Project and Portfolio Management Center

Software Version: 9.40

Document Management Guide and Reference

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Software Release Date: September 2016

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Contents

Chapter 1: Getting Started with HPE Document Management

The Document Management System (DMS) in Project and Portfolio Management Center (PPM) gives you more control over document search and storage.

Starting from PPM version 9.20, the HPE Document Management System is remodelled to fully leverage your current Oracle databases—either a PPM–dedicated database or an external database on your network, providing you the standard out-of-the-box document management capabilities.

With the new HPE DMS, you can track, index, and search multiple versions (including historical versions) of supporting documents attached to PPM entities in Demand Management, Portfolio Management, Program Management, and Project Management.

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

The system requirements for HPE document management system are the same as those for the PPM database. For more information, see the *System Requirements and Compatibility Matrix.*

Changes to Documentum-based Document Management Solutions

The Documentum-based document management solutions (either using HPE version of EMC Documentum Content Server EE software or integration with stand-alone instance of EMC Documentum Content Server EE software using connector) are not available DMS options starting from PPM version 9.20. You are encouraged to migrate your Documentum-based DMS solution to a supported DMS solution. For details about DMS migration, see "Upgrading and Migrating DMS Solutions from PPM Version 9.14 or Earlier" on page 34.

For detailed information about Documentum-based DMS solutions, see the Document Management Guide and Reference for PPM version 9.10 or earlier.

Functional Capabilities of HPE Document Management

HPE document management system provides the following key functional capabilities:

- Add documents to a PPM entity from the **References** section of a details page, from any document field on a request, from user data fields in both the PPM Workbench and the standard interface.
- Access documents from PPM
- Ability to check documents in and out, and to override check-outs
- Version control of attached documents and maintenance of version history
- Add key words and versioning information to documents at check-in
- Search for entities based on key words in documents attached as references to PPM entities or to user data fields
- Ability to conduct both keyword and full text content searches of the document repository from within PPM Center, including historical versions
- Ability to retrieve archived document versions
- Full text indexing supporting multiple languages

> **Note:** For information on how to use HPE document management, see "What Document Management Users Need to Know" on page 54.

HPE Document Management Use-Case Scenario

The following use-case scenario exemplifies how HPE document management system is used within large organizations.

A large national insurance company, XYZ Corporation, has just installed PPM. 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 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 HPE document management system follow the same security rules (including field-level security rules) that apply to all PPM 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 system 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.

Available HPE Document Management System Solutions

PPM version 9.40 offers the following DMS solutions:

- PPM Database DMS: Introduced into PPM since version 9.13. From PPM users' perspective, this solution provides all the features of a Documentum-based DMS solution, as well as a new feature to search only the latest versions of documents or to search all versions. This solution allows you to store all the documents and associated metadata in your HPE PPM database, and provides documents check-in, check-out, and versioning functionalities out-of-the-box. It requires no additional software or hardware products, no additional deployment or configuration. It involves no extra license cost.
- PPM External Database DMS: Provides the same features as the PPM Center Database DMS solution, except that the documents are saved in an external database schema, instead of in the PPM Center database schema.
- PPM Center File System: The default DMS solution you have in a fresh install of PPM Center. The File System DMS solution only offers "attachment-like" behavior, and offers none of the features expected from a Document Management System.

The following table summarizes functional differences among different DMS solutions.

Functional comparison of DMS features

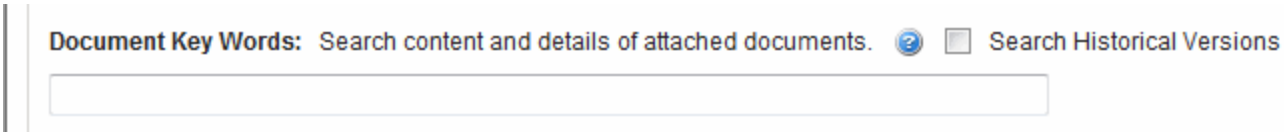
DMS Feature	File System	PPM Database DMS or PPM External Database DMS
Versioning	—	Yes
Check in/Check out	—	Yes
Check out override	—	Yes
Full Text Search	—	Yes (after enabling full-text search)
Key Words	—	Yes
Tip only / History Search	—	Yes (after enabling full-text search)

UI Changes

There is almost no difference for a PPM User when using Documentum or PPM Database DMS (or PPM External Database DMS). The only difference is that when full-text search is enabled in PPM Database DMS or PPM External Database DMS, the search pages display an option to "Search Historical Versions".

Search Operators

The documents keywords search operators you can use are different between Documentum and PPM Database DMS (or PPM External Database DMS). The search syntax is described on the Search Help page. Click to open the Search Help page.



The following table summarizes the differences of search operators between Documentum-based DMS solutions and database-based DMS solutions.

Differences of Search Operators

Operators	PPM Database DMS, or PPM External Database DMS	Documentum
"AND"	You should insert the word and	By default, each query is an AND query. Since

Differences of Search Operators, continued

Operators	PPM Database DMS, or PPM External Database DMS	Documentum
queries	(case-insensitive) or & character between the search words.	this is the default search behavior, there is no need to include the word and between search keywords.
Phrase search	By default, each query is a "Phrase" query.	You can also search for documents containing a specific phrase, or set of words in a specific order. Enclose the words in double quotes to enable this type of query. All words enclosed in double quotes must occur together and in the specified order for a document to be considered as a match.
Exclusion of words	To specifically exclude documents that contain a particular word, preface the keyword with a NOT (~) sign.	To specifically exclude documents that contain a particular word, preface the keyword by a minus (-) sign. In this case, all documents that contain the specified word are excluded from the results, even if they match other keywords in your query.
"OR" queries	You can insert the word or (case-insensitive) or | character between the search words.	If you want to search for documents containing one OR another keyword, you can insert the word or between the search words.
Combination search	You may perform combination searches for documents by combining AND, OR, and ~ queries. If you want to search for documents containing both AND and OR queries, make sure to wrap sub-queries with parentheses "(" and ")".	Any of these search formats can be used in combination. OR queries take precedence over AND queries.
Search historical versions	The Search Historical Versions option allows you to search content and/or version comments of historical versions of documents in addition to full search (including document content and document properties) of their current version.	Not supported.
Synonyms	Not supported.	To expand your search to include keywords that have a similar meaning as a word you have specified, preface your keyword with a tilde (~). In this case, a document is considered as a match if it contains the search keyword you specified, or additional words that have a similar meaning.

PPM Standard Interface with Document Management System

The Search Requests pages in Figure 1 and Figure 2 illustrate the difference between the standard and the advanced document management capabilities of the available DMS solutions. Figure 1 shows the Search Requests page in a PPM system with the default document search functionality. You can type text in the **Document File Name Contains** field directly to search for documents with names that match known text. You can also type request key words to use to search the contents of request **Notes** and **Description** fields.

