HP Enterprise Maps

For Windows and Linux Operating Systems

Software Version: 2.00

Installation and Configuration Guide

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Chapter 2: Prerequisites and Supported Platforms

Before installing HP EM you must make sure that the environment you want to install to is appropriate and suitable for your needs.

The following sections describe the requirements and options available:

Design Your Deployment

- **Development**

    If you are a developer, CIO, or other IT manager who wants to learn the functions of HP EM, this is the correct type of deployment for you. It should be on one machine and preferably on one J2EE server instance.

    HP EM ships with an embedded application server. You are required to have a database and Java installed and configured before you run the HP EM installer. Oracle XE or MSSQL Express and Oracle Java7 SDK are satisfactory prerequisites for HP EM.

Use the HP EM installation wizard to install the product following the default settings. Server configuration for the application server is handled within this wizard and in the serverstart and serverstop scripts.

- **Trial Version**

  If you want to evaluate HP EM, you can download a Virtual Appliance (VA) trial version. You must have a VM host on your computer to run the VA trial version. The trial version contains a 60 instant-on license, which can be renewed.

  To download the trial version, go to http://www.hp.com. Select **For Work > Software > See all Software > Free & Trial Software > On-premise software** tab. Search for the Enterprise Maps VA product name and click **Download now**.

- **Production**

  Deploying HP EM for use in a production environment is flexible enough to be clustered and linked to a database and directory service on separate machines. If you are creating such a deployment, you should already have a set of tools and procedures for deploying J2EE applications and managing relational databases.

  When you design your HP EM production environment, you may need additional configuration options that are available in the HP EM wizard installer as well as in the configuration files.

  HP EM supports a silent non-wizard installation that can be executed at the command-line in one step. The silent installation can easily be plugged in to higher-level orchestration and deployment engines. For advanced security hardening, decoupled DBA scenarios, or recovery and failover procedures, see the HP Live Network or the advanced documentation at the HP Support website.

  For information about a silent installation, run the jar file using the `-help` option:

  ```
  java -jar hp-em-2.00.jar -help
  ```

Prerequisites - Hardware

HP recommends the following minimum hardware configuration for each physical node of a distributed production environment:

- Intel Xeon E processor family, 4 cores, 16 GB RAM, 40 GB free disk space, 1Gbps network card.

- Network bandwidth of 1 Gb/sec or higher.

For customization and evaluation purposes, HP EM requires the following hardware:

- Intel Core i7 processor, 16 GB RAM, 40 GB free disk space, 1Gbps network card.

- Network bandwidth of 100Mb/sec or higher.

> **Warning**: SPARC machines are not suitable for HP EM deployments.

Example:

It is possible to evaluate HP EM on a system that has the following configuration:

- x64-based PC Intel(R) Core(TM) i7-3720QM CPU @ 2.60GHz, 4 Core(s), 8 Logical Processor (s)

- Physical Memory (RAM) 16 GB

- 500GB HDD Intel(R) 7 Series Chipset Family SATA

- Intel(R) 82579LM Gigabit Network

Prerequisites - JDK Software

Each machine running HP EM requires a Java SE Development Kit (JDK) and your selected Java 2 Platform Enterprise Edition (J2EE) application server. The application server must use this JDK.

HP EM supports the following JDK:

- Oracle (Sun) JDK 1.7 64-bit

> **Caution:** HP recommends using a 64-bit operating system in conjunction with a 64-bit JDK. 32-bit operating systems may not provide sufficient memory for this version of HP EM.

The JAVA_HOME environment variable must be set to point to the Java JDK used by the host J2EE application server.

To Ensure the Correct JDK is Used:

1. Open a command prompt (cmd in Windows) or a terminal session (UNIX/Linux).

2. Execute echo %JAVA_HOME% (Windows) or echo $JAVA_HOME (UNIX/Linux)

3. Do one of the following:

   - If JAVA_HOME points to JDK 1.7 then proceed with installation.

   - If JAVA_HOME does not point to JDK 1.7 then reset the JAVA_HOME environment variable to a valid JDK 1.7.

> **Warning:** If you have both a JDK and JRE installed, JAVA_HOME must point to the Oracle JDK.

Recommended Environments

HP recommends the following environment:

- Oracle (Sun) JDK 1.7 64-bit

Supported Database Types

HP EM supports the following databases:

- Oracle 11g

- Oracle 12c

- Microsoft SQL Server 2012 (SP1)

- Microsoft SQL Server 2014

HP EM supports deployment to the following database and driver combinations:

Supported Database Drivers

Database	DB Version	Driver Packages	Driver Version	Driver Class
Oracle Database	11.2.0.3.0	ojdbc6.jar, orai18n.jar	11.2.0.3.0	oracle.jdbc.driver.OracleDriver
	12.1.0.1.0	ojdbc7.jar. orai18n.jar	12.1.0.1.0	
Microsoft SQL Server	2012 SP1 2014	sqljdbc4.jar	4.0	com.microsoft.sqlserver.jdbc. SQLServerDriver

Supported Application Servers

Enterprise Maps can be deployed only to the JBoss 7 server which is integrated in the installation package (Embedded JBoss7).

Prerequisites - Operating Systems

The server running HP EM must use a supported operating system.

HP recommends the following operating systems:

- Windows Server 2008 R2

- Windows Server 2012 R2

- Windows 7 and Windows 8

- Linux (RedHat 5.6, 6, 7 64-bit)

- CentOS 6.4 64-bit

- Ubuntu 13.10 64-bit

Caution: HP recommends using a 64-bit operating system in conjunction with a 64-bit JDK. 32-bit operating systems may not provide sufficient memory for this version of HP EM.

Prerequisites - Browsers

Client machines accessing HP EM must use a supported browser. HP EM supports the following browsers:

- Google Chrome (latest version)

- Microsoft Internet Explorer 10 or newer

- Firefox (latest version)

Prerequisites - Mail Clients

If you want HP EM to send automatic notifications, you must use a supported mail client. HP EM supports the following mail clients:

- Microsoft Outlook 2013

Supported LDAP Implementations

When you install HP EM, you can select to use an external LDAP server to retrieve information about users and groups.

HP EM uses LDAP for authentication and to obtain user and group information. HP EM accesses this information as read-only and never modifies it.

HP EM supports the following LDAP implementations:

- Sun ONE Directory Server 5.2

- Sun Java System Directory Server 6.3

- Microsoft Windows Server 2008 Active Directory

Prerequisites - Adobe Flash

Client machines accessing HP EM require Adobe Flash Player version 10.0 or newer.

Supported Product Integrations

HP EM supports integration with the following products:

Product	Version	Features
HP Business Service Manager	9.13, 9.20, 9.21	uCMDB service discovery. Service entry to governance/synchronization. BSM health report monitoring.
HP Project and Portfolio Management	9.20, 9.21	Primary source of financial and project information about applications in the corporation. Provides useful financial insights into enterprise architecture.
Sparx Systems Enterprise Architect	10, 11	Primary source of system graphical design. Provides a complete lifecycle to build and maintain systems from analysis through maintenance.

Chapter 3: Preparing Databases

This section describes database administration tasks for HP EM. The database administrator must perform tasks at the time of installation and may also have tasks when HP EM is updated, extensions are applied, or data is migrated.

Before you can install HP EM the database administrator must set up the database.

Read "Database Installation Types" below first for information about the different database installation scenarios which vary according to the required level of access to the database.

> **Caution:** For performance reasons, HP recommends verifying the network performance between the location of the application server and the location of the database. Check the traceroute to the database, HP recommends a maximum response time of 10ms, 1 hop is optimum, 2 hops is ok.

> **Caution:** Encryption keys for password encryption are stored in the EAR file. It is recommended that this file be protected with system file permissions.

The database specific sections describe database specific prerequisites and procedures describing how to create the various user types required by the different database installation scenarios.

- "Set Up Oracle Database" on the next page

- "Set Up Microsoft SQL" on page 18

Database Installation Types

- **Create Schema**

  The Create Schema option, available in the HP EM Wizard Installer and command-line deployment, creates tables and indexes in the default schema in an existing database or tablespace provided by the database administrator. Select this method if you have an account in a database with an empty schema (recommended) and privileges to create tables and indexes.

  > **Note:** In this document, power user refers to users with the privilege to create tables and indexes.

- **Create Database / Tablespace**

  The option to create a database or tablespace is available in the HP EM Wizard Installer and command-line deployment. This option automates database arrangement as much as possible,

but requires database administrator credentials. The process creates users, the database or tablespace depending on your database type, and continues with the creation of the schema.

There are some differences in the create database process depending on the database type:

- **Microsoft SQL**

  This option requires an existing user with the database creator role.

  This option creates a new physical database with collation inherited from the server settings.

- **Oracle Database**

  This option requires an existing database and database administrator credentials.

  This option does not create a new physical database. It creates a new tablespace to hold HP EM data separately and creates a new database account which uses the new tablespace as its default tablespace.

- **Manual Database Arrangement**

  The database administrator may want to arrange the database manually:

  - In some cases, the database administrator (DBA) cannot share the DBA credentials required for the Create Database option or the power user credentials for the Create Schema option.

  - In some cases, the database administrator may want to amend the default DDL scripts. For example, to create indexes in a separate tablespace.

  In these cases, the database administrator must perform the database related installation operations manually as part of Decoupled Database Installation.

  Typically the database administrator creates a power user account for the HP EM schema and a common user account with minimal privileges to insert, select, update, and delete SQL operations in power user tables.

  The database administrator does not distribute the power user credentials and provides the common user credentials to the HP EM administrator to configure the application server datasource.

Set Up Oracle Database

Configure the Oracle database as follows for use with HP EM:

- If you are upgrading from HP EM 1.x, use a new database. Using the same database as the previous version will lose your data.

- If you are clustering Oracle database (RAC), you must use Oracle Database 10.2.0.4 or higher. HP EM does not support RAC in earlier versions.

- HP EM installation requires a JDBC driver:

Database	DB Version	Driver Packages	Driver Version	Driver Class
Oracle Database	11.2.0.3.0.	ojdbc6.jar, orai18n.jar	11.2.0.3.0.	oracle.jdbc.driver.OracleDriver
	12.1.0.1.0	ojdbc7.jar. orai18n.jar	12.1.0.1.0	

- To use HP EM Full Text Search, include the "Oracle Text" extension when installing the Oracle server. The "Oracle Text" extension is applied to Oracle by default.

- HP strongly recommends creating a database that uses the Unicode for Database Character Set (NLS_CHARACTERSET=AL32UTF8). If you use a non-Unicode database, you may encounter problems storing and searching some national characters outside your character set. Changing the character set after installation is only possible by creating a new database.

- HP recommends setting the `cursor_sharing` parameter to `FORCE` to improve performance and economize shared pool usage.

- If exception `'ORA-01425: Escape character must be string of length 1'`, set `cursor_ sharing=EXACT` or request a patch from Oracle for bug #9689594 suitable for your system.

- Create accounts based on the database installation type selected for HP EM installation. The access required is defined by the database installation type:

  - For the Create Database option, an account is created by the installer.

  - For the Create Schema option, if you want to separate the HP EM data (recommended), create a tablespace in the database. Create a power user to own the schema, with the new tablespace as its default tablespace.

  - For Manual Database Arrangement, create a tablespace in the database, create a power user account to own the schema, with the new tablespace as its default tablespace. Optionally, create a common user account with minimal privileges. For example: in Oracle 12c you can do that using the following script:

```
--Oracle 12c
alter session set "_ORACLE_SCRIPT"=true;
create user em identified by em default tablespace users temporary tablespace
temp quota unlimited on users container=all;
--Oracle 12c
alter session set "_ORACLE_SCRIPT"=false;
grant CREATE TABLE, CREATE ANY TABLE, SELECT ANY TABLE, DROP ANY TABLE, INSER
T ANY TABLE, UPDATE ANY TABLE, DELETE ANY TABLE, CREATE ANY VIEW, CREATE
```

```
SESSION, CREATE PROCEDURE, create materialized view, CREATE SEQUENCE to em;
alter profile default limit password_life_time unlimited;
exit
```

- Grant special privileges for the datasource user by executing the following commands:

  GRANT SELECT ON sys.dba_pending_transactions TO *user*;

  GRANT SELECT ON sys.pending_trans$ TO *user*;

  GRANT SELECT ON sys.dba_2pc_pending TO *user*;

  GRANT SELECT ON sys.dbms_xa TO *user*;

  Otherwise, you will get the following error in the server log:

  ```
  WARN [com.arjuna.ats.jta.logging.loggerI18N]
  [com.arjuna.ats.internal.jta.recovery.xarecovery1]
  Local XARecoveryModule.xaRecovery got XA exception
  javax.transaction.xa.XAException, XAException.XAER_RMERR
  ```

Caution: If you are using Oracle DB with a UNIX 64-bit operating system (including Linux), a TNS-12535 error may occur during installation. This error occurs due to a problem with the random pool. Fix the problem by adding `/sbin/rngd -r /dev/urandom -o /dev/random -t 55` to `/etc/rc.d/rc.local`.

Tip: HP recommends the following free Oracle (performance) troubleshooting tool: AWR (Automatic Workload Repository) reports. These reports must be generated by the database administrator.

If required, see the following sections for additional Oracle setup details:

- "Set Up an Oracle Power User" below

- "Set Up an Oracle Common User" on the next page

Set Up an Oracle Power User

In order to use the Create Schema option during installation or for Manual Database Arrangement, the database administrator should create a *power user* with appropriate privileges to the database.

To Set Up a Power User in Oracle:

1. HP recommends creating a new tablespace to hold HP EM data.

2. Create an account that can create schema items, with the new tablespace as its default tablespace.

3. Grant privileges to the account to connect to the database and create tables, indexes, sequences, and views.

```
Sample commands to prepare system privileges for Oracle power user

sqlplus system/password@connect_identifier
/* add "connect", "resource" roles to <user> */
grant connect to user;
grant resource to user;
/* add "create view", "create materialized view" privileges to <user> */
grant create view to user;
grant create materialized view to user;
/* in case new versions of Oracle (12c or later), some more are needed */
grant unlimited tablespace to user;
grant create any synonym to user;
grant drop any synonym to user;

exit;
```

4. Optionally, grant the account the privilege to execute **"CTXSYS"."CTX_DDL"**.

   This privilege is a precondition for using the HP EM full-text search feature on the database.

Set Up an Oracle Common User

In cases where the database administrator restricts access to the database to just select, insert, update, and delete operations, HP EM requires a user with these privileges.

> **Note:** The HP EM schema must exist before you create the common user.

To Set Up a Common User in Oracle:

1. Save the following SQL statements to the `script.sql` file:

```
set pagesize 0;
set pagesize 0;
set line 200;
set verify off
set feedback off
spool ./grant.sql
SELECT 'GRANT INSERT, UPDATE, DELETE, SELECT ON ' || table_name || ' TO &2;'
FROM user_tables;
SELECT 'GRANT SELECT ON ' || sequence_name || ' TO &2;' FROM user_sequences;
spool off
spool ./synonyms.sql
SELECT 'CREATE SYNONYM ' || table_name || ' FOR &1' || '.' || table_name ||
';' FROM user_tables;
```

```
SELECT 'CREATE SYNONYM ' || sequence_name || ' FOR &1' || '.' || sequence_na
me || ';' FROM user_sequences;
spool off
```

These statements generate scripts to set the environment, grant rights and create synonyms.

2. Connect to the database as the *power_user* and execute `script.sql` to produce the scripts `grant.sql` and `synonyms.sql`. Then execute `grant.sql`.

```
sqlplus power_user/password@SID
-- generate grant and create synonym statements
@script.sql power_user common_user
-- execute grant.sql
@grant.sql
exit
```

3. As the *common_user*, execute `synonyms.sql`.

```
sqlplus common_user/password@SID
-- execute synonym.sql
@synonyms.sql
exit
```

Set Up Microsoft SQL

You can use HP EM with an Microsoft SQL database. The database requires set up and configuration prior to installing HP EM.

