HP Project and Portfolio Management Center

Software Version: 7.5

Document Management Guide and Reference

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1 Getting Started with HP Document Management

Introduction to HP Document Management

The optional document management module in HP Project and Portfolio Management Center (PPM Center) gives you more control over document search and storage than does the standard PPM Center application. The HP document management technology is a modified version of the EMC Documentum product. With it, you can track, index, and search multiple versions of supporting documents attached to PPM Center entities in HP Demand Management, HP Portfolio Management, HP Program Management, and HP Project Management.

Documents managed in these environments are always directly related to a PPM Center entity through the standard attachment field and document references functionality in PPM Center. Entities include requests (portfolios, proposals, projects, and assets), project plans, and programs.

➤ If you have purchased the full Documentum product from EMC and installed it on your system, you cannot use it with PPM Center. Only the modified version that HP provides works for document management in PPM Center.

The document management module includes the following components, all of which are available only from HP for exclusive use with PPM Center:

- Integrated Content Server

- Documentum Foundation Classes (DFC)

- Full-text indexing software (index agent and index server)

> The HP document management module is supported on English-only Oracle databases.

For more information about the system requirements for document management, see the *System Requirements and Compatibility Matrix.*

Functional Capabilities

Key functional capabilities of the HP document management module include the following:

- Searching the contents of documents associated with groups of entities to locate a particular entity in the group

- Check-in and check-out functionality, including check-out override capabilities

- Version control of attached documents

- History of document versions is maintained

- Users can retrieve older document versions

- Full-text indexing

For information about how to use the HP document management module, see Chapter 6, *What Document Management Users Need to Know,* on page 103.

Availability and Licensing

HP document management is free to customers who purchase a PPM Center application such as HP Demand Management or HP Project Management. The license key supplied at the time of purchase gives you access to both the application and the document management code from the appropriate HP Web site.

Use-Case Scenario

A large national insurance company, XYZ Corporation, has just installed PPM Center and the HP document management module. A business analyst working with the IT organization at XYZ is preparing a proposal for new software to be used by insurance investigators across the corporation. Before submitting the proposal for review, the analyst must complete a business case document.

The PPM Center workflow associated with the proposal enforces this requirement. If the business case document is not attached to the proposal, the analyst cannot move to the next workflow step.

As the analyst checks out the business case document, and later checks in new drafts, document versions are created and stored. If necessary, users can access earlier versions of the business case document.

Documents managed using the HP document management module follow the same security rules (including field-level security rules) that apply to all PPM Center entities. This means that application users view only information that applies to their current roles and tasks.

The business analyst can use the document management module to search for entities based on the contents and metadata of documents attached to the entities. The analyst can use key words to locate relevant proposals, assets, requests, and other entities related to a business case, regardless of where the details about the entities reside.

Document Management Enhancements to the Standard Interface

Figure 1-1 and *Figure 1-2* show the difference between standard attachment functionality and document management capabilities.

Figure 1-1. Search Requests page in PPM Center

Figure 1-1 shows the Search Requests page in a system without document management. You can type request key words to use to search the contents of

request **Notes** and **Description** fields, but this search will not include the contents of documents attached to requests.

Figure 1-2. Searching a request with document management installed

Figure 1-2 shows the Search Requests page in a system with document management. You can still use the **Request Key Words** field to search request notes and descriptions.

To include the contents of attached documents in your search, type the text to search for in the **Document Key Words** field. Words that you type in the **Document Key Words** field are used to search the contents of documents attached to requests that meet the other filter criteria. To search for documents with names that match known text, use the **Document File Name Contains** field to search the filenames of attached documents.

The document management module affects the following pages and entities in the PPM Center standard (HTML) interface:

- Initiative Requests
- Packages
- Programs
- Project Issues
- Project Resource Request
- Project Risks
- Project Scope Changes
- Projects
- Requests
- Tasks

With document management, the Request Detail report displays additional information about attached documents.

If You Already Use Document Management in PPM Center

The document management module in this release of PPM Center uses the 5.3 SP5 versions of Documentum:

- Content Server

- Indexing Server

- Documentation Foundation Classes (DFC)

If you are on the 5.3 SP2 versions, then you must upgrade all Documentum components to 5.3 SP5. Installing the 5.3 SP5 versions over your existing installed components should achieve the upgrade. However, for detailed instructions, see the Documentum documentation.

➤ HP recommends that you install DFC 5.3 SP5 (on PPM Server machines that are not Content Server hosts) before you install PPM Center 7.5.

For detailed instructions on how to install the Documentum Foundation Classes as a separate installation independent of Content Server installation, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

If you have a 5.2 installation of Content Server, you should contact HP-Mercury support.

How Document Management Affects Performance

This section addresses the issue of how document management affects PPM Center performance.

Implementing document management as part of PPM Center affects the following functional areas:

- Attaching a document to a PPM Center entity (such as a request or project), either through attachment fields, or through the **References** section available for some entities

- Viewing a document that is attached to a PPM Center entity

Without the document management module, documents attached to HP entities are uploaded and stored on the PPM Server file system. With document management, attached documents are uploaded to the PPM Server, and then stored in a Documentum repository.

In the typical configuration, the PPM Server and the Content Server are located on the same local network. This ensures that any communication between the two servers enjoys fast, uninterrupted network access.

The overhead of storing and retrieving attached documents to and from the Content Server adds minimal overhead to client response time. With or without the document management module, the key factor that determines user response time is the quality of the wide-area network (WAN) between the client machine and the PPM Server. If it takes five minutes to attach a 2 MB document to a PPM Center request without document management, then the process will still take five minutes with document management in place, assuming that the PPM Server and Content Server are on the same local network.

Performance and Attaching Documents

With document management enabled, attaching a document to a PPM Center entity results in the following:

1. The attached document is uploaded to the PPM Server for temporary storage.

   While attaching a document, the time required to upload that document with document management in place is the same as the time required if document management is not enabled. This is the key performance consideration for client users. The network quality between the client and the PPM Server directly affects the time it takes to upload documents, independent of whether document management is enabled.

2. The user saves the entity (for example, a request) to which the document is attached, the document is copied to the content server, and the temporary copy is removed.

   When the entity is saved, the save time is increased by 50 to 100 percent over the save time for the same entity without an attached document. The time it takes to save an entity increases for each additional document attached, or for each new version of an existing document uploaded.

Overview of Document Management Deployment

A Content Server environment consists of a specific combination of operating system and database, and, optimally, an index server host machine for the full-text index server.

To deploy the document management module for the first time, you perform the following tasks either before or after you install or upgrade PPM Center:

- Install Content Server and configure it to work with PPM Center.

  Content Server installation and setup for use with PPM Center can take more than half a day. The time required for setup depends on server performance, the quality of the network connecting servers, and, if you are upgrading from earlier document management functionality, the number of attachments you plan to migrate.

  For information about how to install and configure Content Server, see Chapter 2, *Installing and Configuring Content Server,* on page 23.

- Install full-text indexing, and configure the index agent.

  For information on full-text indexing and how to install it, see Chapter 3, *Installing Content Server Full-Text Indexing Software,* on page 57.

- Install the DFC on any PPM Server machine that is not a Content Server host.

  For detailed instructions on how to install Documentum Foundation Classes as a separate installation independent of Content Server installation, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

Although the PPM Server uses only a subset of the features that the standard Content Server application provides, Content Server installation includes more than what is required for HP document management. For example, the installation procedure installs Apache Tomcat and an older version of the SDK that PPM Server does not support. Although this does not affect the PPM Server, you may notice some information displayed during installation that does not apply to PPM Center document management.

Installation Sequence

If you are installing the document management components for the first time, you can perform the installation either before or after you install or upgrade PPM Center.

Install Documentum 5.3 SP5 products in the following order:

1. On the Content Server host machine, install Content Server and configure a repository.

   For information about how to install and configure Content Server, see Chapter 2, *Installing and Configuring Content Server,* on page 23.

   Documentum Foundation Classes is automatically installed with Content Server.

2. On PPM Servers on which Content Server is not installed, install the DFC.

   For detailed instructions on how to install Documentum Foundation Classes as a separate installation independent of Content Server installation, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

3. Install the index server and index agent.

   For information about full-text indexing and the steps you perform to install it on Windows or UNIX systems, see Chapter 3, *Installing Content Server Full-Text Indexing Software,* on page 57.

   For instructions on how to enable the HP Document Management Module after you install the required components, see Chapter 5, *Enabling Document Management,* on page 83.

   For information about how to use the HP document management module, see Chapter 6, *What Document Management Users Need to Know,* on page 103.

Prerequisite Documents

This section describes the HP and Documentum guides and reference documents required to install and configure the HP document management module. HP provides relevant guides and manuals from EMC Documentum when you purchase PPM Center.

HP Documents

The following HP documents are required for the document management module installation:

- *System Administration Guide and Reference*

- *System Requirements and Compatibility Matrix*

EMC Documentum Guides

To supplement the information provided in this document, you will need a set of guides from EMC Documentum that contains complete details on how to install and administer the Documentum components of the document management module.

The following EMC Documentum guides contain content that is relevant to the HP document management module:

- *Content Server Installation Guide* provides information about installing Content Server. This manual contains the information you need to install or upgrade Content Server on Windows, UNIX, or Linux systems with the Oracle database. It describes decisions you must make and requirements that must be met before you install the server.

- *Documentum Foundation Classes Installation Guide* contains information and instructions on how to install and upgrade to DFC.

- *Content Server Full-Text Indexing System Installation and Administration Guide* contains information and instructions you need to install or upgrade the full-text indexing system used with Content Server on Windows, UNIX, or Linux. It describes the decisions you must make and requirements that must be meet before you install the full-text indexing software. Use this guide with the *Content Server Installation Guide.*

- *Content Server DQL Reference Manual* is the reference manual for Documentum's Document Query Language, supported by Content Server.

- *Content Server Administrator's Guide* contains the following:

  o Information, instructions, and procedures for the system administration tasks for a Content Server installation.

  o An overview of the system configuration and guidelines for making configuration decisions.

  o Information on how to configure repositories, Content Servers, clients, and sessions.

  o Information about how to perform routine maintenance.

  o Information about connection brokers, full-text indexing administration, managing the content storage area, and repository security.

2 Installing and Configuring Content Server

Overview of Installation and Configuration

A Content Server environment consists of:

- A specific combination of operating system and database.

- Optimally, an index server host machine for the full-text index server.

Deploying the PPM Center document management module for the first time involves installing Content Server, and then configuring the server with PPM Center.

Content Server installation and setup for use with PPM Center can take more than half a day. The time required for setup depends on server performance, the quality of the network connecting servers, and, if you are upgrading from earlier document management functionality, the number of attachments you plan to migrate.

➤ You can set up document management to work with PPM Center *after* you deploy PPM Center. PPM Center runs normally without the document management functionality, so you can perform the integration with the Content Server at a later time, if necessary.

Although the PPM Server uses only a subset of the features that the standard Content Server application provides, Content Server installation includes more than what is required for HP document management. For example, the installation procedure installs Apache Tomcat and a version of the JDK that PPM Server does not support. Although this does not affect the PPM Server, you may notice some information displayed during installation that does not apply to HP document management.

Content Server Components

To understand Content Server functionality, it is useful to know something about its components and structure. This section contains information on the connection broker application, the document repositories, and the Documentum Foundation Classes, and how these components interact with one another and with PPM Center.

Connection Broker

The connection broker is part of Content Server, and is created during Content Server installation. It runs in the background and provides connection information to client applications. PPM Server is a client application to the connection broker.

The connection broker listens for incoming requests on a port you specify. During Content Server installation, you provide the machine hostname and port number. The PPM Server requires this information to communicate with Content Server.

The default port number is 1489. You can specify any unused port on the machine, but HP recommends keeping the default setting.

Repository

Managed documents are stored on Content Server in a repository. This virtual storehouse consists of content and index files and object metadata. Metadata includes properties that describe file characteristics such as creation date, author, and version number.

The repository has a file system component and a database component. For this reason, you must ensure that the Content Server host has access to an Oracle database.

File content and indexes are stored on the file system, while the object metadata are stored in an Oracle database. PPM Center stores documents in the repository that you specify during Content Server installation.

A single connection broker can route requests to multiple repositories. You can create a separate repository for each PPM Server instance, and then point each PPM Server instance to its own repository. This separates the storage areas (physical disk and database schema) and gives you more control over your hardware. You can create multiple repositories on the same Content Server.

About Creating a Repository

You must create a repository for every PPM Server in your configuration, the configuration wizard helps you do this. This section describes some of the items that should be done before running the wizard and provides some tips for troubleshooting issues with the wizard. For usage of the wizard, see

Every repository you create requires:

- A service listed in the `/etc/services` directory.

- A unique database schema created in an Oracle database.

  Multiple repositories cannot share a schema.

  HP recommends that you use the same string for the user name of the Documentum installation owner and for the name of the Oracle database schema created for the repository.

- As you create a repository using the configuration wizard, you are prompted to specify an ID for it.

  Type a number between 0 and 16,777,215 that is unique to the repository.

- The configuration wizard parses your `tnsnames.ora` file to list database SID information, and prompts you to select the database to use. If the database that contains your schema is not listed, the problem might be in the `tnsnames.ora` file.

  After the information is collected, the installation program creates and configures the repository.

To find log information that can help you diagnose any errors that occur, look in the following directory:

```
$DM_HOME/install/setup/*.log
```

- If you add a repository to the existing Content Server (or modify an existing repository associated with Content Server), then you must stop the connection broker, and restart it before you can access the new (or modified) repository. For information about how to stop and start the connection broker, see *Starting and Stopping the Connection Broker and Repository* on page 54.

- If, after you create a repository, you cannot start the connection broker or start and connect to the repository, try to start and connect manually.

  For information about the source of the problem, refer to the error information reported to the console.