Figure 1. Search Requests page with PPM Center Database DMS

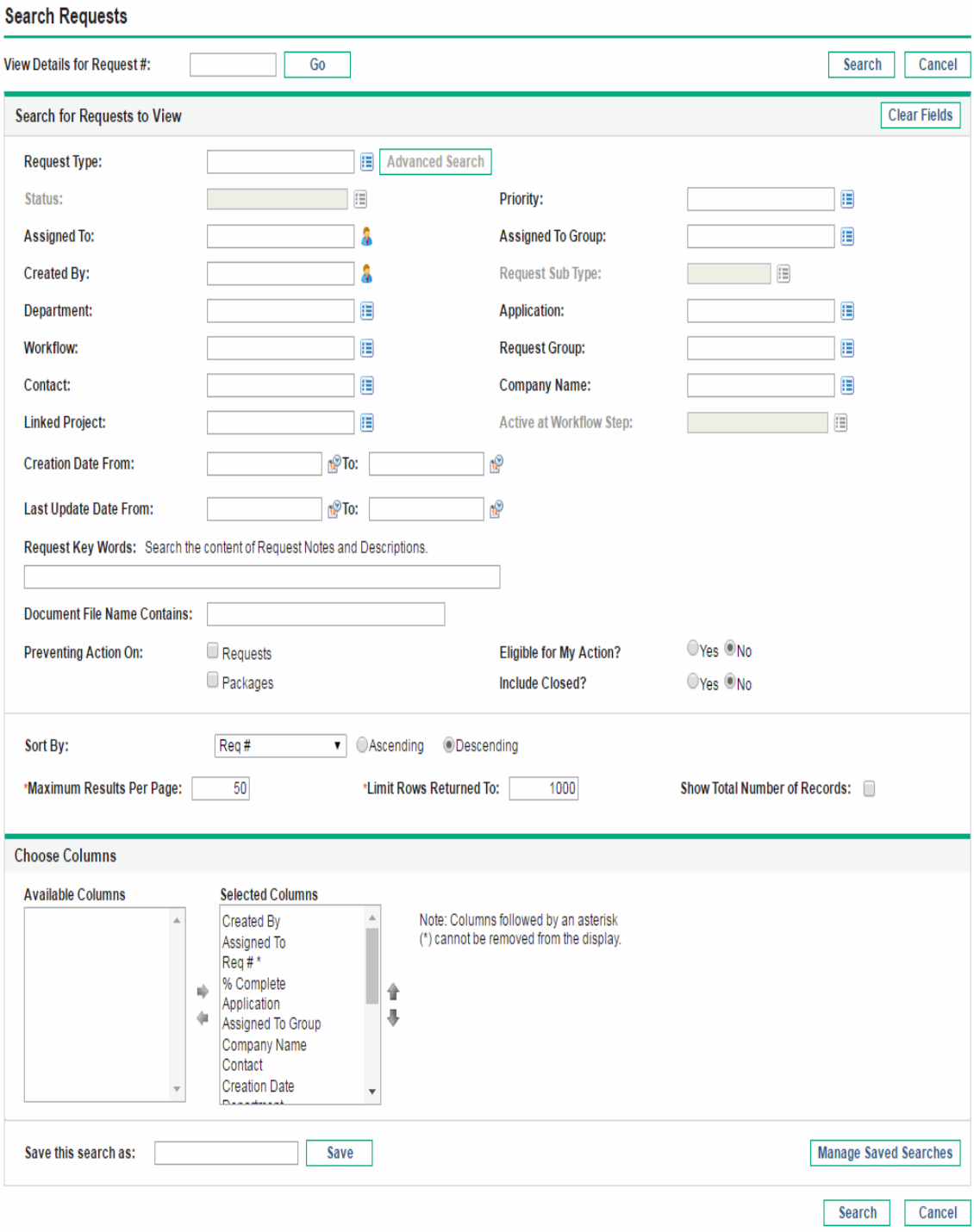
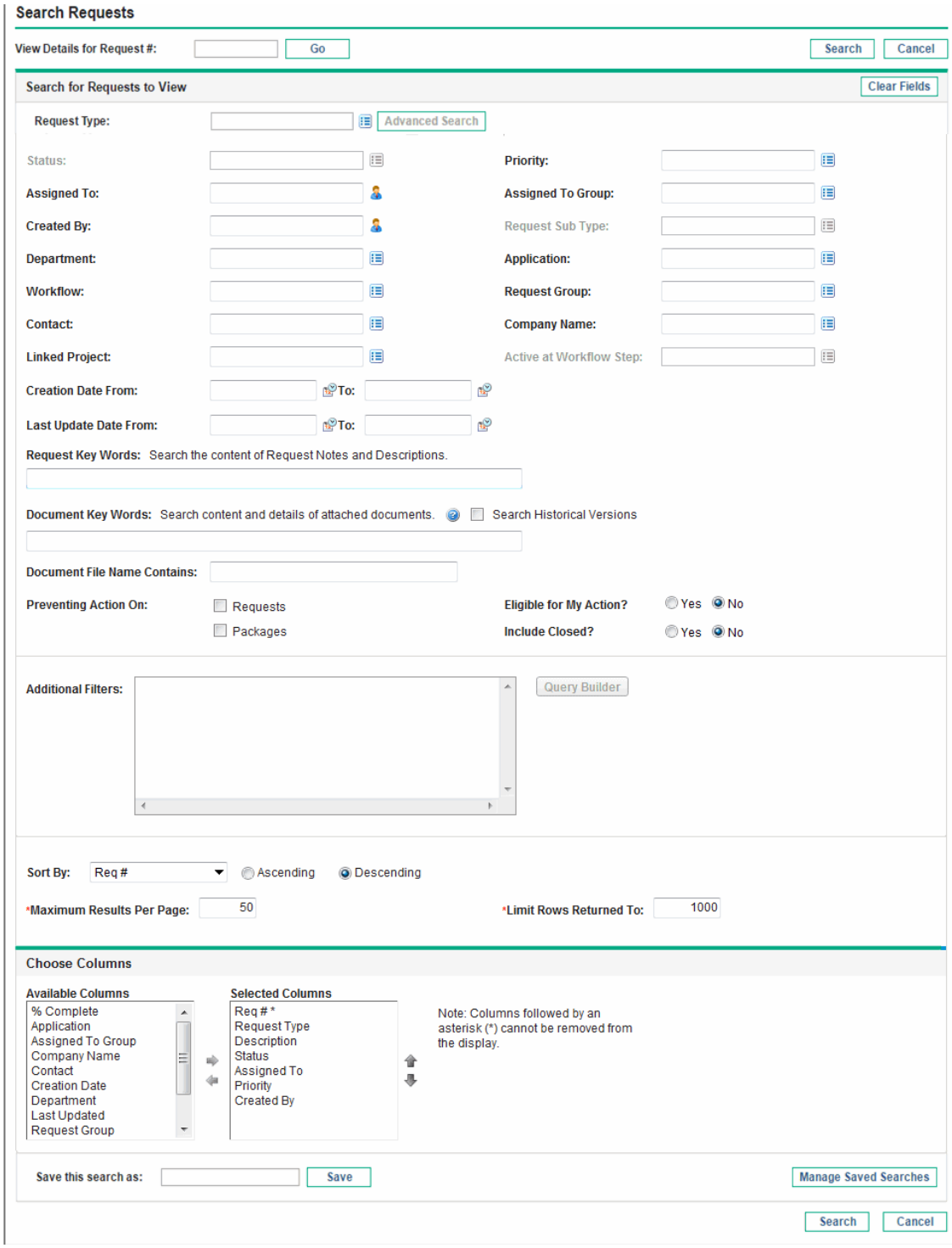


Figure 2 shows the Search Requests page in a system with the full text search functionality enabled.

