation Manager to perform a graphical mode installation. There are two options you can choose from, graphical mode or extracting the product files. In this option, you use the installer to extract the product files. You perform the configuration and the deployment of the product to the application server yourself.

Before you begin, make sure that you meet these prerequisites:
- You completed the installation preparation tasks (including preparing your IBM WebSphere Application Server and database).
- You added the InfoSphere MDM Collaboration Server offering to IBM Installation Manager.

1. Start IBM Information Manager. Go to the IM directory and run the **./IBMIM** command to start IBM Information Manager.
2. On the IBM Installation Manager home screen, click **Install**.
3. On the Install Packages screen, select the edition. Click **Next**.
4. On the second Install Packages screen:
   a. Select the **Installation Directory** into which you want to install each component. If you choose to install a component in a directory other than the default, select that component and click **Browse** in the **Installation Directory** field.
      Attention: If you have IBM Rational Application Developer installed, make sure that you do not install InfoSphere MDM Collaboration Server into the same package group. On the Install Packages screen, select **Create a new package group**.
   b. For **Architecture Selection**, ensure that **64-bit** is selected.
   c. Click **Next**.
5. Select the language and click **Next**.
6. Select the **Extract the product files** feature to install and click **Next**.
7. Review the information that is given on the Extract Information screen and click **Next**.
8. Review the information that is given on the Installation Summary screen and click **Install**.
9. On the final IBM Installation Manager screen, click **View Log Files** to view the logs.
10. Click **Finish** and close IBM Installation Manager.

Verify a successful installation by viewing the log files.

Installing the product in graphical mode

You can use IBM Installation Manager to perform a graphical mode installation. There are two options you can choose from, graphical mode or extracting the product files. In addition to extracting the product files, the installer can be used to configure the product that is based on the information you provide to the installer.

The application is eventually deployed to the application server. This option is available only if you use WebSphere Application Server as the application server.

Before you begin, make sure that you meet these prerequisites:
- You completed the installation preparation tasks (including preparing your IBM WebSphere Application Server and database).
- Your IBM WebSphere Application Server (deployment manager and node) and database are started.
- You added the InfoSphere MDM Collaboration Server offering to IBM Installation Manager.

1. Start IBM Information Manager. Go to the IM directory and run the **./IBMIM** command to start IBM Information Manager.
2. On the IBM Installation Manager home screen, click **Install**.
3. On the Install Packages screen, select the edition. Click **Next**.
4. On the second Install Packages screen:
   a. Select the **Installation Directory** into which you want to install each component. If you choose to install a component in a directory other than the default, select that component and click **Browse** in the **Installation Directory** field.

      Attention: If you have IBM Rational Application Developer installed, make sure that you do not install InfoSphere MDM Collaboration Server into the same package group screen. On the Install Packages screen, select **Create a new package group**.
   b. For **Architecture Selection**, ensure that **64-bit** is selected.
   c. Click **Next**.
5. Select the language and click **Next**.
6. Select the features to install and click **Next**.
7. Enter the configuration information. Use the installation worksheets for guidance.
   a. On the Database Configuration screen, enter the database details and click **Test Connection** before you exit the screen.
   b. On the WebSphere Application Server Configuration screen:
      - Enter the information that you used during the application server preparation.
      - Select **Retrieve Host Details** to obtain your Cell, Node, and Server information.
      - If you are installing in a clustered environment, select **Install MDM application on cluster** and choose the cluster name from the **Cluster** list. See Deploying the product in a cluster environment for information about cluster setup and install.
   c. On the Application Configuration screen:
      - Provide your Perl installation home, JDK home, Cache multicast address and TTL, RMI port and Application server HTTP port.
      - Select the Locale that you want to use for the installation.
      - If you want the installer to create the table to be used by InfoSphere MDM Collaboration Server, select the **Create database tables to be used by the product** check box.
8. Review the configured parameters on the Summary screen and click **Next**.
9. Review the installation summary information and click **Install**.

10. On the final IBM Installation Manager screen, click **View Log Files** to view the logs.
11. Click **Finish** and close IBM Installation Manager.

Verify a successful installation by viewing the log files.

Installing the product manually

You can install the product manually making sure to set your environment variables, your runtime properties, your database drivers, and the application server settings.

Attention: You must provide all the parameters that you are prompted for during the product installation stage. If you fail to provide all the parameters, the product installation remains incomplete.

1. Set your environment variables.
2. Add the Perl installation directory to your `PATH` statement.
3. Generate and configure the `env_settings.ini` file.
4. Configure the application server.
5. Create the schema.

See the following topics for step-by-step instructions:

1. Setting the environment variables
2. Creating the env_settings.ini file
3. Configuring the application server
4. Running schema creation scripts

Installing the product silently

To install IBM InfoSphere Master Data Management Collaboration Server silently, you must edit the sample silent mode response files.

Sample silent mode response files are provided in the `STARTUP_INSTALL_HOME/ StartupKit` directory. The following sample silent mode response files for InfoSphere MDM Collaboration Server are available:

Payload-install.res
> This is a sample response file that is used in extracting InfoSphere MDM Collaboration Server product files for manual configuration and deployment.

WAS_DB2.res
> This is a sample response file that is used in the installation of InfoSphere MDM Collaboration Server with IBM WebSphere Application Server and DB2.

WAS_Oracle.res
> This is a sample response file that is used in the installation of InfoSphere MDM Collaboration Server with IBM WebSphere Application Server and Oracle.

Uninstall.res
> This is a sample response file that is used in uninstalling InfoSphere MDM Collaboration Server.

Creating a response file while you are running a graphical installation

Use this procedure to capture responses and create a response file when you are running IBM Installation Manager in graphical mode.

The password values in the file are encrypted. If the password value is changed in the system, you must input the correct password value to the response file before you use it for a silent installation. You can enter a new unencrypted value for the password, and the system encrypts it when the file is used during installation.

Issue the **../IBMIM -record $YOUR_PATH/mysilent.res** command to create the response file by starting the installation.

Customizing the silent mode response file

You use this procedure to customize your silent mode installation response file.

Although code examples might show with line breaks in the following content, the text between <.../> must be entered in the response file as one line without breaks.

1. Open your response file.
2. Specify the home and shared resource directories.
   a. To specify the `MDM_INSTALL_HOME` directory, add the following lines to your response file:

      ```
      <profile id='IBM InfoSphere Master Data Management'
       installLocation='/usr/IBM/MDM/H087/mdm'/>
      <data key='eclipseLocation' value='/usr/IBM/MDM/H087/mdm'/>
      ```

      Where `usr/IBM/MDM/H087/mdm` is the MDM installation home directory.
   b. To specify the Installation Manager Shared Resource directory, add the following lines to your response file:

      ```
      <preference name='com.ibm.cic.common.core.preferences.eclipseCache'
       value='/usr/IBM/MDM/H087/Shared'/>
      ```

      Where `usr/IBM/MDM/H087/Shared` is the Installation Manager Shared Resource directory.
3. Specify the MDM offering version and the features that you want to install by adding the following line:

   ```
   <offering id='com.ibm.mdm.collaborative'
    version='11.3.0.v20130415-1124'
   profile='IBM InfoSphere Master Data Management'
    features='com.ibm.im.mdm.db.feature'
    installFixes='none'/>
   ```

   Where `11.3.0.v20130415-1124` is the version number of MDM.

   Note: You can find the version number by looking in your installation media folder, for example, `download_path/MDM/disk1/md/Offerings` and locating the offering JAR file. For example, `disk1/md/Offerings/ com.ibm.mdm.collaborative_11.3.0.v20130415-1124.jar`, where `11.3.0.v20130415-1124` is the version number.

4. Specify the feature to install during the single IBM Installation Manager session by adding this line:

```
<offering id='com.ibm.mdm.collaborative'
 version='11.3.0.v20130415-1124'
profile='IBM InfoSphere Master Data Management'
 features='com.ibm.im.mdm.db.feature'
installFixes='none'>
```

Where `features='com.ibm.im.mdm.db.feature` is the specific feature to install. See Examples for specifying features for a silent installation for more information.

5. Specify your database parameters.

   Note: For **Extract the Product Files** option, steps 5 - 7 are not required.

6. Specify your WebSphere Application Server parameters.

7. Specify your Application Configuration parameters.

Continue with disabling the installer splash screen and running the silent installation.

Examples for specifying features for a silent installation:

You must edit your response file and specify the exact features that you want to install during a silent installation.

Although code examples might show with line breaks in the following content, the text between `<.../>` must be entered in the response file as one line without breaks.

Specify the features in the following line in the `<offering id.../>` section of your response file: `features='com.ibm.im.mdm.db.feature'`. For example:

```
<offering id='com.ibm.mdm.collaborative' version='11.3.0.FP00IF000_20130503
-1713' profile='IBM InfoSphere Master Data Management'
features='com.ibm.im.mdm.db.feature' installFixes='none'>
```

Example 1: Installing InfoSphere MDM Collaboration Server and MDM database and IBM WebSphere Application Server

To install only InfoSphere MDM Collaboration Server with database and application server, add this line:

```
features='com.ibm.im.mdm.db.feature'
```

Example 2: Extracting the Product Files

To extract only the product files, include this line:

```
features='com.ibm.im.mdm.wl.feature'
```

Silent installation database parameters for DB2:

You must specify parameters for your IBM DB2 database in your silent installation response file.

Enter the following lines in your response file if you are using a DB2 database. Change value= to the specific value used by your database.

Although code examples might show with line breaks in the following content, the text between <.../> must be entered in the response file as one line without breaks.

Database type
```
<data key='user.db.type,com.ibm.mdm.collaborative' value='DB2'/>
```

Database alias in a database catalog for the DB2 client
```
<data key='user.db.name,com.ibm.mdm.collaborative' value='MDM11E'/>
```

Database name
```
<data key='user.db.name.remote,com.ibm.mdm.collaborative'
 value='YOURDBASENAME'/>
```

Database schema name
```
<data key='user.db.schema,com.ibm.mdm.collaborative'
 value='SCHEMANAME'/>
```

Database server host name
```
<data key='user.db.host,com.ibm.mdm.collaborative'
 value='your.host.com'/>
```

Database server port name
```
<data key='user.db.port,com.ibm.mdm.collaborative'
 value='50000'/>
```

Database user name (should be the same as the schema name)
```
<data key='user.db.user,com.ibm.mdm.collaborative'
 value='USERNAME'/>
```

Database password
```
<data key='user.db.password,com.ibm.mdm.collaborative'
 value=''/>
```

DB2 client home directory
```
<data key='user.db2.home,com.ibm.mdm.collaborative'
 value='/home/ws8admin'/>
```

Database JDBC URL
```
<data key='user.user.db.url,com.ibm.mdm.collaborative'
 value='jdbc:db2://HOSTNAME:PORT/DBASENAME'/>
```

Silent installation database parameters for Oracle:

You must specify parameters for your Oracle database in your silent installation response file.

Enter the following lines in your response file if you are using an Oracle database. Change value= to the specific value used by your database.

Although code examples might show with line breaks in the following content, the text between <.../> must be entered in the response file as one line without breaks.

Database type
```
<data key="user.db.type,com.ibm.mdm.collaborative' value='ORACLE'/>
```

Oracle client TNS name
```
<data key='user.db.name,com.ibm.mdm.collaborative' value='TNSNAME'/>
```

Oracle server database name
```
<data key='user.db.name.remote,com.ibm.mdm.collaborative'
 value='DBASENAME'/>
```

Database user name (should be the same as the schema name)
```
<data key='user.db.user,com.ibm.mdm.collaborative'
 value='USERNAME'/>
```

Database user password
```
<data key='user.db.password,com.ibm.mdm.collaborative'
 value='DBPASSWORD'/>
```

Database JDBC URL
```
<data key='user.user.db.url,com.ibm.mdm.collaborative'
 value='jdbc:oracle:thin:@HOSTNAME:PORT/DBASENAME'/>
```

Database server host name
```
<data key='user.db.host,com.ibm.mdm.collaborative'
 value='DBHOSTNAME'/>
```

Database server port
```
<data key='user.db.port,com.ibm.mdm.collaborative'
 value='1521'/>
```

Database schema name
```
<data key='user.db.schema,com.ibm.mdm.collaborative'
 value='SCHEMANAME'/>
```

Oracle client home directory
```
<data key='user.L2.db.home,com.ibm.mdm.collaborative'
 value='ORACLEHOMEPATH'/>
```

Oracle system identifier name
```
<data key=' user.oracle.sid,com.ibm.mdm.collaborative'
 value='ORACLEHOMEPATH'/>
```

Silent installation WebSphere Application Server parameters:

You must specify parameters for WebSphere Application Server in your silent installation response file.

Enter the following lines in your response file. Change `value=` to the specific value used by your application server.

Although code examples might show with line breaks in the following content, the text between `<.../>` must be entered in the response file as one line without breaks.