  Before the server configuration utility can create a repository, it tries to start the connection broker. If it cannot start the connection broker, it cannot continue.

Documentum Foundation Classes

PPM Center communicates with Content Server through an application programming interface (API) library called *Documentum Foundation Classes,* or the *DFC.*

To function correctly, a PPM Server must be able to locate the DFC. When you run the kConfig.sh script to configure document management (see *Configuring Document Management in PPM Center* on page 84), a properties file named dfc.properties is added to the *<PPM_Home>*/server/*<Server_Name>*/conf directory. This file includes DFC installation directory information.

The DFC uses *.dll native library files on Windows, and UNIX native library files such as *.so. To communicate with Content Server, the PPM Server startup script (kStart.sh) and configuration script (kConfig.sh) must have access to these library files.

The DFC is automatically installed with Content Server. If you install the Content Server on the same machine as the PPM Server, there is no need install the DFC separately. However, if Content Server and the PPM Server are on separate machines, you must install the DFC separately on the PPM Server.

For information about how to install the DFC, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

High-Level Content Server Installation Sequence

The high-level steps used to install and configure the HP document management module are as follows:

1. Check the HP document *System Requirements and Compatibility Matrix* to make sure that your system meets the minimum requirements for document management installation and setup.

2. Install PPM Center, as described in the *System Administration Guide and Reference.*

3. Install the Oracle client software on the machine that is to host Content Server.

4. Read all information related to Content Server installation.

   For information on what to read before you install and configure Content Server, see *Prerequisite Documents* on page 20.

5. Install and configure the document management module, including Content Server and full-text indexing software.

   a. On the Content Server host machine, install the Content Server and configure a repository. Dependent products such as the DFC are automatically installed with Content Server.

   b. On PPM Servers on which Content Server is not installed, install the DFC.

   c. Install the index server and index agent.

You can install the module on the machine running the PPM Server, or on a different machine. For information about how to set up Content Server, see *Installing Content Server* on page 46.

Refer to the EMC Documentum *Content Server Installation Guide* and *Content Server Administrator's Guide,* described in *Prerequisite Documents* on page 20.

For information about how to install the full-text indexing software, see *Installing Content Server Full-Text Indexing Software* on page 57.

6. If you installed Content Server and the PPM Server on separate machines, install the DFC on the PPM Server.

   For information about how to install the DFC, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

7. Although PPM Center does not use the email notification feature in Documentum, you must specify a value in the **SMTP** field during Content Server installation.

> You can specify an invalid SMTP server, but you must complete the field.

8. Configure the document management components to work with PPM Center. Perform this configuration separately for every server in a PPM Server cluster.

   This step is described in *Configuring Document Management in PPM Center* on page 84. Briefly, browse to the dfc.properties file to the *<PPM_Home>*/server/*<Server_Name>*/conf directory on the PPM Server, and then run the *<PPM_Home>*/bin/kConfig.sh script. This establishes the communication between the PPM Server and Content Server.

9. Test the connection between PPM Server and Content Server.

10. Test the document management functionality in PPM Center.

    For example, add a document attachment to a request, modify the document, and then check to make sure that two versions of the document exist in the system. Also, check to make sure that key words added to the document produce the search results you expect.

For more information about using document management in PPM Center, see .

Content Server Configuration Concepts

Content Server configuration occurs in the `server.ini` file and on the repository in the server configuration object named `dm_server_config`.

server.ini File

The `server.ini` file, contains information that Content Server uses at startup including:

- Repository name

- Connectivity

- Password

- Owner

- Connection broker connectivity

- Other parameters, such as the number of maximum concurrent sessions

The `server.ini` file is similar to the `server.conf` file in PPM Center. Depending on your operating system, you can find the file in the following location.

Operating System	File Location
Windows	`%DOCUMENTUM%\dba\config\<Repository>`
UNIX	`$DOCUMENTUM/dba/config/<Repository>`

After you update the `server.ini` file, restart Content Server to apply your changes.

dm_server_config Object

The repository server configuration object named `dm_server_config` is used to configure the Content Server. Each repository is associated with a corresponding server config object.

You can use IDQL to query to verify that a repository is properly associated with a server config object.

The IDQL utility is an interactive tool that lets you enter ad hoc DQL queries against a repository. IDQL is also a useful as a tool for testing and other tasks that support an application or installation because it allows you to run scripts and batch files.

IDQL is included and installed with Content Server. It is found in `$DM_HOME/bin` on Linux and in `%DM_HOME%\bin` on Windows.

For more information about the IDQL utility, see the EMC Documentum *Content Server Administrator's Guide.*

To run a DQL query against a repository, you must first start an IDQL session, as follows:

1. At the command prompt, navigate to the `$DM_HOME/bin` directory.

2. Run the IDQL utility executable, `idql32.exe`.

3. At the prompt, type the repository name.

4. Press `Enter`.

5. At the prompt, type the account name for a user with at least System Administrator privileges in the repository.

6. Press `Enter`.

7. At the prompt, type the password for the user account.

8. Press `Enter`.

   An interactive document query interface session starts. You can type your query at the prompt. The following example DQL query returns one row for each repository on Content Server.

Example query:

```
1> select "object_name"
2> from "dm_server_config"
3> go
```

After you run this statement, you can interact with a particular repository server configuration by updating that repository server config object. For example, to see the configuration parameters for a repository named "PPMdocs," run the following DQL statement:

```
1> select * from "dm_server_config"
2> where "object_name" = 'PPMdocs'
3> go
```

To close an IDQL session, type the quit command at the IDQL prompt.

You can update configuration information in the repository server configuration object while Content Server is running, without having to restart it.

Content Server Installation Requirements and Setup

Before installing Content Server, be sure that the following steps have been completed:

1. Check the HP document *System Requirements and Compatibility Matrix* to make sure that your system meets the minimum requirements for document management installation and setup.

2. Install PPM Center, as described in the *System Administration Guide and Reference.*

3. Read all information related to Content Server installation.

   For information on what to read before you install and configure Content Server, see *Prerequisite Documents* on page 20.

4. Continue with and complete the required preparation steps for your configuration, as detailed in the following sections.

Required Windows User Accounts

Select or create a Windows user to function as the installation owner. You must use this account when you install the Content Server.

Content Server runs under the account of the installation owner. Use this account to perform all Content Server administration.

The Windows user that you log on as for installation must meet the following requirements:

- The installation owner account can be a local or domain account, but if it is a domain account, then it must be a member of the local administrator group.

- The installation owner account must have Full Control permission in the `%DM_HOME%` directory.

- The installation owner account must not be the same account as the Windows administrator.

- The installation owner account must have the following rights, which are granted during installation:
  - Act as part of the operating system
  - Create a token object
  - Increase quotas
  - Log on as a service
  - Log on locally
  - Replace a process-level token
- The user name is restricted to alphanumeric, hyphen (-), and underscore (_) characters.

  The user name you specify when you install the Content Server must match this Windows user name including case, even though Windows user accounts are not case-sensitive.

- The password is restricted to alphanumeric characters, hyphens (-), underscores (_), and periods (.).

Required UNIX Accounts

On Linux, every Content Server installation must have group and user accounts for the installation owner, repository owner, and repository users. Some of these accounts must be in place before you begin to install. You can set up other accounts during or after installation.

Every Content Server installation must have an owner and each repository must have an owner. Each repository has users. The individual responsibilities of the installation owner, repository owner, and repository users are described in the following sections.

Installation Owner Group

To support external password validation, set up a group account whose members are the installation owner, any other Content Server administrators, and repository owners. This group will own the external password validation program.

Installation Owner User Account

Create a UNIX user account (referred to in this document as dctm) that you can use to install, execute, and administer Content Server.

▶ The user account password cannot contain special characters such as $ or @.

The installation owner is the user whose account is used to install the Content Server and create a repository. The server runs under the installation owner account.

The installation owner must have an operating system account. The installation owner user name must consist of ASCII alphanumeric characters, dashes (-) and underscores (_). The first character must be a letter. The installation owner password must consist of letters, numbers, dashes, underscores, and periods.

The installation owner account must have read, write, and execute permission on the /var/tmp directory and on the installation directory ($DM_Install and its subdirectories).

⛔ Do not use the root account as the installation owner account.

As installation owner, you can perform all administrative or maintenance tasks associated with repository installation. After you create a repository, you can create additional repository accounts with Superuser or System Administrator privileges. You can also use those accounts for repository administration.

▶ After you install the Content Server, you must enable the automatic deletion of old audit trail objects from the repository. For information on how to do this, see "Postinstallation Tasks," in the EMC Documentum *Content Server Installation Guide*.

You can create an operating system account to use exclusively for server installation and repository maintenance. You can use a single user account as installation owner for multiple Documentum installations on your network.

On Linux, you can create multiple server installations on a single host computer. You can have separate installation owners for each installation or you can use separate environment files to enable a single installation owner to own all of the installations.

Repository Owner Account

The repository owner is the user whose account is used to connect to the database. The repository owner owns all objects in the database. Each repository must have a unique repository owner.

The repository owner user name and password must consist of letters, numbers, dashes (-) and underscores (_). The first character in the name must be a letter, and all characters must be ASCII characters. The corresponding password must consist of a combination of letters, numbers, dashes, underscores, and periods.

During server installation, you can specify an existing database account for database access. If you designate an existing account to use for database access, that user becomes the repository owner. Alternatively, the installer can create a database user during installation. The new user then becomes the repository owner. If the installer creates the database user, the database user name defaults to the repository name.

Assign the following privileges to the database user account of the repository owner:

- Connect to the database

- Create tables, views, and indexes in the database

- Insert records (rows) into tables

- Drop tables, views, and indexes

- Unlimited tablespace

If you allow the Content Server installer to create a database account for the repository owner, the required privileges are automatically granted to the repository owner. If you create the account before you run the installer, assign the CONNECT and RESOURCE privileges to the account.

Setting Up the UNIX Services File

The `services` file contains information on the port numbers used by the services or processes that run on a host. The `services` file must contain an entry for each repository running on a host.

On UNIX, you must manually create the service name entry in the `services` file before you install the server. For each repository running on the host, the service name entries are made in one of the following:

- `/etc/services` file

- NIS services map

You must have root privileges to edit the `/etc/services` file.

The repository does not have a default service name or default port number. The service name you place in the `services` file must be the same name you provide during repository configuration, which is then used to create the `server.ini` file. The service name for the repository can be the same as the repository name, but this is not a requirement.

As root, create the service name entries using the following format:

```
<Service_Name> <Port_Number>/tcp #Comment here, if needed
```

or

```
<Repository> <Repository_Port>/tcp # RepositoryForPPM
```

`<Repository>` and `<Repository_Port>` are user-specific. The port must be an unused port on the machine running Content Server, and the repository name must be an alphanumeric string unique to the repository. The repository name can contain hyphens (-) and underscores (_), but no other special characters.

If Network Information Service (NIS) is running, the local services file (`/etc/services`) is ignored. Place the entries in the NIS services map. Use the `ypwhich` command to identify the host name of the NIS master server, if one exists.

The port number can be any unused port number greater than 1024. (Linux reserves port numbers up to 1024 for system use.) For example, if the repository service were named mugwort, the services file entry might be:

```
mugwort 1497/tcp # repository
```

If you have multiple repositories on a single machine, create a services file entry for each repository. Make sure that each has a different name and port number.

Content Server Installation Directories for UNIX

You can create the installation directories before you install the server or you can let the Content Server installer create the directories from your input.

If you allow the server installer to create the directories, make sure that the directories you specify during installation match those in the environment variables.

Determine the directories where you plan to install the Content Server, and then set the $DM_INSTALL and $DM_HOME environment variables in the installation owner environment.

The $DM_INSTALL environment variable corresponds to the directory where you plan to install the Content Server. The installation owner must have read, write, and execute permission on the $DM_INSTALL directory and its subdirectories. The $DM_HOME environment variable corresponds to the $DM_INSTALL/product/<Version> directory.

The environment variables and installation directories must contain only ASCII characters. The directory in which you install the Content Server cannot contain spaces or the following characters:

```
! \ / : * ? " < > |
```

Default Operating System Permissions on UNIX Directories and Files

As Content Server creates directories and files in the server installation, it assigns default operating system permissions to them. The default permissions assigned to directories are 777 and the default permissions assigned to files are 666. To change the defaults assigned to public directories and files, set the `umask` key in the `server.ini` file. Setting `umask` affects all public directories and files created after you set the key.

The `umask` key works similarly to the UNIX umask functionality. The value is subtracted from the default permissions to determine the actual permissions assigned to a file or directory. For example, if you set `umask=2,` then the default permissions assigned to directories becomes 775 and the default permissions for files becomes 662. Or, if you set `umask=20,` then the permissions become 757 for directories and 626 for files.

UNIX Graphical Installer Set Up

If you plan to use the graphical installer:

- Install the X Window System on the UNIX host.

- Add the xterm program directory to the `PATH` variable of the Documentum installation owner. You can install the xterm program in any of several locations, depending on your operating system and software packages installed. Typical locations include `/usr/openwin/bin` on Solaris and `/usr/bin/X11` on HP-UX and AIX.

Preparing the Database for Content Server Installation

Every repository must have a correctly configured Oracle database. The requirements are as follows:

- If you install the database on the Content Server host with a Linux system, verify that the system path includes the directory for the database.

- If you install the database on the Content Server host with a Windows operating system, ensure that the database service is set to start automatically. Server installation sometimes requires a restart of the computer. After the restart, installation does not proceed correctly unless the database starts automatically.

- If you create a remote Content Server for a distributed content environment, the `server.ini` file from the primary Content Server host is copied from the primary host to the remote host. To ensure that the `database_conn` key on the primary Content Server host is valid on the remote hosts, ensure that the values used on the primary and remote hosts for database connectivity are identical.