Figure 2. Search Requests page with fulltext search enabled PPM Center Database DMS



You can still use the **Request Key Words** field to search request notes and descriptions, and the **Document File Name Contains** field to search for documents with names that match known text.

With full text search feature enabled, you can include the contents of attached documents in a text search by typing the text in the **Document Key Words** field. The text you type in this field is used to

search the contents of documents attached to requests that meet the other filter criteria. If you select **Search Historical Versions**, you can also search for the text in historical versions.

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

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

With HPE document management system, the Request Detail report includes additional information about attached documents.

Supported Migration Paths

For details about supported DMS migration paths, typical upgrade and migration scenarios and the high-level steps required to complete the migration, see "Upgrading and Migrating DMS Solutions from PPM Version 9.14 or Earlier" on page 34.

How Document Management Affects Performance

This section addresses how HPE document management affects PPM performance.

The document management system in PPM affects the following functional areas:

- Attaching a document to a PPM entity (such as a request or package), either through user data fields, any document field on a request, the PPM Workbench, or through the **References** section available for some entities in the standard interface
- Viewing a document that is attached to a PPM entity

With PPM Center File System as the DMS, documents attached to HPE entities are uploaded and stored on the PPM Server file system; With PPM Center Database DMS, attached documents are uploaded to the PPM Center database; With PPM Center External Database DMS, attached documents are uploaded to the specified Oracle database on your network.

In the default configuration (with PPM Center Database DMS), the PPM Server and Oracle database are located on the same local network. This ensures that any communication between the PPM Server and PPM Center database enjoys fast, uninterrupted network access.

The overhead of storing and retrieving attached documents to and from the PPM Center database adds minimal overhead to client response time. The key factor that determines response time is the quality of the wide-area network (WAN) between the client machine and the PPM Server.

Related Documents

This section describes the HPE PPM and EMC Documentum guides and reference documents required to install and configure the HPE document management module.

In addition to this guide, the following PPM documents are required for HPE document management module installation:

- *Installation and Administration Guide*.
- This guide includes initial product installation procedures as well as configuration, operation, maintenance, migration, and performance information. In particular, this guide provides an overview of the PPM architecture and optional configurations. This information can help you determine the optimal configuration of your deployment.
- *System Requirements and Compatibility Matrix*
- This document provides the details that enable you to understand the hardware and software options available for your PPM deployment.

  It includes information about the environments and products supported by HPE for this version of PPM Center. Additionally, this guide identifies required third-party software as well as software that you can use to enable optional features and functionality.

- *Upgrade Guide*

  If you plan to upgrade from an earlier version of PPM, see this guide for information on supported upgrade paths, what to do to prepare to upgrade, and how to perform and then verify the upgrade.

- *Release Notes*

  This document provides late-breaking information that is not included in the core product documentation and may affect your PPM installation.

Chapter 2: Configuring Database-Based DMS Solutions

This section provides PPM administrators concepts of database-based DMS solutions and some pointers on how to configure the database-based DMS solutions, including database sizing suggestions, instructions on configuring full text search feature as well as creating and maintaining Oracle TEXT indexes.

Overview of Database-Based DMS Solutions

PPM Center offers the following database-based DMS solutions:

- PPM Database DMS — Allows you to store all the documents and associated metadata in your PPM database, and provides documents check-in/out and versioning functionalities out-of-the-box. It requires no additional software or hardware products, no additional deployment or configuration. In addition, no extra license cost.
- PPM External Database DMS — Provides the same features as the PPM Center Database DMS solution, except that the documents and associated metadata are stored in a different Oracle database on your local network where your PPM Server is located. For information about defining an external database for this DMS solution, see "Configuring PPM External Database DMS Solution" on page 20.

Contents of the documents (in whatever document format) are stored in BLOB fields. The database-based DMS solutions leverage Oracle TEXT to provide full-text search, and the related indexes are CONTEXT indexes, both for metadata and document contents.

PPM Center users experience no difference between a PPM Server using Documentum (either HPE version or stand-alone version) and a PPM Server using an Oracle database-based DMS. The only small discrepancy lies in the full text search, where the advanced search operators are slightly different, and the Oracle database-based DMS solutions allow you to search only in the tip documents, or in both the tip version documents and the history.

Therefore, organizations who are managing their PPM documents using other solutions, EMC Documentum or the PPM file system, can easily migrate their current DMS to either of the new database-based DMS solution. For details on how to migrate to a database-based DMS solution, see "Migrating DMS Using the Administrator Console Tool" on page 38.

> **Note:** By default, document contents are stored in the default PPM tablespace USER_CLOB, while the metadata and the TEXT indexes (when created) are stored in the default PPM tablespace USER_DATA. DBAs can change the tablespaces used by PPM Database DMS. For example, to save DB disk space by compressing documents contents, or by tuning tablespace-level settings that would provide better performance for their specific usage. Such customization of tablespace is supported, but out of the scope of this document.

The following table describes server configuration parameters that were introduced to implement the database-based DMS solutions.

Server configuration parameters introduced

Parameter name	Description, Usage	Default and Valid Values
DMS_DB_ ENABLE_ FULLTEXT_ SEARCH	Setting this value to `true` enables the database full text search feature. Note that administrators shall create and build database indexes in advance. For details, see "Configuring Full Text Search in Database-Based DMS Solutions" on page 23.	Default: `false` Valid values: `true, false`
DMS_FILENAME_ DISPLAY_LENGTH	Specifies filename display length.	Default: `30` Valid values: `integer`
DMS_FILENAME_ SEARCH_MAX_ RESULTS	Specifies maximum number of matching items before applying filters from other search criteria, such as creation date or "Closed" status. You may need to increase this value if too many filename matching items are filtered out by very selective search criteria.	Default: `1000` Valid values: integer
DMS_MIGRATION_ DELAY_ BETWEEN_ DOCUMENT	Specifies duration (in seconds) that a thread will wait between two documents to migrate. To lighten the load of the migration process on the PPM Server, increase the value of this parameter.	Default: `0` Valid values: `integer`