1. Use SQL Server Configuration Manager to enable the TCP/IP protocol and use a static port (for example 1433).

2. HP EM installation requires a JDBC driver:

Database	DB Version	Driver Packages	Driver Version	Driver Class
Microsoft SQL Server	2012 SP1, 2014	sqljdbc4.jar	4.0	com.microsoft.sqlserver.jdbc. SQLServerDriver

3. HP EM requires XA transactions support. For details about setting up XA transaction support, go to the following location:

    http://msdn2.microsoft.com/en-us/library/aa342335.aspx

4. If you want to use the full-text search feature in HP EM, make sure that the Full-Text Search engine is installed together with the database engine during the installation of MSSQL Server.

5. Create a login in the database server to hold HP EM tables in the database. The login must have the *database creator* role.

   The login must be able to access the master database for XA related stored procedures:

   - Create a user in the master database for the login.

   - Assign the SqlJDBCXAUser role to the account.

6. Create users based on the database installation type selected for the HP EM installation:

   - For the Create Database option the installer uses the login to automatically arrange the database.

     The created database inherits collation from the MSSQL server default collation. HP EM requires case-sensitive collation. Use a server with case-sensitive collation or manage database collation manually using the Create Schema option.

   - For the Create Schema option, if you want to separate the HP EM data (recommended), use the login to create a database. The database must have case-sensitive collation.

     > **Note:** You can create the database on behalf of another account or use an existing account with an existing database, but you must then grant create table privileges to the new account or the existing account.

     The installer uses the login to create the schema in this new database.

   - For Manual Database Arrangement, use the power user login to create the database with case-sensitive collation. Then create the schema manually, and optionally create a common user account with minimal privileges.

> **Note:** If you intend to use user accounts and group names in HP EM that contain non-Latin characters, you must specify an appropriate collation on the database that supports such non-Latin characters.

> **Note:** To prevent some possible deadlocks, HP recommends executing the following statement:
> ```
> ALTER DATABASE [database_name] SET READ_COMMITTED_SNAPSHOT ON;
> ```

If required, see the following sections for additional MSSQL setup details:

- "Set Up an MSSQL Common User" below

Set Up an MSSQL Common User

In cases where the database administrator restricts access to the database to just select, insert, update, and delete operations, HP EM requires a user with these privileges.

To Set Up a Common User in MSSQL:

1. Open Microsoft SQL Server Management Studio or the sqlcmd command-line editor.

2. Create a common user login in the server and user in the database created for HP EM (emdb).

   For example, execute the following statements:

```
USE [master]
GO
CREATE LOGIN [common_user] WITH PASSWORD=N'...', DEFAULT_DATABASE=[master],
CHECK_EXPIRATION=OFF, CHECK_POLICY=OFF
GO
USE [emdb]
GO
CREATE USER [common_user] FOR LOGIN [common_user]
GO
```

3. Grant rights to the common user to read and write to HP EM tables.

   For example, execute the following statements:

```
USE [emdb]
GO
EXEC sp_addrolemember N'db_datawriter',N'common_user'
GO
USE [emdb]
GO
EXEC sp_addrolemember N'db_datareader', N'common_user'
GO
```

4. The login must be able to access the master database for XA related stored procedures.

   Create a user in the master database for the login and add the user to the SqlJDBCXAUser role.

   For example, execute the following statements:

```
USE [master]
GO
CREATE USER [common_user] FOR LOGIN [common_user]
GO
USE [master]
GO
EXEC sp_addrolemember N'SqlJDBCXAUser', N'common_user'
GO
```

Chapter 4: Preparing LDAP and SiteMinder

Depending on your deployment you may want to integrate with LDAP or SiteMinder.

The set up of each, prior to HP EM installation, is explained in the following sections:

- "Prepare LDAP Integration" below

- "Set Up SiteMinder Endpoint Authentication" on the next page

Prepare LDAP Integration

Automatic Service Discovery

The automatic discovery of LDAP servers means you do not have to hardwire the URL and port of the LDAP server. Instead you can use `ldap:///o=JNDITutorial,dc=example,dc=com` as a URL, and the real URL is deduced from the distinguished name `o=JNDITutorial,dc=example,dc=com`.

Automatic discovery of the LDAP service using the URL's distinguished name is supported only in Java 2 SDK, versions 1.4.1 and later, so make sure that your Java version supports this.

LDAP Service Properties

Enterprise Maps integration with LDAP uses a JNDI interface to connect to LDAP servers.

For more information, about the JNDI API, see
http://java.sun.com/products/jndi/tutorial/ldap/connect/create.html and
http://java.sun.com/j2se/1.5.0/docs/guide/jndi/jndi-dns.html#URL .

The following JNDI properties must be known to the server:

Property Name	Property Description	API Link
Naming Provider URL	URL of the LDAP service.	http://java.sun.com/j2se/1.5.0/docs/api/javax/naming/Context.html#PROVIDER_URL
Initial Naming Factory	Java class for the initial naming factory.	http://java.sun.com/j2se/1.5.0/docs/api/javax/naming/Context.html#INITIAL_CONTEXT_FACTORY
Security Principal	The name of the security principal for read access to the directory service.	http://java.sun.com/j2se/1.5.0/docs/api/javax/naming/Context.html#SECURITY_PRINCIPAL
Password	Password of security principal.	http://java.sun.com/j2se/1.5.0/docs/api/javax/naming/Context.html#SECURITY_CREDENTIALS

Property Name	Property Description	API Link
Security Protocol	Name of the security protocol. Default is "simple."	http://java.sun.com/j2se/1.5.0/docs/api/javax/naming/Context.html#SECURITY_PROTOCOL

Set Up SiteMinder Endpoint Authentication

In Siteminder, configure HP EM endpoint authentication.

By default, HP EM performs the following authentication on HP EM endpoints:

- **FORM authentication**:

    - /web/service/catalog/*

    - /web/policy-manager/*

    - /web/shared/*

    - /web/artifactIconList.htm

- **HTTP basic authentication**:

    - /em/platform/restBasic/*

    - /platform/restSecure/*

    - /policymgr/restSecure/*

    - /reporting/restSecure/*

    - /remote/navigator/*

    - /remote/upload/*

- **Unauthenticated URL patterns:**

    - /em/platform/rest/*

    - /platform/rest/*

    - /policymgr/rest/*

    - /reporting/rest/*

    - /web/design/*

    - /remote/dql/*

Note: All endpoints are preceded by `http(s):/host:port/context` as set during installation.

Chapter 5: HTTP Proxy Requirement

Due to security and cluster support, an HTTP proxy server must be installed before installing HP EM. Apache is the recommended proxy server. The HTTP proxy server will mitigate the impact of existing and future security defects in the embedded JBoss application server.

This section describes how to install HP EM with a proxy server in the following topics:

- "Install Enterprise Maps with a Proxy Server" below

- "Test the Proxy Server Installation" on page 27

Install Enterprise Maps with a Proxy Server

Follow the steps below to enable accessing Enterprise Maps through a proxy server.

1. "How to Install HP EM with a Proxy Server" below as follows:
   a. Install the Apache Web Server

   b. Configure the Apache Web Server as a Reversed Proxy

   c. Enable SSL in the Apache Web Server (Optional)

2. "How to Configure HP EM with a Proxy Server" on page 26

How to Install HP EM with a Proxy Server

1. Install the Apache Web Server.

   It is recommended that you use the Apache web server as the proxy server by enabling `mod_proxy`. A stable version of the Apache Web Server (2.4.10) can be downloaded from the Apache website **http://httpd.apache.org/**.

2. Configure the Apache Web Server as a Reversed Proxy:

   a. After the Apache web server is installed, go to `APACHE_HOME\conf` and backup `httpd.conf`.

   b. Edit the `httpd.conf` file as follows:

      ○ Change the HTTP port: Listen **80**

      ○ Enable the Proxy modules:

      ```
      LoadModule proxy_module modules/mod_proxy.so

      LoadModule proxy_connect_module modules/mod_proxy_connect.so
      ```

```
LoadModule proxy_ftp_module modules/mod_proxy_ftp.so

LoadModule proxy_http_module modules/mod_proxy_http.so
```

- Add these lines at the end:

  ProxyRequests Off

  ProxyPass /enterprisemaps http://[host]:[port]/enterprisemaps

  ProxyPassReverse /enterprisemaps http://[host]:[port]/enterprisemaps

- If SSL is enabled for this proxy server, also add the line:

  SSLProxyEngine on

  c. Restart the Apache Web Server.

3. Configure SSL for the Apache Web Server:
   a. Prepare the folder:

   - Create openssldirectory inside Apache home.

   - Copy openssl.cnf from /conf to /openssl

   - CD to /openssl

   b. Generate a new certificate request:

   ```
   ..\bin\openssl req -config .\openssl.cnf -new -out cert.csr
   ```

   Provide the following information:

   - Enter PEM pass phrase: **<password>**

   - Verifying - Enter PEM pass phrase: **<password>**

   - Country Name (2 letter code) [AU]:**<country>**

   - State or Province Name (full name) [Some-State]:**<state>**

   - Locality Name (example: city) []:**<city>**

   - Organization Name:(example: company) [Internet Widgits Pty Ltd]:**<company>**

   - Organizational Unit Name (example: section) []:**<organization unit>**

   - Common Name (example: server FQDN or YOUR name) []:**<hostname>**

   - Email Address []:**<email>**

       ○ A challenge password []:**<password>**

       ○ An optional company name []:**<company>**

  c. Convert the private key file:

```
..\bin\openssl rsa -in privkey.pem -out cert.key
```

Provide below information:

Enter pass phrase for privkey.pem: **<password>**

  d. Create a self-signed certificate (output is also a CA certificate):

```
..\bin\openssl x509 -in cert.csr -out cert.crt -req -signkey cert.key -da
ys 365
```

  e. Edit or add the following lines in httpd-ssl.cnf

       ○ Change SSL port: Listen **443**

       <VirtualHost _default_:443>

       ○ Set certificate paths

       SSLCertificateFile "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/openssl/cert.csr"

       SSLCertificateKeyFile "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/openssl/cert.key"

       SSLCertificateChainFile "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/openssl/cert.crt"

  f. Restart the Apache Web Server.

  g. On the client browser, add **cert.crt** to Trusted Root CA.

> **Caution:** If **openssl** is installed with Apache web server, make sure it is patched frequently to avoid any security issues.

How to Configure HP EM with a Proxy Server

To configure Enterprise Maps with proxy server, provide proxy server hostname and ports instead of real server hostname and ports during Enterprise Maps installation or by running **Setup** tool after Enterprise Maps is installed.

> **Note:** If we install Enterprise Maps on an application server rather Embedded Jboss, we have to redeploy **hp-soa-systinet.ear** file after changing Endpoint Properties in Setup tool.

Test the Proxy Server Installation

Access the proxy server with URL (*http://[proxyHost]:[proxyPort]/enterprisemaps*).

A successful configuration must result in the following:

1. Enterprise Maps login is shown.

2. Browser address bar shows URL of the proxy server instead of the Enterprise Maps server.

Chapter 6: Using the HP EM Wizard Installer

The HP EM Wizard Installer is the easiest way to install HP EM. However, it may not be suitable for all the configuration options required by production environments.

If the HP EM Wizard Installer is not suitable for your environment, you can use the silent installation. For information, run the jar file using the `-help` option:

```
java -jar hp-em-2.00.jar -help
```

You can also set advanced configuration options as described in these chapters: "Preparing Databases" on page 13 and "Deploying HP EM" on page 61.

Before using the HP EM Installer, make sure that you have a correctly set up environment.

For hardware and software requirements, as well as supported platforms, see "Prerequisites and Supported Platforms" on page 7.

For an evaluation environment, you need valid credentials to a configured database. For details, see "Preparing Databases" on page 13.

JBoss does not require any additional configuration for evaluation purposes.

HP EM installation consists of the following steps:

1. "Step 1 - Start the HP EM Installation" on the next page

2. "Step 2 - Welcome" on page 30

3. "Step 3 - License" on page 31

4. "Step 4 - Installation Folder" on page 32

5. "Step 5 - Scenario Selection" on page 33

6. "Step 6 - Updates" on page 34

7. "Step 7 - Custom Extensions" on page 35

8. "Step 8 - Password Encryption" on page 36

9. "Step 9 - Database Selection" on page 38

10. "Step 10 - Database Setup" on page 38

11. "Step 11 - Database Parameters" on page 39

    - "Oracle Create Tablespace" on page 40

    - "Oracle Create Schema" on page 41

Step 1 - Start the HP EM Installation

1. Make sure the application server is not running.

2. Do one of the following:

   - Execute the file `hp-em-2.00.jar`, located on the installation CD or in your distribution directory.

   - Execute the following command:

     java -jar hp-em-2.00.jar

   - For manual database deployment, execute the following command:

     java -jar hp-em-2.00.jar -a

The HP EM Installation wizard opens displaying the Welcome page.

Continue to .

The install command has the following additional options:

- **-h, --help**

  Display the available options or list the available scenarios or steps in the console.

- **-x, --extract** *PATH*

  Extract the installation archive to the specified location.

- **-i, --install-to** *EM_HOME*

  Install HP EM in console mode to the specified location. Normally used in conjunction with **-u**.

- **-s, --save-config** *FILE*

  Execute the HP EM Installation, but save the configuration to the specified file instead of installing HP EM.

- **-a, --dbadmin-mode**

  Run the installation in decoupled database mode.

- **-u, --use-config** *FILE*

  Use the properties in the specified XML file to override the default or current configuration properties.

- **--passphrase** *PASSPHRASE*

  If you want to use password encryption, specify the passphrase to use for encryption.

- **-d, --debug**

  Execute the installation in debug mode. All properties, SQL statements, and installation details are output to `EM_HOME/log/install.log`.

Step 2 - Welcome

In the Welcome page, review the hardware and software requirements.
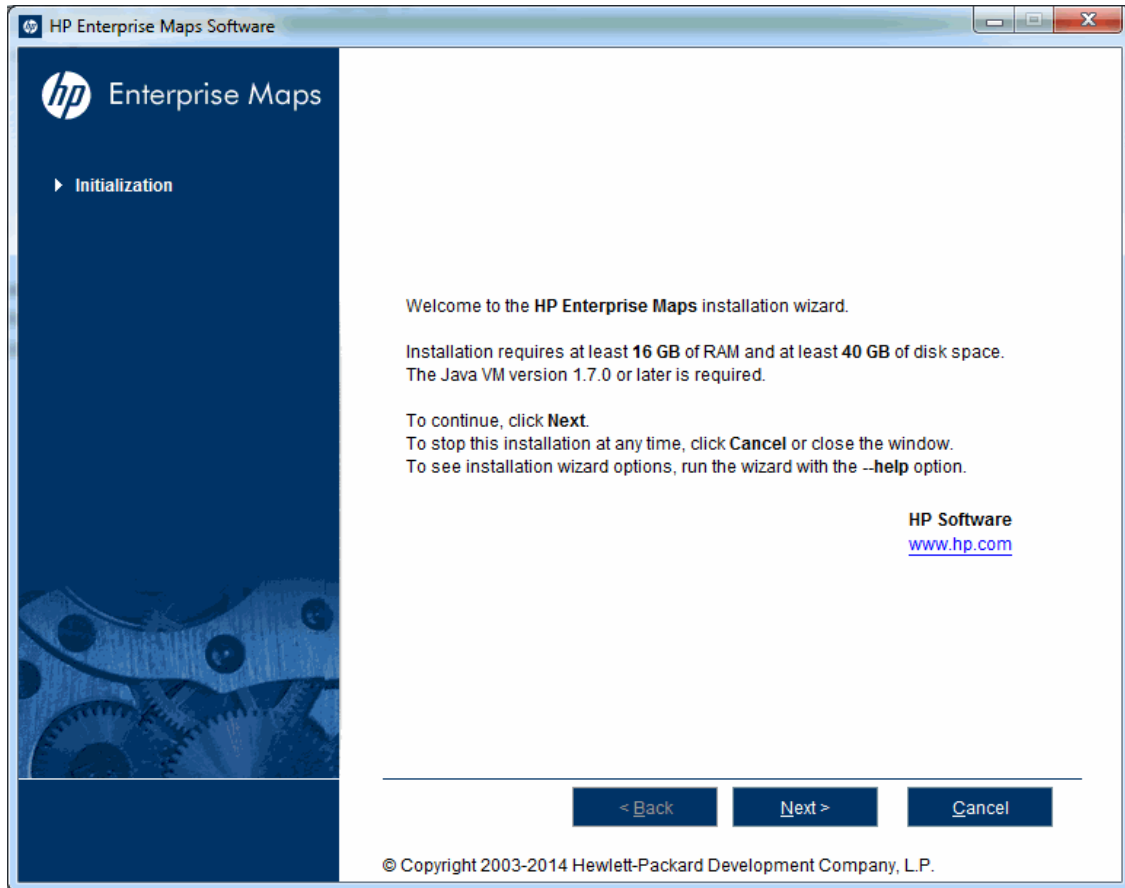
Click **Next** to continue to "Step 3 - License" below.