- You must install the database client on remote Content Server hosts. The remote Content Server configuration program must connect to the database to create the server config object, acs config object, file store storage object, and location objects for the remote server.

- Content Server uses the repository owner account to connect to the database. The sections on the repository owner in the *Content Server Installation Guide* provide more information.The server runs as the installation owner, but a separate account must exist to give the server access to the database tables underlying the repository. Each repository must have a unique repository owner and each repository owner must have a unique database account.

You can create the repository owner account and the database or tablespace that the repository uses before you install the Content Server, or the server installation software can create the account and database or tablespace. Before you begin installation, decide whether to create the account yourself or allow the installation program to create the account. The account must have the CONNECT and RESOURCE privileges to do the following:

- Connect to the database

- Create tables, views, and indexes in the database

- Insert records (rows) into the tables

- Drop tables, views, and indexes

● If you choose to have the Content Server installation software create the repository owner account in the database for you, you must have the database administrator user name and password.

● If you install your Oracle database on a machine other than the Content Server host, verify the following:

- The remote machine has an operating system that the Oracle version supports.

- You can connect to the database client from the system on which you plan to install the Content Server.

● Install only the English version of a database. Content Server does not support localized versions.

● Create the repository database with the UTF-8 code page.

On Oracle 9i, when you create the database and choose the database character set (code page), select Unicode (AL32UTF8). If you choose to migrate an existing database to UTF-8, use AL32UTF8.

On Oracle 9i, when you create the database and choose the database character set (code page), select Unicode (AL32UTF8).

To install and configure your Oracle database for document management:

1. Install and configure the Oracle client software on the machine on which you plan to install the Content Server.

2. Add an entry in tnsnames.ora for the repository database. Or use the Oracle client software to do the same.

3. Use the `tnsping` command and SQL*Plus to verify that the Oracle client software is correctly installed.

   For information on the `tsnping` command, see oracleutilities.com/OSUtil/ping.html. For information on SQL*Plus, see your Oracle documentation.

4. Ensure that SQL*Plus is installed on the Content Server host.

   SQL*Plus is needed for creating tablespaces and the database user (repository owner) account.

5. Ensure that `sqlnet.ora` and `tnsnames`.ora are configured correctly. The database aliases must be in the `tnsnames.ora` file, and the `tnsnames.ora` file must be configured on the Content Server host.

   To specify connections, use fully-qualified names in `tnsnames.ora`.

   For example:

   ```
   PPMDEV_TEPPMDS1.USA.NET =
     (DESCRIPTION =
       (ADDRESS_LIST =
         (ADDRESS = (PROTOCOL = TCP)(HOST = hennington)(PORT =
   1521))
       )
       (CONNECT_DATA =
         (SERVER = DEDICATED)
         (SERVICE_NAME = PPMDEV)
       )
     )
   ```

6. Verify that you can connect to the Oracle database by using SQL*Plus from the system where you intend to install the Content Server.

7. Start the Oracle Listener process and configure it to start automatically on the machine where the Oracle database resides.

8. After you verify that the Oracle client software is correctly installed, restart the machine.

Preparing to install the Content Server

Before you install the Content Server, you must perform some configuration steps and set up the required user accounts on the system.

The configuration tasks are as follows:

1. Ensure that the machine where you plan to install the Content Server has access to a valid SMTP server for email notifications.

   Although PPM Center does not use this notification mechanism, you cannot install the Content Server without it. If a valid SMTP server host name is not available during installation, supply an invalid host name so that the installation can finish. Do not leave the field blank.

2. Stop all nonessential services and stop all nonessential programs.

3. Add the following environment variable:

   For Windows:

   Edit the PATH variable to include:

   `<DFC_Install_Location>\<Java_Version>`

   where `<Java_Version>` is the Java Runtime Environment (JRE) version supported for the Content Server version you plan to install. The DFC installation location is set during server installation. It is typically `C:\Program Files\Documentum`.

For UNIX:

To configure the runtime environment of the dctm user, in one of the
`*.rc` files, set the following environment variables:

```
setenv DOCUMENTUM <Install_Directory>
```

i. Before you begin to install the Content Server, check to make sure
that this install directory exists. Set these variables in the
installation owner's `.cshrc` file (C shell) or `.profile` file (Bourne
or Korn shells). Alternatively, set the variables in a file called by
the `.cshrc` file or `.profile` file.

```
setenv DM_HOME $DOCUMENTUM/product/<Version>
setenv DOCUMENTUM_SHARED $DOCUMENTUM/shared
setenv LD_LIBRARY_PATH $DM_HOME/bin:$JAVA_HOME/lib
```

▶ LD_LIBRARY_PATH is a Solaris-specific shared library environment variable.
This variable name and value varies, depending on the UNIX operating system
and version. For descriptions of all required environment variables, see the EMC
Documentum *Content Server Installation Guide.*

4. Obtain the Content Server bundle for your operating system and copy it to
a temporary directory from which to run the installation.

▶ This temporary directory is referred to in this manual as `$DM_INSTALL`.

5. Use an extraction utility such as UnZip or use the Java `jar xvf` command
to extract the installation bundle and extract the installation files.

For example:

```
ContentServer_<Operating_System>.bin
consistency_checker.ebs
dfcSetup.jar
jdkSetup.jar
server.jar
suite.jar
tomcat_4127Setup.jar
setupError.log
```

6. Select the installation location.

   The installation location is referred to in this document as:

   - `C:\Documentum\`

   - `%DM_HOME%`

   The directory path name cannot contain spaces or special characters.

7. Check the regional and language options settings on Windows to make sure that the selected date format displays a four-digit year.

8. If you install a distributed configuration, ensure that all host computers in the configuration are set to the same Universal Time Coordinated (UTC) time.

9. Choose an Oracle database in which to install the repository. Verify that you can connect to this database using SQL*Plus from the system on which you plan to install the Content Server.

   Content Server installer automatically creates the repository schema in this database.

Preparing to install the Content Server on a UNIX System

Before you install the Content Server on a UNIX system, ensure that the following are complete:

1. *Content Server Installation Directories for UNIX* on page 37

2. *UNIX Graphical Installer Set Up* on page 38

3. *Setting Up the UNIX Services File* on page 36

4. *Required UNIX Accounts* on page 33

   Set up a group account, an installation owner account, and a repository owner account.

   a. *Installation Owner Group* on page 33

   b. *Installation Owner User Account* on page 34

   c. *Repository Owner Account* on page 35

5. Content Server uses a semaphore. Check to make sure that semaphores are enabled on the host machine.

6. If you plan to install on an AIX host, check to make sure that AIX is running in 32-bit mode.

UNIX Installation Considerations

Before you install the Content Server on Linux, consider the following:

- Because Content Server is not a Java application, there are version-dependent installers.

- Content Server installation requires root access to the host machine.

Unlike the PPM Server installation, the Content Server installation and the stand-alone DFC installation programs run only in graphical mode. On Linux hosts, this may require that you have the X Window System emulation software installed.

Installing Content Server

This section provides information about how install the Content Server.

➤ You do not need a special license to install the HP version of Content Server.

For supplemental information on Content Server installation, see the EMC Documentum documents described in

To install the Content Server:

1. Locate and run one of the following based on your operating system.

Operating System	Content Server Installer
Windows	ContentServer_<*Operating_System*>.exe
UNIX	ContentServer_<*Operating_System*>.bin

   The Content Server installer program starts and displays the Welcome page.

2. Click **Next.**

   The installer verifies your system requirements and prompts you to type the installation directory.

3. If prompted, select **I accept the terms of the license agreement,** and then click **Next.**

4. (Windows only) Type the full path of the directory in which you want to install the Content Server. For example:

   ```
   C:\Documentum
   ```

   The directory path name cannot include spaces.

5. Click **Next.**

   The installer prompts you to indicate whether you want to install optional components for the DFC.

6. Leave **Developer Documentation (18 MB)** and any other checkboxes unselected and click **Next.**

7. (Windows only) Accept the default DFC installation directory (`C:\ Program Files\Documentum`) or type the full path of the directory in which you want to install the DFC.

   This directory name can contain spaces.

8. Click **Next.**

9. (Windows only) Accept the default DFC user directory (the `%DM_HOME%` directory) or type the full path of a different directory to use as the DFC user directory. Click **Next.**

10. Type the information for your primary connection broker.

Field Name	Description
Primary Connection Broker Host Name	The name of your primary connection broker host computer.This must be the same machine on which you are installing Content Server.
Port Number	The port number for your primary connection broker host computer. The default port is 1489.The port that you specify must not be used by any other process. Make note of the machine name and port number you type so that you can provide these later as you integrate the document management module with the PPM Server.

11. Click **Next.**

12. Leave the **Enable Trusted Content Services** unselected and click **Next.**

13. Leave the **Enable Content Services for EMC Centera** unselected and click **Next.**

   The installer prompts you to specify the Java port numbers for Apache Tomcat. Content Server uses Tomcat internally to run required Java programs.

   ▶ PPM Center does not make use of this Content Server feature.

14. Accept the default port, or type the number of any unused port above 1024 on which Apache Tomcat can listen for requests.

15. Accept the default port, or type the number of any unused port above 1024 to use to stop the Tomcat server. Click **Next.**

16. On the confirmation page, verify your installation parameters, and then click **Next.**

17. (UNIX only) If you have the root user password, select the **Run dm_root_ task now** checkbox, and then click **Next** to run the script. Otherwise, leave the checkbox unselected and click **Next.**

   The installer installs the products and components, and then displays its final page. Click **Finish.**

   If you choose not to supply the root password during the procedure, you must run the `$DOCUMENTUM/dba/dm_root_task` script or the `sudo` command after installation and before you continue as root. Otherwise, the connection broker cannot start, and you cannot create a repository.

   ‼ Navigate to the `$DM_Install` directory (as root), and run the script as follows:

   `./dm_root_task`

   Type the group ID of the Documentum user.

   The installer prompts you to indicate whether you want to configure the server now or later.

18. (Windows only) Select **Configure server now,** and then click **Next.**

   The installer prompts you to indicate whether you want to restart your computer.

19. Select **Yes.**

    After you restart your machine, the configuration process starts automatically.

20. Proceed to *Configuring Content Server Components*.

Configuring Content Server Components

You will need to create a repository for each PPM Server in you configuration.

These instructions assume that after entering all necessary data and making proper selections that you click **Next** to navigate to the next page in the wizard.

To configure Content Server components:

1. Restart your computer and log on as the Content Server installation owner.

2. Start the configuration wizard.

   The Welcome page displays.

   If the configuration wizard does not start, locate and run either `Server_Configuration_Program.exe` or `Server_Configuration_Program.bin`.

3. Click **Next.**

   The configuration program performs a series of system checks, and for Windows prompts you to type the Content Server installation owner password.

4. (Windows only) Type the Content Server installation owner password.

5. Click **Next.**

6. Leave the **Enable Trusted Content Services** checkbox unselected**.**

7. If prompted, leave the **License Key** field empty.

8. Leave the **Enable Content Services for EMC Centera** checkbox unselected**.**

   The configuration prompts you to choose between the express and custom configuration methods.

   ➤ If your organization has an external storage solution such as network attached storage (NAS) or storage area network (SAN) in place, do not use the Documentum express configuration procedure. You must use the custom configuration instead.

   For information about custom and express methods for configuring Content Server components, see "Express or Custom Configuration" in the EMC Documentum *Content Server Installation Guide.*

9. If you are not using an external storage solution such as NAS or SAN, select **Express Configuration.** If you are using an external storage solution, select **Custom Configuration,** and then follow the instructions provided.

   ➤ The custom configuration wizard may prompt you for additional information. For advanced information on how to perform a custom configuration, see the EMC Documentum *Content Server Installation Guide*.

   Later, if you want to update or delete a repository or perform another configuration task, you can run the wizard again and select the custom configuration option.

   The configuration wizard prompts you for repository information.

10. In the **Repository Name** field, type a name for the repository to create.

    The repository name can contain up to 32 characters. Make a note of the name so that you can provide it later when you configure PPM Server.

11. In the **Repository ID** field, type a unique ID number between zero (0) and 16,777,215 for the repository.

12. (Optional) In the **Repository description** field, you can type a description of the repository.

13. In the **Repository size** list, select one of the following.

Size	Description	Recommended
Small	Single table space with an initial data file size of 100 MB.	
Medium	Separate table spaces for data and indexes, with initial data file size of 180 MB and an initial index file size of 180 MB. Adjust the size later, if necessary.	X
Large	Separate table spaces for data and indexes, with initial data file size of 250 MB and initial index file size of 250 MB.	

As it creates a schema, the configuration wizard creates a new tablespace in the database.

14. (Windows only) In the **Authentication Domain** list, select the authentication domain.

15. (Windows only) For **Service Startup Type,** click one of the following to set the repository service at server restart behavior:

- **Automatic**

- **Manual**

If other services must start before Content Server can start, then specify a manual startup. For example, start the Oracle database that contains the repository, if it resides on the same machine.

16. (UNIX only) In the **Service Name** field, type the services name for the repository.

This is the service name you specified in the services file.

The configuration wizard prompts you to indicate whether you want to create an Oracle database user account or use an existing account.

17. Select **Create new Oracle user account and tablespaces.**

18. Type or Select the following database connection information.

Field Name	Description
Database Connection String	The database where you want to install the repository. The **Database Connection String** list only displays the names of databases that are correctly configured in the Oracle client `tnsnames.ora` file and accessible from this machine.
Database User Name	The user name for the Oracle schema. The default name is the same as the repository name you provided, see step 10 on page 50.
Database User Password	The password for the Oracle schema.
Confirm User Password	The password for the Oracle schema.
Database Administrator Name	The user name for the SYSTEM account on the Oracle database.
Database Administrator Password	The password for the SYSTEM account on the Oracle database.