Server configuration parameters introduced, continued

Parameter name	Description, Usage	Default and Valid Values
DMS_MIGRATION_DOCUMENTS_BATCH_SIZE	Specifies the number of documents that to be queued for migration on a given PPM Service node. Every time the DMS Migration Engine Service runs on a Service node, the queue of documents to migrate is filled up.	Default: `1000` Valid values: integer
DMS_MIGRATION_THREAD_COUNT	Specifies number of threads that will be migrating documents on a given PPM Service node.	Default: `3` Valid values: integer
MAX_WEB_ATTACHMENT_SIZE_IN_MB	Specifies maximum attachment size (in MB) for files uploaded using PPM web interface. Attachments size is capped at 2 GB.	Default: `2048` Valid values: integer

Database-Based DMS Concepts

This section provides information that help database administrators (DBAs) to understand the features and limitations of the database-based DMS solutions, including:

- "Data Tables " below
- "Documents Contents Tablespace" on the next page
- "Full Text Search Feature" on the next page

Data Tables

The documents information and contents are stored in the following four tables:

- KNTA_DOCUMENTS: Used by all PPM DMS solutions (File System, PPM Database DMS, and PPM External Database DMS). It stores the documents information that is displayed in the **References** section of a PPM entity page, as well as the current "check out" status of the document.

  The following three columns are only used during documents migration:
  – MIGRATION_STATUS
  – LAST_FLAGGED_TIME
  – ENGINE_UUID

- KNTA_DOCUMENT_VERSIONS: Stores the document version metadata, including filename, file size, extension, version comment, version check in date and user.
- KNTA_DOCUMENT_TIP_CONTENTS: Stores a copy of the document metadata from the KNTA_DOCUMENTS table (document name, description, author, and so on) and the latest version, as well as the binary contents of the latest version of the document in BLOB column DOC_CONTENTS for full-text indexing.
- KNTA_DOCUMENT_HISTORY_CONTENTS: Stores a copy of the metadata from KNTA_DOCUMENT_VERSIONS, as well as the binary contents of all non-tip versions of documents in DOC_CONTENTS for full-text indexing.

Every time a new version of a document is checked in, the row related to this document is copied from the KNTA_DOCUMENT_TIP_CONTENTS table to the KNTA_DOCUMENT_HISTORY_CONTENTS table, and the document contents of the new version are updated in the DOC_CONTENTS column of the KNTA_DOCUMENT_TIP_CONTENTS table.

For details about these tables, see the Data Model Guide.

Documents Contents Tablespace

All binary documents contents are saved in the two DOC_CONTENTS columns (BLOB) of the KNTA_DOCUMENT_TIP_CONTENTS table and the KNTA_DOCUMENT_HISTORY_CONTENTS table.

These columns are using the PPM default CLOB tablespace upon creation. However, considering that the amount of data stored in attachments can be very large (up to tens of GB), you might prefer to store these attachments in a separate dedicated tablespace.

Though this is supported, HPE recommends you to change the tablespace of these columns before performing the migration, so that all documents can directly use the newly configured tablespace.

> **Note:** You can use compressed tablespaces to store DMS documents. This could significantly reduce the space needed on the disk of PPM database.

Full Text Search Feature

By default, the full text search feature is not enabled with PPM Database DMS or PPM External Database DMS.

In order to enable full text search, DBAs must first create the TEXT indexes on documents contents and metadata, and modify a server parameter (from the Administrator Console of PPM). For detailed instructions, see "Configuring Full Text Search in Database-Based DMS Solutions" on page 23. PPM Server restart is not required.

Why not enable Full text search by default?

The PPM Database DMS or PPM External Database DMS solution relies on Oracle TEXT technology to perform full text search. There are multiple ways to configure the Oracle TEXT indexes, and DBAs shall choose which configuration suits their users' preferences best, especially in how often the indexes will be updated.

Moreover, HPE recommends DBAs to create the indexes after you have completed migrating your documents, so that the indexes can be created in one run, having no impact on migration performance. As indexes creation is a database-intensive operation, it is also better to let DBAs decide when this operation should occur in order to minimize the impact on PPM users.

> **Note:** Readers are assumed to be knowledgeable about Oracle TEXT. If that is not the case, HPE strongly encourage you to read the *Oracle TEXT Application Developer's Guide* (http://download.oracle.com/docs/cd/B28359_01/text.111/b28303.pdf) or to consult Oracle online documentation related to Oracle TEXT.

Configuring PPM Database DMS Solution

You can complete the configuration work when you prepare to migrate your current DMS to the PPM Center Database DMS. For details, see "Migrating DMS Using the Administrator Console Tool" on page 38.

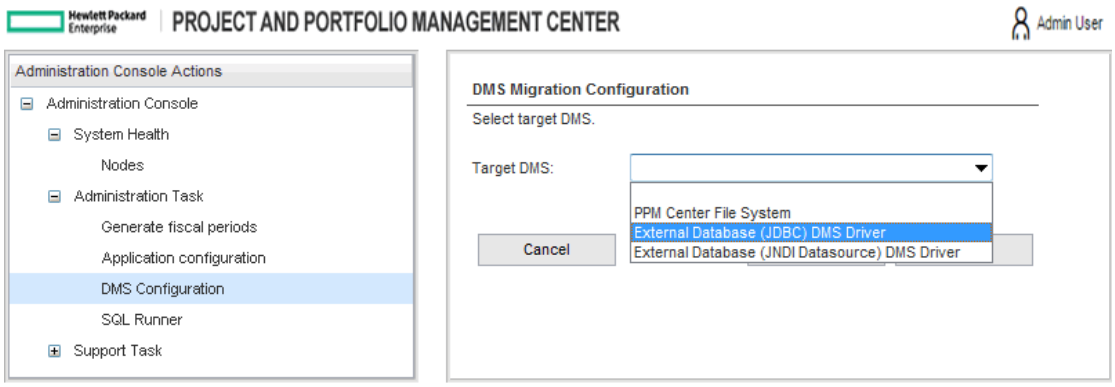
Configuring PPM External Database DMS Solution

There are two ways to define the external DB schema to use for storing documents:

- By providing JDBC connection parameters (the **External Database (JDBC) DMS Driver** option)
- By creating a new JNDI datasource on your PPM Server and providing the JNDI name of that datasource (the **External Database (JNDI) DMS Driver** option)

You can find these two options in the list of supported **Target DMS** options in the DMS Migration Configuration screen of the Administration Console.

Available DMS Migration options for a PPM server currently using PPM Center Database DMS



Why Store the DMS Documents on Another Database Schema?

You might not want to store them in the PPM Center database schema for different possible reasons:

- Your PPM Center database schema is regularly backed up, and the extra documents space renders back-up procedure too time-consuming if the volume of PPM Center attachments is very large (hundreds of GB).
- You would like to back up your PPM Center database daily, but it is acceptable to back up attachments only weekly or monthly.
- You do not want any additional load on the PPM Center production database to be caused by attachments storage, retrieval and searches.