Step 3 - License

In the License page, review the license. The License page shows the license in English, German, Spanish, and French.
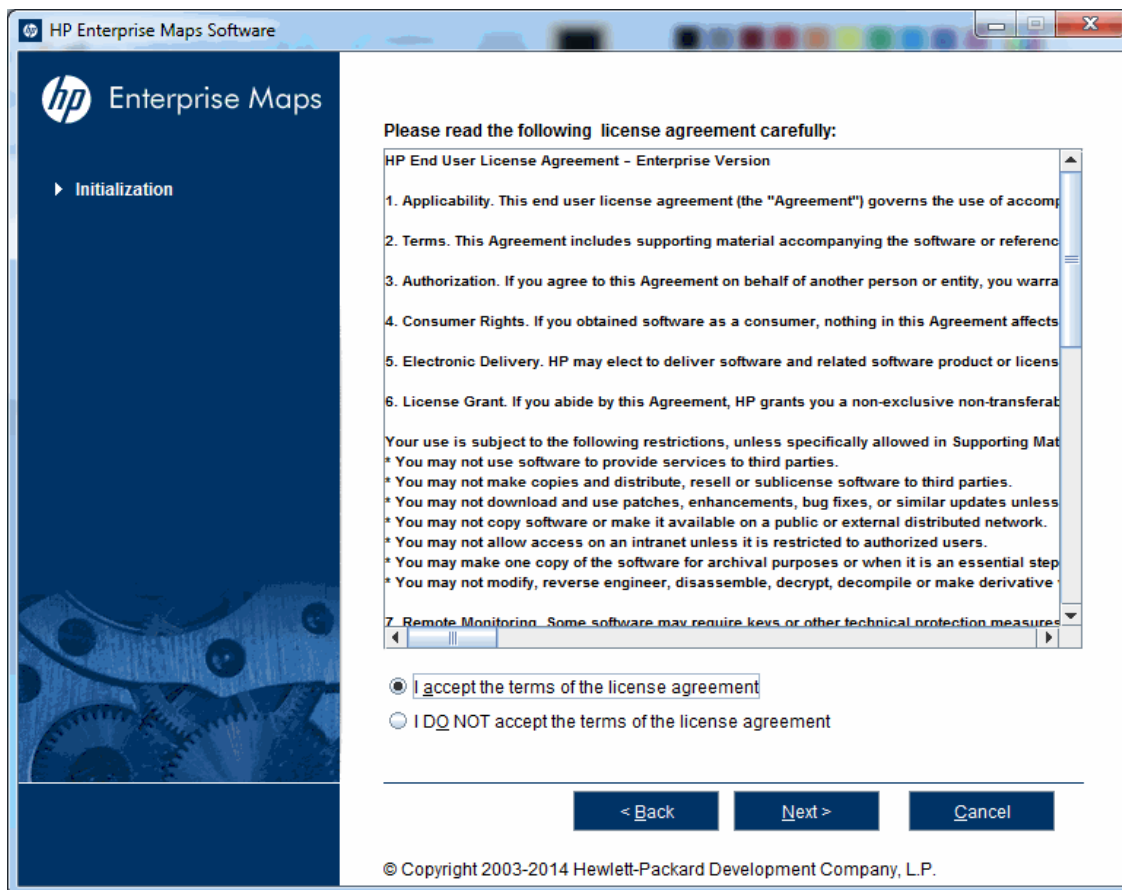
Click **Show the license agreement in more languages** to open a PDF which contains the license agreement in different languages including Japanese, Korean, Chinese, and Taiwanese.
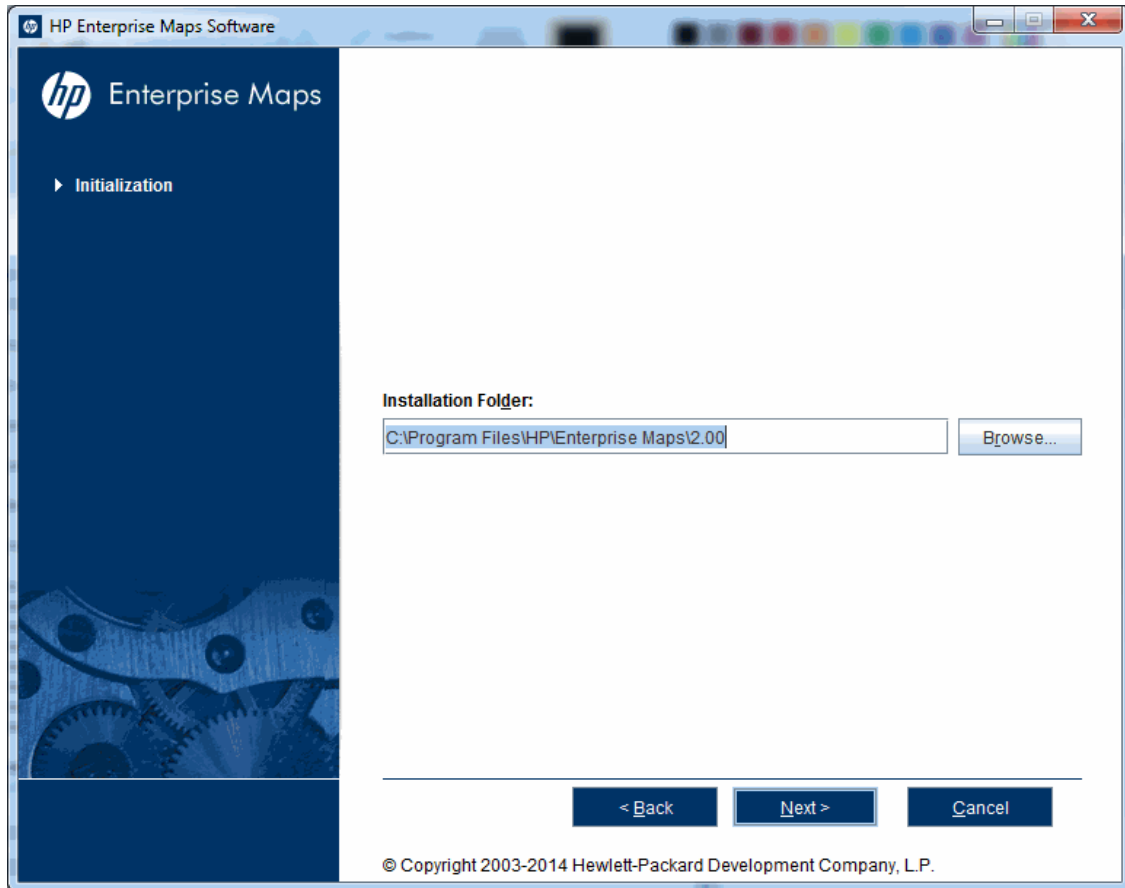
Select **I Accept the Terms of the License Agreement**.

Click **Next** to continue to "Step 4 - Installation Folder" below.

Step 4 – Installation Folder

In the Installation Folder page, input or click **Browse** to select the location you want to use as your Enterprise Maps installation folder.

Note: The location name cannot contain more than 80 characters.

Note: In this document, the installation location is referred to as EM_HOME.

Click **Next** to unpack the distribution files to the chosen location and continue to "Step 5 - Scenario Selection" below.

Step 5 - Scenario Selection

In the Scenario Selection page, select **Default**.
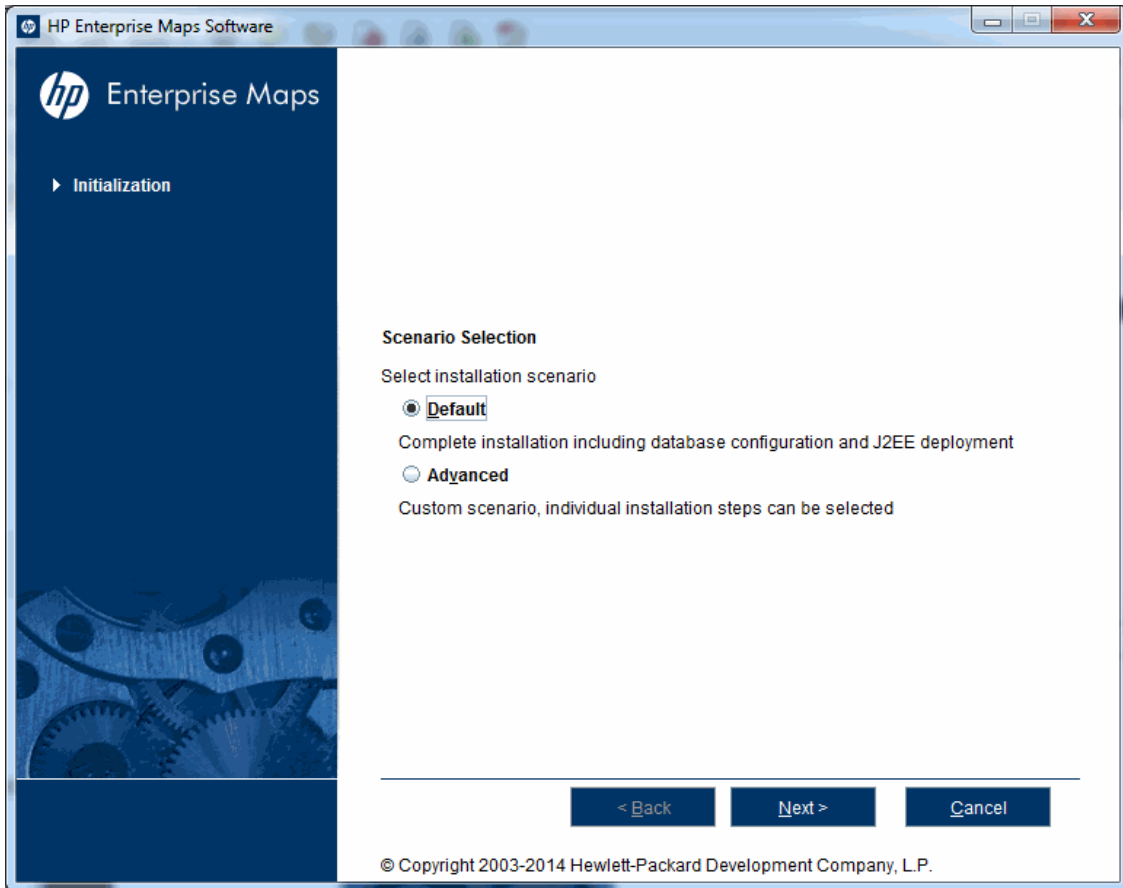
Note: The **Advanced** scenarios enable you to perform parts of the installation separately.

Click **Next** to validate the installation and continue to "Step 6 - Updates" below.

Step 6 - Updates

In the Updates page, use **Add** and **Remove** to select updates (such as patches) to apply during the installation.
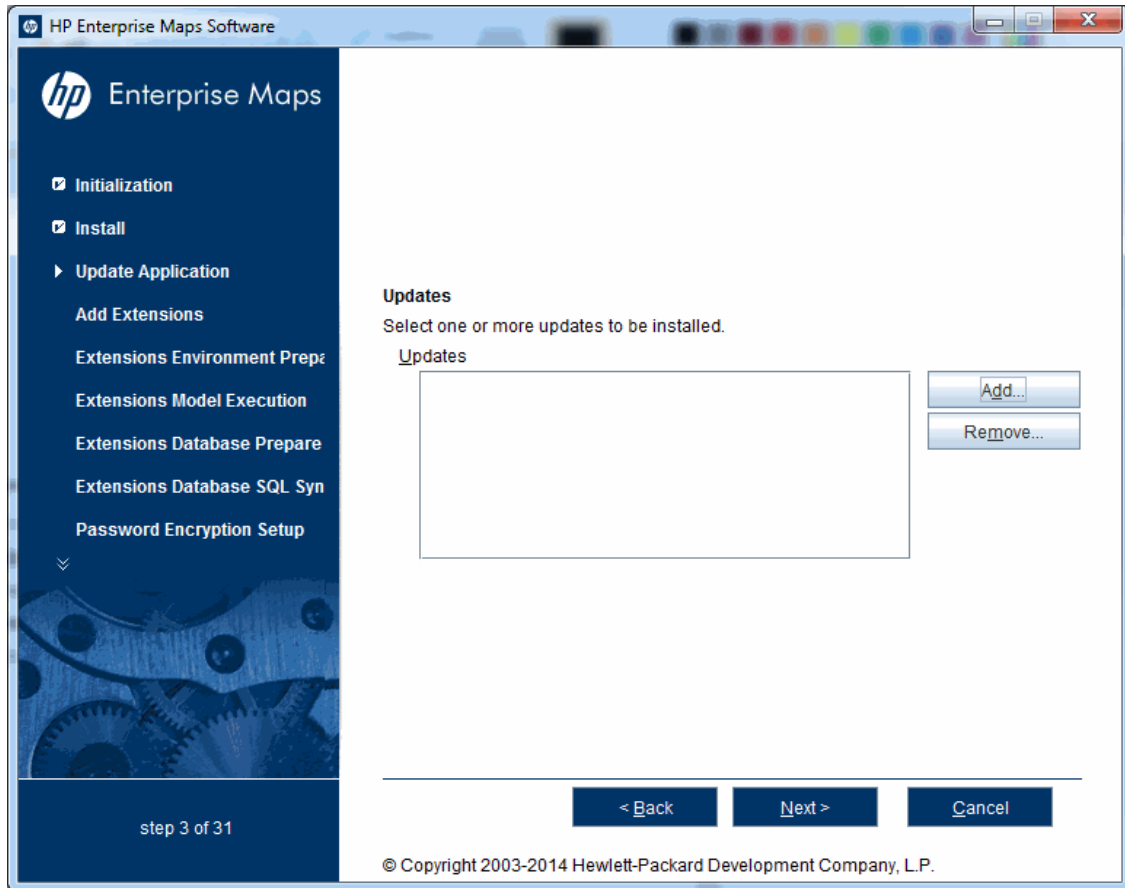
Click **Next** to verify any selected updates and continue to "Step 7 - Custom Extensions" below.