19. To send email notifications for some system events, Content Server requires an SMTP server.

    a. In the **SMTP Server Name** field, type the name of an SMTP server on your network.

    b. In the **Installation Owner's Email Address** field, type the email address of the person you want to receive Content Server email notifications.

    Email traffic is minimal. Under normal operating conditions, this account receives no email messages.

20. If you are running the PPM Server on a machine other than the Content Server host, install the DFC on the PPM Server.

    For information about how to install the DFC, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

The server configuration wizard displays a progress bar. Configuration takes several minutes.

21. After configuration finishes, review the information displayed on the summary page.

22. On the confirmation page, click **Finish.**

23. Run the wizard again if you have more than one PPM Server in your configuration.

Post-Installation Tasks

After you complete Content Server installation and configuration, do the following:

1. Use the Interactive DQL editor (IDQL) tool to test the installation.

    For information about IDQL and how to use it, see Appendix B, "IAPI and IDQL" in the EMC Documentum *Content Server Administrator's Guide.* For information on how to execute an idql statement, see *Example query: on page 31*.

2. Restart the machine.

3. Check to make sure that the PPM Server is not running.

4. Run the `kConfig.sh` script.

Starting and Stopping the Connection Broker and Repository

This section provides steps you can use to stop and start the connection broker and repository on Windows or UNIX systems. It also contains information about what to do if you cannot start the repository.

Because the connection broker and repository run as separate processes on Content Server, you must start and stop them independently. To start and stop a repository, the connection broker must be running. This means that you must start the connection broker before starting the repository, and you must stop the repository before you stop the connection broker.

To start the connection broker and repository:

1. Start the connection broker and then wait for a minute.

2. Only after the connection broker starts, start the repository.

To stop the connection broker and repository, use the reverse process, stopping the repository first, and then the connection broker.

Methods to Start and Stop the Connection Broker and Repository

Depending on the operating system that your Content Server is running, you can start and stop the connection broker and repository using one of the following methods.

Table 2-1. Starting and stopping the connection broker and repository

Operating System	Use	Details
Windows	Services page of the Microsoft Management Console	Because the connection broker and repository run as Windows services, you can start and stop them from the Services page of the Microsoft Management Console.
Windows	Documentum Server Manager	On the Content Server host: 1. Select **Start > Programs > Documentum > Documentum Server Manager.** 2. Use the **Start** or **Stop** buttons on the Repository and Connection Broker tabs.
Windows and UNIX	Command window	Navigate to the `$DOCUMENTUM/dba` directory. To stop a repository, run `dm_shutdown_<Repository>`. To start a repository, run `dm_start_<Repository>`. To stop the connection broker, run `dm_stop_<Connection_Broker>`. To start the connection broker, run `dm_launch_<Connection_Broker>`.

If You Cannot Start the Repository

If you cannot start the repository, use the following command sequence to produce a log file for debugging purposes.

On Windows

```
> cd %DOCUMENTUM%\dba
> .\dm_start_<Repository>
> .\dm_shutdown_<Repository>
> cd log
> ls <Repository>.log*
```

On UNIX

```
> cd $Documentum/dba
> ./dm_start_<Repository>
> ./dm_shutdown_<Repository>
> cd log
> ls <Repository>.log*
```

The log file provides a message similar to the following:

```
Fri Jan 14 07:59:21 2005 996756 [DM_SERVER_E_REGISTER_IN_USE]
error: "The server failed to register itself as there is already
a server on port (4678). Error (515) Service name already in
use. errno: 125, message: Address already in use."
```

Content Server session logs are written to the `$DOCUMENTUM/dba/log` directory. Each repository running on a Content Server has a corresponding log file, which is created every time Content Server is restarted.

The current log file for a repository is named `<Repository>.log`. Previous log files names have the suffix `.save.<Time_Stamp>`.

For example, if your repository is named PPMdocs, then, in the `$DOCUMENTUM/dba/log` directory, you would view something similar to the following:

```
PPMdocs.log
PPMdocs.log.save.09.12.2004.18.05.14
PPMdocs.log.save.11.11.2004.15.21.25
```

For more information about Content Server log files, see the EMC Documentum *Content Server Administrator's Guide.*

3 Installing Content Server Full-Text Indexing Software

Overview of Full-Text Indexing

Full-text indexing enables the rapid searching and retrieval of text strings within content files and content file attributes. If you are using distributed content, all content is copied to the primary content store for indexing. The drive on which the primary content store resides must have sufficient space for the primary content store plus the content copied from remote stores for indexing.

During Content Server installation, you are prompted to designate the languages for which grammatical normalization is enabled. Grammatical normalization ensures that all forms of a word are indexed and that a search for one form of a word also returns other forms.

Full-text indexing is enabled in the repository by default when the repository is created for this Content Server version. However, Content Server itself does not create or maintain the full-text index. You must install the full-text indexing software components, which create and maintain the index.

Full-text indexes enable document management users to search for specific text in stored documents or document attributes.

The full-text indexing software consists of:

- Content Server

- Index agent

- Index server

Content Server manages the objects in a repository, generates the events that trigger full-text indexing operations, queries the full-text indexes, and returns query results. For a complete description of the full-text indexing process, the chapter "Full-Text Indexing" in the EMC Documentum *Content Server Administrator's Guide.*

About the Indexing Process

The indexing process does not destroy existing content or attributes in a repository. Indexing is governed by queue items. During normal repository operations, queue items are generated by operations such as Save operations. When the index agent runs in migration mode, a single queue item, the *high-water mark,* governs indexing. For information about index agent modes and the high-water mark, see .

During indexing, the content files and attributes are read, but not modified. For a complete description of the indexing process, see the chapter "Full-Text Indexing" in the EMC Documentum *Content Server Administrator's Guide.*

About the Indexing Software

Two software components, the *index agent* and the *index server,* underlie full-text indexing operations. This section provides information about these components.

Index Agent

The index agent exports documents from a repository and prepares them for indexing. It is a Web application than runs in an instance of the Apache Tomcat servlet container. Tomcat is automatically installed during index agent installation. Each index agent runs in its own Tomcat instance.

A given index agent runs against only one repository. Typically, you install the index agent on the Content Server host, but you can install it on a different machine.

If you install the index agent on a machine other than the Content Server host, that machine must be running a supported operating system. For a list of the supported operating systems, see the *System Requirements and Compatibility Matrix.*

Index Agent Modes

The index agent runs in one of the following modes:

- **Migration mode.** The index agent prepares all indexable objects for indexing in object ID order. A single queue item, the high-water mark, records the ID of the most recent object indexed. The index agent reads the value in the queue item, exports the next batch of indexable objects from the repository, and updates the queue item. Content Server generates a queue item if an event such as a check-in or save requires that a new or modified object be indexed.

- **Normal mode.** The index agent reads the queue item, prepares the object for indexing, and updates the queue item. After the index agent successfully submits the object for indexing, it deletes the queue item from the repository. If the index agent does not successfully submit the object, the queue item remains in the repository and the error generated by the unsuccessful attempt to index the object is stored in the queue item.

▶ An index agent running in normal mode and an index agent in migration mode cannot simultaneously update the same index.

Index Server

The index server creates full-text indexes and responds to full-text queries from Content Server. Depending on the configuration, a single index server instance can serve one or multiple repositories.

▶ Because the index server operations are processor- and memory-intensive, HP recommends that you install the index server on a machine other than the Content Server host. You must install the index server on the same operating system that is running on the Content Server host.

Documentum supports the following configurations for the full-text indexing components:

- **Single host.** Content Server, repository, index agent, and index server on same host

- **Separate host.** Content Server and repository on one host with the index agent and index server on a separate host

Each repository requires its own index agent. For example, if you have multiple repositories in a single Content Server installation, you must install a separate index agent for each repository. Regardless of where the indexing software resides, a single index server can serve multiple repositories.

Preparing to Install Full-Text Indexing

This section provides the steps you perform to prepare to install the full-text indexing software for the first time.

To prepare for full-text indexing software installation:

1. If you plan to install the indexing software on a machine other than the Content Server host, do the following to ensure that the DNS entries for the two machines are correct (so that they can locate each other on the network):

   a. On the index server machine, look up the Content Server host:

      ```
      nslookup <FQDN_of_Content_Server_Host>
      ```

      where *<FQDN_of_Content_Server_Host>* is the fully-qualified domain name of the Content Server host.

      This returns one or more IP addresses for the Content Server host.

   b. Use the first IP address returned in step 1 for a reverse lookup:
      ```
      nslookup <IP_Address_Returned>
      ```

      The correct return value is the FQDN you typed in step a on page 60.

c. If the `nslookup` commands do not return the correct values, update the DNS servers used by the hosts to reflect the correct FQDNs.

d. If necessary, on a Windows system with more than one network card, update the host files to ensure that the correct IP address for each host is listed first.

e. If the `nslookup` commands succeeded and return the correct values, ping the index server host from the Content Server host to ensure it responds and to ensure that the IP address that responds to the ping is the IP address defined in the ftengine config object.

2. Disable any antivirus software running on the system.

   To install the index agent and index server, you must be logged on to the system as the same user who installed Content Server (the Content Server installation owner).

3. If you plan to install the index agent and index server on a machine other than the Content Server host, ensure that the Content Server installation owner user account exists on that machine.

4. If you plan to install the index agent and index server on a UNIX system, set the environment variables (listed in the following table) in the installation owner environment.

Environment Variable	Description	Required Values
DOCUMENTUM	The directory in which the indexing software is installed	Any directory in the installation owner's environment
DOCUMENTUM_ SHARED	The directory in which DFC is installed	Any directory in the installation owner's environment

Environment Variable	Description	Required Values

LD_LIBRARY_ PATH, SHLIB_ PATH, or LIBPATH	Index server library location	`$DOCUMENTUM/fulltext/ IndexServer/lib`
		`$DOCUMENTUM/fulltext/ fast40`
		`$DOCUMENTUM_SHARED/dfc`
		`$DOCUMENTUM_SHARED/ IndexAgents/ftintegrity`

FASTSEARCH	Index server location	`$DOCUMENTUM/fulltext/ IndexServer`
DISPLAY	Controls the display	`localhost:0.0`
LC_ALL		C
JAVA_HOME	Home directory for the Java installation on the host	Any directory in the installation owner environment

The index server installation includes a script that sets required environment variables for running the index server. The script is `setupenv.sh` or `setupenv.csh,` depending on the shell you use, and it is located in the `<Indexserver_Install_Directory>/bin` directory.

5. To ensure that the environment variables are set correctly, run the `setupenv.sh` or `setupenv.csh` script.

6. For performance reasons, HP recommends that you mount or share the drive or drives on which the repository file stores are located with the index server host (see *Sharing the Drives where Content Files Reside*).

Sharing the Drives where Content Files Reside

The index server requires access to the content files in a repository. If you install the index server on the Content Server host, then the index server has direct access to the file store storage areas.

➤ Because the index server operations are processor- and memory-intensive, HP recommends that you install the index server on a machine other than the Content Server host. You must install the index server on the same operating system that is running on the Content Server host.

If the index server is not installed on the Content Server host, the default behavior of the index agent is to use the Getfile method to retrieve a temporary copy of a file, store it in a temporary location, and pass that location to the index server. After indexing the file, the index server deletes the temporary copy.

For performance reasons, HP recommends that you mount or share the drives where the repository file store storage areas reside with the index server host. When the drives are shared or mounted, the index agent uses the Getpath method to pass to the index server the direct path to a file that must be indexed.

Mount or share the drives before you install the indexing software. After you install the software, edit the indexagent.xml file to map the file stores for the index agent and use the index agent administrative interface to indicate that the file stores are mapped. For instructions on how to edit the indexagent.xml file, see *Modifying the indexagent.xml File to Map File Stores* on page 71.

You can share or mount the drives so that the content files are read-only. HP strongly recommends that you mount or share drives so that the paths are logically identical on the Content Server and index server hosts.

On Windows hosts, use UNC paths. On UNIX, use NFS and, if necessary, symbolic links. If you must mount from a Windows platform to a UNIX platform, use third-party utilities to mount or share the drives. The changes to the indexagent.xml file depend on whether the paths are logically identical. For instructions on how to share or mount drives, see the documentation for your operating system.

Even if the file store storage area drives are mounted, XML content is retrieved using the `Getfile` method rather than the `Getpath` method. Content located in Centera stores, external stores, or encrypted file stores must be retrieved for indexing using the `Getfile` method.

Installing the Full-Text Indexing Components

This section provides the steps you perform to install the full-text indexing software, and then create a full-text index. Use these instructions to install the index agent or the index server software. The same installation program is used for both components. You can install either or both of the components on a given host.

Note that the installer installs the index agent configuration program, which you use to configure an index agent instance. If you do not configure the index agent immediately after you install the configuration program, you can configure it later.

To install the index server and the index agent configuration program:

1. Ensure that the repository for which you are installing the index server and index agent is running.

2. Log in to the index server and index agent host as the Content Server installation owner.

3. Obtain the installation files and save them to a temporary location on the host.

4. Start the full text installer.

Operating System	Executable Filename
Windows	`Full-text_Indexing_Components_5.3_ SP5_windows.exe`
HP-UX	`fulltextHpuxSuiteSetup.bin`

Operating System	Executable Filename
AIX	`fulltextAixSuiteSetup.bin`
Solaris	`fulltextSolSuiteSetup.bin`
Linux	`fulltextLinuxSuiteSetup.bin`

The Welcome page opens.

5. Click **Next.**

The license agreement page opens.

6. Click **I accept the terms of the license agreement,** and then click **Next.**

The installer program lists the programs you can install.