WebSphere Application Server installation home directory
```
<data key='user.L1.was.home,com.ibm.mdm.collaborative'
 value='/WAS_INSTALL_HOME'/>
```

WebSphere Application Server type, either ND (Federated) or BASE (Standalone)
```
<data key='user.was.type,com.ibm.mdm.collaborative'
 value='ND'/>
```

Profile Home
```
<data key='user.was.profile.home,com.ibm.mdm.collaborative'
 value='/opt/IBM/WebSphere/AppServer/profiles/AppSrv01'/>
```

WebSphere Application Server Network Deployment Manager or WebSphere Application Server Base server1 SOAP port

```
<data key='user.deploy.port,com.ibm.mdm.collaborative'
 value='8879'/>
```

WebSphere Application Server HTTP port

```
<data key=' user.ce.http.port,com.ibm.mdm.collaborative'
 value='7507'/>
```

WebSphere Application Server Deployment Manager or WebSphere Application Server Base host name

```
<data key='user.deploy.host,com.ibm.mdm.collaborative'
 value='HOSTNAME'/>
```

WebSphere Application Server Deployment Manager or WebSphere Application Server Base virtual host name

```
<data key='user.deploy.vHost,com.ibm.mdm.collaborative'
 value='vHOSTNAME'/>
```

WebSphere Application Server deployment target

```
<data key='user.was.cell,com.ibm.mdm.collaborative'
 value='CELLNAME'/>
<data key='user.was.node,com.ibm.mdm.collaborative'
 value='NODENAME'/>
<data key='user.was.server,com.ibm.mdm.collaborative'
 value='SERVERNAME'/>
```

WebSphere Application Server security parameters

```
<data key='user.was.security,com.ibm.mdm.collaborative'
 value='1'/>
<data key='user.was.security.on.off,com.ibm.mdm.collaborative'
 value='on'/>
<data key='user.was.user,com.ibm.mdm.collaborative'
 value='USERNAME'>
<data key='user.was.password,com.ibm.mdm.collaborative'
 value=''/>
<data key='user.security.user.name,com.ibm.mdm.collaborative'
 value='USERNAME'/>
<data key='user.security.user.password,com.ibm.mdm.collaborative'
 value=''/>
```

Note: The following parameters must not be modified in your response file:

```
<data key='user.was.cluster,com.ibm.mdm.collaborative'
 value='None'/>
<data key='user.was.cluster.flag,com.ibm.mdm.collaborative'
 value='false'/>
```

Silent installation Application Configuration parameters:

You must specify parameters for Application Configuration in your silent installation response file.

Enter the following lines in your response file. Change value= to the specific value used by your application server.

Although code examples might show with line breaks in the following content, the text between <.../> must be entered in the response file as one line without breaks.

Perl installation home directory

```
<data key=' user.ce.perl.directory,
  com.ibm.mdm.collaborative'  value='PERL_HOME'/>
```

JDK home directory

```
<data key=' user.ce.jdk.path,
  com.ibm.mdm.collaborative'  value='JDK_PATH'/>
```

Locale (Language to be used by InfoSphere MDM Collaboration Server)

```
<data key=' user.ce.locale,
  com.ibm.mdm.collaborative'  value='en_US'/>
```

Cache multicast address

```
<data key=' user.ce.cache.multicast.address,
  com.ibm.mdm.collaborative'  value='239.1.1.1'/>
```

Cache multicast time-to-live (0 for single server and 1 for clusters)

```
<data key=' user.ce.cache.multicast.ttl,
  com.ibm.mdm.collaborative'  value='0'/>
```

RMI port

```
<data key=' user.ce.rmi.port,
  com.ibm.mdm.collaborative' value='17507'/>
```

Create schema (Create tables to be used by the product –- Y or N)

```
<data key=' user.ce.create.schema,
  com.ibm.mdm.collaborative'  value='N'/>
```

Disabling the installer splash screen during silent installation

Use this procedure to disable the IBM Installation Manager splash screen for silent installations. This task must be completed for the silent installation to run successfully.

Follow these steps to add the **-nosplash** parameter in the IBMIM.ini file.

1. Go to the INSTALLATIONMANAGER_INSTALL_HOME/eclipse directory.
2. Open the IBMIM.ini file.
3. Add the **-nosplash** parameter. For example:

   ```
   Linux and UNIX:  vi IBMIN.ini
   /opt/IBM/InstallationManager/eclipse/
    jre_6.0.0.sr9_20110208_03/jre/bin/java
   -nosplash
   -vmargs
   -Xquickstart
   -Xgcpolicy:gencon
   ```
4. Save and close the file.

Installing silently by using a response file

You can install InfoSphere MDM Collaboration Server silently, where the installation choices are provided in an options file instead of in the interactive IBM Installation Manager panels. This type of installation is helpful when you are doing multiple identical installations.

Verify that the installation startup kit is installed. The response files in the kit can be used for a silent installation. Ensure that you have completed the steps in the Disabling the installer splash screen during silent installation topic.

A properties file is generated when you run the interactive installation program. To use a silent installation, you must edit the properties file or create your own file by editing one of the sample response files.

1. To use a sample response file, go to STARTUPKIT_INSTALL_HOME. Response files have a .res extension. Use the file that is applicable to your operating system.

2. Edit the response file and make any necessary changes before you start the installation.

3. Start the installation with the applicable command:

   a. Issue the **IBMIM -record recordedFile** command to run IBM Installation Manager and then generate the response file.

   b. Issue the **IBMIM -acceptLicense -silent -input inputFile** command to run IBM Installation Manager in silent mode.

4. If an unrecoverable problem occurs during the silent installation, look for the cause of the problem in the log files in the MDM_INSTALL_HOME/logs/logs directory. After you correct the issue, run the silent installation again.

Chapter 6. Configuring the product

You can configure the product manually making sure to set your environment variables, your runtime properties, your database drivers, and the application server settings.

Attention: You must provide all the parameters that you are prompted for during the product configuration stage. If you fail to provide all the parameters, the product configuration remains incomplete.

1. Set your environment variables.
2. Add the Perl installation directory to your PATH statement.
3. Generate and configure the `env_settings.ini` file.
4. Configure the application server.
5. Create the schema.

Setting the environment variables

You must set up specific environment variables in order for IBM InfoSphere Master Data Management Collaboration Server to run successfully.

Previous versions of the product used environment variables to store configuration information. Started from InfoSphere MDM Collaboration Server Version 9.0, the configuration parameters are specified in the file `<install dir>/bin/conf/env_settings.ini`. You can create an `env_settings.ini` file in one of three ways:

- Using the `deploy.properties.sample` Java properties file,
- Using the `<install dir>/bin/conf/env_settings.ini.default` template
- Using the `<install dir>/bin/conf/deploy.samples` sample file.

For more information about the `env_settings.ini` file, see "Creating the `env_settings.ini` file"

1. Set and export the following environment variables in the InfoSphere MDM Collaboration Server user's `.bashrc` file.

   ```
   PERL5LIB = <install dir>/bin/perllib
   LANG=<locale value>, for example en_US
   ```

   Note: Locale `C` should not be set as a default as it can cause problems when you use Perl.
2. Logout and log in as the InfoSphere MDM Collaboration Server user to pick up the changes to `.bashrc` file.

You need to set up the `env_settings.ini` file.

Creating the `env_settings.ini` file

If you installed the product manually and you did not use the installer application, you need to create the `env_settings.ini` file manually. You will also need to edit the file.

Ensure that you run the **<install dir>/setup.sh** script before you create the
`env_settings.ini` file.

See How to configure the env_settings.ini file to watch an educational video about
creating and modifying the `env_settings.ini` file.

1. Copy the `<install dir>/bin/conf/env_settings.ini.default` file as:

   ```
   cd <install dir>/bin/conf
   cp env_settings.ini.default env_settings.ini
   ```

2. Set the appropriate environment parameters.

Setting the common parameters in the `env_settings.ini` file

After you create the `env_settings.ini` file, you need to set the common
parameters.

1. Open the `env_settings.ini` file.

2. Set the following parameters:

   java_home
   > The path of Java home.

   jar_dir
   > The location of the third-party JAR files.

   encrypt_password
   > If you choose to encrypt the database password, add the
   > **encrypt_password** parameter to the [db] section of the
   > `env_settings.ini` file, and set it to yes. Remove the **password**
   > parameter from the [db] section of the `env_settings.ini` file. This
   > ensures that the database password is not present anywhere in the text
   > format. It is present only in the encrypted format in the `db.xml` file. If
   > you choose to leave the database password in plain format, add the
   > **encrypt_password** parameter to the [db] section of the
   > `env_settings.ini` file, and set it to no. Keep the **password** parameter in
   > the [db] section of the `env_settings.ini` file as in earlier versions of
   > InfoSphere MDM Collaboration Server.
   >
   > Remove the following properties from the `common.properties` file:
   > * `db_userName`
   > * `db_password`
   > * `db_url`
   > * `db_class_name`

Configuring cache parameters

You must configure a few cache parameters in order for IBM InfoSphere Master
Data Management Collaboration Server to be able to use a unique multicast
address for its cache system.

InfoSphere MDM Collaboration Server uses a distributed cache. A distributed
cache uses an IP multicast. Multicast addresses are typically in the 239.0.0.0 to
239.255.255.255 range. Refer to your network administration to determine the
correct multicast address.

1. Open the `env_settings.ini` file, and go to the [cache] section.

2. Set the following parameters:

multicast_addr
> The multicast address that the cache system uses.

multicast_ttl
> Time-to-live multicast parameter needs to be set to 0 for single-system installations and 1 for clusters.

Setting the common database parameters

If you want to set up the database, you need to configure the database type and common parameters and configure the database type-specific parameters.

You need to set the following parameters regardless of the database you are using:

type   Possible values are DB2 or Oracle.

home   The database home directory.

username
> The user name to connect to database.

password
> The password to connect to database.
>
> **Note:** Decide whether the database password is to be stored in an encrypted format or plain format and set the `encrypted_password` parameter in the `env_settings.ini` file.

hostname
> The host name of the DB2 or Oracle server.

port   The port the database server listens on.

Storing database passwords in an encrypted format

For audit and security purposes, always store sensitive information, such as passwords, in an encrypted format.

There are other database-related scripts, for example:
- Schema, company creation, and deletion scripts
- Migration scripts
- Maintenance scripts

Note: The maintenance scripts require the argument `dbpassword` if the `encrypt_password` parameter is set to `yes` in the `env_settings.ini` file.

If the argument is not passed, you are prompted for the database password. If the `encrypt_password` parameter is set to `no` or is not set at all, you can run the scripts without the `dbpassword` argument. Depending on the value of the `encrypt_password` parameter, the `db.xml` file stores either the plain text password or encrypted password.

1. Add the `encrypt_password` parameter to the [db] section of the `env_settings.ini` file.
2. Set the `encrypt_password` parameter to `yes` if you want the password to be encrypted.

   Note: If you do not want to encrypt the password, keep the password parameter, as is, in the [db] section.

3. Run the `bin/configureEnv.sh -dbpassword=<database password>` command. You are prompted to enter the password if it is not given as an argument. For example, if the `--overwrite` option is not used, a warning displays asking that you to run the script with the dbpassword argument. If the **encrypt_password** parameter in the `env_settings.ini` file is not set or set to `no`, the dbpassword argument is not required for the **configureEnv.sh** script.

4. Confirm that the script created the `db.xml` file in the `$TOP/etc/default` directory. This step is important because:
   - It is the only place from where the Java code can read the encrypted password or plain text password
   - The decrypted password can be used in a JDBC connection.

5. Whenever any of the database-related properties in the [db] section of the `env_settings.ini` file are changed, run the `bin/configureEnv.sh -dbpassword=<database password>` command to re-create the `db.xml` file. You are prompted to enter the password if its not given as an argument. In this case, if the **encrypt_password** parameter in the `env_settings.ini` is not set or set to `no`, the dbpassword argument is not required for the **configureEnv.sh** script.

6. Confirm that the script created the `db.xml` file in the `$TOP/etc/default` directory. This step is important because:
   - It is the only place from where the Java code can read the encrypted password or plain text password
   - The decrypted password can be used in a JDBC connection.

7. With this change, if you create IBM InfoSphere Master Data Management Collaboration Server schema, start `create_schema`. For example:

   `bin/db/create_schema.sh -dbpassword=<database password>`

   You are prompted to enter the password if its not given as an argument. If the **encrypt_password** parameter in the `env_settings.ini` file is not set or is set to `no`, the dbpassword argument is not required for the scripts.

8. Run the `bin/test_db.sh -dbpassword=<database password>` command. You are prompted to enter the password if its not given as an argument. If the **encrypt_password** parameter in the `env_settings.ini` file is not set or is set to `no`, the dbpassword argument is not required for the scripts.