Which Option (JDBC or JNDI) to Choose?

The short answer is: For staging and production environments, you should always choose the JNDI option, but for test and development environments, JDBC should be enough and is simpler to set up.

	External Database (JDBC)	External Database (JNDI)
Advantages	Simple to setup (no change on PPM Server).	Better performance (JDBC connections are pooled and reused). Allows exhaustive configuration of datasource. **Note:** For instructions on creating JNDI datasource, see"Creating JNDI Datasource" on the next page.

	External Database (JDBC)	External Database (JNDI)
Disadvantages	Performance impact: A new JDBC connection must be created for every DMS operation (download a document, save a document, search documents).	Needs to create datasource on each of your PPM Server(s).

Creating JNDI Datasource

If you select **External Database (JNDI Datasource) DMS Driver** as your target DMS solution, you need to create a datasource pointing to the DB Schema to use for storing documents on each of your PPM Server nodes. All these datasources must point to the same schema, and this schema cannot be the PPM Center database schema (otherwise you should simply use the PPM Center Database DMS solution for storing documents in the PPM Center database schema).

To create your JNDI datasource,

1. Go to `<PPM_Home>/server/<PPM_Instance>/deploy` directory, make a copy of the `itg-ds.xml` and rename the copy (for example `dms-ds.xml`).

   > **Note:** The new file name MUST end with "**`-ds.`**`xml`" and it MUST be located in the `/<PPM_Instance>/deploy/` directory.

2. Edit the file content.

   Replace the highlighted values with the JNDI name of your choice and the connection parameters of your DMS database schema. You can also change other parameters (`max-pool-size`) to meet your needs.

   Though you can define the values for <*user-name*> and <*password*> in this file, it is not recommended as you can provide them on the DMS Configuration screen, and the password will be encrypted in PPM (while it would appear in clear text if defined in this file).

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
  <local-tx-datasource>
    <jndi-name>dms</jndi-name>
    <connection-url>jdbc:oracle:thin:@11.22.33.44:1521:dms_sid</connection-url>
    <driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
    <max-pool-size>60</max-pool-size>
    <blocking-timeout-millis>180000</blocking-timeout-millis>
    <idle-timeout-minutes>60</idle-timeout-minutes>
```