7. Leave **Documentum Index Agent Configuration Program** and **Documentum Index Server** selected and click **Next.**

8. (Windows only) Indicate whether to install the developer documentation and the primary interop assembly installer, and then click **Next.**

9. (UNIX only) On the Select Optional Features page leave the **Developer Documentation** checkbox unselected and click **Next.**

10. If required, install Documentum Foundation Classes (DFC).

For Windows:

a. Accept the default installation directory (`C:\Program Files\ Documentum`) or specify a different directory.

b. Accept the default user directory (`C:\Documentum`) or specify a different directory.

On UNIX, the DFC directories are determined by environment variables set before installation.

11. Click **Next.**

12. If a `dmcl.ini` file does not exist on the machine, provide the following connection information:

a. In the text field, type the host name of the computer on which a connection broker is running.

b. In the text field, type the port number that the connection broker uses.

13. Click **Next.**

14. Install the index server, as follows:

a. Accept the default index server installation directory or specify a new directory, and then click **Next.**

b. If prompted, type the password for the account you used to log in, and then click **Next.**

The installer verifies the password.

c. Type the base port number for the index server, and then click **Next.**

The index server requires 4,000 available ports in sequence; for example, if the base port you designate is 3000, the index server uses ports 3000 through 7000. The default base port is 13000.

d. To enable support for grammatical normalization and parts of speech to be indexed, select the checkbox.

Specifying the parts of speech to index can reduce the size of the indexes and the disk space required to maintain them. You can enable grammatical normalization only for the languages listed.

If you enable grammatical normalization, it is enabled by default for Japanese and Korean and cannot be disabled. Content files in languages that you do not select or that are unavailable for normalization are still indexed. For more information about this setting, search for "grammatical normalization" in the EMC Documentum *Content Server Full-Text Indexing System Installation and Administration Guide.*

e. Choose languages for grammatical normalization and the parts of speech to be indexed.

f. Accept the default directory (`%DOCUMENTUM%`) for the full-text indexes or specify a different directory, and then click **Next.**

If you specify a different directory, ensure that its name contains no spaces. The installer creates the `\data\fulltext` directory in the location you specify.

The installer program displays a list of the products to be installed.

15. Click **Next.**

The installation program displays a progress bar so that you can follow the progress of the software installation.

16. Click **Finish.**

17. After you install the full-text indexing software, ensure that the index server starts, as follows.

   - (Windows only) Select **Yes, restart my computer,** and then click **Next.**

   - (UNIX only) Navigate to the `$DOCUMENTUM/fulltext/IndexServer/ bin` directory, type `startup.sh,` and then press **Enter.**

The index server starts.

Configuring the Index Agent

The index agent configuration program configures the index agent to process documents for a particular repository and to pass the documents to the correct index server instance for indexing. Use these instructions to run the index agent configuration program.

To configure the index agent:

1. To start the configuration program, after the host reboots and you log in as the installation owner.

   - (Windows only) Select **Start > Programs > Documentum > Index Agent Configuration Program.**

   - (UNIX only) Navigate to `$DOCUMENTUM_SHARED/IndexAgents` and start the configuration program for your operating system, as follows:

     o For AIX, use `IndexAgent_Configuration_Program.aix`

     o For Solaris, use `IndexAgent_Configuration_Program.bin`

     o For HP-UX, use `IndexAgent_Configuration_Program.hp`

     o For Linux, use `IndexAgent_Configuration_Program.linux`

   The Welcome page opens.

2. Click **Next.**

3. (Windows only) Type the installation owner password, and then click **Next.**

4. Leave **Create & Configure Index Agent** selected and click **Next.**

5. On the Select Index Agent Ports page:

   a. In the top **Port Number** field, accept the default value specified for Apache Tomcat (9082), or type a different port number for the index agent to use to communicate with Tomcat.

   ➤ (Windows only) The default ports for the first index agent on the host are 9081 and 9008.

b. In the bottom **Port Number** field, accept the default value specified for the index agent (9009), or type a different port number for the index agent to use to stop Tomcat.

▶ If the index agent is on the Content Server host, do not specify port numbers used by the Java method server or Site Caching Services.

Type the port numbers for the index agent to use to communicate with, and to stop, Tomcat.The index agent runs in the Apache Tomcat servlet container. You must designate two ports for the index agent and Tomcat to use.

6. Click **Next.**

7. In the **Repository Name** list, select the repository for which the index agent is to prepare documents.

The list displays the repositories that project to the connection brokers listed in the dmcl.ini file on the host. The dmcl.ini file was created during installation if a dmcl.ini file was not already on the host.

8. Click **Next.**

9. Type the user name and password for the Superuser account for the index agent to use to connect to the repository.

Use this user name and password later to access the Index Agent Admin Tool.

▶ The machine where the index server and index agent are installed must be identified using a fully-qualified domain name. For example, you could use a host name such as isolde.documentum.com, but not an IP address such as 172.04.8.275.

The index agent configuration program validates the user name and password you typed.

10. Click **Next.**

11. Select the **Normal Mode** for running the index agent.

12. Click **Next.**

13. On the Enter Index Server Details page, type the name of the machine where the index server for this index agent is running and the base port number for the index server.

   a. In the **Index Server Host Name** field, type the name of the host on which the index server for this index agent is running.

   b. In the **Index Server Base Port Number** field, accept the default value or type a different base port number for the index server.

   ➤ The index server requires a contiguous range of four thousand free ports. The default range is from 13000 to 17000.

14. Click **Next.**

   A summary dialog box opens.

15. Review the configuration settings, and then click **Next.**

   - (UNIX only) To start the index agent and its Tomcat instance, navigate to *<DOCUMENTUM_SHARED>*/IndexAgents/*<IndexAgentN>*/, where *<IndexAgentN>* is the number corresponding to the new index agent instance, and then type **startupIndexAgent.sh.**

   - (Windows only) The index agent is created and Tomcat is started.

16. Click Finish.

Modifying the indexagent.xml File to Map File Stores

If you have shared or mounted the drives that contain the repository file stores and installed the indexing software, you must manually edit the index agent configuration file to indicate that the drives are shared. The changes depend on whether the file system paths to the content are identical on the Content Server host and index server host.

To modify the `indexagent.xml` file and map the file stores:

1. On the index agent host, navigate to the following directory:

   ```
   $DOCUMENTUM_SHARED/IndexAgents/IndexAgent1/webapps/
   IndexAgent1/WEB-INF/classes/
   ```

2. Open the `indexagent.xml` file in a text editor.

3. If the paths to the content files are identical on the Content Server host and index server host, locate the `<exporter>` element and change the value of the `<all_filestores_local>` element to true, as follows:

   ```
   <all_filestores_local>true</all_filestores_local>
   ```

4. If the paths to the content files are different, create a file store map within the `<exporter>` element.

   Do not modify the value of `<all_filestores_local>`. For example, if Content Server is on a host called Dandelion where `filestore_01` is physically located in the directory `/Dandelion/Documentum/data/repository_name/content_storage_01` and the index agent and index server are on a host from which the drive on the Content Server host is shared as `/mappingtoDandelion/repository_name/content_storage_01`, create an alias as follows:

   ```
   <local_filestore_map>
      <local_filestore>
         <store_name>filestore_01</store_name>
         <local_mount>/mappingtoDandelion/<Repository>
         /content_storage_01</local_mount>
      </local_filestore>
   <!-- and so on for each filestore --!>
   </local_filestore_map>
   ```

If you are indexing content stored on an NAS device or a Windows 2003 Server host, you may view the following error message in the message attribute of the `dmi_queue_item`:

```
DocumentRetriever :ERROR Retrieval error: Couldn't open file
<file path/name> ERROR Processor error status:
DataNotAvailable Not read permission
```

To resolve this error, edit the `<local_mount>` element or elements in the `IndexAgent.xml` file that reference the storage area or areas on the NAS device. Add two backslashes immediately after the opening `<local_mount>` element. For example, assume the following references a storage are on an NAS device:

```
<local_mount>\\100.2.4.32\share3\c\data_for_example\content_
storage_1</local_mount>
```

After editing, it is as follows:

```
<local_mount>\\\\100.2.4.32\share3\c\data_for_example\
content_storage_1</local_mount>
```

5. Save the `indexagent.xml` file.

6. Start a browser and open the Index Agent Admin Tool at the following URL:

   <Host_Name>:*<Port_Number>*/*<IndexAgentN>*/login.jsp

   where *<Host_Name>* is the name of the host where the index agent is running, *<Port_Number>* is the port where the index agent is listening, and *<IndexAgentN>* is the number assigned to the index agent instance. If the browser is on the index agent host, replace hostname with localhost.

7. Stop the index agent.

8. Indicate which file stores are mapped.

9. Restart the index agent.

For information on how to stop and start the index agent, see .

Starting and Stopping the Index Agent

If the index agent is running in migration mode, use the Index Agent Admin Tool to start or stop it.

➤ Note that stopping the index agent does not stop or start the Tomcat process in which the index agent runs.

To start or stop the index agent running in migration mode:

1. Start a browser and navigate to the following URL:

   <Host_Name>:*<Port_Number>*/*<IndexAgentN>*/login.jsp

   where *<Host_Name>* is the name of the host where the index agent is running, *<Port_Number>* is the port where the index agent is listening, and *<IndexAgentN>* is the number assigned to the index agent instance. If the browser is on the index agent host, replace *<Host_Name>* with *<Local_Host>*.

2. Log in to the Index Agent Admin Tool.

3. To start the index agent, in the index agent status line, click **Start.**

4. Click **OK.**

5. To stop the index agent, in the index agent status line, click **Stop.**

6. Click **OK.**

Administering Full-Text Indexing

To administer full-text indexing, you use the Index Agent Admin Tool. You can use this tool to map file stores, monitor indexing, and stop or start the index agent and index server on a host.

The Index Agent Admin Tool is installed as part of the index agent and index server installation. It is a JSP page, that you can access by going to the following URL:

`<Host_Name>:<Port_Number>/<IndexAgentN>/login.jsp`

where `<Host_Name>` is the name of the machine on which the index agent is running, `<Port_Number>` is the port that the index agent uses to listen, and `<IndexAgentN>` is a number that designates an index agent instance.

4 Installing Documentum Foundation Classes

About EMC Documentum Foundation Classes

The Documentum Foundation Classes (DFC) are automatically installed with Content Server. If you install the Content Server on the same machine as the PPM Server, there is no need to perform a separate DFC installation. However, if Content Server and the PPM Server are on separate machines, you must install the DFC on the PPM Server.

This chapter provides the information you need to prepare to install the DFC, and then to install it. For supplementary information, see the EMC *Documentum Foundation Classes Installation Guide.*

Before You Install Documentum Foundation Classes

This section describes the steps to take before you install the DFC.

Setting the Environment Variables for the DFC

The DFC uses several environment variables to find its components.

- **Windows.** The DFC installation program sets the environment variables.

- **UNIX.** The DFC installation program does not set environment variables, so you must set them manually before you install.

If the installation program does not find the required environment variables, installation fails.

File System Locations for the DFC Components

The DFC maintains components at different file system locations, described in the following sections.

DFC Program Root Directory

The DFC installs program files under the program root directory.

On Windows, the installation program asks for a program root directory and uses the `C:\Program Files\Documentum` directory if you do not specify a location.

On UNIX, the installation program uses the environment variable `DOCUMENTUM_SHARED` to determine the program root directory. If this variable is undefined, the installation fails.

DFC User Root Directory

The DFC creates client-oriented directories (for example, `checkout` and `export`) in the user root directory. On Windows systems, the installation program asks for a user directory root and uses `C:\Documentum` if you do not specify a location.

On UNIX systems, the installation program uses the environment variable `DOCUMENTUM` to determine the user directory root. If this variable is undefined, the installation fails.

Directory for Shared Libraries

The DFC installation program places shared libraries at specific locations relative to the program root directory. On Windows systems, the installation program uses the shared subdirectory of the program root directory. It adds the full path of this directory (followed by a separator character) to the value of the `PATH` system environment variable.

On UNIX systems the installation program uses the `dfc` subdirectory of the program root directory. You must place the full path of this directory onto the library path. The library path environment variable has different names in different operating system versions, as follows:

- `LD_LIBRARY_PATH` in Solaris or Linux

- `SHLIB_PATH` in HP-UX

- `LIBPATH` in AIX

Directory for the DFC Configuration Files

The installation program creates the config directory to store configuration files. The installation program creates the config directory under the program root directory on UNIX systems, and under the user root directory on Windows systems. For the DFC to operate successfully, the classpath must contain the full path to the config directory.

On Windows systems, the installation program adds the full path of the config directory (followed by a separator character) to the value of the CLASSPATH system environment variable.

On UNIX systems, you must place the full path of the config directory onto the classpath. For example, in the syntax of the csh shell, add $DOCUMENTUM_ SHARED\config: to the front of the values defined for the CLASSPATH environment variable. You can do this before or after running the installation program, because the installation program does not use this setting.

The DFC_DATA environment variable has been deprecated. To specify a directory to contain the config directory, use the dfc.data.dir property in the dfc.properties file.

If the DFC installation program finds DFC_DATA set to the full path of a directory, it uses the config subdirectory of that directory as the location of configuration files.

Locations of the DFC Classes

The Java runtime environment uses the CLASSPATH environment variable to find the DFC classes and the config directory. On a Windows system, the installation program places the full paths to dctm.jar and the config directory (with separators) at the front of the classpath. On a UNIX system, the installation program does not modify the classpath. You must place the full paths of dctm.jar file and the config directory onto the classpath.

Installing the DFC

To install the DFC:

1. Ensure that you have set the environment variables (`DOCUMENTUM_SHARED`, `PATH`, and `Library path`).

   For information about the environment variables to set, see *Setting the Environment Variables for the DFC* on page 76.

2. Log on to the machine that is hosting the PPM Server as a user with administrator privileges.

3. Depending on your operating system version, run one of the following installation programs.

Operating System	Install Program
Windows	dfcWinSuiteSetup.exe
Solaris	dfcSolSuiteSetup.bin
Linux	dfcLinuxSuiteSetup.bin
AIX	dfcAixSuiteSetup.bin
HP-UX	dfcHpux11SuiteSetup.bin

   The Documentum DFC Runtime Environment Installer opens to the Welcome page.