Setting DB2 parameters

Ensure that you set the following DB2 parameters.

DB2 provides a JDBC driver, which can be used either in type two architecture or type four architectures. You can use either architecture with IBM InfoSphere Master Data Management Collaboration Server.

1. Configure the [db.<type>] section that corresponds to the value of `type` in the database section. For example, if you are using DB2, set `type=db2` in the database section and configure the [db.db2] section.

2. Configure the JDBC driver type parameter in the [db] section for DB2.
   a. For Type 4 architecture:
      1) Type four architectures is the default type.
      2) Set the **jdbc_driver_type** parameter to 4.
      3) Set the port parameter in the [db] section to the port the DB2 listener is on. Ask your database administrator for the port.

b. For Type 2 architecture:

   1) Set the **jdbc_driver_type** parameter to 2. The port and host name parameters in the db.db2 section are ignored.

3. Configure the [db.db2] section for DB2. Set the following parameters:

  a. Set the following parameters in the [db.db2] section.

alias   This parameter is in the [db.db2] section in the env_settings.ini file. This parameter is used by the CLP and the JDBC Type 2 drivers. It is the alias the CLP uses in the CONNECT statement.

db_name
    This parameter is in the [db.db2] section in the env_settings.ini file. The **db_name** parameter defaults to the value of the alias parameter, therefore, **db_name** must be set only when the name of the database differs from the alias the client uses. This parameter is only used for Type 4 connections.

Here is a simple example if you were using a Type 4 connection, you would have:

```
Client alias = 'mydb', db name = 'mydb'

[db]
type-=db2
username=dbuesr
password=somepwd
home=/home/db2inst1/sqllib
hostname=my-dbserver.company.com
port=60004
jdbc_driver_type=4

[db.db2]
alias=mydb
```

Here is an example of a Type 4 connection when the alias is different from the database name:

```
Client alias = 'mydb', db name = 'mdmpim'
[db]
type-=db2
username=dbuesr
password=somepwd
home=/home/db2inst1/sqllib
hostname=my-dbserver.company.com
port=60004
jdbc_driver_type=4

[db.db2]
alias=mydb
db_name=mdmpim
...
```

Here is a simple example if you were using a Type 2 connection, you would have:

```
[db]
type-=db2
username=dbuesr
```

```
password=somepwd
home=/home/db2inst1/sqllib
#hostname=my-dbserver.company.com
#port=60004
jdbc_driver_type=2
```

Setting Oracle parameters

Ensure that you set the following Oracle parameters.

Oracle supports the following JDBC driver types:

thin   This type is the default type.

OCI   The OCI driver allows the use of TAF (Transparent Application Failover) for RAC (Real Application Cluster) installations.

You can use either driver type with IBM InfoSphere Master Data Management Collaboration Server.

1. Configure the [db.<type>] section, which corresponds to the value of `type` in the database section. For example, if you are using Oracle, set `type=oracle` in the database section and configure the [db.oracle] section.
2. Configure the [db] section for Oracle.
   a. Set the JDBC driver type. Set the driver type to either `thin` or `OCI`.
3. Configure the [db.oracle] sections for Oracle.

   instance
   > The name of the Oracle instance. The instance that is used in the JDBC connect string and the SQLPlus connect string if the **tns_name** parameter is not set.

   tns_name
   > This parameter is in the [db.oracle] section in the `env_settings.ini` file. The TNS name is used by SQLPLus to connect to the database. Set this section only if the SQLPlus uses a different name to connect to the database other than JDBC. This parameter defaults to the value of the instance parameter, therefore, **tns_name** must be set when the client connection differs from the SID of the database.

   SID   Oracle System Identification (SID) is unique for each Oracle database system. Oracle SID identifies the system and SERVICE_NAME identifies the remove service. This parameter is in the [db.oracle] section in the `env_settings.ini` file.

   success_token
   > If the Oracle database client used is in a language other than English, in order for the **test_db.sh** script and other shell scripts to work, specify in this parameter the text that is returned when a successful connection is made to the Oracle database server.

Here is a simple example:

```
(Database SID = 'mydb', client uses  'mydb' to connect using sqlplus

[db]
type-=oracle
username=dbuesr
password=somepwd
```

```
home=/opt/oracle/app/product/11.1.0/db_1
hostname=my-dbserver.company.com
port=1525


[db.oracle]
instance=mydb
```

Here is an example where the SQLPlus is different from SID:

```
(Database SID = 'mdmpim', client uses  'mydb' to connect using sqlplus
```

```
[db]
type-=oracle
username=dbuesr
password=somepwd
home=/opt/oracle/app/product/11.1.0/db_1
hostname=my-dbserver.company.com
port=1525


[db.oracle]
instance=mydb
tns_name=mdmpim
```

Setting up Oracle to use the OCI drivers

The OCI is an application-programming interface to Oracle databases. It consists of a library of C language routines to allow C programs (or programs that are written in other third-generation languages) to send SQL statements to the database and interact with it in other ways. The OCI driver allows the use of TAF (Transparent Application Failover) for RAC (Real Application Cluster) installations. You need to set up and configure support for the OCI driver for Oracle, and change the IBM InfoSphere Master Data Management Collaboration Server environment settings.

Ensure that the Oracle client is installed. See the system requirements for details: http://www-01.ibm.com/support/docview.wss?uid=swg27035486.

Add the following environment variables in `.bashrc` or `.bash_profile` file in IBM InfoSphere Master Data Management Collaboration Server.

- $ORACLE_HOME - This variable is the directory where Oracle client software is installed.
- $LD_LIBRARY_PATH - This variable is an environment variable for Sun and Linux. Use $LIBPATH for AIX® and $SHLIB_PATH for HPUX.
- $PATH

For example, the environment variables in `.bashrc` or `.bash_profile` file looks like:

```
export ORACLE_HOME=/opt/oracle/11g/client_1
export LD_LIBRARY_PATH=$ORACLE_HOME/lib:$LD_LIBRARY_PATH
export PATH=$ORACLE_HOME/bin:$PATH
```

Configuring the application server parameters

After you install the product and configured your database, you can perform more configurations of the application server. After the installation is configured, use the shell scripts in the `<install_dir>/bin/go` directory to start, stop, and abort InfoSphere MDM Collaboration Server.

Configuring the application server requires four steps. In the `env_settins.ini` file:

1. Set the **appserver** type and common properties in the [`appserver`] section.
2. Configure the parameters for the appserver type in the [`appserver.<type>`] section.
3. Configure the parameters for each appserver service in the [`appserver.<service name>`] section.
4. Add the security properties **username** and **password** to the [`appserver`] section.

Setting the common application server parameters

In order to set up the application server, you need to configure the application server type and common parameters, as well as, configure the application type-specific parameters.

Set the following parameters in the [`appserver`] section of the `env_settings.ini` file:

type Refer to the `env_setting.ini.default` file for the entire list of sections supported

home The home directory of the appserver.

rmi_port
     The RMI port.

See "Setting WebSphere Application Server parameters."

Setting WebSphere Application Server parameters

If you are using WebSphere Application Server as your application server for running IBM InfoSphere Master Data Management Collaboration Server, you must verify the configuration settings, start the application server, configure group and server settings, run some scripts, and then start the application server.

Before you can set up InfoSphere MDM Collaboration Server, you must ensure that it is configured.

1. Configure the [`appserver.websphere`] section with the following parameters:

   application_server_profile
        The name of the WebSphere Application Server profile.

   cell_name
        The name of the WebSphere Application Server cell where InfoSphere MDM Collaboration Server is installed.

   node_name
        The name of the node in the WebSphere Application Server cell where InfoSphere MDM Collaboration Server is installed.

   admin_security
        Set this parameter to `true` if WebSphere Application Server administrative security is enabled.

2. Configure the [`appserver.appsvr`] section with the following parameters:

   port The port that InfoSphere MDM Collaboration Server runs on.

   appserver_name
        The name of the WebSphere Application Server component, which is created in a later step.

vhost_name

The name of the WebSphere Application Server virtual host component, which is created in a later step.

3. Add the security parameters **username** and **password** to the [appserver.websphere] section. For example:

```
# Application server admin user name and password.  This info is
 required WebSphere when admin_security
 in [appserver.websphere] section is set to true. If username
 and password are not provided in env_settings.ini, user will
 need to provide the values in the command line when invoking
 scripts like start_local.sh or otherwise the user will be
prompted to enter the values before the execution of the
script will continue.
 #username=
 #password=
```

Note: If you choose not to save the credential information in the env_settins.ini file, you can provide it from the command line. To provide the credentials from the command line, perform the following steps:

a. Redeploy InfoSphere MDM Collaboration Server to the application server. The application server shell script, **install_war.sh**, installs InfoSphere MDM Collaboration Server into the WebSphere Application Server.

b. Ensure that the default WebSphere Application Server (server1) is installed and running. You also must verify that you can log in to the server. For more information about the default WebSphere Application Server, see the administration information in the: WebSphere Application Server v8.5 product documentation

c. Run the application server shell script, **install_war.sh**, with optional parameters, which are in the $TOP/bin/websphere/ directory:

Syntax
```
install_war.sh [ --wsadminUsername=<WAS admin user name>
 --wsadminPwd=<password for WAS admin user>]
```

The install_war.sh script installs the WAR file for each application server that is defined in the [services] section in the env_settings.ini file. When WebSphere Application Server security is enabled, add the wsadminUsername and wsadminPwd arguments to the **install_war.sh** command.

Note: When WebSphere Application Server security is not enabled, the arguments wsadminUsername and wsadminPwd are not required in the **start_local.sh**, **start_rmi_appsrv.sh**, **stop_local.sh**, and **rmi_status.sh** commands.

d. If you want to install GDS feature along with InfoSphere MDM Collaboration Server installation, you must run the application server shell script for GDS, install_gds_war.sh, which is in the $TOP/bin/websphere/ directory:

Syntax
```
install_gds_war.sh
```

Configuring WebSphere MQ parameters

For IBM InfoSphere Master Data Management Collaboration Server functions that have dependencies on WebSphere MQ to work, you need to update the env_settings.ini file.

1. Open the env_settings.ini file, and go to the [mq] section.
2. Set the following parameters:

   enabled
   > Set to yes to enable the support for functions, which have dependencies on WebSphere MQ.

   home The installation directory of the WebSphere MQ client. Lowest version that is required is 7.0.1.

3. Save your changes.

Validating the environment

Before you can configure the application server, you need to verify that your environment is installed and configured properly.

This script needs to be run only one time.

1. Go to the *<install_dir>* directory.
2. Run the *<install_dir>*/setup.sh script. This script does:
   - Checks if the database client is configured.
   - Validates the Perl installation and notifies you of any missing Perl modules.

     Note: If any Perl modules are missing, install those Perl modules and run this script again.

Configuring the installation

Before you can configure the application server, you need to configure the installation.

The **configureEnv.sh** script does:
- Validates the env_settings.ini file and notifies you if there are any errors.
- Generates the configuration for IBM InfoSphere Master Data Management Collaboration Server services
- Generates a <install dir>/build/build.properties file for Ant
- Generates the common.properties file

  Note: Comments inside the common.properties file will be stripped after you run the **configureEnv.sh** script. If you want the descriptions for each property, refer to the common.properties.default file.

  Note: If the common.properties file *does* exist, a warning message is reported and displays the missing properties, which exist in the common.properties.template file. If the common.properties file does *not* exist, you can either copy the properties from the common.properties.default file or delete the common.properties file and run the **configureEnv.sh** script to generate a new one.

You must run this script after a change is made to the env_settings.ini file or the addition of any JAR files to the jar directory in an enterprise installation.

1. Go to the `<install dir>/bin` directory.
2. Run the `<install dir>/bin/configureEnv.sh` script.

Running the compatibility scripts

Use the compatibility scripts to add some of the old environment variables that are used in previous versions of IBM InfoSphere Master Data Management Collaboration Server. The variables include *$TOP, $CCD_DB,* and *$JAVA_RT.*

Add the following compatibility script lines to the `.bashrc` file:

```
rootDir=`perl $PERL5LIB/getTop.pl`
 source $rootDir/bin/compat.sh
```

Configuring the application server

To run IBM InfoSphere Master Data Management Collaboration Server successfully, you must configure with WebSphere Application Server.

Configuring WebSphere Application Server

If you are using WebSphere Application Server as your application server for running IBM InfoSphere Master Data Management Collaboration Server, you can configure the application server with these steps.

If you are installing the product on AIX, you must increase the size of the **ncargs** parameter to accommodate the long list of arguments that the product installation requires. Run the following command:

```
chdev -l sys0 -a ncargs=NewValue
```

Where *NewValue* can be a value from 6 (the operating system default) to 128 and represents the number of 4 K blocks to be allocated for the argument list.