Step 7 – Custom Extensions

In the Custom Extensions page, use **Add** and **Remove** to select existing extensions that will extend the functionality of HP EM. The selected extensions will be applied during the installation.
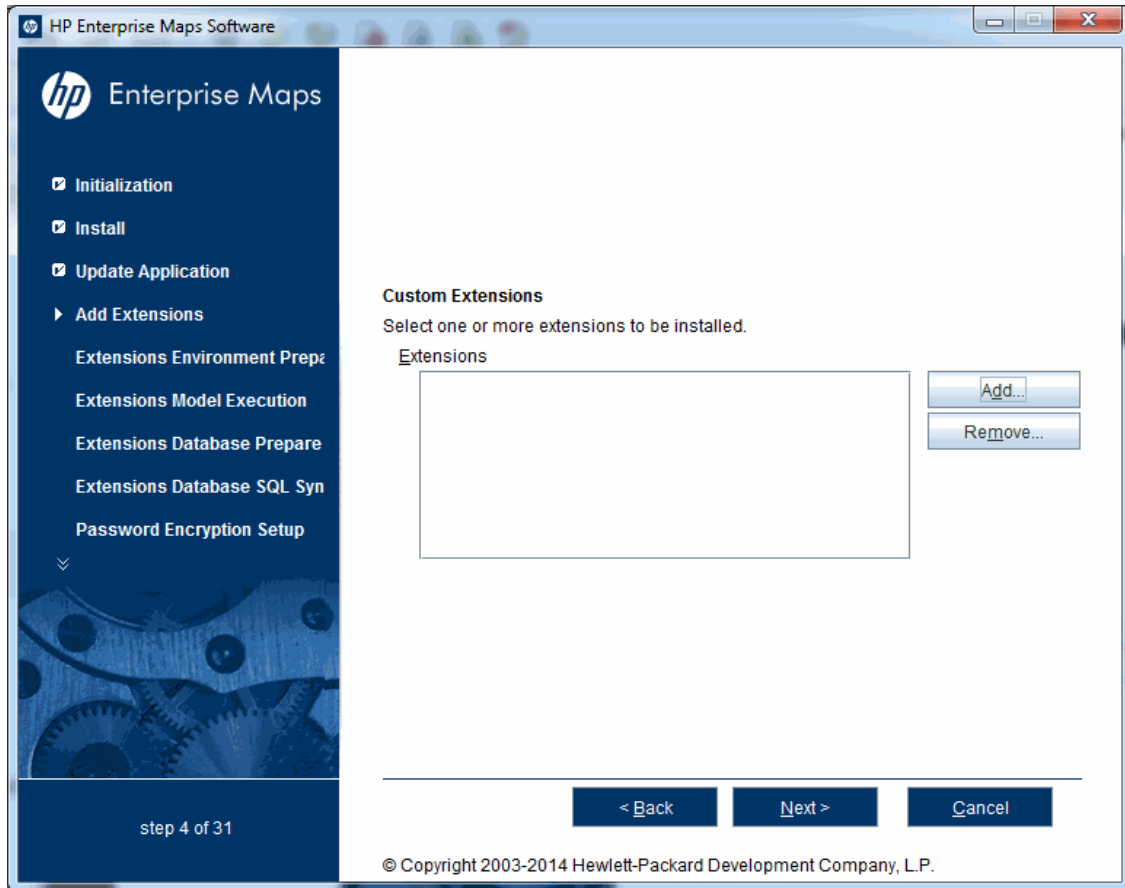
Click **Next** to validate any selected extensions and continue to "Step 8 - Password Encryption" below.

Step 8 – Password Encryption

In the Password Encryption page select whether HP EM protects credentials for access to other systems with strong encryption.
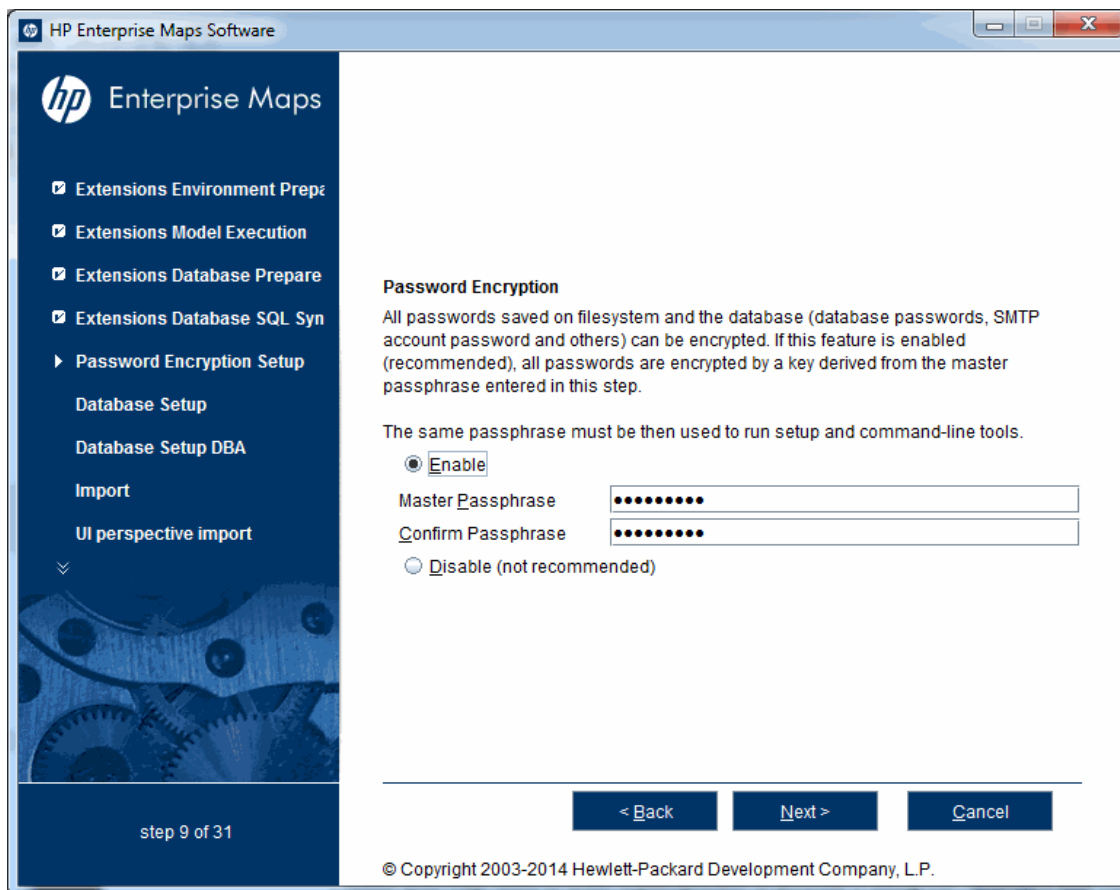
Do one of the following:

- For production or sensitive installations, select **Enable** and type the **Master Passphrase** and **Confirm Passphrase**.

- For demo installations, select **Disable**.

> **Note:** After installing with encryption, all passwords stored in the configuration file are in an encrypted, unreadable form without the provided passphrase. To execute some command line tools, you may need to enter a passphrase or provide it using the **--passphrase** command line option.
>
> If you want to export an image without using the passphrase, you must turn off the server passphrase, export the image, and then turn on the server passphrase. Otherwise you will get an error.

If you enabled encryption, click **Next** to validate the encryption and continue to "Step 9 - Database Selection" on the next page.

If you disabled encryption, click **Next** to continue to "Step 13 - Repository Import" on page 47.

Step 9 - Database Selection

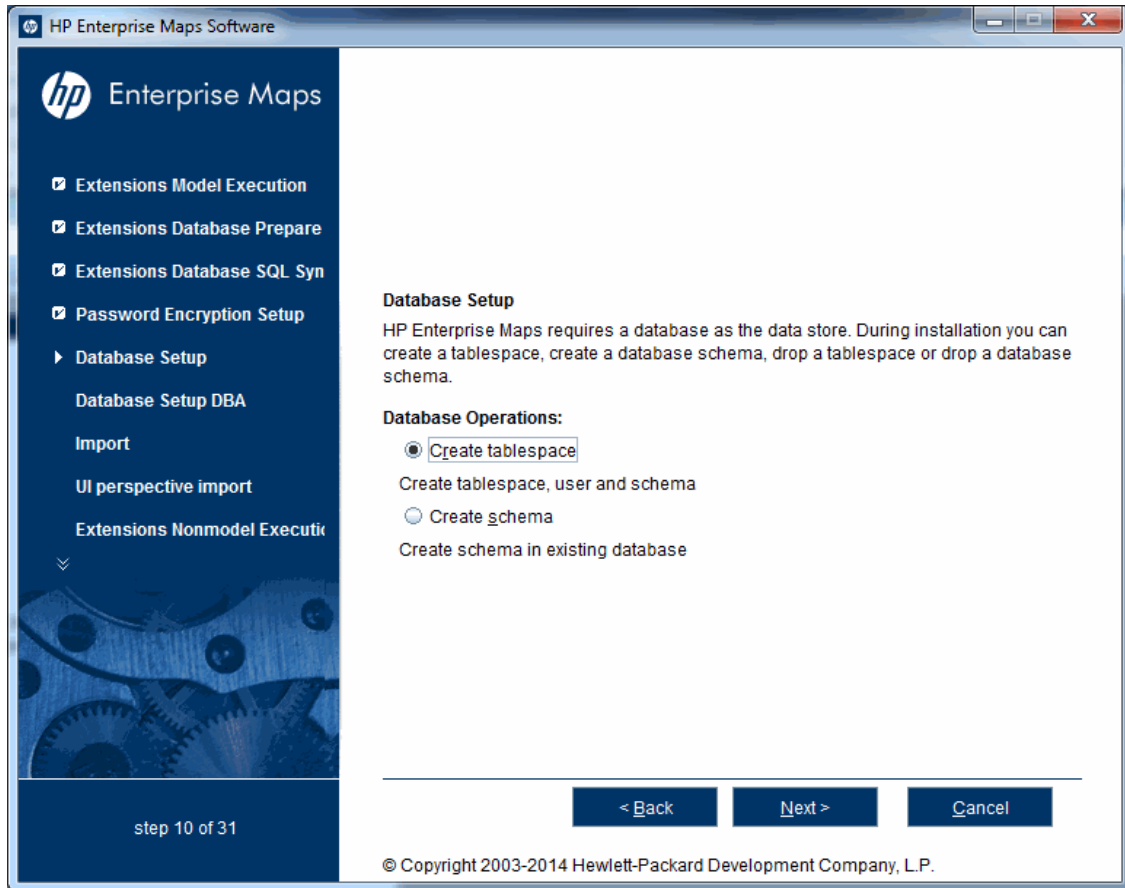In the Database Selection Page, select one of the following database types to use:
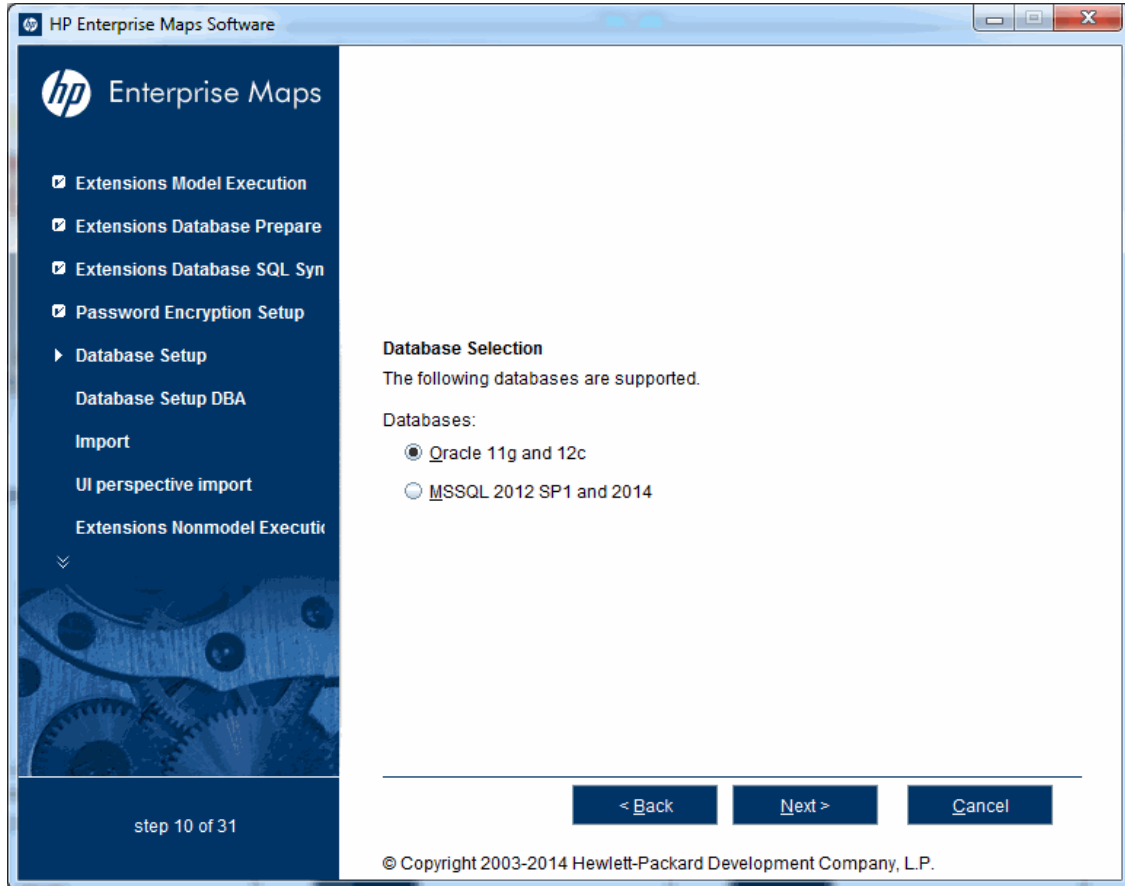
- **Oracle 11g and 12c**

- **MSSQL 2012 SP1 and 2014**

Select your database type and click **Next** to continue to .

Step 10 - Database Setup

In the Database Setup Operations page, select your database installation type:

If you chose Oracle, your choices are:

- **Create Tablespace**

- **Create Schema**

If you choose MSSQL, your choices are:

- **Create Database**

- **Create Schema**

Select the appropriate option according to your database administrator.

Click **Next** to open the Database Options page specific to the database and database installation type.

Continue to "Step 11 - Database Parameters" below.

Step 11 - Database Parameters

The required database parameters vary depending on your database type and setup type.

For details, see the appropriate section:

- "Oracle Create Tablespace" below

- "Oracle Create Schema" on the next page

- "MSSQL Create Database" on page 43

- "MSSQL Create Schema" on page 44

Oracle Create Tablespace

In the Oracle tablespace page, set the following parameters:

Oracle Create Tablespace Parameters

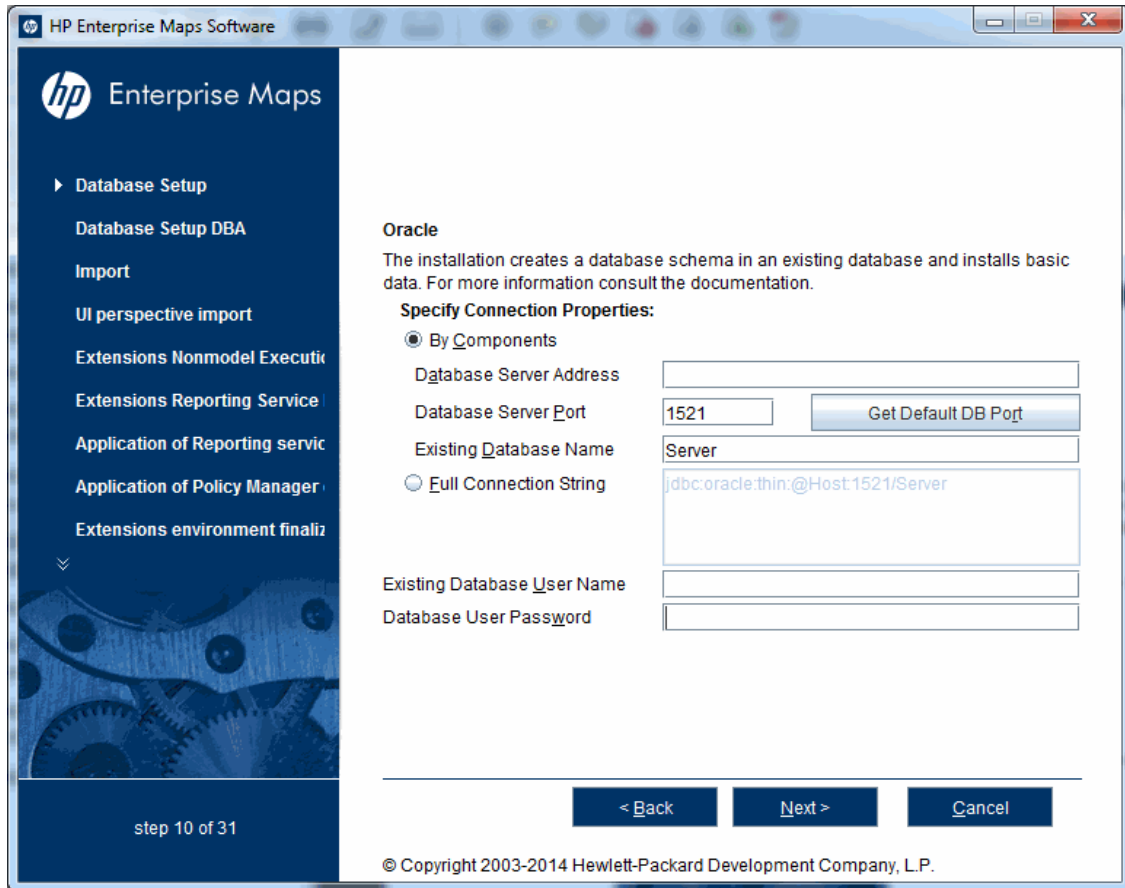| Parameter	Description	Notes
Database Server Address	Hostname or IP address where the database server is accessible.	For example, in the database connection string `jdbc:oracle:thin:@orahost:1521/platform` the hostname is `orahost`.