4. Click **Next.**

5. Read the license agreement, select **I accept the terms of the license agreement,** and then click **Next.**

6. (Windows only) Accept the default DFC installation directory displayed in the **Destination Directory** field (`C:\Program Files\Documentum`), or type the full path to a different directory.

   In this guide, this DFC installation directory is referred to as `$DFC_HOME`.

7. Click **Next.**

   The DFC installer prompts you to indicate whether you want to install optional features.

8. Leave the checkboxes unselected and click **Next.**

9. (Windows only) Accept the default shown in the **User Directory** field, or specify a different directory. The default directory is:

   `C:\Documentum`

10. Click **Next.**

    The DFC installer prompts you to type the location (host name) and port number of the connection broker to which you want to connect.

11. In the **Primary Connection Broker Host Name** field, type the name of the machine that hosts the connection broker.

12. Accept the default port number (1489) displayed in the **Port Number** field, or type a different port number for the machine that hosts the connection broker.

    Type the information for the connection broker created during Content Server installation.

    You can use an IP address or a symbolic address such as `MyHost.MyCompany.com`. The installation program skips this step if it finds a `dmcl.ini` file that contains the required information.

13. Click **Next.**

    The installation program displays a summary of what is to be to installed and where. Make a note of any information you want to record.

14. Review the summary information, and then click **Next.**

    The installer program prompts you to indicate whether you want to specify a global registry for this DFC to use.

15. Leave the checkbox unselected and click **Next.**

16. After the DFC is successfully installed, click **Finish.**

17. Ensure that the version of the DMCL shared library just installed is the one that the DFC always uses.

    The shared library has filename `dmcl40` or `libdmcl40.` The filename extension varies with the operating system. To determine the location where the installation program places the shared library, see *Directory for Shared Libraries* on page 77.

    The installation program replaces copies of the shared library that it finds, but other copies may exist on the machine. It is safe to replace all of them with the current version, but if you do not wish to do so, you must ensure that the old version does not precede the current version in any path environment variable that the current DFC might use.

18. If a machine hosts Content Server, manually replace the DMCL shared library that is in the server's `bin` directory.

Troubleshooting the DFC Installation

The installation program maintains an error log, which it writes to a file named `setupError.log` located in the working directory. If it cannot write to the working directory, it writes to the home directory of the user who ran the installation. If installation fails, reading this file can help you detect what went wrong. If it does not, and you must call HP-Mercury support, supply your support contact with the entire log file, unedited. The `setupError.log` file does not contain passwords or other secure information.

5 Enabling Document Management

Enabling Document Management

This section provides the procedure you use to configure PPM Center to work with document management on Windows or on UNIX. If you are running multiple PPM Servers in separate file systems, be sure to perform this procedure on every server.

Enabling document management involves configuring the PPM Server so that it has access to the repository that you created for use with PPM Center during Content Server installation. If you are enabling document management on a PPM Server that already contains attached documents, the documents are migrated to the document management repository.

Before you enable document management, keep in mind that, after existing attachments are migrated to the Content Server repository, and new attachments are added through the PPM Center standard interface, you cannot disable document management and revert to storing attachments in the PPM Center file system. However, in a new PPM Center instance that does not yet have any attached documents, you can disable document management at any time and revert to storing attachments on the PPM Center file system.

For information about how to disable document management (after you have enabled it) in PPM Center, see *Disabling Document Management* on page 93.

Configuring Document Management in PPM Center

To configure PPM Center to work with the document management module:

1. Make the DFC native libraries available to the PPM Server by setting the shared library path environment variable on the PPM Center host.

   The shared library path varies with the operating environment, as follows:

   - On Microsoft Windows, use `%PATH`.

   - On Sun Solaris, use `$LD_LIBRARY_PATH`.

   - On HP-UX, use `$SHLIB_PATH`.

   - On IBM AIX, use `$LIBPATH`.

   - On Linux, use `$LD_LIBRARY_PATH`.

   The shared library path must include the location of the native libraries (the `*.dll` files on Windows and the UNIX native files on UNIX) installed with the DFC. The location of the native library depends on the operating environment, as follows:

   - (Windows only) The location is `%DOCUMENTUM%/shared`, where `%DOCUMENTUM%` is the Content Server installation directory.

   - (UNIX only) The location is `$Documentum/shared/dfc`, where `$Documentum` is the Content Server installation directory.

   If, for example, Content Server is installed in the `/var/Documentum` directory on Solaris, and the PPM Center user uses the `~/.bashrc` logon script, you would add the following two lines to the `~/.bashrc` file:

   ```
   LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/var/Documentum/shared/dfc
   export LD_LIBRARY_PATH
   ```

2. Copy the `dfc.properties` file, which is located in the shared directory under the Content Server installation directory, to *`<PPM_Home>`*`/<Server_Name>/conf`.

3. Run the *`<PPM_Home>`*`/bin/kStop.sh` script to stop the PPM Server, or, on Windows, stop the server from Windows Services.

4. Set your display options so that the configuration tool can run in graphic (swing) mode.

    ▶ Before you perform the next step, check to make sure that the account under which you are to run the kConfig.sh script has read, write, and execute permissions to the directories for PPM Center and for the Content Server.

5. Run the following command:

    ```
    <PPM_Home>/bin/kConfig.sh script - swing
    ```

    ▶ If the kConfig.sh script fails at any point, you can rerun it.

    The PPM Center Configuration wizard starts.
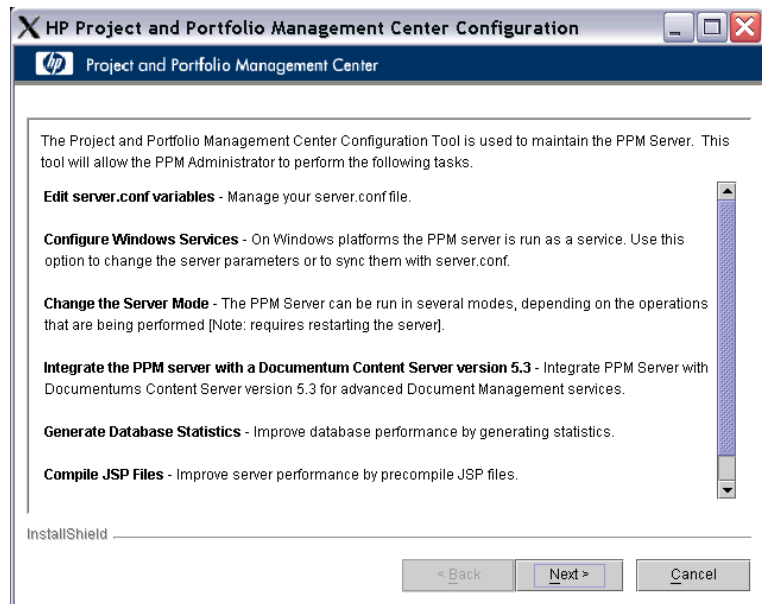
6. Click **Next.**
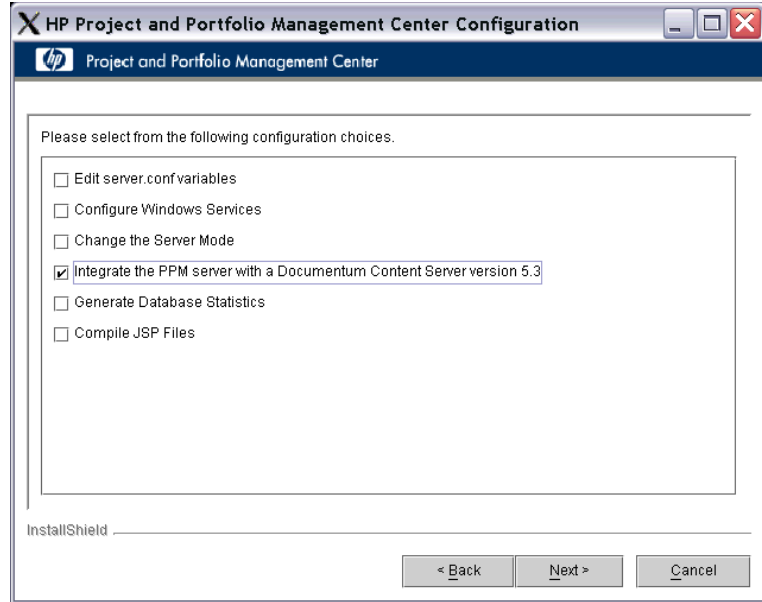
7. Select the **Integrate the PPM server with a Documentum Content Server version 5.3** checkbox, and then click **Next.**
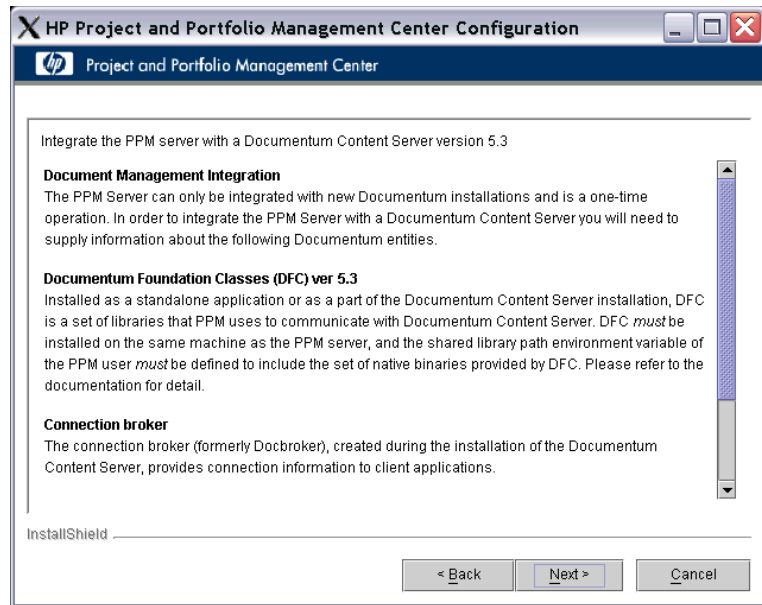
The configuration wizard lists the Documentum components for which you must supply information.

8. Click **Next.**
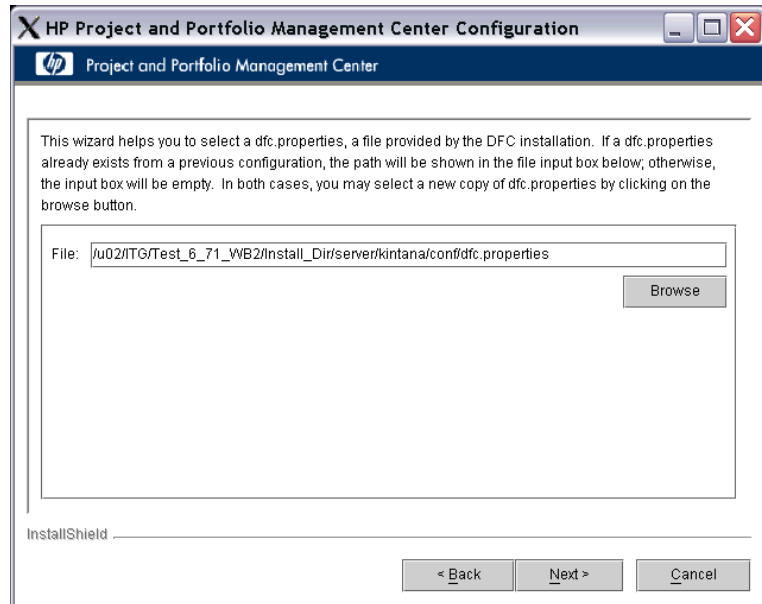
9. In the **File** field, type the full path to the `dfc.properties` file.

   In typical installations this file is in the `DFC User` directory, under the `config` subdirectory.

10. Click **Next.**
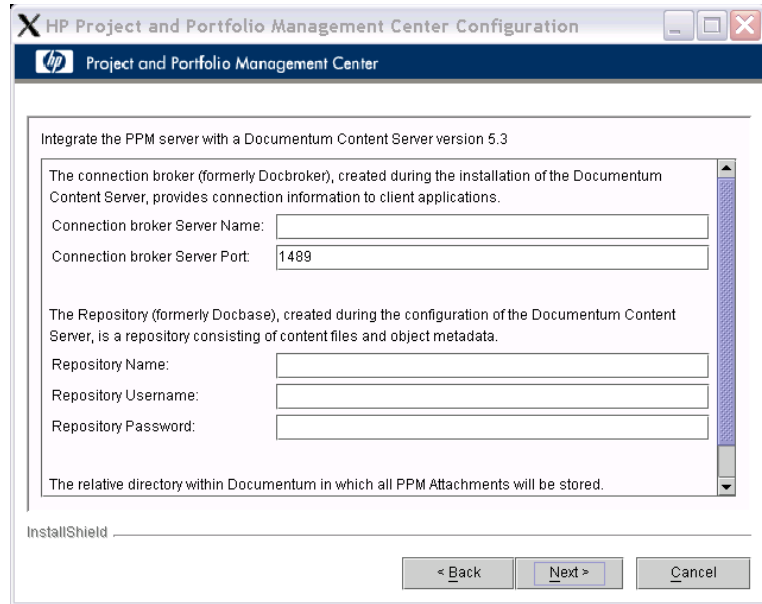
11. Type the following Content Server information:

   a. In the **Connection Broker Server Name** field, type the name of the
      connection broker server (the machine that hosts Content Server).

   b. In the **Connection Broker Server Port** field, type a port number for the
      connection broker.

   c. In the **Repository Name** field, type the name of the repository.

   d. In the **Repository Username** field, type the username for the account of
      the user who installed Content Server.