1. Add a WebSphere Application Server group. This group is used to grant permissions in ${WAS_HOME} which is necessary for the InfoSphere MDM Collaboration Server application server. Some examples of group names are: *wasgrp, wasgroup,* or *pimgroup.*

   On AIX server, you can add a group using the SMIT administration tool. For more information about creating a group and setting permissions for the group, see your operating system documentation. Ensure that the InfoSphere MDM Collaboration Server user is always part of the WebSphere Application Server group.
2. Add the InfoSphere MDM Collaboration Server user to the group created in the previous step. To check group membership, run the **id** command from the UNIX command prompt as the InfoSphere MDM Collaboration Server user. If the group is not in the list of groups, log out, log in, and run the **id** command to check the user again.
3. Start the WebSphere Application Server default server. To start the WebSphere Application Server default server, run the following command as root:

   `${WAS_HOME}/bin/startServer.sh server1`
4. In the WebSphere Application Server console, change the umask for the server1 process to 002. In the **Run as group** text box for server1, set the text box to the group created in the first step.

5. Stop the WebSphere Application Server console. To stop the administration console, run the following command as root:

   `${WAS_HOME}/bin/stopServer.sh server1`

6. Change the permissions on the WebSphere Application Server directory so that the group has write permission:

   `# chgrp -R wasgroup (WAS_HOME) # chmod -R g+rw (WAS_HOME)`

   Note: The *WAS_HOME* variable is not defined here because you must run the commands as root. You must manually enter the WebSphere Application Server installation path, for example: `chmod -R g+rw /opt/IBM/WebSphere/AppServer`. The group that is used here must be the same as the one you set up in step 4.

7. Start the application server and the administrative console. To start the WebSphere Application Server, run the following command as root:

   `${WAS_HOME}/bin/startServer.sh server1`

   Generally, InfoSphere MDM Collaboration Server is installed on the root directory of WebSphere Application Server but some installations use an installation ID (such as *wsadmin*) to run the WebSphere Application Server console.

8. After you install InfoSphere MDM Collaboration Server, and after you perform the previous configuration steps, run the following scripts in the listed order:

   a. **$TOP/bin/websphere/create_vhost.sh** You are prompted to create two virtual hosts, if GDS is also configured in the `env_settings.ini` file. Create two virtual hosts.

   b. **$TOP/bin/websphere/create_appsvr.sh** You are prompted to create two application servers, if GDS is also configured in the `env_settings.ini` file. Create two application servers.

   c. **$TOP/bin/websphere/install_war.sh** You are prompted to install the application server that is configured for IBM InfoSphere Master Data Management Collaboration Server in the [appserver.appsvr] section of the `env_settings.ini` file. Install InfoSphere MDM Collaboration Server on the default application server (`appsvr_<SERVER_NAME>`).

   d. **$TOP/bin/websphere/install_gds_war.sh** You are prompted to install the application server configured for Global Data Synchronization in the [appserver.appsvr] section of the `env_settings.ini` file. Install Global Data Synchronization on the application server (`appgds_<SERVER_NAME>`).

Configure a cluster environment

To improve performance, you can run services in a clustered environment so that you can run multiple services on one computer or on multiple computers.

Clustering services

You can run services in a clustered environment so that you can run multiple services on one computer or on multiple computers.

The most common system setup is to place every service within the same logical computer. This scenario is outlined in the installation documentation. This scenario is acceptable for smaller installations and development installations. This scenario is the easiest to manage and set up because the administrator is required to use only one set of scripts, on one logical computer to manage the instance. If you outgrow this type of installation, you can grow into a cluster configuration.

Advantages and possibilities of clustering are:
- Each of the six product services performs some specific tasks, and is isolated at run time because each service runs in a separate JVM. The advantage of this design is that each service has well-defined responsibilities, and can start or shut down independently.
- You can use clustering to distribute the load and processing within the product domain to make the best use of the system infrastructure. You can also use clustering to improve availability and system performance. The most common reason for setting up a clustered environment is for improving performance and scalability. The common clustered environment configuration includes having multiple scheduler's on dedicated computers. Separating the scheduler and appsvr services onto separate computers increases the performance in any installation where the scheduler is used for frequent, large, or long-running jobs.
- Determine the required number of scheduler and appsvr services you need to improve overall responsiveness. The number of concurrent jobs and their complexity determines the number of scheduler's and threads (number of jobs) that each scheduler can run.
- You might want to cluster multiple product instances to work as a group, either at the application server level, or product application level.
- When you create a clustered environment, if the primary server fails, the services that were not previously running on a secondary server can be restarted with minimal effort and downtime.

Limitations of clustering are:
- Running appsvr services on different servers can be problematic.
- You can start multiple services to distribute loads, such as multiple scheduler's to run jobs on one or more servers. However, the scheduler's are simple independent instances and do not support failover in case one instance is down.
- Running multiple instances of the workflow engine service is not supported.
- Clustering for high availability can require more testing for your implementation.

The two types of application server clustering are vertical and horizontal:

Vertical clustering

    Vertical clustering is effectively making the application server larger, or scaling it vertically. For example, if memory is slowing down performance, you can add memory inexpensively without any additional licensing costs, and more services can be deployed on the same hardware. This application is a simple and inexpensive way to achieve more performance from the system. With vertical clustering, you add more services to the same server.

Horizontal clustering

    Horizontal clustering uses multiple servers. Deploying on more servers is similar to deploying more services on the same computer (vertical clustering), but you must modify and run scripts for each server. You configure the admin_properties.xml file that is in the $TOP/etc/default directory to define each computer in your clustered environment.

    When you deploy on multiple servers, you must use a shared disk solution such as NFS.
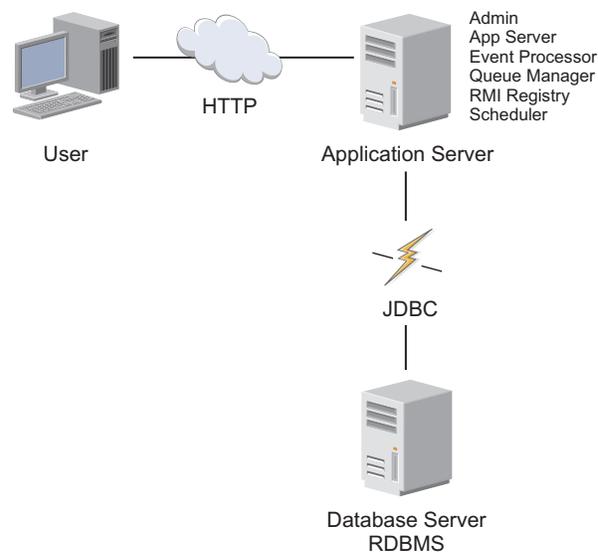
Vertical clustering

You can enable multiple appsvr and scheduler services on a single machine to increase the capacity of your installation.

Vertical clustering is only supported within the WebSphere Application Server environment. The following guidelines must be met:

- Ensure that there is an app server named `appsvr`. All other app servers must have unique names.
- The names of all the other WebSphere Application Server app server and virtual host components must be unique. The WebSphere Application Server appserver and virtual host components are installed in the same cell on the same node.
- The app servers must use separate ports.

The following figure shows a single application server configuration where you can add more admin, eventprocessor, queuemanager, or scheduler services to vertically scale the application server and create a clustered environment:

Single Application Server

Creating a second application server service on the same server:

To deploy a second application server service on the same server for vertical clustering, you must configure the application server to run on a different port and as a different instance name.

Two application servers are being defined:

- `appsvr` (the default)
  - Runs on port 7507
  - The WebSphere Application Server components are `my_was_server` and `my_was_vhost`.
- `appsvr2`
  - Runs on port 7508
  - The WebSphere Application Server components are `my_was_server2` and `my_was_vhost2`.

Both app servers are installed in profile `AppSvr01` in node `myNode01` in cell `myCell01`.

1. Stop all IBM InfoSphere Master Data Management Collaboration Server services.
2. Update the `env_settings.ini` file. Add the application server to the `appsvr` line in the `[services]` section.
3. Add a section to the `env_settings.ini` file for the new service. For example, if the new application server is called `appsvr01`, then you must add a section that is called `appserver.appsvr01`. You can copy an existing appserver section and update it.
4. Install the WebSphere Application Server components. Run the following scripts:
   - create_vhost.sh
   - create_appsvr.sh
   - install_war.sh

   These scripts replace the existing WebSphere Application Server components.
5. Restart all InfoSphere MDM Collaboration Server services.

```
[services]
appsvr=appsvr, appsvr2


[appserver]
type=websphere
rmi_port=17507
home=/opt/IBM/WebSphere/AppServer


...

[appserver.websphere]
application_server_profile=AppSrv01
cell_name=myCell01
node_name=myNode01
#admin_security=false

[appserver.appsvr]
port=7507
appserver_name=my_was_server
vhost_name=my_vhost

[appserver.appsvr2]
port=7508
appserver_name=my_was_server2
vhost_name=my_vhost2
```

Horizontal clustering

You can enable multiple appsvr, eventprocessor, queuemanager, or scheduler services on multiple machines to increase the capacity of your system installation.

The following figure shows a horizontally clustered environment where multiple services exist on multiple application servers:
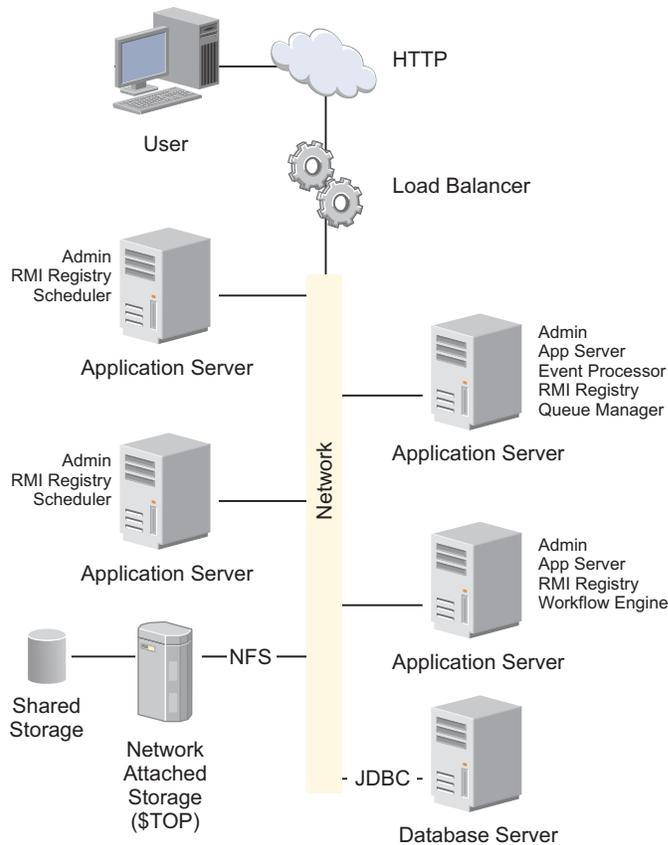
Restriction: The following restrictions apply to horizontal clustering:

- Each machine must run rmiregistry
- Each machine must run at least the admin service
- There can be only 1 instance of workflowengine in the entire cluster
- Each machine in the cluster requires a separate directory for configuration files (the contents of <install dir>/bin/conf) and a separate logging directory.

To tune a complex installation, you implement multiple services and spread them across multiple systems. Tuning a complex installation is the same as tuning single application servers, but tuning a complex installation might also involve using a hardware load balancer that routes user HTTP requests to a pool of application servers.

To tune an application server "pool", you:
- Plan the location and number of services
- Tune individual servers

Planning the location and number of application servers for scaling

In a system deployment that involves more than one application server, each application server must run one admin and one rmiregistry service. Only one workflowengine service can exist in an installation because using multiple workflowengine services will lead to data corruption. The appsvr, eventprocessor, queuemanager, or scheduler services can be instantiated multiple times on a single or on multiple physical systems and must be instantiated at least once. However,

the services that do the bulk of the work are the appsvr and the scheduler services. You typically need only one eventprocessor service and one queuemanager service.

Given these restrictions, best practices are:

- Run the eventprocessor and queuemanager services on any machine with any other service. These services are not "heavy" services.
- If a system runs the scheduler and appsvr services, use one or more dedicated systems for the scheduler. The application servers that you dedicate for the scheduler service must also run the admin and rmiregistryservices. If memory and CPU capacity exists, multiple schedulers can run on the same machine.
- If possible, do not run the appsvr service on a machine that also runs the scheduler.
- To improve response time for users, use multiple appsvr services. These appserver services can be on a single machine, or on multiple machines, or both. If possible, do not run the appsvr and scheduler services on the same system.

Tuning individual application servers

Tuning the application servers in the pool is similar to tuning a standalone application server. Although fewer services might be running on a given system, the practical maximum JVM size of 1.5 GB applies on 32-bit systems. If you have fewer services per system, you can use smaller individual systems where applicable.