Oracle Create Tablespace Parameters, continued

Parameter	Description	Notes
Database Server Port	Connection port for the database.	For example, in the database connection string `jdbc:oracle:thin:@orahost:1521/platform` the port number is `1521`.
Existing Database Name	Name of the database.	For example, in the database connection string `jdbc:oracle:thin:@orahost:1521/platform` the database name is `platform`.
Full Connection String	Full connection string to the database.	Select this as option as an alternative to inputting the individual connection parameters.
Database Administrator Name	User name and password of the administrator of the database.	
Database Administrator Password		
New Database Tablespace	Name of the tablespace to create.	The tablespace name must not conflict with existing objects in the database.
Tablespace Datafile	Path to the tablespace datafile that is stored on the database host machine.	The new database tablespace must not conflict with existing objects in the database.
New Database User Name	Name and password of a new database user.	The user name must not conflict with existing objects in the database.
Database User Password		
Confirm Password		

Click **Next** to continue to .

Oracle Create Schema

In the create a new Oracle schema page, set the following parameters:

Oracle Create Schema Parameters

Parameter	Description	Notes
Database Server Address	Hostname or IP address where the database server is accessible.	For example, in the database connection string `jdbc:oracle:thin:@orahost:1521/platform` the hostname is `orahost`.
Database Server Port	Connection port for the database.	For example, in the database connection string `jdbc:oracle:thin:@orahost:1521/platform` the port number is `1521`.
Existing Database Name	Name of the database.	For example, in the database connection string `jdbc:oracle:thin:@orahost:1521/platform` the database name is `platform`.
Full Connection String	Full connection string to the database.	Select this as option an alternative to inputting the individual connection parameters.

Oracle Create Schema Parameters, continued

Parameter	Description	Notes
Existing Database User Name	User name and password to connect to the database.	
Database User Password		

Click **Next** to continue to .

MSSQL Create Database

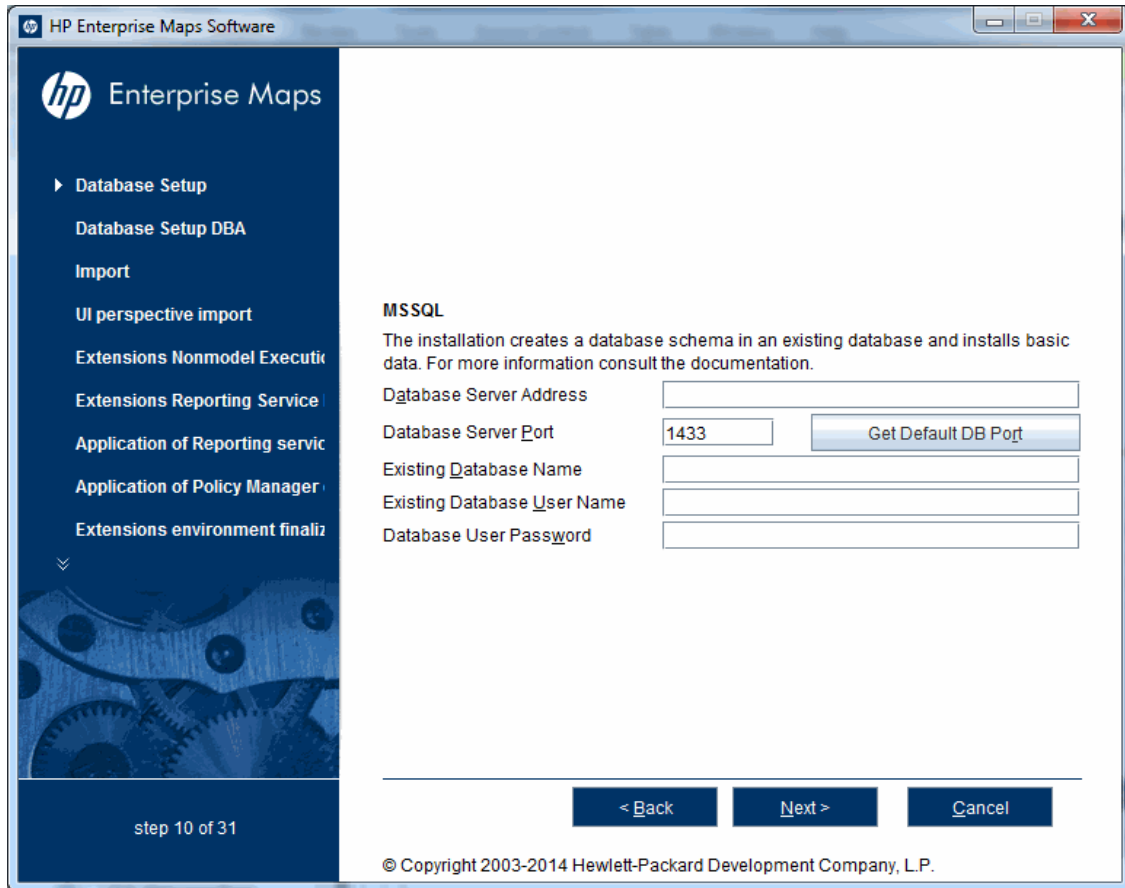In the create a new MSSQL database page, set the following parameters:

MSSQL Create Database Parameters

Parameter	Description	Notes
Database Server Address	Hostname or IP address where the database server is accessible.	For example, in the database connection string `jdbc:sqlserver://sqlhost:1433:platform` the hostname is `sqlhost`.
Database Server Port	Connection port for the database.	For example, in the database connection string `jdbc:sqlserver://sqlhost:1433:platform` the port number is `1433`.
New Database Name	Name of the database.	For example, in the database connection string `jdbc:sqlserver://sqlhost:1433:platform` the database name is `platform`.
Existing Database User Name	For the Create Database option the user must have the database creator role.	
Database User Password		

Click **Next** to continue to .

MSSQL Create Schema

In the create a new MSSQL schema page, set the following parameters:

MSSQL Create Schema Parameters

Parameter	Description	Notes
Database Server Address	Hostname or IP address where the database server is accessible.	For example, in the database connection string `jdbc:sqlserver://sqlhost:1433:platform` the hostname is `sqlhost`.
Database Server Port	Connection port for the database.	For example, in the database connection string `jdbc:sqlserver://sqlhost:1433:platform` the port number is `1433`.
Existing Database Name	Name of the database.	For example, in the database connection string `jdbc:sqlserver://sqlhost:1433:platform` the database name is `platform`.
Existing Database User Name	For the Create Schema option the user must have schema creation rights.	
Database User Password		

Click **Next** to continue to "Step 12 - JDBC Drivers" below.

Step 12 - JDBC Drivers

In the JDBC Drivers page, input or click **Browse** to select the drivers to use.
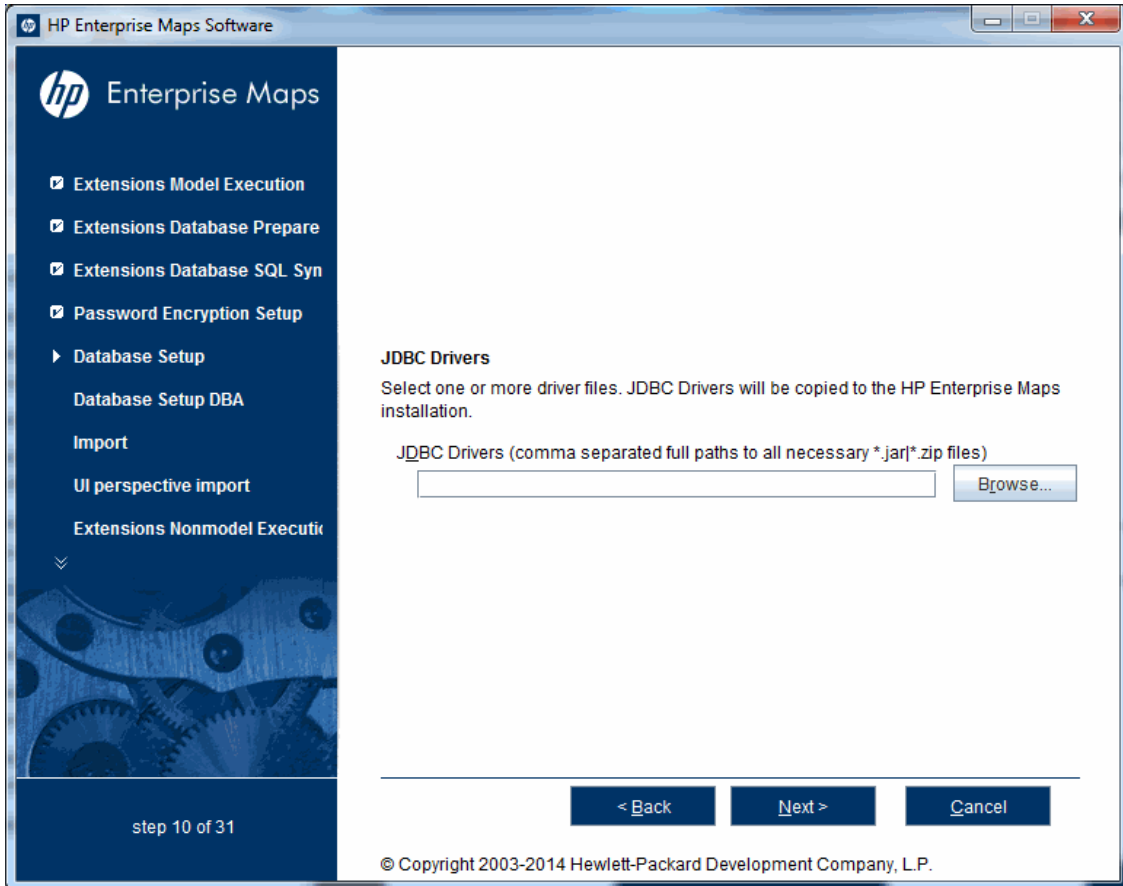
Note: Separate multiple driver names with commas.

Supported Oracle Drivers

Database	DB Version	Driver Packages	Driver Version	Driver Class
Oracle Database	11.2.0.3.0	ojdbc6.jar, orai18n.jar	11.2.0.3.0	oracle.jdbc.driver.OracleDriver
	12.1.0.1.0	ojdbc7.jar, orai18n.jar	12.1.0.1.0	

Supported MSSQL Drivers

Database	DB Version	Driver Packages	Driver Version	Driver Class
Microsoft SQL Server	2012 SP1, 2014	sqljdbc4.jar	4.0	com.microsoft.sqlserver.jdbc.SQLServerDriver

Click **Next** to validate the database parameters, the configuration tables, and the driver.

Continue to .

Step 13 - Repository Import

In the Repository Import page, select the initial data you want to upload to HP EM.
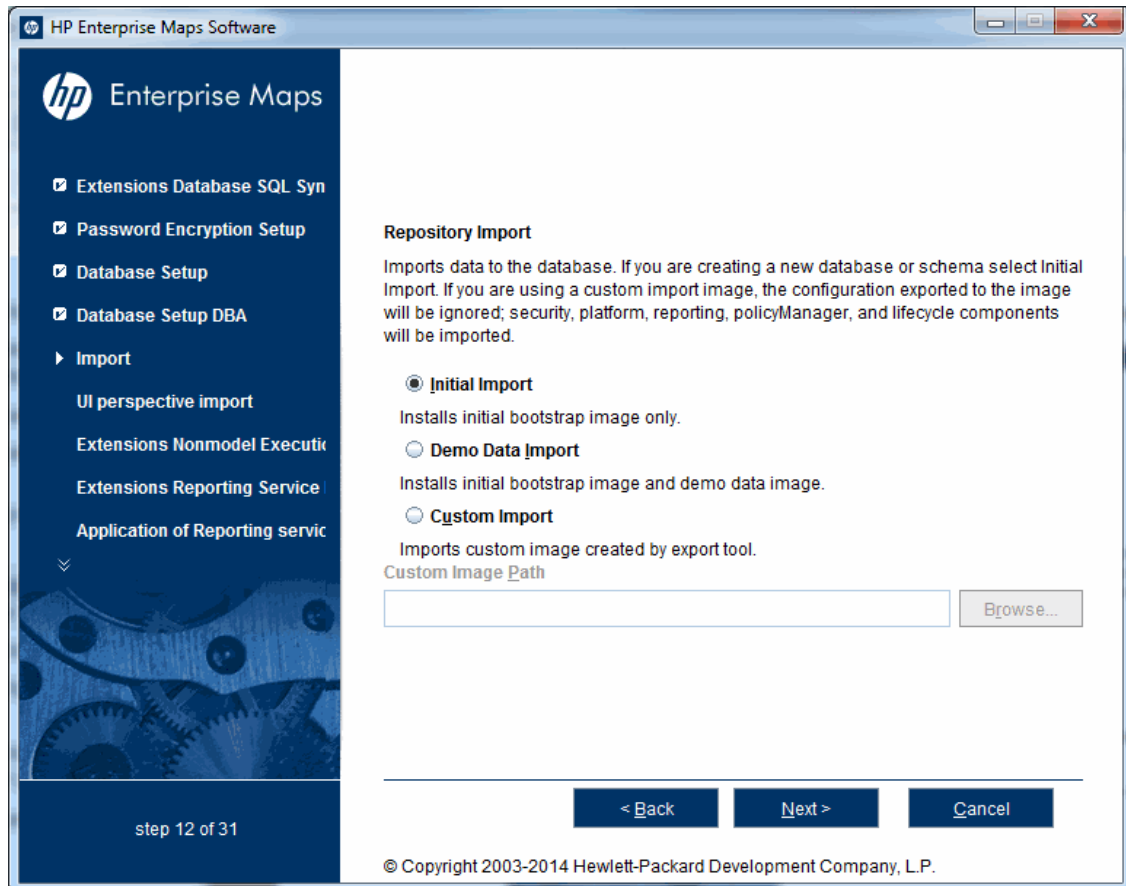
Do one of the following:

- Select **Initial Import** to import a bootstrap image only.

- Select **Demo Data Import** to import the included demo data set.

  The demo data contains a demo domain containing a large number of artifacts and some users. The user details for JBoss are contained in the `user.properties` file and may be changed later.

  > **Note:** The compliance status of artifacts included in the demo data does not reflect their initial status as the import does not contain any policy validation data. Regenerate the validation data manually or allow the automatic validation task to regenerate it.

- Select **Custom Import**, and input or **Browse** to select a custom image.

Click **Next** to validate the data image and continue to "Step 14 - Endpoint Properties" below.

Step 14 - Endpoint Properties

In the Endpoint Properties page, specify the endpoint properties:

1. Enter the **Hostname**.

   ▪ For integration with SiteMinder, set the endpoint to the proxy server integrated with SiteMinder.

   ▪ For a JBoss cluster, specify the load balancing server hostname and ports.