   ➤ This is the "installation owner" operating system account on the computer
      hosting Content Server, and not the database user of the repository schema.

   e. In the **Repository Password** field, type the password for the account of
      the user who installed Content Server.

   ➤ This is the "installation owner" operating system account on the computer that
      hosts Content Server, and not the database user account of the repository
      schema.

f. In the **Document Cabinet** field, type the relative directory in which to store PPM Center attachments.

Repository objects are organized into folders. The cabinet is a top-level folder in which PPM Server instance stores attached documents.

➤ In <*PPM_Home*>/conf/dms.conf, the property dms.documentum.cabinetName specifies the cabinet name to use. HP recommends using the default value.

12. Click **Next.**

The configuration utility configures the server and copies any existing document attachments into Content Server.

13. After the setup is complete, on the last configuration page, click **Finish.**

14. Run the <*PPM_Home*>/bin/kStart.sh script to start the PPM Server. Alternatively, on Windows, use the Windows service to start the server.

After you restart the PPM Server, document management is enabled.

You must move attached documents into the document management system before you can access them through the PPM Center standard interface.

➤ HP recommends that you allow the kConfig.sh script to copy existing attached documents into the document management system; verify that you can still access the documents through PPM Center after the server is running again, and then manually delete (or archive) the original documents in the attachments directory.

Troubleshooting Installation and Configuration

This section addresses some of the common problems that can occur during or after document management installation and configuration.

Problem

After you successfully install the Content Server and integrate it with PPM Center, the PPM Center instance fails to come up during a `kStart.sh` script run and the error `DM_USER_E_NOT_DOCUMENTUM_USER` is displayed. The user referenced in the server log is CustomerKintana. However, the actual user is Customer\Kintana (Kintana under the Customer domain). The PPM Center instance was started successfully before you installed Content Server.

Solution

Test the repository user name and password by logging in to Content Server using the IDQL button in the Content Server Manager application. You are not required to specify the domain for user names. User names are case-sensitive.

Problem

The password for the connection between PPM Center and Content Server is set when you first configure the connection between PPM Center and Content Server. Later, you change the operating system name and password for Content Server. Running the `kConfig.sh` script triggers a warning message that indicates that you can only run the configuration for Content Server during the initial installation.

Solution

Make the following changes to *<PPM_Home>* configuration:

1. To obtain a new password, run the *<PPM_Home>*`/bin/kEncrypt.sh` script, as follows:

   ```
   sh kEncrypt.sh <Your_Password>
   ```

2. In the `<PPM_Home>`/`conf` directory, open the `dms.conf` file:

   a. Specify your new password as the value for the `superUserPassword` parameter.

   b. Replace `#!#` with `\#\!\#`.

3. If the Windows system account has changed, then reset the `dms.documentum.superUserName` parameter.

4. To update all of the PPM Center configuration files, run the `<PPM_Home>`/`bin/kUpdateHtml.sh` script.

5. Restart PPM Center.

Problem

During Content Server installation on UNIX, you see the following error message displayed:

```
Could not create the PPM Folder in the Documentum Content Server
Exception: FATAL ERROR: Permission denied Failed to instantiate
exclusively - lock.
```

Source

This can happen if the permissions for the DFC directories are not set up correctly.

Solution

Make sure the permissions on the DFC directories are set up correctly.

Check to make sure that the user has the required permission for the DFC directories. On Linux, the PPM Center owner must have read, write, and execute permissions. On Windows, the user must have administrator-level rights (or group rights) to the local machine.

Problem

PPM Center cannot connect to the repository. Content Sever was correctly installed, and the connection broker and repository were correctly configured. However, a PPM Center error message (`DM_SESSION_E_AUTH_FAIL`) indicates that the username and password provided for the repository are invalid. Verification through SQL*Plus and Toad shows that the repository user name and password supplied for Documentum are correct.

Source

Two user accounts are related to Content Server; one is the Documentum Oracle user name and schema owner. The second is the Content Server user account, to which PPM Center connects to access document management functionality. This user is listed in the Documentum `server.ini` file. To verify that the correct user name and password are being used, run the IDQL query tool from the Documentum Server Manager application.

Solution

Verify that the correct user name and password are being used, by running the IDQL query tool from the Documentum Server Manager application.

Problem

The Content Server configuration utility cannot locate the `dmcl.ini` file.

Source

The `dmcl.ini` file is a configuration file that Content Server clients use to locate a connection broker and repository. Content Server tries to create this file in the standard WINDOWS or WINNT directory (for example, `C:\WINDOWS`) on the host computer, but cannot if the home directory of the operating system user is different than the standard directory.

Solution

Create a new system environment variable named `DMCL_CONFIG`, and specify the full path to the `dmcl.ini` file as its value.

Disabling Document Management

After you migrate existing attachments to the Content Server repository *and* add attachments to it through the PPM Center standard interface, you cannot revert to storing attachments in the PPM Center file system. However, until you have performed these tasks, you can disable document management and revert to storing attachments on the PPM Center file system. This section describes how.

To disable document management functionality after you have enabled it, but before attachments are migrated to the repository and added to the repository through the PPM Center standard interface, do the following:

1. Update the `<PPM_Home>/conf/dms.conf` file content to include the following two lines:

   ```
   dms.filesys.attachmentDir=C\:\\PPM\\product\\attachments
   dms.driverName=com.kintana.dms.filesys.DMSFileSystemDriver
   ```

   where `C:\PPM\product` is the `<PPM_Home>` directory. Note the required escaping of colon `(:)` and backslash `(\)` characters.

   ► This example is for a PPM Server running on Windows. On Linux, use single forward slashes `(/)` as directory delimiters.

2. To implement the configuration change, stop, and then restart the PPM Server.

For information about how to uninstall the Content Server, see the EMC *Documentum Content Server Installation Guide.*

Verifying Document Management Setup in PPM Center

Before you begin to use PPM Center with the document management module, verify the installation and configuration, as follows:

- If your PPM Center instance from an earlier release contained attachments, make sure that you can still access those attachments.

- Attach new documents, modify them, and then check to make sure that the documents are accessible and correctly versioned.

➤ After your organization starts to use the document management module, you cannot easily revert the document management functionality and go back to storing attached documents on the PPM Center file system.

Migrating a Repository to a New Content Server Instance

If you want to move your Documentum repository to another machine, you must first install a new instance of Content Server on the target machine, and then copy the repository to the new Content Server instance. You can use any of several methods to move a repository from one Content Server to another. This section provides instructions for the following methods, that you can perform without having to purchase additional tools:

- Copy the repository file system, export, and then import the database schema separately to a new Content Server instance.

- Use the Documentum Dump and Load utilities to export and import the repository as a single entity. This procedure is only recommended for use with small to moderate-sized repositories.

➤ If you are moving the PPM Server to a different machine that is not hosting Content Server, you must install the DFC on the new server. After you successfully clone the document management module, you can reconfigure the new PPM Server to point to the new repository.

Copying a Repository

You can clone a repository by copying all server-side files and the corresponding Oracle database schema. The following procedure provides the steps you use to clone a repository. The term source in these steps refers to the repository you are copying, and target refers to the Content Server that is to receive the copy.

To clone a repository, your system must meet the following requirements:

- The source Content Server and target Content Server must be running the same operating system.

- On the target Content Server, the operating system user to own the copied repository must have the same user name and password as the operating system user on the source Content Server.

> HP recommends that you use a clean, unused Content Server as the target. You must change the security keys to match the source Content Server, which affects any existing repositories on the target.

To clone a repository:

1. Stop the source repository.

2. Make a note of the name and ID of the source repository to copy.

   To determine the repository ID, use a text editor such as Notepad to open the `server.ini` file on the source `($DOCUMENTUM/dba/config/<Repository>/server.ini)`, and then check the value of the `repository_id` parameter.

3. Copy the `aek.key` file `($DOCUMENTUM/dba/secure/aek.key)` from the source to the same directory on the target.

4. Copy the `dbpasswd.txt` file to the new machine.

5. On the target:

   a. Log on as the same operating system user who owns the repository on the source Content Server.

   b. Create a new repository and give it the same name and ID as the source repository.

      If you are creating the repository database schema manually, HP recommends that you specify the same data and index tablespace names as the source repository database schema uses. This facilitates data importation later.

6. Stop the target repository.

7. On the source, use the zip or tar utility to unpack the entire repository directory (`$DOCUMENTUM/data/<Repository>`).

8. Export the repository schema from the source database.

9. Connect as SYSTEM to the target database, and then drop the new target repository schema.

10. Re-create an empty target schema and specify the same name and password used for the source target schema, as follows:

```
SQL> create user <Repository_Schema_Name>
2 identified by <Repository_Schema_Password>
3 default tablespace <Data_Tablespace>
4 temporary tablespace <Temp_Tablespace>
5 quota unlimited on <Data_Tablespace>
6 quota unlimited on <Index_Tablespace>
```

🛑 If you are using Oracle 10g, do *not* include the next line (*7 quota unlimited on <Temp_Tablespace>;*).

```
7 quota unlimited on <Temp_Tablespace>;
SQL> grant connect to <Repository_Schema_Name>;
SQL> grant create session to <Repository_Schema_Name>;
SQL> grant create sequence to <Repository_Schema_Name>;
SQL> grant create table to <Repository_Schema_Name>;
SQL> grant create view to <Repository_Schema_Name>;
```

11. Import the source repository schema export file into the target schema that you re-created in step 10.

12. Connect to the new target repository database schema, check the following, and make updates to refer to the new target repository location rather than the original source repository:

```
select r_install_domain, web_server_loc from dm_server_
config_s;
select host_name from dm_mount_point_s
select target_server from dm_job_s;
select projection_targets in dm_server_config_r;
```

13. To ensure that all views are rebuilt, run the following SQL statement in the target database schema:

```
update dm_type_s set views_valid=0;
```

14. Copy the zip or tar of the source repository file system to the target Content Server, and extract it into the corresponding target folder `$DOCUMENTUM/ data/<Repository>`.

15. Edit the target `server.ini` file (`$DOCUMENTUM/dba/config/ <Repository>/server.ini`) to ensure that the `preserve_existing_ types` key in the `SERVER_STARTUP` section is set to `TRUE`, as follows:

```
preserve_existing_types=T
```

16. Save the `server.ini` file.

17. Start the target repository.

Dumping and Loading a Repository

HP provides the Dump and Load tools that you can use to export and import a complete repository in a single bundled file. These tools are similar to the Oracle `imp` and `exp` commands.

This section provides information on how to use the Dump and Load tools to dump the contents of the source repository into a flat binary file, and then load it into a target repository. This procedure is not recommended for use with large repositories. However, for small- to moderate-sized implementations, it is simpler to use than the method provided in *Copying a Repository*

➤ Because the load procedure does not automatically create a new repository, you must create an empty target repository in which to load the dump from the source. After you create the target repository, then you can dump and load the target repository contents.

To dump and load the entire contents of a repository:

1. In the source repository, use DQL to run `dmclean`:

   ```
   1> execute "do_method"
   2>    with method = 'dmclean'
   3> go
   ```

2. In the source repository, use DQL to create a `dm_dump_record` object (dump file):

   ```
   1> create "dm_dump_record" object
   2>
   = '<full_path_to_output_file>'
   3>    set "dump_operation" = 'full_docbase_dump'
   4>    set "include_content" = true
   5> go
   ```

   Creating the dump file may take a while. For a system with thousands of documents, expect this to take a couple of hours.

3. After the dump is completed, use a binary transfer protocol to move the output file to the target system.

4. On the target repository, use DQL to run the following command:

```
1> create "dm_load_record" object
2>    set "file_name" = '<full_path_to_dump_file>'
3>    set "relocate" = true
4> go
```

The dump is loaded into the target repository. This process takes about the same amount of time taken to create the dump file.

5. To update the full-text indexes, after the load is complete, in the target repository, run the following command:

```
1> execute "update_ftindex"
2>    with "name" = 'filestore_01'
3> go
```

6. To update the PPM Server to reference the new target repository, do one of the following:

- Run the *<PPM_Home>*/bin/kConfig.sh script, and choose the **Integrate the PPM server with a Documentum Content Server** option.

- Update the *<PPM_Home>*/conf/dms.conf file. To update the password, you must run the *<PPM_Home>*/bin/kEncrypt.sh script to encrypt it. In addition, you must escape the pound (#), exclamation (!), colon (:), and equals (=) characters in the password.

  For example, change:

  `#!#the:encrypted=string#!#`

  to

  `\#\!\#the\:encrypted\=string\#\!\#`

7. On the PPM Server machine:

- Check to make sure that you can start the PPM Server.

- If your PPM Center instance from an earlier release contained attachments, make sure that you can still access those attachments.

- Attach new documents, modify them, and then check to make sure that the documents are accessible and correctly versioned.

Destroying the Load Object

HP recommends that, after you verify that you can access the expected objects, you destroy the load object. This frees up some space and ensures that the load object does not interfere with future load operations in the target repository. For information about how to destroy a load object, see the EMC Documentum *Content Server Administrator's Guide.*

Migrating Document Management to a New PPM Center Instance

Before you use the procedure described in this section to migrate document management to a new instance of PPM Center, see the chapter on migrating instances in *System Administration Guide and Reference.*

To migrate the document management module to the new instance:

1. Install PPM Center on the new instance, as described in the *System Administration Guide and Reference.*

2. Make sure that the DFC is installed on the new machine.

    For information about how to install the DFC, see Chapter 4, *Installing Documentum Foundation Classes,* on page 75.

3. Copy the dbpasswd.txt file to the new machine.

4. Copy the dfc.properties file to the new machine.

    ▶ You can copy the dfc.properties file to the PPM Server without editing it.