Exception: In an environment with multiple application servers, the binary files and document store must be on a shared file system, most likely NFS. The connection between each application server and the NFS server must be examined for performance. Because InfoSphere MDM Collaboration Server does not create a high demand on the disk, it is possible to use one of the application servers as the NFS server. You must ensure that the NFS server is robust because the entire installation will fail if the NFS server fails.

Configuring member machines:

On each machine in the cluster, you need to configure the member machines. Every system must run at least the admin service and that only one workflow engine service can exist.

1. Create the init script.
   a. In the InfoSphere MDM Collaboration Server users .bashrc file on each machine, add the environment variable CCD_CONFIG_DIR and set it to the configuration directory. For example, export CCD_CONFIG_DIR=/home/mdmpim/mdmconfig.
   b. Log out and log in or source the init script.
2. Set your runtime parameters.
   a. Create an env_settings.ini file in the configuration directory.
   b. Set the **log_dir** parameter in the [env] section of the env_settings.ini file to the logging directory.

      Note: If you want to see the same log files for all of the services together, ensure that the logging directory is shared across all of the machines in the cluster.
   c. Define the services to be run on each system.
   d. Run setup.sh for each system.

e. Run `configureEnv.sh` for each system.

3. Update the `admin_properties.xml` file.

   a. On one system, edit the `<install dir>/etc/default/admin_properties.xml` file and add the host name of each node.

Example of a horizontal cluster:

The following example depicts a horizontal cluster.

This example uses the following configuration:

- IBM InfoSphere Master Data Management Collaboration Server is installed in the `/usr/local/mdmpim` directory. This directory is shared between all nodes and is available at `/usr/local/mdmpim` on all nodes. The InfoSphere MDM Collaboration Server user has read, write, and run permissions to the directory and all the files and directories below it.
- The InfoSphere MDM Collaboration Server user name is `mdmpim`
- The InfoSphere MDM Collaboration Server user's directory is `/home/mdmpim`
- The cluster consists of three systems:
  - `node1.mycompany.com`
  - `node2.mycompany.com`
  - `node3.mycompany.com`
- The logging directory is `/home/mdmpim/logs`
- The configuration directory is `/home/mdmpim/config`
- Node1 runs the appserver. Node 2 runs the workflowengine and a scheduler. Node 3 runs only a scheduler service.

Example

1. Create the logging directory. On all three nodes, run the `mkdir /home/mdmpim/logs` command.
2. Create the configuration directory. On all three nodes, run the `mkdir /home/mdmpim/config` command.

   a. On node1, run the `cp –r /usr/local/mdmpim/bin/conf/* /home/mdmpim/config` command.

   b. On node1, run the `rm –fr /usr/local/mdmpim/bin/conf/*` command.

3. Configure the InfoSphere MDM Collaboration Server user's environment. On all three nodes:

   a. Edit the `$HOME/.bashrc` directory.

   b. Set and export PERL5LIB and LANG.

   c. Set and export `CCD_CONFIG_DIR=/home/mdmpim/config`.

   d. Log out and log in.

4. Configure runtime parameters. On all three nodes:

   a. Create and edit the `env_settings.ini` file.

   b. Uncomment and set `log_dir=/home/mdmpim/logs`

   c. Configure services.

      1) On node1, edit the `[services]` section to read:

         ```
         admin=admin
         eventprocessor=eventprocessor
         queuemanager=queuemanager
         appsvr=appsvr
         ```

2) On node2:

```
admin=admin
scheduler=scheduler
workflowengine=workflowengine
```

3) On node3:

```
admin=admin
scheduler=scheduler
```

   d. Set the **appserver** and **db** parameters.

5. Start services. On all three nodes, change to the `<install dir>/bin/go` directory and run the `start_local.sh` script.

Deploy the product in a cluster environment

You can use deployment scripts to deploy IBM InfoSphere Master Data Management Collaboration Server in a clustered environment. You use the WebSphere Application Server Deployment Manager to deploy InfoSphere MDM Collaboration Server.

Overview of clustering and workload management

IBM InfoSphere Master Data Management Collaboration Server uses the clustering and workload management features by WebSphere Application Server.

InfoSphere MDM Collaboration Server supports the deployment of the InfoSphere MDM Collaboration Server product in this clustered environment as shown in the following figure.
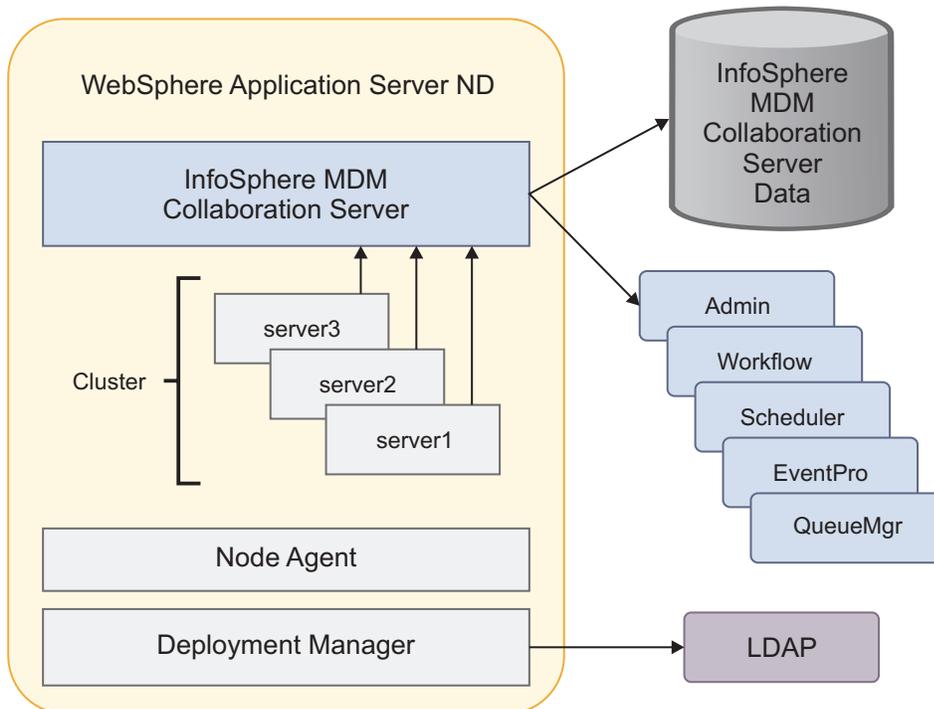
Figure 2. Cluster deployment for InfoSphere MDM Collaboration Server

Preparing the logging and configuration directories

To configure horizontal clustering, you need to prepare the logging and configuration directories.

1. Install IBM InfoSphere Master Data Management Collaboration Server. Ensure that the `<install dir>` directory is shared across all of the machines in the cluster and found on each machine in the same path. The InfoSphere MDM Collaboration Server user on each machine must have write permissions to the `<install dir>` directory. NFS is the ideal approach. To configure for horizontal clustering, you must manually install InfoSphere MDM Collaboration Server.

2. Create the configuration directory. Create a directory that is writable by the InfoSphere MDM Collaboration Server user. For example, `/home/mdmpim/config` on each machine. Each machine in the cluster requires its own directory for configuration files.

3. Create the logging directory. Create a directory that is writable by the InfoSphere MDM Collaboration Server user. For example, `/home/mdmpim/logs` on each machine. Each machine in the cluster can have its own logging directory.

   Note: If you want to see the same log files for all of the services together, ensure that the logging directory is shared across all the machines in the cluster.

4. On one system in the cluster, copy all the files and directories from the `<install dir>/bin/conf` to the directory created above. For example, `cp –r /usr/local/mdmpim/bin/conf/* /home/mdmpim/conf`. Delete all the files and directories under the `<install dir>/bin/conf` directory.

Maintaining a cluster environment

To maintain a cluster, some common tasks that you perform are adding more servers to the cluster, stopping the cluster, and restarting the cluster.

Ensure that you start the WebSphere Application Server Deployment Manager before you install InfoSphere MDM Collaboration Server and creating the cluster.

Important: Ensure that you do not use the `install_war.sh` script on an existing cluster or cluster member. If you run this script on an existing cluster or cluster member, a failed error message is displayed.

Important: Before the deployment, ensure that only `server1` exists. If any other servers exist, delete it.

Ensure that you set up the WebSphere Application Server. For more information, see "Setting up WebSphere Application Server" on page 45

1. Create more application servers. For more information about creating application servers, see: WebSphere Application Server product documentation Create more members, for example, `server2` at port 9081 and `server3` at port 9082, in the cluster.

2. Restart the cluster.

   a. Stop the cluster. For more information about stopping the cluster, see: WebSphere Application Server product documentation. For example, select the cluster MDMPIM and click **Stop**. All servers (members) are stopped.

   b. Start the cluster. For more information about starting the cluster, see: WebSphere Application Server product documentation. For example, select the cluster MDMPIM and click **Start**. All servers (members) are started.

3. Stop and start servers `server1`, `server2`, and `server3`.
   a. Stop all of the servers. For more information, see Stopping the product.
   b. Start all of the servers. For more information, see Starting the product.

Deploying InfoSphere MDM Collaboration Server using WebSphere Application Server Deployment Manager

Before you can deploy IBM InfoSphere Master Data Management Collaboration Server, you must configure your application server, create a cluster, configure your host, sync the application servers, and restart the cluster and InfoSphere MDM Collaboration Server.

Ensure you meet the following prerequisites:
- Start the WebSphere Application Server Deployment Manager before you install InfoSphere MDM Collaboration Server and creating the cluster.

  Important: Ensure that you do not use the `install_war.sh` script on an existing cluster or cluster member. If you run this script on an existing cluster or cluster member, a failed error message is displayed.

  Important: Before the deployment, ensure that only `server1` exists. If any other servers exist, delete it.
- Ensure that you set up WebSphere Application Server. For more information about setting up the server, see "Setting up WebSphere Application Server" on page 45
- If you are using IBM WebSphere MQ, ensure that you install WebSphere MQ Client on all instances of InfoSphere MDM Collaboration Server on every cluster.

Deploy InfoSphere MDM Collaboration Server using WebSphere Application Server Deployment Manager:
1. Deploy the application on the application server. For more information, see "Configuring WebSphere Application Server" on page 81.
   a. Ensure `server1` is used in the `env_settings.ini` file. For example:

      ```
      [appserver.websphere]
      application_server_profile=mdmpim
      cell_name=mdmpimNode01Cell

      node_name=mdmpimNode01
      # set security to true if administrative security is enabled.
      Defaults to false if not set
      admin_security=false

      [appserver.appsvr]
      port=9080
      # for websphere, add appserver_name and vhost_name
      appserver_name=server1
      vhost_name=mdmpim_vhost
      ```

      Since `server1` is already created, the step for `create_appsvr.sh` can be skipped.
   b. Install InfoSphere MDM Collaboration Server to the application server `server1`.

c. Log in to InfoSphere MDM Collaboration Server: http://
   <hostname>:<port>/utils/enterLogin.jsp

2. Create the cluster with one existing application server. For more information about creating a cluster, see: WebSphere Application Server product documentation A new cluster is created with one member that is converted from the application server server1.

3. Create more application servers. For more information about creating an application server, see: WebSphere Application Server product documentation Create more members, for example, server2 at port 9081 and server3 at port 9082, in the cluster.

4. Configure the virtual host. For more information about configuring a virtual host, see: WebSphere Application Server product documentation Configure the virtual host mdmpim_vhost with host aliases for all cluster members (hostnames/ports) on the WebSphere Application Server admin console, for example:
   - *:9080 - for server1
   - *:9081 - for server2
   - *:9082 - for server3

5. Sync all of the application servers. Before you restart all of the cluster members, do a full synchronization and populate the application on server1 to all other servers, that is, server2 and server3. For more information about syncing, see: WebSphere Application Server product documentation Select the node that is used for this application, for example, mdmpimNode01, and click **Full Resynchronize**. For more information about Full Resynchronize, see WebSphere Application Server product documentation.

6. Restart the cluster.
   a. Stop the cluster. For more information about stopping the cluster, see: WebSphere Application Server product documentation. For example, select the cluster MDMPIM and click **Stop**. All servers (members) are stopped.
   b. Start the cluster. For more information about starting the cluster, see: WebSphere Application Server product documentation. For example, select the cluster MDMPIM and click **Start**. All servers (members) are started.

7. Stop and start servers server1, server2, and server3.
   a. Stop all of the servers. For more information, see Stopping the product.
   b. Start all of the servers. For more information, see Starting the product.

Configuring runtime properties

You must set a few runtime properties in the common.properties file as part of configuring IBM InfoSphere Master Data Management Collaboration Server. For more information about these parameters, see the comments in the common.properties file.