2. If necessary, change the default **Port Numbers**: HTTP = 8080, HTTPS = 8443. You select one or both port numbers.

   Caution: If you change the port numbers from their default values, you must also change the application server configuration to use these ports.

3. (Optional) Select **Enforce HTTPS** if you want to generate only HTTPS links.

4. (Optional) Select **Verify Certificates** if you want the server certificates to be verified in initiated HTTPS connections.

5. Use the default **Web Context**: **em**.

6. Use the default **Documentation Context**: **hp-em-doc**.

7. (Optional) Select **Enable multihost setup** to use the specified **Hostname** in the HTTP header for all web pages during the web session.

8. Refer "How to Configure HP EM with a Proxy Server" on page 26.

Click **Next** to continue to "Step 15 - User Management Integration" below.

Step 15 – User Management Integration

In the User Management Integration page, select if you want to integrate with LDAP or store accounts in your database.
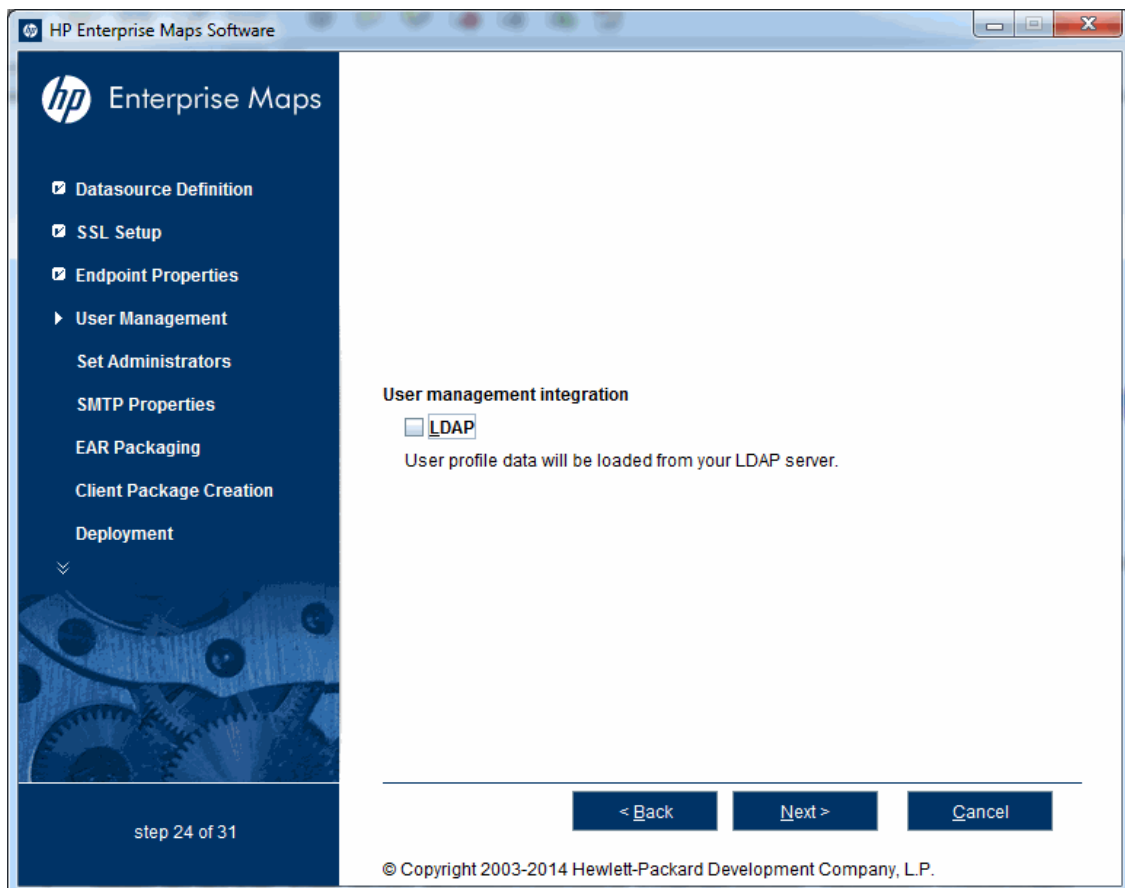
- Select **LDAP** if you want to integrate with an LDAP server account store.

- Do not select **LDAP** if you want to store accounts in your database.

If you selected LDAP, click **Next** to continue to "LDAP Service Properties" on the next page.

If you did not select LDAP, click **Next** to continue to .

LDAP Service Properties

In the LDAP Service page, set the following LDAP connection parameters, credentials, and case-sensitivity properties:

LDAP Service Properties

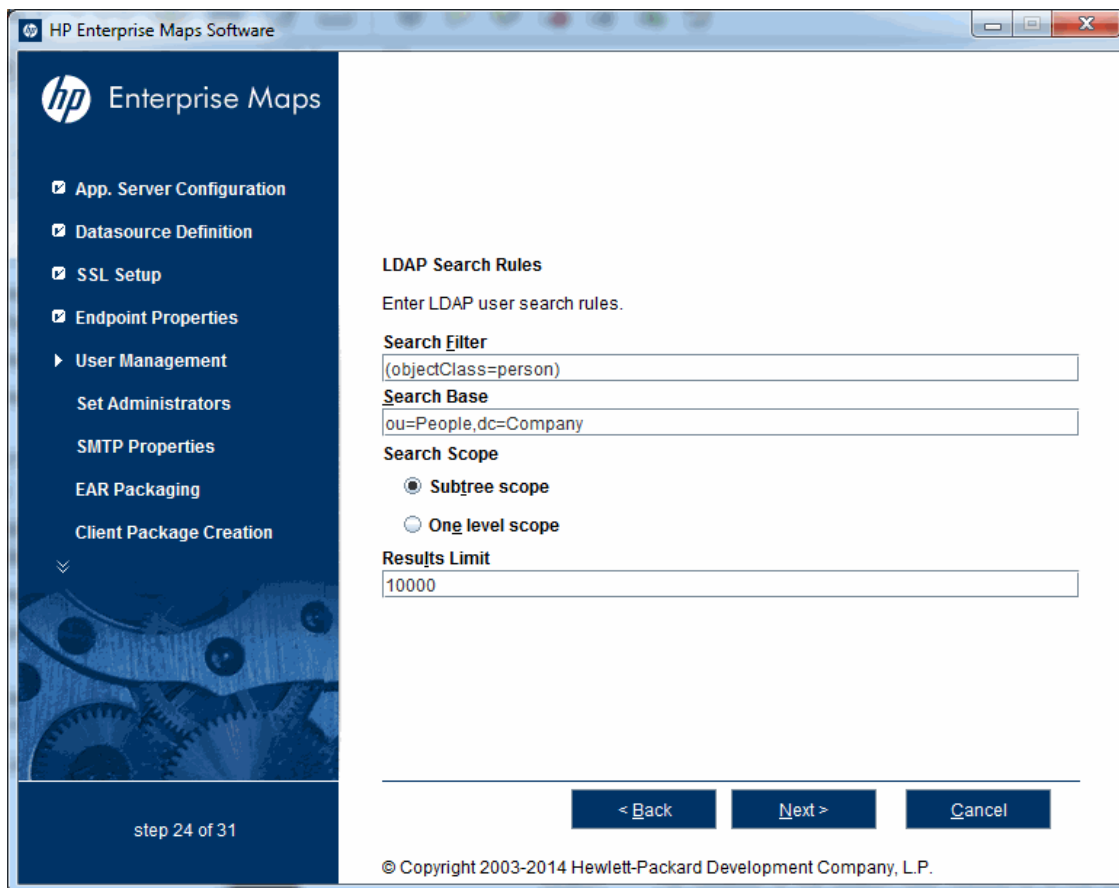| Property	Description
Naming Provider URL	URL on which LDAP is installed (for example: ldap://localhost:389).
Initial Naming Factory	Keep the default.

LDAP Service Properties, continued

Property	Description
Security Principal	Principal to login to LDAP (for example: uid=admin, ou=Administrators, ou=TopologyManagement, o=NetscapeRoot).
Password	Username password.
Security Protocol	Keep the default.
Case Sensitivity	When checked, sets all user names to be case sensitive. The default for HP EM logins is case-insensitive. **Note:** You must ensure that the application server uses matching case-sensitive or -insensitive authentication.

Click **Next** to continue to "LDAP Search Rules" below.

LDAP Search Rules

In the LDAP Search Rules page enter the following search rule properties:

LDAP Search Rules Properties

Property	Description
Search Filter	The notation of the search filter conforms to the LDAP search notation. You can specify the LDAP node property that matches the user account or group.
Search Base	LDAP is searched from this base according to the Search Scope settings.
Search Scope	- Subtree Scope: The search base and all its sub-nodes are searched. - One-level Scope: Only direct sub-nodes of the search base (entries one level below the search base) are searched. The base entry is not included in the scope.
Results Limit	Number of items returned when searching LDAP. If more results are returned by an LDAP search the remainder are disregarded and not shown.

Click **Next** to continue to "LDAP User Properties Mapping" below.

LDAP User Properties Mapping

In the User Property Mapping page, use **Add** and **Remove** to set the user property mappings
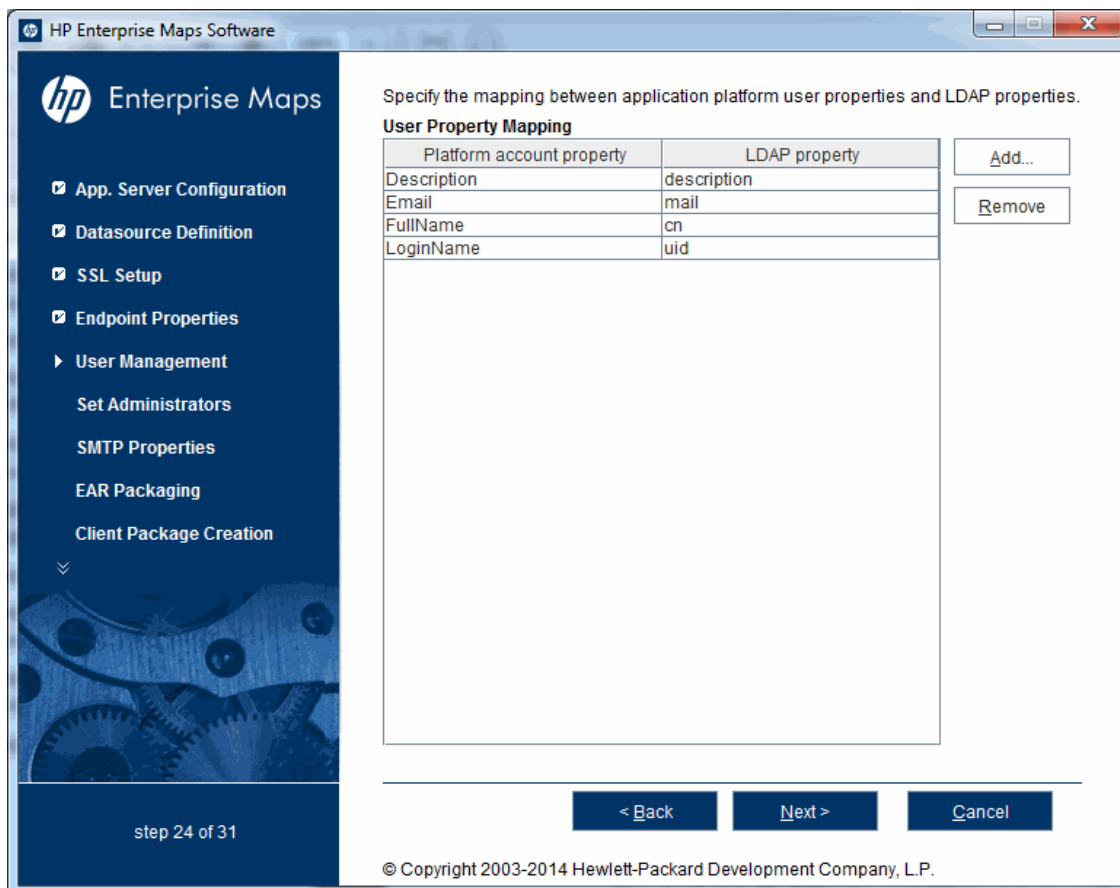
You must map the following mandatory user account properties from an LDAP server:

```
java.lang.String loginName
java.lang.String fullName
```

You can map the following optional user account properties from an LDAP server:

```
java.lang.String Email
java.lang.String Description
java.lang.String LanguageCode
java.lang.String Phone
java.lang.String AlternatePhone
java.lang.String Address
java.lang.String City
java.lang.String Country
```

Caution: Ensure that your mappings are correct and that these properties exist on your LDAP server. The incorrect mapping of any properties, even optional ones, can have a severe performance impact for sign-in for some LDAP services.

Click **Next** to continue to "LDAP Group Search Rules" on the next page.

LDAP Group Search Rules

In the Group Properties page, enter the following group search rules properties:

LDAP Group Search Rules Properties

Property	Description
Search Filter	The notation of the search filter conforms to the LDAP search notation. You can specify the LDAP node property that matches the user account or group.
Search Base	LDAP is searched from this base according to the Search Scope settings.
Search Scope	• Subtree Scope: The search base and all its sub-nodes are searched. • One-level Scope: Only direct sub-nodes of the search base (entries one level below the search base) are searched. The base entry is not included in the scope.
Results Limit	Number of items returned when searching LDAP. If more results are returned by an LDAP search the remainder are disregarded and not shown.

Click **Next** to continue to "LDAP Group Properties Mapping" on the next page.

LDAP Group Properties Mapping

In the Group Property Mapping page, use **Add** and **Remove** to set the group property mappings. between application user properties and LDAP properties.

The properties to map are: **Description**, **Member**, **Name**, and **Owner**.
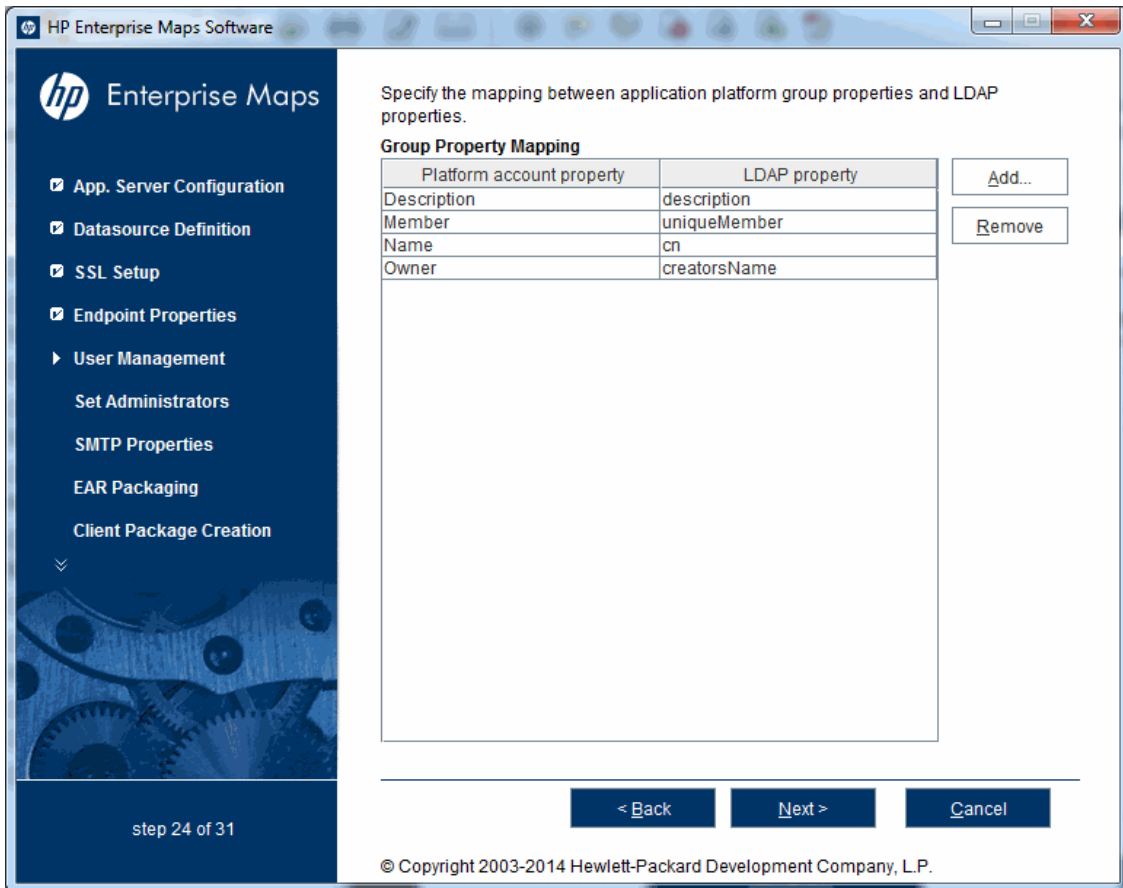
The following mandatory group properties must be mapped from an LDAP server:

```
java.lang.String name
java.lang.String member
```