5. Install the document management module on the new instance.

6. Enable document management in PPM Center, as described in *Enabling Document Management* on page 83.

Security Considerations

Security in the HP document management module follows the standard PPM Center model for document attachments. Using requests as an example:

● As is true for document attachments under the control of standard PPM Center functionality (without document management), users must have the Demand Mgmt: Edit Requests access grant to add, check out, or check in documents related to requests.

  For requests in particular, attachment fields can be subject to additional field-level security if configured in the associated request type.

● Users who have permission to view the contents of an attachment field can view the attached document, the descriptive fields, and the version history.

The document management module provides a System: Override Document Check Out access grant that lets the user delegate document control to another person in the organization.

For more information, see the *Security Model Guide and Reference* and "Protecting Repository Objects," in the EMC Documentum *Content Server Administrator's Guide.*

Reporting Meta Layer Entities Associated with Document Management

The Reporting Meta Layer (RML) of PPM Center allows you to use third-party reporting software such as Documentum Content Server (Content Server) and full-text indexing software to define custom reports. Any third-party reporting tool that can run SQL queries on an Oracle database can work with PPM Center reporting capabilities by:

- Using the RML schema in the PPM Center database as its data source

- Building reports using the standard capabilities of the PPM Center reporting system

➤ If you plan to work with the RML, you must be an experienced system or database administrator and have basic PPM Center system knowledge, which is documented in the *System Administration Guide and Reference.*

Table 5-1 lists the RML entities that are related to document management in PPM Center.

Table 5-1. RML entities associated with document management

Token	Description
MPKG_REFERENCES.RML	Used to relate transaction entities.
MPRJ_PROJECT_REFERENCES.RML	Used to view the references of projects.
MPRJ_TASK_REFERENCES.RML	Used to view the references of tasks.
MREL_REFERENCES.RML	Used to view the references of releases in HP Deployment Management.
MREQ_REFERENCES.RML	Used to view the references of requests in HP Demand Management.

For more information about the RML entities listed in *Table 5-1*, see the *Reporting Meta Layer Guide and Reference.*

6 What Document Management Users Need to Know

Attaching Documents to Entities

This section contains the procedure you use to attach documents to a PPM Center entity such as a request or a project, in a PPM Center instance containing the document management module.

You can attach documents to an entity in one of following ways:

- If the entity has a custom attachment field, you can attach a document directly to that field.

- You can add a document as a reference to any entity that supports references.

The following section provides the steps you use to attach documents to an entity that supports references.

Adding a Document as a Reference

To attach a document to an entity that supports references:

1. From the standard interface, open the entity to which you want to attach a document.

➤ You can also attach a document to an entity that you are creating and have not yet submitted.

2. At the bottom of the page, expand the **References** section.

3. In the **New Reference** list, leave **Attachment** selected.

4. Click **Add.**

The Add Document window opens.

5. In the **File** field, type the full directory path of the file to attach.

➤ The file you specify must reside in a directory on the HP Project and Portfolio Management Center server.

6. (Optional) Specify the following information:

- In the **Initial Version Comment** field, type notes on the initial version of the document you are attaching.

- In the **Author** field, type the name of the document author or authors.

- In the **Description** field, type a description of the document and its purpose.

- In the **Key Words** field, type keywords to add to an index of document contents.

  The keywords you add to attachments help users search for entities with attachments that contain those words.

➤ Because the Content Server automatically indexes the contents of text-based files, there is no need to specify keywords for text-based documents. However, users cannot search non-text attachments such as image files unless you specify keywords.

For information about the full-text indexing feature, see the EMC Documentum *Content Server Administrator's Guide.*

7. Click **Add.**

The **References to be added on Save** field lists the document file you specified.

8. Click **Save.**

	Name	Version	Size	Author	Checked Out By	Last Checked In By	Check In Date
Actions	InstallConfig.p...	1	100 KB	admin user	-	admin user	2/21/07
	Manual for installing and configuring core 8.2 product.						

The document, which was loaded into the document management system after you clicked **Save,** is now listed in the **Attached Documents** section of the entity page.

The information displayed for the attached document also includes:

- Document version, size, and author

- Who (if anyone) has the document checked out

- When and by whom the document was last checked in

If PPM Center is running, and the Content Server stops, users can continue to use PPM Center, but cannot add or access attachments until the Content Server is up and running again.

Any errors that occur while the PPM Server communicates with the Content Server are recorded in a log file. Server log files are stored in the <*PPM_Home*>/server/ kintana/log directory. Server log files are named serverLog.txt and serverLog_timestamp.txt.

Active PPM Servers log their output to the serverLog.txt file. The serverLog_ timestamp files are archived versions of the serverLog.txt file. For more information about PPM Server log files, see "Getting Information from Log Files," in "Maintaining the System," in the *System Administration Guide and Reference.*

Editing Document Attachment Information

To edit document attachment information from the **References** section of an entity page:

1. In the standard interface, on an entity page, expand the **References** section.
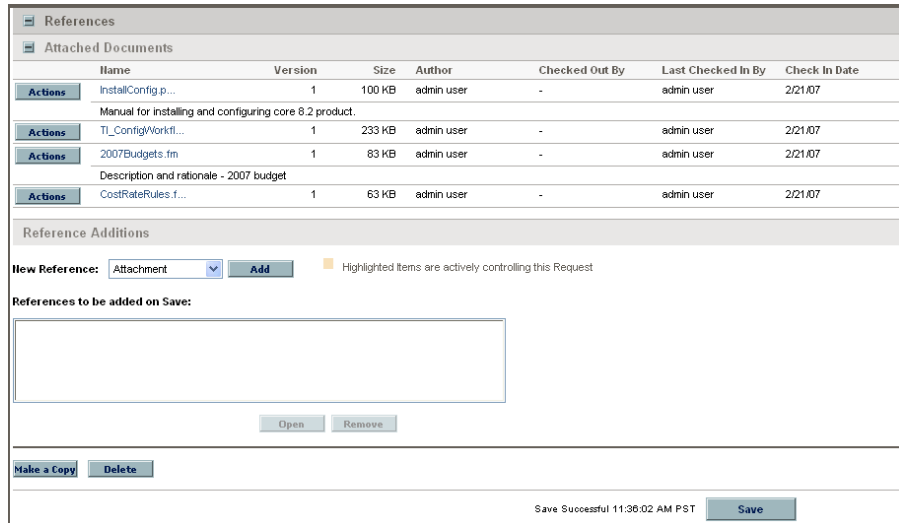
2. Under **Attached Documents,** to the left of the name of the document that has associated attachment information you want to edit, click **Actions.**

   The Document Actions window opens. From this window, you can view document information, open the Edit Details window, check out the document, or remove the document from the **Attached Documents** section.
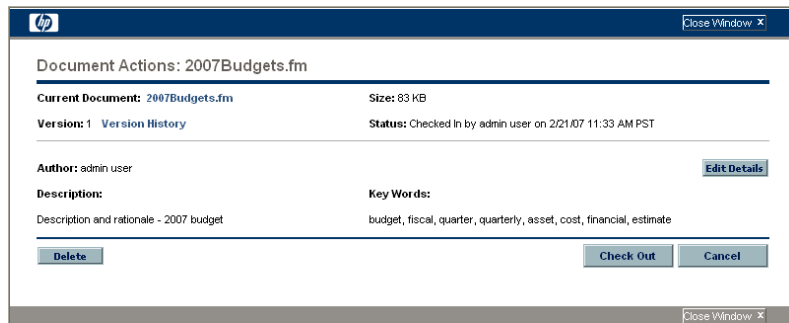
3. Click **Edit Details.**

The Edit Details of Document window opens. You can use this window to change descriptive information about the document.

4. Make the required changes to the document information.

5. Click **Done.**

Checking Attached Documents Out and In
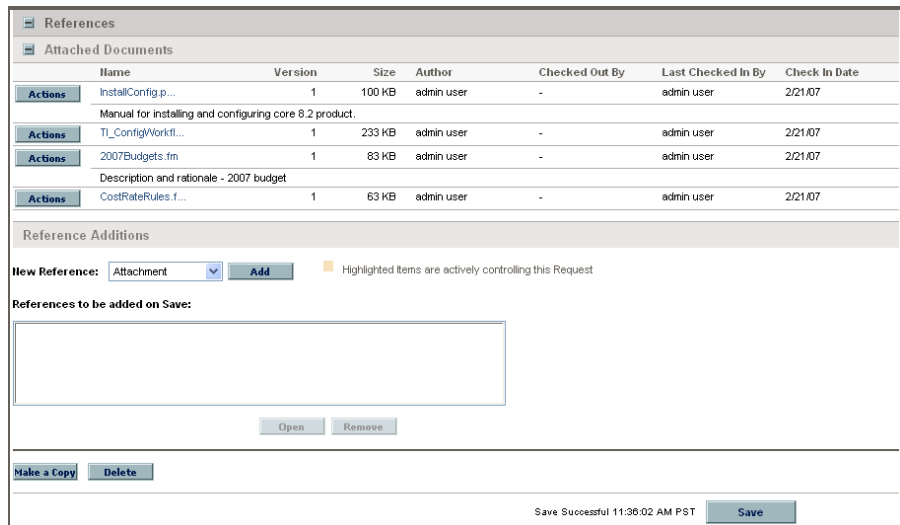
To check an attached document in or out, use one of the following methods:

- If the entity has a custom attachment field, use that field to check the document in or out.

- Use the **References** section of the entity page.

Checking a Document Out and In from the References Section

To check out an attached document, edit it, and check it back in:

1. In the standard interface, on an entity page, expand the **References** section.

2. Under **Attached Documents,** to the left of the name of the document you want to check out, click **Actions.**
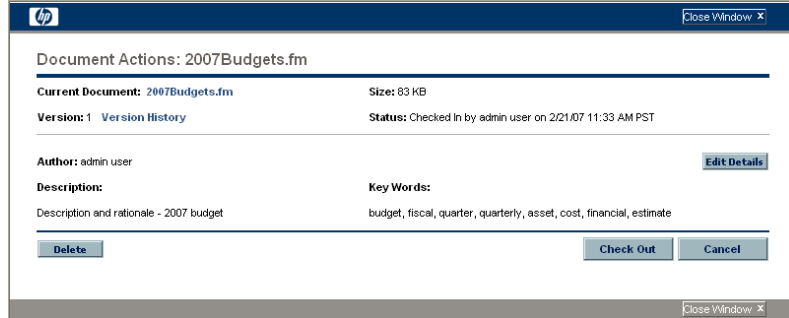
The Document Actions window opens.

3. Click **Check Out.**

The document opens for editing.

4. After you finish making changes, save and close the document.

The Document Actions window now displays the **Check In** button.

5. Click **Check In.**

Note that, in the **References Added** section of the entity page, the document version number displayed is now incremented by one.

Searching for Entities by Document Key Word

In the PPM Center standard interface, you can search for entities based on key words in referenced documents. The Content Server searches the descriptive fields for the document (author, description, title, and key words) and document content. The descriptive field searches are relevant to all text and binary documents. Content searches are relevant only to text-based documents.

To search for an entity using document key words:

1. Open a page for an entity that supports document management.

2. In the **Document Key Words** field, type one or more words to use as search criteria, separated by a space.

▶ Keyword searches are not case-sensitive.

The ***<Entity_Name>* Search Results** section lists only attached documents that include all of your search terms. For example, a search for "development test" is treated as "development" and "test." A document must have both "development" and "test" in its content or its descriptive fields to qualify as a match. To search for documents that contain either "development" or "test," type `development OR test.`

For information about other ways to specify search terms, see *Specifying Search Terms*.

3. Scroll to the bottom of the entity page and click **Search.**

The search returns a list of all entities (of the selected type) that have one or more attached documents containing key words that match your search terms. A document that you just attached may not show up on the Search Results page for several minutes. Before a content search can find a document, the document content must first be indexed. Although indexing is automatic, the process is periodic, and so may require several minutes to complete.

Specifying Search Terms

In addition to searches based on the AND and OR operators, you can search for exact phrases, exclude documents based on a key word, or search by combining queries. This section provides information on how to specify the key words for these search types.

Searching by Phrase

To search for an exact phrase, type double quotation marks ("key words") at either end of the phrase. The content server returns a list of entities with attached documents that include all of the words inside the quotation marks, in the same order as you typed them.

Excluding Documents that Contain a Specific Text String

To exclude documents that contain a particular key word, type a minus character (-) in front of the key word. For example, to include documents with "development" or "test," but not those with "production," type **development OR test -production.**

Combination Queries

You can use any of the search formats described in the previous section in combination.

OR queries take precedence over AND queries. For example, if you search for **finance development OR test,** the search first finds documents that contain either the word "development" or the word "test," and then finds documents from that list that also contain the word "finance."

Tokens Associated with Document Management

Table 6-1 lists the tokens related to document management. You can use these tokens to reference documents, version history, and metadata. Except for DOC_HISTORY, these tokens are also valid in systems without document management.

These tokens only work for custom fields, and not for reference attachments.
These tokens do not support client-side token parsing.

Table 6-1. Tokens associated with document management

Token	Description
DOC_LINK	Resolves to a URL that, when clicked, opens the latest version of the document. Forces user authentication before delivering the document.
DOC_HISTORY	Resolves to a URL that, when clicked, displays a view of the document's version history. Forces user authentication before delivering the information.
AUTHOR	Resolves to the author descriptive field stored with the document.
DESCRIPTION	Resolves to the descriptive field stored with the document.
LAST_CHECK_IN_DATE	Resolves to the timestamp of the last check-in.
LAST_CHECKED_IN_BY_NAME	Resolves to the full name of the PPM Center user who added or last checked in the document.
LAST_CHECKED_IN_BY	Resolves to the ID of the PPM Center user who added or last checked in the document.

For more information about tokens and how to use them, see *Commands, Tokens, and Validations Guide and Reference.*

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