A compatibility script, for example, **configureEnv.sh**, supports limited backwards-compatibility. This script creates the shell scripts, **compat.sh** in the <install dir>/bin directory. This script, **compat.sh** contains the most-commonly used environment variables from the pre-6.1 configuration. Additionally, a Perl script <install dir>/bin/perllib/getTop.pl can be used to get the absolute path to <install dir>.

The script **configureEnv.sh** generates the `common.properties` file from the values in the `env_settings.ini` file. The `common.properties` file must be customized after the **configureEnv.sh** script is run and before InfoSphere MDM Collaboration Server is started for the first time.

1. If you are using FTP, set the directory for using FTP for import operations by specifying the **FTP_root_dir** parameter.
2. Set the temporary directory by specifying a value for the **tmp_dir** parameter. The directory /tmp is the default.

See "Creating a schema" for what to do next.

Run schema creation scripts

After you install the application server, the database and the IBM InfoSphere Master Data Management Collaboration Server application, you must run the scripts to create the schema for the database.

Creating a schema

IBM InfoSphere Master Data Management Collaboration Server provides a script that you use to create the schema for your database.

Before you can create a schema, ensure that you:
• Create valid table space names and ensure that they are valid.
• Ensure database connectivity.

.

If you run the `create_schema.sh` script without the *tablespace* option, all tables and indexes are created in the default table spaces USERs and INDX only. If you created all of the buffer pools and table spaces as outlined in the Creating tablespaces topic, make sure to use an appropriate table space mapping file.

The `<install dir>/bin/db/analyze_schema.sh` runs the native database schema analyzer.

1. Use the following shell script to create the schema: `<install dir>/bin/db/create_schema.sh`. It creates a log file that is called `<install dir>/logs/schema.log`.

   Attention: When you run the `create_schema.sh` script, errors are not displayed. Ensure that you review the log file to view any errors.

   Note: Only run *create_schema.sh* one time. If you run `create_schema.sh` on an existing schema, you replace it with an empty schema.

2. Optional: You can specify the `--tablespace` argument to specify a table space name mapping file that shows the customized table space names for the required table spaces: `create_schema.sh --tablespace=<tablespace name mapping file>`. If you do not specify the argument `--tablespace=`*tablespace_name_mapping_file* on the command line when you first run the `create_schema.sh` script, all tables and indexes are created in the default table spaces USERS and INDX. If you do not specify the argument `--tablespace=`*tablespace_name_mapping_file* in a later run, the name that is used for the previous *create schema* operation is used. For more information about table spaces, see "Table space names for static tables" on page 95

3. Review the log file after running the `create_schema.sh` command to check for errors.

Custom table space names

There are two types of tables: static tables and runtime tables. There are also two ways InfoSphere MDM Collaboration Server creates tables.

Static tables

These tables are created during installation phase when you run the **create_schema.sh** script.

Runtime tables

These tables are created during run time when the following functions are used.

- Creating user-defined logs
- Deleting a catalog
- Importing items
- Integrity verification scripts
- Docstore Maintenance script

By default, table spaces USERS, INDX, and BLOB_TBL_DATA are used for creating InfoSphere MDM Collaboration Server database tables. Table space name customization for overriding default table space names is available in the following section.

This custom table space function addresses the deployment issues and is for new installations only, so there are no migration issues. If you have an existing system that is deployed, your DBA must manually change the table space names for all tables under InfoSphere MDM Collaboration Server database schema on an appropriate maintenance window. Also, the table space parameter in the `common.properties` file must be updated to new table space names where you want the runtime tables to be created.

Table space names for runtime tables:

IBM InfoSphere Master Data Management Collaboration Server creates tables during run time using default table space names: USERS and INDX.

The default table space names can be changed through the `$TOP/etc/default/common.properties` file.

You can change these default table space names on these parameters in the `user_tablespace_name` and `index_tablespace_name` file. For example,

```
user_tablespace_name=pim_data
index_tablespace_name=pim_index
```

In this example *pim_data* and *pim_index* replaces USERS and INDX table spaces. These table spaces are used for tables that are created during run time.

Important: These properties are optional. If any of them is not defined, the hardcoded default values are used.

Note: The properties **user_tablespace_name** and **index_tablespace_name** are not listed in the `$TOP/etc/default/common.properties` directory. If you intend to

change your table space names, then you need to add these properties to the $TOP/etc/default/common.properties directory and set the required values.

After you modify the table space name parameters, InfoSphere MDM Collaboration Server must be restarted. You must ensure that the table spaces are created and usable by InfoSphere MDM Collaboration Server database user before you restart.

Table space names for static tables:

InfoSphere MDM Collaboration Server creates tables during installation phase using default table space names: USERS, INDX, and BLOB_TBL_DATA.

A table space mapping file can be used to define custom table space names instead of the default table space names that are mentioned previously. This file is a comma-delimited text file that maps the tables, table spaces, and index table spaces together. This file is used as a parameter for the **create_schema.sh** script, for example:

```
$TOP/bin/db/create_schema.sh --tablespace=<table space name mapping file>
```

The table space name mapping file has the following format for each line:

```
table_name,(table_tablespace_name), (index_tablespace_name)
```

As shown previously, both **table_tablespace_name** and **index_tablespace_name** are optional. For example:

```
tctg_sel_selection,ctg_tables,
tctg_dys_dynamic_selection,ctg_tables,
tctg_itm_item,
tctg_itd_item_detail,ctg_tables,ctg_indx
tctg_ita_item_attributes,ctg_tables,ctg_indx
```

The table space name mapping file includes the following properties:
- If any of the **table_tablespace_name** and **index_tablespace_name** are not specified, the default table space names are used.
- All the tables that are used by InfoSphere MDM Collaboration Server is not included in the mapping file, use the default table space names.
- Blank lines are ignored.
- Lines that starts with # are considered as comment lines and are ignored, for example:

```
#---------------------------
# This is a comment line
#---------------------------
```

A default mapping file is in: $TOP/src/db/schema/gen/tablespace_name_mapping_file.txt

This file follows the format that is specified previously and it can be used as a template for customizing table space names. It includes all required table spaces that are created during installation phase of InfoSphere MDM Collaboration Server.

In production environments it is ideal to use the table spaces as outlined in the table space requirements section, so highly used tables such as itd, ita, itm,

icm, and `lck` are stored in separate table spaces and buffer pools. This separation helps to improve overall performance. To do so, you need to create a table space mapping file with the following contents:

```
tctg_itd_item_detail,itd_data,itd_ix
tctg_ita_item_attributes,ita_data,ita_ix
tctg_itm_item,itm_data,itm_ix
tctg_icm_item_category_map,icm_data,icm_ix
tutil_lck_lock,lck_data,lck_ix
```

Testing the database connectivity

Before you can use IBM InfoSphere Master Data Management Collaboration Server, you must create the database schema.

When you are connecting the database, the `<install dir>/bin/test_db.sh` script tests the native client and the JDBC connections. The script prints any errors.

The schema generation script, **create_schema.sh**, does not stop if it encounters an error nor does it display errors. Examine the log file, `<install dir>/logs/schema.log`, to ensure that the schema was successfully created.

You can run the script, **create_schema.sh**, with the **–verbose** option. This option prints the logging information to the log file. It also includes the SQL that was sent to the database and the output from the Java programs.

1. Verify database user. Verify that the database user referenced in the `common.properties` file exists in the database with the correct privileges.
2. Verify that you have command-line connectivity and that InfoSphere MDM Collaboration Server can connect to the database by running the following shell script:
   a. Run `test_db.sh`. The command `test_db.sh` tests command-line connectivity using DB2 or sqlplus. It also tests JDBC connectivity using Java.
3. After the database user is set up correctly, create the InfoSphere MDM Collaboration Server database schema.

Error handling for table space name mapping file

In addition to the standard script errors in 'create schema', and the new *tablespace_name_mapping_file* command-line argument, the mapping file errors are validated.

The following mapping file errors are validated:

1. If the mapping file does not exist, the system returns this error:

   ```
   The tablespace name mapping file 'file_name' does not exist.
   ```

   If this output happens, the script stops.

2. If the mapping file is not a readable text file or invalid, the system returns this error:

   ```
   The tablespace name mapping file 'file_name' is invalid.
   ```

   If this output happens, the script stops.

3. If a line in the mapping file is not formatted as required, the system returns this error:

```
The following line in the tablespace name
mapping file 'file_name' is invalid and
will be ignored: the_line.
```

If this output happens, the script continues.

4. If a table name in a line in the mapping file does not exist or is not a valid IBM InfoSphere Master Data Management Collaboration Server table, the system ignores the line and return this error:

```
Invalid table name: table_name.
```

If this output happens, the script continues.

5. If a table name or the whole line is duplicated, ignore the line and report warning to user:

```
Duplicated table name: table_name.
```

If this output happens, the script continues.

The *table_tablespace_name* and *index_tablespace_name* are optional. If any of them are missing, `create_schema.sh` script uses the default table space names. No error message or warning is returned.

If the table space name mapping is completed successfully, the system returns this message:

```
The system has applied the tablespace name(s) for each table successfully.
```

If any error reported, the system returns this message:

```
The system failed to apply the tablespace name(s) for each tables
```

All of these message strings are localized.

Configuring GDS feature

You must configure a few GDS parameters in order for IBM InfoSphere Master Data Management Collaboration Server to be able to exchange product data with a data pool.

Creating a `.bindings` file for Windows

To configure the IBM InfoSphere Master Data Management Collaboration Server GDS WebSphere MQ settings, you need to create a `.bindings` file.

The following steps create a `.bindings` file on the Windows operating system.

1. Set up the WebSphere Message Queue class path. The WebSphere Message Queue default installation directory is at `C:\Program Files\IBM\WebSphere MQ` in Windows that should be set as `MQ_INSTALL_DIR`. Assuming you must update the system class path variable *(CLASSPATH)* with the following JAR files:
   - <MQ_INSTALL_DIR>\Java\lib\providerutil.jar
   - <MQ_INSTALL_DIR>\Java\lib\com.ibm.mqjms.jar
   - <MQ_INSTALL_DIR>\Java\lib\ldap.jar
   - <MQ_INSTALL_DIR>\Java\lib\jta.jar

- `<MQ_INSTALL_DIR>\Java\lib\jndi.jar`
- `<MQ_INSTALL_DIR>\Java\lib\jms.jar`
- `<MQ_INSTALL_DIR>\Java\lib\connector.jar`
- `<MQ_INSTALL_DIR>\Java\lib\fscontext.jar`
- `<MQ_INSTALL_DIR>\Java\lib\com.ibm.mq.jar`

2. Create a directory on the WebSphere MQ server and call it: `C:\JNDI-Directory`.

   Note: If this directory exists, delete any earlier versions of the `.bindings` files from it.

3. Go to the `<MQ_INSTALL_DIR>\Java\bin` directory and add the following changes to the `JMSAdmin.config` file. Ensure that the values for the following parameters are:

   - INITIAL_CONTEXT_FACTORY=com.sun.jndi.fscontext.RefFSContextFactory
   - PROVIDER_URL=file:/C:/JNDI-Directory

   Note: If these parameters are not present, include these parameters with the previous values.

4. Open a command prompt and change the directory to `<MQ_INSTALL_DIR>\Java\bin`. Issue the `JMSAdmin.bat` file. On successful initialization of this batch file, you see a `InitCtx>` prompt. You are now ready to run the MQSC commands. If an exception occurs, then check whether the class path system variable is properly set for the JAR files that are listed in step 1 previously.

5. Run the following commands in this sequence:

   a. `InitCtx> def q(INBOUND_QUEUE_NAME)`

   b. `InitCtx> def q(OUTBOUND_QUEUE_NAME)`

   c. `InitCtx> def qcf(QUEUE_CONNECTION_FACTORY_NAME) transport(CLIENT) channel(java.channel) host(WMQ_SERVER_IP)`

   d. `port(WMQ_SERVER_DEFINED_PORT) qmgr(QUEUE_MANAGER_NAME)`

   e. `InitCtx> end`

   For example:

   a. `InitCtx> def q(XML_IN)`

   b. `InitCtx> def q(XML_OUT)`

   c. `InitCtx> def qcf(ptpQcf) transport(CLIENT) channel(java.channel)`

   d. `host(9.121.222.84) port(1414) qmgr(bcg.queue.manager)`

   e. `InitCtx> end`

   Where:

   XML_IN
   > The inbound queue that is used by the GDS messaging service to read from.

   XML_OUT
   > The outbound queue to which GDS posts messages.

   ptpQcf
   > The queue connection factory name as defined in `$TOP/bin/conf/env_settings.ini` as a value for the **queue_connection_factory** parameter under the [gds] section.

   9.121.222.84
   > The WebSphere MQ server IP address.

1414 The WebSphere MQ server that is defined listen port.

bcg.queue.manager
> The queue manager name under which the queues are defined.

Note: If you receive a message similar to unable to bind object message, check whether the JNDI-Directory directory exists. Also, if there is already an earlier version of the .bindings file in the folder, delete it and redo steps 4 and 5 previously.