The following optional group properties can be mapped from an LDAP server:
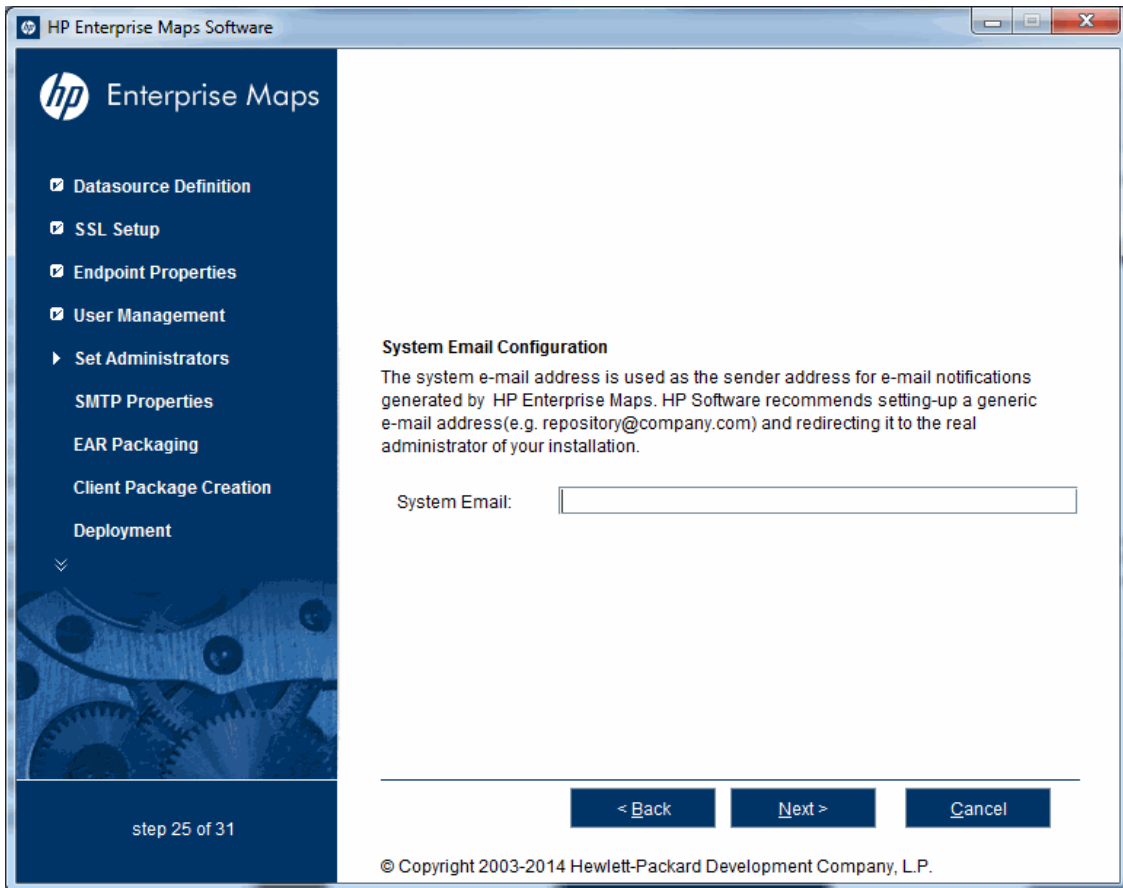
```
java.lang.string Owner
java.lang.String Description
```

Caution: Ensure that your mappings are correct and that these properties exist on your LDAP server. The incorrect mapping of any properties, even optional ones, can have a severe performance impact for sign-in for some LDAP services.

Click **Next** to continue to "Step 16 - System Email Configuration" on the next page.

Step 16 – System Email Configuration

Enter the system mail account to be used as the source of automatic notification mails and system messages.

Click **Next** to continue to "Step 17 - Administrator Account Configuration" below.

Step 17 – Administrator Account Configuration

In the Administrator Account Configuration page, set the HP EM administrator credentials.
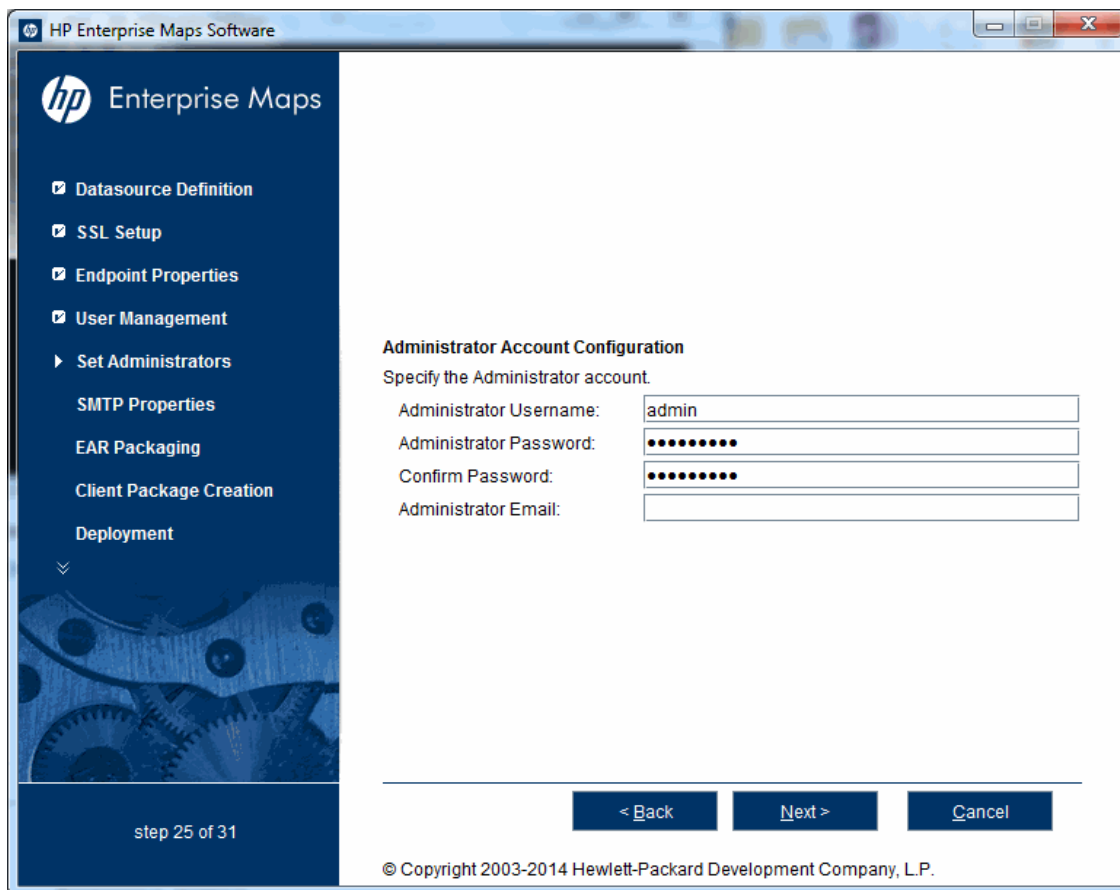
1. Enter the **Administrator Username**.

   > **Note:** The administrator login name must be valid for the selected application server instance. The user with the specified name becomes an HP EM administrator. For JBoss the specified administrator account is automatically created.

2. Enter the **Administrator Password**.

3. Enter the **Confirm Password**.

4. Enter the **Administrator Email**.

   Click **Next** to continue to "Step 18 - SMTP Server Authentication" below.

Step 18 – SMTP Server Authentication

If you want mail notifications, set the mail server host.
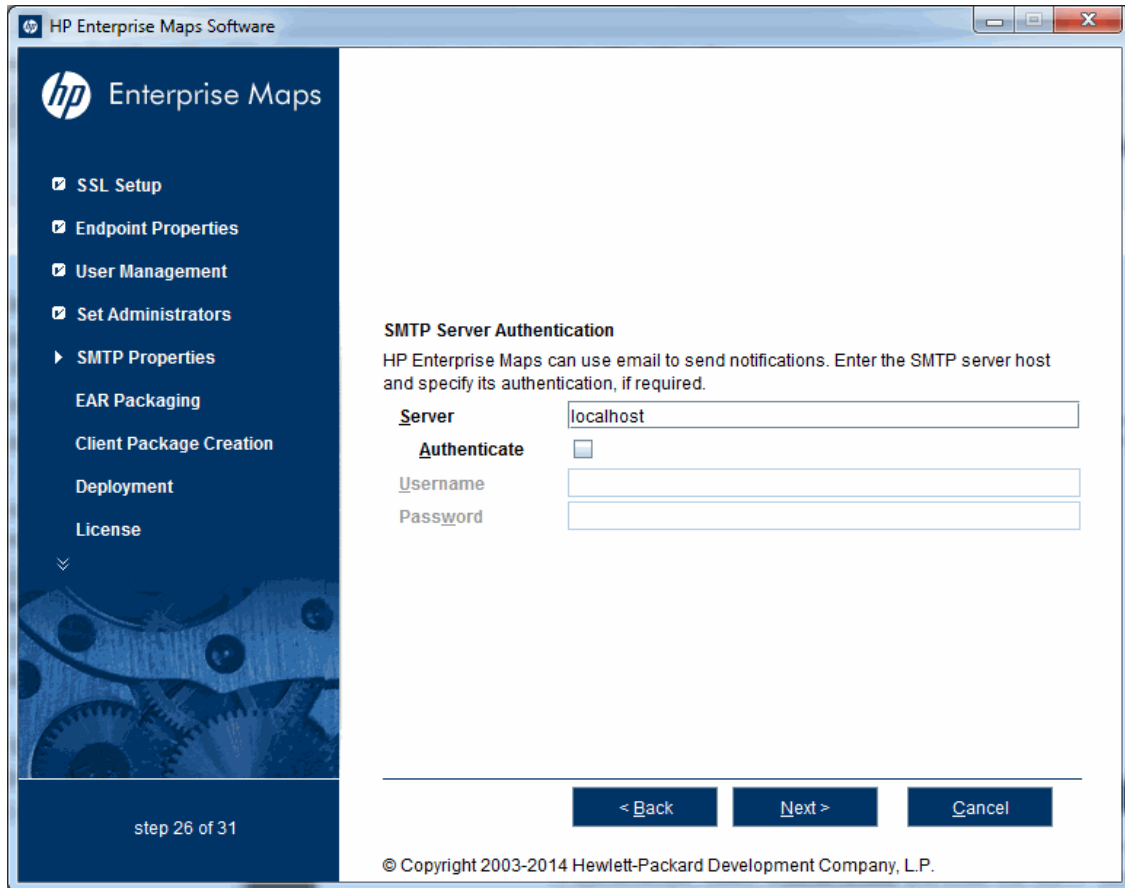
To authenticate, select **Authenticate** and enter the SMTP server credentials.

Click **Next** to create the client package and continue to "Step 19 - License Information" below.

Step 19 – License Information

In the License Information page set which license to use.
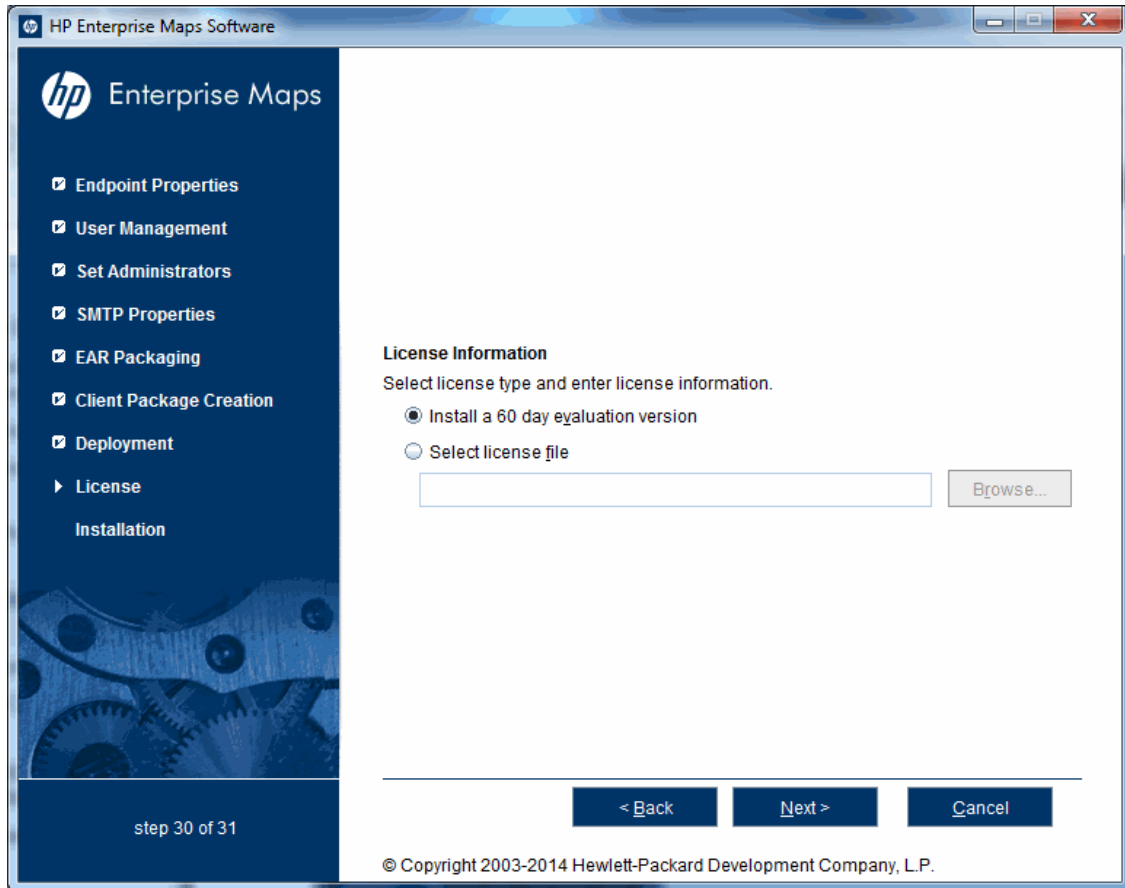
Do one of the following:

- Select **Install a 60 day evaluation license**.

- Select **Enter license details** and type the license details provided by your sales representative.

> **Note:** The administrator can change the license at a later date. For details, see "License Management" on page 70.

Click **Next** to continue to "Step 20 - Confirmation" below

Step 20 - Confirmation

In the Confirmation page, click **Next** to start the installation process.

Continue to "Step 21 - Installation Progress" below.

Step 21 - Installation Progress

The Installation Progress page tracks each step of the installation.

For manual database deployment the installation stops after creating the database scripts.

When the installation is complete, click **Next** to open the Installation Finished page.

Click **Finish** to exit the Installation Wizard.

Chapter 7: Deploying HP EM

After installation, deployment environments may require additional configuration.

For details, see the following sections:

- "Set Up SiteMinder Integration" below

- "Enable Full-Text Search in MSSQL" on the next page

- "Enable Full-Text Search in Oracle" on page 63

- "Configure LDAP over SSL/TLS" on page 65

Set Up SiteMinder Integration

You can configure HP EM to accept authentication headers or cookies added to HTTP requests after a successful authentication performed by an authentication proxy. The changes affect the configuration properties stored in the database and the application EAR file.