6. Copy the generated .bindings file from the JNDI-Directory directory and paste the file to the required destination at InfoSphere MDM Collaboration Server under the following directories:
   - $TOP/etc/default/
   - $TOP/etc/appsvrgds_<SERVER_NAME>

Setting Global Data Synchronization parameters

Ensure that you set the following Global Data Synchronization feature parameters.

1. Open the env_settings.ini file, and go to the [gds] section.
2. Set the following parameters:

enabled
> Set this parameter to one of two possible values, yes or no. Set it to yes if you want to enable GDS. The default is no.

company_code
> Set this parameter to the company code for which you want to load the GDS data model.

gds_app_type
> Set this parameter to one of two possible values, Demand or Supply.

ACTIVE_DATA_POOL_ID
> Set this parameter to one of two possible values, Transora or WWREV6.

inbound_queue_name
> Enter the name of the WebSphere MQ inbound queue from where the listener of the Global Data Synchronization feature of IBM InfoSphere Master Data Management Collaboration Server will read XML messages.

outbound_queue_name
> Enter the name of the WebSphere MQ outbound queue where the Global Data Synchronization feature of IBM InfoSphere Master Data Management Collaboration Server will post or push XML messages.

queue_connection_factory
> Enter the name of the WebSphere MQ queue connection factory.

datapool_gln
> Enter the GLN of the data pool with which the Global Data Synchronization feature of InfoSphere MDM Collaboration Server is supposed to exchange XML messages.

self_gln
> Enter the GLN of your organization. You need to populate this parameter only if your organization is a retailer type of organization (gds_app_type=Demand).

3. Go to the [appserver.appsvrgds] section and set the following parameters:

port Set this parameter to a value of your choice. The value that you set is the port number used by the Global Data Synchronization feature of InfoSphere MDM Collaboration Server appserver for GUI. For example, 7525.

appserver_name
Set this parameter to gds_<APP_SERVER_NAME>. For example, gds_appsvr.

vhost_name
Set this parameter to gds_<VIRTUAL_HOST_NAME>. For example, gds_vhost.

4. Go to the [services] section and set the following parameters:

appsvr
appsvr, appsvrgds

5. Because many functions in Global Data Synchronization have dependencies on the services provided by WebSphere MQ, set the following parameters in the [mq] section:

enabled
Set to `yes` to enable the support for functions which have dependencies on MQ.

home The installation directory of the WebSphere MQ client. Lowest version required is 7.0.1.

6. Save and close the `env_settings.ini` file.

7. If you are using WebSphere Application Server as your application server, you must complete these configuration steps for the WebSphere MQ .jar files.

   a. Change directories to the `<install_dir>`/jars directory.

   b. Create the following three soft links, replacing *WAS_HOME* with the home directory for WebSphere Application Server and *DEFAULT_APPSVR* with the name of the default application server:

      - ln -s `<WAS_HOME>`/profiles/`<DEFAULT_APPSVR>`/installedConnectors/ wmq.jmsra.rar/com.ibm.mq.jar com.ibm.mq.jar

      - ln -s `<WAS_HOME>`/profiles/`<DEFAULT_APPSVR>`/installedConnectors/ wmq.jmsra.rar/com.ibm.mqjms.jar com.ibm.mqjms.jar

      - ln -s `<WAS_HOME>`/profiles/`<DEFAULT_APPSVR>`/installedConnectors/ wmq.jmsra.rar/dhbcore.jar dhbcore.jar

   c. Run the `bin/configureEnv.sh` script to update the classpath.

Here is an example of the `appserver.appsvr` and `appserver.appsvrgds` sections of the `env_settings.ini` file:

```
#For PIM App Server
  [appserver.appsvr]
  port=7505
  appserver_name=pim_appsvr
  vhost_name=pim_vhost
  #For GDS App Server
  [appserver.appsvrgds]
  port=7525
  appserver_name=gds_appsvr
  vhost_name=gds_vhost
```

Here is an example of the `services` section of the `env_settings.ini` file:

```
[services]
admin=admin
eventprocessor=eventprocessor
queuemanager=queuemanager
scheduler=scheduler
workflowengine=workflowengine
appsvr=appsvr,appsvrgds
```

Here is an example of the mq section of the env_settings.ini file:

```
[mq]
enabled=yes
home=/opt/mqm
```

Configuring Global Data Synchronization memory parameters for messaging

You need to configure the Global Data Synchronization memory parameters for the messaging module before you can use the Global Data Synchronization messaging service.

1. Open the `<Install_Dir>/bin/gdsmsg.sh` file.
2. Set the values for the initial heap size and the maximum heap size on the **CCD_JMS_JVM_DEBUG_OPTS** parameter. The default values are -Xmx1024m -Xms512m.

   Note: You must not attempt to set the maximum heap size more than the physical memory available on your computer.
3. Save and close the `<Install_Dir>/bin/gdsmsg.sh` file.

This is an example of setting the CCD_JMS_JVM_DEBUG_OPTS parameter for an initial heap size of 512 MB and a maximum heap size of 1024 MB.

```
CCD_JMS_JVM_DEBUG_OPTS="-Xmx1024m -Xms512m"
```

Setting up an AS2 connector

You must install and configure an AS2 connector to enable IBM InfoSphere Master Data Management Collaboration Server to communicate with a datapool.

The AS2 protocol is used for communication between InfoSphere MDM Collaboration Server and a datapool. This protocol provides fast and secure transmission of business data.

Install and configure the AS2 connector. For more information, refer to your AS2 connector documentation.

AS2 connector

The AS2 (Applicability Statement 2) protocol is used for securely transmitting business documents in the XML, binary, and Electronic Data Interchange (EDI) formats over the Internet. It is frequently used in business-to-business data exchange operations. In order to ensure correct XML data exchange, the Global Data Synchronization Network has identified and defined AS2 as the standard for communication between suppliers and data pools and data pools and retailers for end-to-end connectivity.

The AS2 protocol is based on the HTTP and SMIME protocols. It allows messages to be encrypted and signed. It also allows the receiver of a message to generate a confirmation message that is sent to the sender of the message.

The Global Data Synchronization feature of IBM InfoSphere Master Data Management Collaboration Server requires a distinct AS2 connector software application that uses the AS2 protocol to communicate with a data pool. The business documents that are exchanged between InfoSphere MDM Collaboration Server and the data pool are in the XML format.

One example of an AS2 connector software that you can use is IBM WebSphere Partner Gateway. For more information about how to install and configure WebSphere Partner Gateway as your AS2 connector software, see the IBM WebSphere Partner Gateway product documentation.

Connecting to a data pool

You need to connect to a data pool to send or receive data.

Before you can connect to a data pool, you must register with the data pool. Registration with a data pool requires you to enter into a contract and to pay the subscription fee. On successful registration, you get the URL that the data pool exposes to customers, and one or more global location numbers (GLNs).

1. Define a participant connection for sending information from IBM InfoSphere Master Data Management Collaboration Server to the data pool. You need to enter the URL that the data pool exposes, the global location numbers that you received from the data pool on registering, and the protocol in which you plan to send your product documents.
2. Define a participant connection for receiving information from the data pool. You need to enter the protocol in which you plan to receive product documents.
3. Activate the connections.

Chapter 7. Verifying the installation

To verify that you have successfully installed IBM InfoSphere Master Data Management Collaboration Server, log in to the product user interface.

Post-installation checklist

After installing IBM InfoSphere Master Data Management Collaboration Server, use the following checks to ensure that you have set up the application correctly.

Database Configuration and Settings

Database Configuration for Oracle Database

All necessary InfoSphere MDM Collaboration Server configurations for Oracle are enabled in `init.ora` file in Oracle. Refer to "Setting up your Oracle database" on page 32 for details on setting up Oracle for use with InfoSphere MDM Collaboration Server. Once the Oracle database is up, the necessary InfoSphere MDM Collaboration Server settings can be verified. You can consult your DBA for assistance with this.

Database Configuration for DB2 Database

All necessary InfoSphere MDM Collaboration Server settings for DB2 database are enabled in three different configuration areas:

1. DB2 Registry variables.
2. DB2 Database Manager Configuration.
3. DB2 Database configuration.

All of these settings can be checked by running a shell script from DB2 Server using DB2 instance owner id to verify the IBM InfoSphere Master Data Management Collaboration Server Installation Guide recommended value with the current value for configuration settings. For details on setting up DB2 for InfoSphere MDM Collaboration Server, see "Setting up your DB2 database" on page 15. For assistance with the shell script, consult your DBA.

WebSphere Application Server settings

You can check settings in WebSphere Application Server admin console against recommendations for WebSphere Application Server in the WebSphere Application Server documentation and against those made in the InfoSphere MDM Collaboration Server Installation Guide, and you can verify that the correct Java and JDK libraries are used. For WebSphere Application Server setup information, see "Setting WebSphere Application Server parameters" on page 78.

Product settings

All product settings are stored in the `common.properties` file. Verify that all the required settings are understood and used.

If necessary verify that the Mount manager is installed and configured correctly.

Setting up a test company using a script

Your product information management (PIM) data is organized in IBM InfoSphere Master Data Management Collaboration Server by companies. To be able to log in to InfoSphere MDM Collaboration Server, you must create a test company using the script that is provided.

<install dir>/bin/db/cleanup_cmp.sh can be used to drop all information in a company such as items and catalogs. The –code argument is required for both create_cmp and cleanup_cmp

1. Use the following shell script to create the schema: `<install dir>/bin/db/create_cmp.sh`. For example, For example, `create_cmp.sh –code=<company code> --name=<company name>`. It creates a log file <install dir>/logs/create_cmp.log

   This script creates the company. You can use this empty test company in your test environment. You can use the `create_cmp.sh` script to create additional test companies.

   Note: ID and password information is hard-coded when you create the company using the script, and so they are case sensitive.

2. Create an empty company called 'test' (which contains no predefined data), by running the following shell script:

   `<install dir>/bin/db/create_cmp.sh --code=test`

   The company demo is created with a single user: admin. The password for admin is "trinitron". Passwords are case-sensitive. The admin user is created with full privileges and should be used by an administrator.

   Remember: You must execute the `create_cmp.sh` shell script only when your system is down. You must not execute the `create_cmp.sh` shell script multiple times in parallel so that more than one instance is running at a given time, otherwise the scripts will fail.

3. Review the log file after executing create_cmp.sh to check for errors.

Loading Global Data Synchronization data model

You need to load Global Data Synchronization data model to enable IBM InfoSphere Master Data Management Collaboration Server to publish product information to your data pool as well as to receive product information from your data pool.

The Global Data Synchronization feature of InfoSphere MDM Collaboration Server loads the appropriate data model based on the configuration settings in the `env_settings.ini` file. The data model is loaded by running the `loadGDSDatamodel.sh` script.

1. Navigate to the `$TOP/bin/db` directory.
2. Run the `loadGDSDatamodel.sh` script.

Starting the product

When you start IBM InfoSphere Master Data Management Collaboration Server, you also start all of its services, and the application servers including the application server of the Global Data Synchronization feature.

Before you start the product, you must ensure that you have configured the application server of the Global Data Synchronization feature in the [services] section of `env_settings.ini` file.

You need to run the `start_local.sh` script to start the product and all of the services that are needed to run the product; and the `rmi_status.sh` script to verify that the application is running. You also need to start the messaging service of the Global Data Synchronization feature to send and receive XML messages. An environment which provides graphical support (for example, VNC) is recommended. In the case where global security is enabled in WebSphere Application Server but the parameter `admin_security=false` is specified in the `env_settings.ini`, you will be prompted with a dialog to provide the WebSphere Application Server administrative username and password. If you use an environment like PuTTY which does not have graphical support, the execution of the command will appear hanged.

1. Run the `start_local.sh` script. This script is located in the `<install directory>/bin/go` directory. If `admin_security=true` is set in the `env_settings.ini` file but the username and password are not provided in the [appserver] section, you should specify these values in the command line as shown below.

   ```
   start_local.sh --wsadminUsername=<was_admin_user>
     --wsadminPwd=<was_admin_password>
   ```

   If `admin_security=true` is set but the username and password are not provided in the `env_settings.ini` file nor as the arguments to the command, you will be prompted to enter the values in the console.

2. Run the `gdsmsg.sh` script with the **start** parameter if you have enabled the Global Data Synchronization feature of InfoSphere MDM Collaboration Server. This script is located in the `<install directory>/bin` directory. You can use the **status** parameter to fetch the status of the Global Data Synchronization listener service.

   ```
   $<Install_Dir>/bin/gdsmsg.sh start
   ```

3. Run the `rmi_status.sh` script to verify that the application is up and running, and that the services have started. The following information is displayed:
   - admin_<name of instance>
   - appsvr_<name of instance>
   - eventprocessor_<name of instance>
   - queuemanager_<name of instance>
   - scheduler_<name of instance>
   - workflowengine_<name of instance>

   This process takes approximately 30-40 seconds, depending on the speed of the processor.

This is an example of output from running the `rmi_status.sh` script showing that all services have started on "pimserver1" where the Global Data Synchronization feature is enabled:

```
[pim1@pimserver1 pim1]$ /opt/pim/pim1/pim900/bin/go/rmi_status.sh
[success] rmistatus (Mon Mar 8 14:00:49 PDT 2010)
//pimserver1:17507/samplemart/admin/admin_pimserver1
//pimserver1:17507/samplemart/appsvr/appsvr_pimserver1
//pimserver1:17507/samplemart/appsvr/appsvrgds_pimserver1
//pimserver1:17507/samplemart/queuemanager/queuemanager_pimserver1
```

```
//pimserver1:17507/samplemart/workflowengine/workflowengine_pimserver1
//pimserver1:17507/samplemart/scheduler/scheduler_pimserver1
//pimserver1:17507/samplemart/eventprocessor/eventprocessor_pimserver1
```

This is an example of output from running the `rmi_status.sh` script showing that all services have started on "pimserver1" where the Global Data Synchronization feature is not enabled:

```
[pim1@pimserver1 pim1]$ /opt/pim/pim1/pim900/bin/go/rmi_status.sh
[success] rmistatus (Mon Mar 8 14:00:49 PDT 2010)
//pimserver1:17507/samplemart/admin/admin_pimserver1
//pimserver1:17507/samplemart/appsvr/appsvr_pimserver1
//pimserver1:17507/samplemart/queuemanager/queuemanager_pimserver1
//pimserver1:17507/samplemart/workflowengine/workflowengine_pimserver1
//pimserver1:17507/samplemart/scheduler/scheduler_pimserver1
//pimserver1:17507/samplemart/eventprocessor/eventprocessor_pimserver1
```

Logging in to the product

IBM InfoSphere Master Data Management Collaboration Server provides a browser-based user interface that you can use to manage and administer your system. You log in with the user name, password, and company that you created from the demo scripts.

1. Open your web browser and enter the URL and port for the Web server. It is important to enter a fully qualified host name along with "`/utils/enterLogin.jsp`". The URL will be similar to the following:

   `http://~/utils/enterLogin.jsp` where ~ is the DNS name or IP address of the system on which the product is running, and the port is defined in the `common.properties` file.

   Note: During the product installation, the web server port was set to 7507 in a two tier configuration. If a different port is used, change the port reference in the file "`server.xml`" for a three tier configuration

2. Use the user name, password, and company that was created from running the demo test scripts. For example, enter the following information:

   Username: Admin

   Password: trinitron

   Company Code: acme

   For details see "Setting up a test company using a script" on page 104

   Note: ID and password information was hard-coded when you created the company using the script, and so these are case sensitive.

If the product home-page loads, the installation was successful. Log out of the application.

Logging in to Global Data Synchronization

Global Data Synchronization provides a browser-based user interface that you can use to manage and administer your system.

Open your web browser and enter the URL and port for the Web server. The URL will be similar to the following:
`http://<Server_Name_OR_IP>:<Port_Number>/Login.do` where
<Server_Name_OR_IP> is the server name or IP address of the system on which the product is running, and the port is defined in the `env_settings.ini` file.

For example, if the port number defined for Global Data Synchronization is 7527, you would have to define the port number in the following location:

- File path and name: `<MDMPIM_Install_Dir>/bin/conf/env_settings.ini`
- Section: `[appserver.appsvrgds]`
- `# This section is specifically for GDS.`
  `[appserver.appsvrgds]`
  `port=7527`

Therefore, the URL would be `http://<Server_Name_OR_IP>:7527/Login.do`

If the product home-page loads, the installation was successful. Log in to the application.

Configuring the product using the Firststeps application

After you have configured IBM InfoSphere Master Data Management Collaboration Server, you can use the Firststeps application to verify the configuration and perform certain tasks.

The Firststeps application enables you to get started with the product once the product has been installed and configured.

1. Open the Firststeps application. The Firststeps file is called launchpad.sh and is located in the `<product install>` directory in the `firststeps/disk1` directory.
2. Click the Verify Installation link to check if the product has been installed successfully.
3. Click on the link to start the application.
4. Run the rmi_status.sh script to check the status of the application. This script is available in the `<product install directory>/bin/go` directory.
5. Click the Create a company link to create a company. This step will succeed only if the product schema has already been created.

Stopping the product

To update or change the runtime configuration of IBM InfoSphere Master Data Management Collaboration Server, you must stop the product and all of its services, and the application servers including the application server of the Global Data Synchronization feature.

You need to run the `abort_local.sh` script to stop the product and all of the services. You also need to stop the messaging service of the Global Data Synchronization feature. An environment which provides graphical support (for example, VNC) is recommended. In the case where global security is enabled in WebSphere Application Server but the parameter `admin_security=false` is specified in the `env_settings.ini` file, you will be prompted with a dialog to provide the WebSphere Application Server administrative username and password. If you use an environment likes PuTTY which does not have graphical support, the execution of the command will appear hanged.

1. Run the `abort_local.sh` script. This script is located in the `<install directory>/bin/go` directory. If `admin_security=true` is set in the `env_settings.ini` but the username and password are not provided in the [appserver] section, you should specify these values in the command line as shown below.

```
abort_local.sh --wsadminUsername=<was_admin_user>
   --wsadminPwd=<was_admin_password>
```

If `admin_security=true` is set in the `env_settings.ini` but the username and password are not provided in the [appserver] section, nor as the arguments to the command, you will be prompted to enter the values in the console.

2. Run the `gdsmsg.sh` script with the **stop** parameter if you have enabled the Global Data Synchronization feature of InfoSphere MDM Collaboration Server. This script is located in the `<install directory>/bin` directory. Use the **stop** parameter to complete processing the messages that have been picked from the message queue and then stop the Global Data Synchronization messaging service. Use the **abort** parameter to stop the Global Data Synchronization messaging service immediately without processing the messages that have been picked from the message queue.

```
$<Install_Dir>/bin/gdsmsg.sh stop
```

Chapter 8. Troubleshooting the installation of the product

If the installation of InfoSphere MDM Collaboration Server fails, you can try performing the following debug steps.

Symptoms

After the installation is complete, you may see error messages in IBM Installation Manager on the Installation Complete panel. You might also see errors in the installation logs.

Resolving the problem

1. Review the messages in the installation log files to diagnose and correct individual error conditions.
2. For DB2 or application server problems, use their tools to diagnose and correct individual error conditions.
3. Rerun IBM Installation Manager to reinstall InfoSphere MDM Collaboration Server.

There are other scenarios you can encounter while installing InfoSphere MDM Collaboration Server.

Issue: Configuring the `default_locale` parameter to ensure users can log in successfully

When installing InfoSphere MDM Collaboration Server, Version 6.0.0 or later, you could have login problems and receive an error after importing a database dump into a different environment.

The following errors might occur after importing the database dump:

In the user interface

```
WPC - Error
AUS-20-014 Invalid username/password/company code.
```

In the `$TOP/logs/<Appserver_hostname>/exception.log` file

```
2009-05-19 07:35:14,651 [jsp_2: enterLogin.jsp] ERROR
com.ibm.ccd.common.error.AustinException - Could not find
 lookup table
with name: Propriétés LDAP, Exception:Could not find
 lookup table
with name: Propriétés LDAP
```

One possible reason that users cannot log in to InfoSphere MDM Collaboration Server is that the value of the `default_locale` parameter is configured incorrectly. For example, if the `default_locale` parameter is set to a certain value, and then a database dump export was taken, the `default_locale` value in the environment where the dump is going to be imported should be set to the same value as the parameter value in the exported environment. That is, if the `default_locale` parameter was set to `fr_FR` in the exported environment, it should be set to `fr_FR` in the imported environment. If the values are not the same, users will not be able to log in to the system.

Issue: InfoSphere MDM Collaboration Server AppServer might not start, or install_war.sh may fail with "arg list too long" error

When installing InfoSphere MDM Collaboration Server, Version 6.0.0 or later, the following error might occur:

```
/bin/go/init_svc_vars.sh: line 21: /usr/bin/mkdir:
The parameter or environment lists are too long.

/bin/read_config_file.sh: line 34: /usr/bin/awk:
The parameter or environment lists are too long.
```

If the ncargs parameter on AIX is not set to a high enough value, the install_war.sh installation script might fail with the error message "arg list too long". This problem might also cause the application server to fail.

The AIX default for the ncargs parameter is set to 6 * 4k.

Since the product needs a long list of arguments to install and run correctly, this parameter might not specify enough memory to run the install_war.sh script or to start the product.

To resolve the problem, the AIX administrator must increase the size of the ncargs parameter, by issuing the following command:

```
chdev -l sys0 -a ncargs=NewValue
```

where *NewValue* is the number of 4k blocks to be allocated for the argument list. You can specify a number between 6 (which is the default value) and 128. You can review the current setting by issuing the following command:

```
lsattr -E -l sys0 -a ncargs
```

You can also change the value of the ncargs parameter (and view additional information) using the smit or smitty AIX configuration commands. For more information about any of these commands, refer to the AIX and pSeries product documentation.

Chapter 9. Uninstalling the product

You use IBM Installation Manager to uninstall your edition.

If you want to remove InfoSphere MDM Collaboration Server, use the IBM Installation Manager uninstall option.

Uninstalling the product using the wizard

Use this procedure to uninstall IBM InfoSphere Master Data Management.

If you are planning to reinstall this runtime environment and use the same database instance that it uses, make sure that you create a backup image of the database as a precaution.

Using the IBM Installation Manager uninstall option removes the entire offering.

Note: The IBM Installation Manager uninstall option attempts to clean up the installation directory and any files created by the user after the product was installed, with the possible exception of a log file. For the clean up of the installation directory to take place, ensure that no shell or application is using the installation directory as its current directory or is locking it in any other way.

1. Start IBM Installation Manager and click **Uninstall**.
2. Select **IBM InfoSphere Master Data Management** and click **Next**.
3. Review the summary information and click **Uninstall**.
4. Click **Finish**.

Uninstalling the product silently

Use this procedure to uninstall InfoSphere MDM Collaboration Server in silent mode.

Note: The IBM Installation Manager uninstallation option attempts to clean up the installation directory and any files created by the user after the product was installed, with the possible exception of a log file. For the clean up of the installation directory to take place, ensure that no shell or application is using the installation directory as its current directory or is locking it in any other way.

A properties file is generated when you are running an interactive uninstall. to use a silent uninstall, you must edit this file or create your own file.

Attention: Although code examples might show with line breaks in the following content, the text between

```
<offering ....... />
```

must be entered in the response file as one line without breaks.

Replace the install tag in your response file with the uninstall tag. For example:

```
<uninstall modify='false'>
<offering id='com.ibm.mdm.collaborative'
```

```
                version='11.3.0.FP00IF000_20130502-1800'
                profile='IBM InfoSphere Master Data Management'
                features='com.ibm.im.mdm.db.feature,
                com.ibm.im.mdm.wl.feature'/>
        </uninstall>
```

Chapter 10. Installing IBM Software Assistant

The IBM Support Assistant (ISA) for IBM InfoSphere Master Data Management Collaboration Server can be installed either from product interface or from a shell/command prompt.

1. Download the IBM Support Assistant, Version 4.0 workbench.

2. Use the installation program to install IBM Support Assistant by following the instructions described here: http://www-306.ibm.com/software/support/isa/isa40/install.html .

3. Install the data collector add-on for InfoSphere MDM Collaboration Server using the instructions in the Troubleshooting section of the product documentation.

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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 20. IBM resources

Resource	Description and location
Product documentation for InfoSphere MDM	You can search and browse across all the InfoSphere MDM documents at http://pic.dhe.ibm.com/infocenter/mdm/v11r0/index.jsp.
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://pic.dhe.ibm.com/infocenter/mih/v11r0/index.jsp.
IBM Support Portal	You can customize support information by choosing the products and the topics that interest you at www.ibm.com/support/.
Software services	You can find information about software, IT, and business consulting services, on the solutions site at www.ibm.com/businesssolutions/.
My IBM	You can manage links to IBM web sites and information that meet your specific technical support needs by creating an account on the My IBM site at www.ibm.com/account/.
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 21. Providing feedback to IBM

Type of feedback	Action
Product feedback	You can provide general product feedback through the Consumability Survey at www.ibm.com/software/ucd/consumability/.

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Table 21. Providing feedback to IBM (continued)

Type of feedback	Action
Documentation feedback	To comment on the information center, click the Feedback link on the top right side of any topic in the information center. You can also send comments about PDF file books, the information center, or any other documentation in the following ways: • Online reader comment form: www.ibm.com/software/data/rcf/ • E-mail: comments@us.ibm.com

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