To Integrate Siteminder Using the Setup Tool:

1. Execute **EM_HOME/bin/setup**, and click **Next**.

2. In the Select Scenarios page, select **Advanced**, and click **Next**.

3. In the Custom Scenario Selection page, select **Siteminder Setup**, and click **Next**.

4. In the Siteminder Setup page, select **Enable Siteminder Integration** and then click **Next**.

5. Do one of the following:

   - Select **Use Cookies** to accept authentication cookies.

   - Select **Use Headers** if the user login name is sent in the authentication header.

6. Set the Login Header or Cookie Name and then click **Next**.

7. After deployment validation, click **Next** to start the setup.

   The Setup Tool updates your deployment and configuration.

8. After setup completes, click **Next** and click **Finish** to exit the Setup Tool

9. Redeploy the HP EM EAR file as described in the appropriate sections for each application server.

Enable Full-Text Search in MSSQL

To enable full text search you must enable the service and create a full text catalog and indexes. Use MSSQL Server Management Studio or the sqlcmd command line tool.

Connect to the database using the same parameters used during HP EM installation.

ToEnable Full-Text search on MSSQL:

1. Make sure that the SQL Server Fulltext Search service is running, and that the database is full-text enabled.

   By default, new databases are full-text enabled unless you create them with MSSQL Server Management Studio.

   In this case, select the database in the Object Explorer window, and select **Properties>Files**, and then select **Use full-text indexing**.

2. To create a full-text catalog, execute the following command:

   ```
   sqlcmd -U <user> -P <password> -d <database>
   CREATE FULLTEXT CATALOG ry_resource_ftsc
   go
   ```

   > **Note:** You must have CREATE FULLTEXT CATALOG permission.

   It is possible to reuse an existing catalog, but HP recommends creating a new one for independent management purposes.

   For more details, see http://msdn2.microsoft.com/en-us/library/ms189520.aspx.

3. Do one of the following:

   - To create a full-text index that is synchronized immediately after any data changes, execute the following command:

     ```
     sqlcmd -U <user> -P <password> -d <database>
     CREATE FULLTEXT INDEX ON ry_resource(
       m_extensions TYPE COLUMN m_extensions_fe LANGUAGE 0x0,
       data TYPE COLUMN data_fe LANGUAGE 0x0)
     KEY INDEX pk_resource ON ry_resource_ftsc WITH CHANGE_TRACKING AUTO
     go
     ```

   - To create a full-text index that is synchronized manually, execute the following command:

     ```
     sqlcmd -U <user> -P <password> -d <database>
     CREATE FULLTEXT INDEX ON ry_resource(
       m_extensions TYPE COLUMN m_extensions_fe LANGUAGE 0x0,
       data TYPE COLUMN data_fe LANGUAGE 0x0)
     ```

```
KEY INDEX pk_resource ON ry_resource_ftsc WITH CHANGE_TRACKING OFF, NO POP
ULATION
go
```

For more details, see http://msdn2.microsoft.com/en-us/library/ms187317.aspx.

To synchronize the index manually, execute the following command:

```
sqlcmd -U <user> -P <password> -d <database>
ALTER FULLTEXT INDEX ON ry_resource START FULL POPULATION
go
```

The statement executes asynchronously, so the population may take some time.

To verify the population status, execute the command:

```
SELECT FULLTEXTCATALOGPROPERTY('ry_resource_ftsc','PopulateStatus')
go
```

Index population is complete when the population status is 0.

For more details, see http://msdn.microsoft.com/en-us/library/ms188359.aspx.

Searching Uploaded Documents with MSSQL

MSSQL supports only a limited set of document types after installation. Typically, it does support
Microsoft ".doc" files, but does not support ".docx",".xlsx" and ".pdf" files. The list of all supported
document types can obtained by the following SQL:

```
SELECT * FROM sys.fulltext_document_types
```

If the list does not contain a document type that you need to include in the full text search, ask your
DBA to obtain and install an iFilter for the missing document type.

- Foxit provides a high performance PDF iFilter for 32=bit and x64 systems. For details, go to
  http://www.foxitsoftware.com/pdf/ifilter.

- Adobe provides a PDF iFilter for 32-bit and x64 systems. For details, go to http://adobe.com.

- Microsoft provides iFilters for MS-Office 2007/2010 document types including docx and xlsx.
  For details, go to http://support.microsoft.com/default.aspx?scid=kb;en-us;945934.

Enable Full-Text Search in Oracle

To enable full text search (FTS), you must create indexes and schedule their update. Use the
Oracle **sqlplus** console. Connect to the database using the same credentials used during
installation.

Caution: FTS does not work for Oracle XE.

The procedure in commands is shown below in "Preparing Oracle For Full Text Search using the
Scheduling Mechanism". It also shows how to synchronize indexes every midnight.

> **Note:** The database user does not have permission to create FTS indexes by default and must be given that permission.

Preparing Oracle For Full Text Search using the Scheduling Mechanism

```
sqlplus system/password@connect_identifier
-- add permission to create indexes
GRANT EXECUTE ON "CTXSYS"."CTX_DDL" TO user;
-- add "create job" permission to <user>
GRANT CREATE JOB TO user;
exit;

sqlplus user/password@connect_identifier
CREATE INDEX idx_ry_resource_meta ON ry_resource(m_extensions)
  INDEXTYPE IS CTXSYS.CONTEXT PARAMETERS
    ('FILTER CTXSYS.NULL_FILTER SECTION
      GROUP CTXSYS.NULL_SECTION_GROUP
      SYNC (EVERY "TRUNC(SYSDATE)+1") TRANSACTIONAL');

CREATE INDEX idx_ry_resource_data ON ry_resource(data)
  INDEXTYPE IS CTXSYS.CONTEXT PARAMETERS
    ('FILTER CTXSYS.NULL_FILTER SECTION
      GROUP CTXSYS.NULL_SECTION_GROUP
      SYNC (EVERY "TRUNC(SYSDATE)+1") TRANSACTIONAL');
```

To enable full text search of pdf, doc, and other document types, use `AUTO_FILTER` in the definition of the `idx_ry_resource_data` index"

```
CREATE INDEX idx_ry_resource_data ON ry_resource(data)
  INDEXTYPE IS CTXSYS.CONTEXT PARAMETERS
    ('FILTER CTXSYS.AUTO_FILTER');
```

> **Warning**: *Do not* implement index synchronization ON COMMIT. It can cause Oracle thread termination, returning the error message `ORA-error stack (07445[ACCESS_VIOLATION])` `logged in` *filename*`.log`. (Tested on Oracle 10gR2 - 10.2.0.1). Use regular synchronization together with the `TRANSACTIONAL` parameter.

For more information about creating indexes, see the Oracle documentation at http://docs.oracle.com/cd/B28359_01/server.111/b28310/indexes003.htm#ADMIN11722.

> **Note:** Not all document types can be indexed correctly. For details, see http://download.oracle.com/docs/cd/B19306_01/text.102/b14218/afilsupt.htm#i634493.

Synchronizing Indexes

Executing index synchronization manually is shown in the following example:

Synchronizing Indexes in Oracle Manually

```
sqlplus user/password@connect_identifier
CALL CTX_DDL.SYNC_INDEX('idx_ry_resource_meta', '2M');
CALL CTX_DDL.SYNC_INDEX('idx_ry_resource_data', '2M');
```

Creating an Indexing Stoplist

You can optionally manage a stoplist by removing words that could frequently appear in documents. By default, the Oracle index stoplist includes words such as "to". Full-text searches including these words return a false empty result. Alternatively, the database administrator should provide HP EM users with the stoplist, and a warning not to use these terms in full-text searches.

An example of commands to set up a stoplist on Oracle is shown in the following example:

Creating an Oracle Indexing Stoplist

```
call CTX_DDL.CREATE_STOPLIST('MyStoplist');
call CTX_DDL.ADD_STOPWORD('MyStoplist', 'a');
... Add a word that should not be indexed. Repeat the command for each word to b
e excluded.

-- Include the DROP INDEX commands only if an index already exists.
DROP INDEX idx_ry_resource_meta;
DROP INDEX idx_ry_resource_data;
CREATE INDEX idx_ry_resource_meta on ry_resource(m_extensions) indextype is ctxs
ys.context parameters
  ('filter ctxsys.null_filter section group CTXSYS.NULL_SECTION_GROUP STOPLIST M
yStoplist
    SYNC (EVERY "TRUNC(SYSDATE)+1") TRANSACTIONAL') ;
CREATE INDEX idx_ry_resource_data on ry_resource(data) indextype is ctxsys.conte
xt parameters
  ('filter ctxsys.null_filter section group CTXSYS.NULL_SECTION_GROUP STOPLIST M
yStoplist
    SYNC (EVERY "TRUNC(SYSDATE)+1") TRANSACTIONAL');
```

Configure LDAP over SSL/TLS

You can configure LDAP over SSL (or TLS) with a directory server of your choice. HP recommends that you first install HP EM with a connection to LDAP that does not use SSL. You can then verify the configuration by logging in as a user defined in this directory before configuring use of SSL.

The configuration procedure assumes that you have already installed HP EM with an LDAP account provider.

HP EM must not be running.

- **LDAP over SSL Without Client Authentication**

  In this case only LDAP server authentication is required. This is usually the case.

To change the LDAP configuration, run the Setup Tool and change Naming Provider URL to use the `ldaps` protocol and the port on which the directory server accepts SSL/TLS connections. An example of such a URL is, `ldaps://ldap.test.com:636`.

Make sure that the hostname specified in the java.naming.provider.urlproperty matches the name that is in the directory server certificate's subject common name (CN part of certificate's Subject). Otherwise you get an exception during startup of HP EM. It informs you of a hostname verification error. The stacktrace contains the hostname that you must use.

- **LDAP over SSL With Mutual Authentication**

  HP EM does not support LDAP over SSL with mutual authentication.

- **Ensuring Trust with the LDAP Server**

  The client that connects to the SSL/TLS server must trust the server certificate in order to establish communication with that server. The configuration of LDAP described in this section inherits the default rule for establishing trust from JSSE (the Java implementation of SSL/TLS). This is based on trust stores.

Chapter 8: Apply Custom Extensions

HP EM 2.00 contains significant changes to the architecture model. If you have customized extensions, apply them to HP EM 2.00.

To Apply Custom Assertion Extensions:

1. Install Assertion Editor as part of HP EM Workbench 2.00.

2. Create a new assertion project in Assertion Editor 2.00.

3. Build the extensions in Assertion Editor 2.00.

4. Apply the extensions to HP EM 2.00.

For details, see the *Assertion Editor Guide*.

To Apply Custom Taxonomy Extensions:

1. Install Taxonomy Editor as part of HP EM Workbench 2.00.

2. Create a new taxonomy project in Taxonomy Editor 2.00.

3. Build the extensions in Taxonomy Editor 2.00.

4. Apply the extensions to HP EM 2.00.

For details, see the *Taxonomy Editor Guide*.

> **Caution:** If your taxonomy extension contains customized system taxonomies (for example, `lifecycleStages` and `documentTypes`), they are merged with the corresponding system taxonomy in HP EM 2.00. In the event of a conflict the old system taxonomy takes precedence.

To Apply Custom Model Extensions:

1. Install Customization Editor as part of HP EM Workbench 2.00.

2. Create a new extension project in Customization Editor 2.00.

3. Build the extensions in Customization Editor 2.00.

4. Apply the extensions to HP EM 2.00.

For details, see the *Customization Editor Guide*.

Custom Java code in old extensions should be reviewed.

To Apply Custom Reporting Extensions:

1. Install Report Editor as part of HP EM Workbench 2.00.

2. Create a new report project in Report Editor 2.00.

3. Build the extensions in Report Editor 2.00.

4. Apply the extensions to HP EM 2.00.

For details, see the *Report Editor Guide*.

Chapter 9: Starting and Configuring HP EM

After deployment, you should start HP EM and apply any required final configuration.

For details, see the following sections:

- "Enable Full-Text Search in HP EM" below

- "Turn Off HP EM Self-Test" below

Enable Full-Text Search in HP EM

Full-text search must also be enabled in the HP EM UI.

To Enable FTS:

1. Sign in to HP EM with the login credentials: Administrator/changeit.

2. Select the **Administration** tab **> Configuration > Configuration Settings** to open the Configuration page.

3. Select **Basic Settings > Full Text Search**.

4. Click **Save** to apply the setting.

Turn Off HP EM Self-Test

The self-test output is accessible to anyone using the URL. For security reasons, you can switch off access to the self-test output after a completed deployment of HP EM passes the self-test.

To Switch Off Self-Test Output:

1. Sign in to HP EM as the administrator.

2. Select the **Administration** tab **> Configuration > Configuration Settings** to open the Configuration page.

3. Select **Self-Test**.

4. Click **Disable** to switch Self-Test off.

To disable the standalone self-tester, undeploy the `self-test-standalone.war` package from your server.

To verify that the self-test has been disabled, check the self-test output URL: `http://hostname:port/context/self-test`.

Chapter 10: License Management

You must have a valid license installed to work with HP EM. To retrieve your license key, go to http://www.hp.com/software/licensing, enter your HP Entitlement Order Number, and click **Go** to activate your HP EM license.

The license must be installed on the same machine on which the HP EM Server is installed. You need to be an Administrator to install a license.

See the following topics to install, manage and reset HP EM licenses.

- " Installing an HP EM License" below

- " Managing Licensed Users" below

- " Resetting the HP EM License" on the next page

Installing an HP EM License

The following is the procedure to install an Autopass license, a .dat file or several .dat files that HP sent to you. You then import the license as described in the following steps. The HP EM server enables you to view all installed licenses.

To install a license:

1. Sign in to HP EM with Administrator credentials: admin/changeit.

2. Select the **Administration** tab **> Configuration > Configuration Settings** to open the Configuration page.

3. Select **License** to open the License page.

4. Click **Import License File > Choose File** to upload the license .dat file.

5. Click **Finish**.

The License page displays the license details.

Managing Licensed Users

Where the license determines a limited number of user seats, the administrator can modify which users can access HP EM.

To manage licensed users:

1. Sign in to HP EM with the login credentials: Administrator/changeit.

2. Select the **Administration** tab **> Configuration > Configuration Settings** to open the

Configuration page.

3. Select **License** to view the current license details in the License page.

4. Cick **Edit** next to the Licensed User Seats to open the Edit Licensed Users page.

> **Note:** The Edit option is only visible for licenses with limited user seats.

5. In the Edit Licensed Users page, do any of the following:

   - To add licensed users, click **Add** and use Browse Address Book or the search input to locate the users you want to add. Click **Select** to confirm your additions.

   - To remove licensed users, select the users in the table, click **Remove** and confirm your decision.

Resetting the HP EM License

There are two ways in which you can reset the HP EM license without having to re-install the product:

To reset the license through the UI:

1. Sign in to HP EM with the login credentials: Administrator/changeit.

2. Select the **Administration** tab **> Configuration > Settings > System Properties**.

3. In the Name text box, search for file named **shared.license.ds1**.

4. Click **Download**, then Open to edit the setting on your computer.

5. In **System Properties** click **Upload** to upload the edited file.

6. Search for property named `shared.license.chosen.api` and change its value to `com.hp.systinet.license.LicenseApiSystinetImpl`.

7. Restart the server for the changes to take effect.

To reset the license directly in the Database (**DB**):

1. Stop the server.

2. Use the SQL Developer (if you use Oracle) and connect to the HP EM database.

3. Open the systemconfiguration table, filter with the name **shared.license.ds1** and edit the BVALUE column.

4. In the editor, save the content as a local file. Edit the local file as desired and then load it to the BVALUE column.

5. Open the systemconfiguration table, filter with the name `shared.license.chosen.api` and edit the BVALUE column with value `"com.hp.systinet.license.LicenseApiSystinetImpl"`.

6. Commit the change.

7. Restart the server.