```
    <check-valid-connection-sql>select 1 from dual</checkvalid-connection-sql>
  </local-tx-datasource>
</datasources>
```

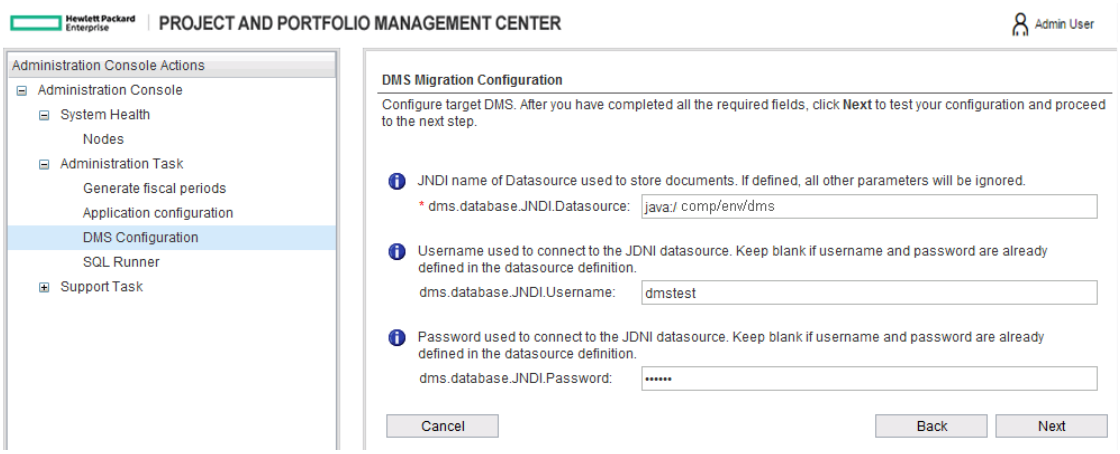
> **Note:** Make sure you remove the `<security-domain>` element.

3. Repeat step 1 and step 2 to create the JNDI datasource on each of your PPM Server cluster nodes.
4. Run the following command:

   ```
   sh ./kUpdateHtml.sh
   ```

5. Restart your PPM Servers.
6. You can now launch the Administration Console to perform DMS migration, and provide the JNDI datasource as shown in the figure below.

Creating JNDI datasource



> **Note:** Make sure you prefix your datasource name in the **dms.database.JNDI.Datasource** field with "`java:`". For example, `java:/comp/env/dms`.

Configuring Full Text Search in Database-Based DMS Solutions

To enable full text search in the PPM Database DMS or PPM External Database DMS solution,

1. Connect to PPM database as SYS DBA, and grant `CREATE JOB` and `CTXAPP` privileges to PPM users by running the `oracle_dms_sysdba_user_manual_script.sql` script.

   > **Note:** After installation of PPM Center, the SQL scripts shall be present in <*PPM_Home*>`/utilities/database_dms/DatabaseDMS_FullTextSearch_Scripts.zip.`

2. Connect PPM database with PPM USER (&PPM_SCHEMA), and then create full text search indexes by running the `oracle_dms_ppm_user_manual_script.sql` script.
3. Wait for the indexes to be created.

   This can take some time if you have a large number of documents.

4. Set the value of server configuration parameter `DMS_DB_ENABLE_FULLTEXT_SEARCH` to `true` in PPM from the Administration Console.

   To do so,

   a. From the Administration Console Actions pane, click **Administration Task > Application configuration**.

   b. Locate the `DMS_DB_ENABLE_FULLTEXT_SEARCH` parameter, and set its value to `true`.

   c. Click **Save**. (No need to restart the PPM Server.)

5. Verify that the **Document Key Words** search fields are available in PPM by going to **Search > Projects/Programs/Requests**, or any other entity that supports document management.

> **Caution:** Enabling the full text search feature requires creation of all the indexes in the first place. Otherwise it might result in an error whenever an user runs a full text search.

Best Practices and Notes on Indexing

- There is no perfect setting related to how often the indexes should be refreshed. Refreshing it too often might result in fragmented indexes, while a very long delay between refreshed would cause outdated indexes and might result in users not being able to search and retrieve documents recently added. It is up to DBAs to decide the optimum setting in accordance with your database administration policies and PPM User's expectations. Note that HPE strongly recommends you not using the **SYNC ON COMMIT** setting as it would result in significant performance overhead when documents are added to the system as well as severe index fragmentation.
- The default LEXER used is WORLD_LEXER, which is especially adapted for a multi-lingual

document base. If you are only storing documents in a language other than English, then you may use a different LEXER than the WORLD_LEXER used by default. You may use, for example, the CHINESE_LEXER, if all documents stored are in Chinese. You are free to use whatever LEXER that better fits your needs.

- The multi-column index on metadata of both TIP and HISTORY tables is created on the FULL_ TEXT_META column. A trigger is already created that will update this column whenever one of the indexed column is updated. This is required to correctly update the index.
- You may want to configure a significant amount of indexing memory when you create the indexes in case you have a very large amount of documents to index. For more information, see Oracle documentation related to Oracle TEXT indexing performance.
- Oracle TEXT indexes can be very large if there is a large amount of text intensive documents to index (text files, log files, XML, and so on). You may want to make sure that the tablespace hosting these TEXT indexes can accommodate such an amount of data.
- For a list of all the file formats supported for indexing by Oracle TEXT, see http://download.oracle.com/docs/cd/E11882_01/text.112/e16593/afilsupt.htm.
- PPM Database DMS Full Text Search feature relies on Oracle TEXT only. As a result, the performance and results of PPM documents full text search when using PPM Database DMS solely relies on the settings you used when creating these indexes.

Creating and Maintaining Oracle TEXT Indexes

TEXT indexes are not created automatically, like other PPM indexes.

PPM Database DMS relies on creation of Oracle TEXT indexes on documents contents and metadata to provide full-text search on documents.

The index creation is not included as part of PPM installation for the following reasons:

- PPM Service Packs installation SQL Scripts can only be run with PPM DB User, not SYS; however, a PPM DB User needs to be granted CTXAPP and CREATE JOBS access grants before he can create TEXT indexes, and only SYS can provide these grants to PPM DB User.
- If for some reason you plan to use PPM Database DMS but have no plan to use full-text search, there is no need to waste DB resources with these indexes, as they are both space and CPU consuming.
- You need to decide or customize the parameters to use to create the TEXT index.

HPE does not offer the recommendation as the answers for the following questions vary with each customer:

- Do you prefer real-time indexing at the cost of a performance impact and a fragmented index on the long run, or is it acceptable to refresh the index only every 24 hours?
- Is the WORLD_LEXER HPE uses by default acceptable for you? Or should you rather use a Japanese Lexer in case you store many Japanese documents?

  Your DBAs are likely to do a better work at creating the TEXT indexes you need by providing default index creation scripts.

> **Caution:** Due to a third-party product limitation, users can not attach documents to PPM entities while PPM Center Database DMS full text index creation is in progress. If they do so, they may receive an error message.

Default TEXT Index Creation Script

The default TEXT index creation script can be found at the following path on an instance of PPM 9.13 or later:

`<PPM_Home>/utilities/database_dms/DatabaseDMS_FullTextSearch_Scripts.zip`

The zip package contains two files:

- The script to run as SYS user to give PPM DB User the required grants to create TEXT indexes.
- The default index creation script. You may want to customize this script to meet your requirements.

TEXT Index Creation Parameters

The first parameter that you may want to update is the lexer used when indexing documents. By default, HPE uses `WORLD_LEXER` as it supports a wide range of languages (including all languages supported by PPM). Refer to the following Oracle documentation for more choices of lexer that might give you better results: http://docs.oracle.com/cd/B28359_01/text.111/b28304/amultlng.htm#CEGBCDHJ.

The other parameter that you may want to modify when creating indexes is the delay between TEXT indexes refresh. This is set in the "`SYNC (every sysdate+XXX)`" of the index creation SQL, where *XXX*

is the average duration between two index refreshes expressed in days. So, using "`T/1440`" allows you to easily express duration `T` in minutes.

The default script creates indexes that will be refreshed every 10 minutes [`SYNC (every sysdate+1/144)`]. In other words, when users add a document to PPM, they may have to wait up to 10 minutes before the document can appear in the search results.

> **Note:** Setting this value to a short delay allows users to see documents shortly after adding the documents in PPM, but will result in index fragmentation on the long run. Fragmented indexes result in slower searches. This can be solved by optimizing the index or dropping and re-creating the index. For more information, see the "Maintaining TEXT Indexes" below section below.

If you do not want to wait for a document to be indexed after adding it to PPM, you can use the option `SYNC (ON COMMIT)`. However, note that when doing so, there will be a noticeable performance impact as the document indexing is done as part of the transaction. Moreover, this results in a very fragmented index on the long run, requiring frequent optimizations, and possibly indexes full rebuilds.

> **Note:** If you choose the `SYNC (ON COMMIT)` option for all your TEXT indexes, the PPM DB User does not need the "CREATE JOB" access grant. Only CTXAPP is required.

Maintaining TEXT Indexes

If your users start to witness slow document searches after some time while using PPM Database DMS, the possible root cause might be TEXT index fragmentation. There are two solutions when this occurs:

- Drop and re-create the index(es). This can be time consuming if you have lots of documents, and during the index rebuilding time, not all documents might be searchable.
- Optimize the index(es). There are multiple levels of index optimization depending on how complete you want the optimization to be. For example, to perform a fast optimization of the tip document contents index, you should run:

  ```
  exec ctx_ddl.optimize_index('DMS_TIP_DOC_IDX','FAST');
  ```

Extensive documentation on Oracle TEXT index optimization can be found on Oracle web site, such as:

- http://docs.oracle.com/cd/B28359_01/text.111/b28303/ind.htm#i1007604, or
- http://docs.oracle.com/cd/B28359_01/text.111/b28304/cddlpkg.htm#CCREF0638

Advice about Using PPM Center Database DMS and PPM Center External Database DMS

This section provides advice for DBAs about using PPM Center Database DMS and PPM Center External Database DMS, including:

Choosing Between PPM Center Database DMS and PPM Center External Database DMS

The only difference between the two solutions is that when PPM Center External Database DMS is in use, all the documents contents, indexes, and versions metadata are stored in a separate database schema, not in the PPM Center schema. Therefore, the only DMS related table that will always be stored in PPM Center schema is the `KNTA_DOCUMENTS` table, which contains basic document information. In this case, you can choose whether to store the separate DMS schema and the PPM Center schema on the same Oracle server or not. Both scenarios are supported.

HPE advises that you use PPM Center External Database DMS if you:

- Have large amounts of attachments (more than 50 GB), or
- Need to apply different settings or maintenance policies to PPM Center business data and attachments. For example, you have to apply different schema-level backup or data integrity policies.

PPM Center External Database DMS allows for a greater flexibility in database settings and tablespace management, as you can tune them in a way other than from PPM Center schema. By using PPM Center External Database DMS, it is easier to make sure that PPM Center database is not impacted if a very fast-growing document amount results in the lack of available space on a tablespace used by DMS tables or indexes, or on the server disk storage.

Conducting Tablespace Management

Tablespace management is left to DBAs as it is considered a database administration task. DBAs are free to store PPM Center DMS data (documents contents, indexes, and metadata) on whichever tablespace they deem appropriate. Having dedicated tablespaces for the main elements of PPM Center Database DMS (content, TEXT indexes) has the following advantages:

- If intense attachments activity leads to using up all available space in a dedicated DMS tablespace, the rest of PPM Center application will not be impacted (unless it turns out to be a lack of space on the disk storage, and that PPM Center application tablespaces use the same disk storage).
- DBAs can choose to compress the tablespace storing DMS documents contents. This can result in significant space savings if most attachments are in a format that can be efficiently compressed (such as log files).
- If needed, DBAs can finely tune the performance of tablespaces according to their usage: tablespace storing documents contents should be optimized for heavy I/O operations (documents store/retrieve), while tablespace storing TEXT indexes should be optimized for fast records access.

Default Tablespaces

When using PPM Center Database DMS, by default, documents contents are stored in the default `USER_CLOB` PPM Center tablespace, while the metadata and the TEXT indexes (when created) are stored in default `USER_DATA` PPM Center tablespace. Indexes on the metadata tables are stored in the `USER_INDEXES` PPM Center tablespace. DBAs can change the tablespaces used by PPM Center Database DMS, for example, to save DB disk space by compressing documents contents, or by tuning tablespace-level settings that would provide better performance for their specific usage pattern.

When using PPM Center External Database DMS, there is no specific tablespaces instruction when the tables are created in the external schema. Tables are automatically created if not existing at the beginning of the migration process, when testing connection to the new DMS system.

Tablespaces customizations are supported for both PPM Center Database DMS and PPM Center External Database DMS, but HPE advises that you do such customizations before the migration is started, so that all data is stored in the intended tablespace as migration proceeds.

Changing the Tablespaces of the Documents Contents

Most of the space consumed by PPM Center (External) Database DMS in the database is used to store the documents contents (the actual attachment files). These contents are stored under their binary form in two BLOB columns:

- `KNTA_DOCUMENT_TIP_CONTENTS.DOC_CONTENT`, to store the latest version (i.e. tip version) of each file.
- `KNTA_DOCUMENT_HISTORY_CONTENTS.DOC_CONTENT`, to store all non-tip versions of each file.

If you want to change the tablespace where these contents are stored, move the `DOC_CONTENT LOB` columns to another tablespace (replace “X” below with either "`TIP`" or "`HISTORY`"):

```
ALTER TABLE KNTA_DOCUMENT_X_CONTENTS MOVE LOB(DOC_CONTENT) STORE AS (TABLESPACE
NEW_TABLESPACE_NAME);
```

When a new version is added to a document, the contents of the old tip version will first be copied to the `HISTORY` table before the new tip contents are inserted in the `TIP` table. As a result, for better performance, HPE advises that you store both `TIP` and `HISTORY` contents in the same tablespace.

It is considered a good practice to have a dedicated tablespace to store documents contents, especially if the size of attachments in PPM Center is very large (more than 50GB of attachments).

Changing the Tablespace of TEXT Indexes

Managing domain indexes (like the Oracle TEXT CONTEXT indexes) is quite different from managing “standard” Oracle indexes. After all, DOMAIN indexes are just a series of Oracle tables put together, and as such, the standard Oracle INDEX management does not apply to them.

Depending on the type of your attachments, the size of the TEXT index can represent a significant part of the size of the file attachments. The measurements on HPE R&D Sample Dataset show numbers ranging from 15% to 30% of the size of the attachments contents. However, if you have documents that are mostly in raw text formats (`log`, `txt`, etc.), then the size of your TEXT index can in theory exceed 100% of the size of the attachments contents. For this reason, it is a good practice to have a dedicated tablespace to store the TEXT index when using PPM Center (External) Database DMS.

The tablespace to be used for storing a TEXT index must be specified upon TEXT index creation. Here is an example on how to store an Oracle TEXT index in the `XYZ` tablespace. Before creating the TEXT index, you have to define a STORAGE parameter, and set the tablespace of all domain tables of the domain index to use the `XYZ` tablespace:

```
begin
   ctx_ddl.create_preference('MY_XYZ_TEXT_STORE', 'BASIC_STORAGE');
   ctx_ddl.set_attribute('MY_XYZ_TEXT_STORE', 'I_TABLE_CLAUSE', 'tablespace XYZ');
   ctx_ddl.set_attribute('MY_XYZ_TEXT_STORE', 'K_TABLE_CLAUSE', 'tablespace XYZ');
   ctx_ddl.set_attribute('MY_XYZ_TEXT_STORE', 'R_TABLE_CLAUSE', 'tablespace XYZ');
   ctx_ddl.set_attribute('MY_XYZ_TEXT_STORE', 'N_TABLE_CLAUSE', 'tablespace XYZ');
   ctx_ddl.set_attribute('MY_XYZ_TEXT_STORE', 'I_INDEX_CLAUSE', 'tablespace XYZ COMPRESS 2');
   ctx_ddl.set_attribute('MY_XYZ_TEXT_STORE', 'P_TABLE_CLAUSE', 'tablespace XYZ');
end;
/
```

> **Note:** The `COMPRESS 2` parameter is here only for the sake of the example, it is not mandatory and can be adjusted depending on your preferences.

You can then create the TEXT index and specify the storage to use as part of the parameters of the index creation:

```
EXECUTE IMMEDIATE 'CREATE INDEX DMS_TIP_META_IDX
    ON KNTA_DOCUMENT_TIP_CONTENTS(FULL_TEXT_META)
    INDEXTYPE IS CTXSYS.CONTEXT
    parameters (''LEXER PPM_DMS_LEXER DATASTORE PPM_DMS_TIP_DS STORAGE MY_XYZ_TEXT_
STORE SYNC (every sysdate+1/144)'')';
```

For more information about available parameters (including tablespace management) when creating an Oracle TEXT index, see http://docs.oracle.com/cd/E11882_01/text.112/e24436/cdatadic.htm.

PPM Center Database DMS Environments Examples

This section presents the database high-level configuration of two different sample environments, and explains the rationale behind these choices. These configurations are only provided for didactical purposes and should not be considered as an official HPE recommendation. Your actual configuration should be adapted according to your environments specificities and Database & System administration policies.

Example 1: Small Size Deployment

- Documents overview:
  - ~ 12K documents
  - Total documents size: ~ 2.5 GB

  - TEXT index size: ~ 410 MB
  - Mostly office documents
- Limited volume increase (~ 15% per year)
- DMS choice: PPM Center Database DMS
  - Limited size of documents and DMS DB overhead do not justify a dedicated DB schema.
  - Simple backup procedure: weekly PPM Center DB Dump (PPM Center business data and attachments).
- Tablespace configuration:
  - Using a dedicated `PPM_DMS` tablespace for DMS documents contents and TEXT indexes, with default tablespace configuration and a limited maximum size to 40 GB. This was decided in order to prevent impact on PPM Center business data tablespaces in case of sudden and massive increase of the documents size. (security concern to prevent a Denial of Service attack by attaching many large documents to PPM Center).
  - Using default tablespace for everything else.
- DMS configuration parameters in PPM Center:
  - `MAX_WEB_ATTACHMENT_SIZE_IN_MB: Default value` (`2048`, i.e. 2GB)
  - `DMS_INSECURE_FILE_EXTENSION_CHECK: Default value` (`false`, all extensions are allowed)

Example 2: Large Size Deployment

- Documents overview:
  - ~ 1.1M documents
  - Total documents size: ~ 395 GB
  - TEXT index size: ~ 127 GB
  - Mostly office documents and log files
  - Frequent documents updates and read operations
- Moderate volume increase (~ 35% per year)
- DMS choice:PPM Center External Database DMS, different DB physical server

  - The large number of I/O operations requires dedicated hardware as the PPM Center Database is already under heavy load due.
  - Dedicated DMS schema allows for differentiated backup strategies:
    - Daily backup for PPM Center Business DB
    - Weekly backup (Week-end) for PPM Center DMS DB
- Tablespace configuration:
  - One compressed tablespace to store documents contents (log files are rarely compressed when attached, and compressing the tablespace allows saving up to 30% disk space). Tablespace is optimized for I/O intensive read/write operations.
  - One tablespace for TEXT indexes, optimized for transactional operations.
  - One tablespace for everything else (DMS tables and indexes), optimized for transactional operations.
- DMS configuration parameters in PPM Center:
  - `MAX_WEB_ATTACHMENT_SIZE_IN_MB: 250`. (Max allowed file size is 250 MB)
  - `DMS_INSECURE_FILE_EXTENSION_CHECK: true`. Prevent uploading files of the extensions defined in the DMS_INSECURE_FILE_EXTENDSIONS parameter. For example, if the value of the DMS_INSECURE_FILE_EXTENDSIONS parameter is `exe,com,bat,reg,jar,cmd,lnk,htm,html,js`, you cannot upload files of these extensions.

Chapter 3: Upgrading and Migrating DMS Solutions from PPM Version 9.14 or Earlier

Caution: Regarding DMS Configuration and PPM Database Dump and Cloning (after PPM version 9.13)

If you are cloning a PPM environment by dumping database (for example, cloning a PROD environment to DEV or TEST), the DB Dump will include DMS configuration. This means that, unless you are using PPM Database DMS (which does not have any configuration), if left unmodified, the new environment will point to the same DMS location (File System, DB, or Documentum server) as the original cloned environment. This would result in data corruption, and should be avoided.

In order to safeguard your DMS configuration before importing a new Database dump, follow these steps to import from a SOURCE DB dump into a TARGET environment:

1. Before importing the source dump in the target environment, while target environment is down, copy the contents of the CONFIGURATION column from the DB table PPM_INT_CONFIGURATIONS row with value SOLUTION_ID=1200 in the file `<PPM_HOME>/conf/dms.conf`. (You only need to do this if the content of the `dms.conf` file and the configuration text content from DB are different.)
2. Import the source DB dump into the target DB.
3. Delete the row from PPM_INT_CONFIGRATIONS with `SOLUTION_ID=1200` from the target DB by running the following command:
   ```
   DELETE FROM PPM_INT_CONFIGURATIONS WHERE SOLUTION_ID=1200;
   ```
4. Start FIRST the PPM server from the PPM_HOME with the up-to-date `dms.conf` file.
   In cluster node, you need to have only one PPM_HOME with a valid `dms.conf` file, and it should be started first.
   Upon server startup, since the row with SOLUTION_ID=1200 is missing from the DB, the DMS configuration will automatically be read from `dms.conf` and saved to database. This will happen only once on server startup. From that moment, `dms.conf` will never be accessed anymore (unless the row is deleted from the DB again), and if in cluster mode, all other PPM servers will read the DMS configuration directly from the database.

This section provides step-by-step instructions on migrating a DMS solution using the Administrator Console tool DMS Configuration and detailed information about upgrading and migrating DMS solutions from PPM Center version 9.14 or earlier.

Upgrading from PPM version 9.14 or earlier

To upgrade and migrate DMS from PPM version 9.14 or 9.13 to version 9.40, you need to upgrade DMS from PPM to version 9.20 and then to 9.30 using the migration paths provided in this section. Then you can upgrade to version 9.40 directly from version 9.30.

> **Note:** Information in this section only applies to DMS upgrade and migration from PPM version 9.14 or earlier to version 9.40.

Supported DMS Migration Paths

The following table lists supported DMS migration paths.

From	To
Documentum-based DMS [a]	One of the following: • PPM File System • PPM Database DMS • PPM External Database DMS
PPM File System	One of the following: • PPM Database DMS • PPM External Database DMS
PPM Database DMS	One of the following: • PPM File System • PPM External Database DMS
PPM External Database DMS	One of the following: • PPM File System • PPM Database DMS • PPM External Database DMS [b]
a. Include DMS solutions based on either embedded Documentum Content Server software HPE supplies or integration with stand-alone Documentum Content Server software using connector. If you migrate from a Documentum-based DMS solution, make sure you read carefully the "Special Notes When Documentum is the Current DMS" on page 41.	

From	To
b. You can migrate your DMS from using an external DB schema to using a different external DB schema, regardless of which connection method you are using (JNDI or JDBC).	

Typical Upgrade and Migration Scenarios

The following table lists typical upgrading and migration scenarios and the high-level steps.

High-Level Steps for Upgrading and Migrating a DMS solution

Current Setup	Target Setup	How to Migrate
PPM version 9.40, with PPM Database DMS as the default DMS	PPM version 9.40 with • File System DMS, or • PPM External Database DMS	1. Migrate DMS to File System or PPM External Database DMS using Administration Console tool DMS Configuration 2. Enable Full Text Search functionality if using database-based DMS (optional)
PPM version 9.13 or 9.14 with document management based on Documentum Content Server EE 6.5 SP2	PPM version 9.40 with PPM Database DMS	1. Fix broken documents (if any). 2. Deploy the DMS hotfix on top of PPM Center version 9.13 or 9.14. 3. Migrate the Documentum-based DMS to PPM Database DMS using the Administration Console tool. 4. Upgrade PPM to version 9.40. 5. Enable Full Text Search functionality (optional)
PPM version 9.12 or earlier (no document management)	PPM version 9.40 with PPM Database DMS	1. Upgrade PPM to version 9.40 by following PPM upgrade path. 2. Enable Full Text Search functionality (optional)
PPM version 8.0X, 9.10, 9.11, or 9.12 with document management based on embedded Documentum Content Server EE 6.5 SP2	PPM version 9.40 with PPM Database DMS	1. Run the PPM server configuration utility (the `kConfig.sh` script) to verify that the integration works fine. 2. (PPM Center version 8.0x only) Upgrade PPM to version 9.10. 3. Upgrade PPM to version 9.14. 4. Deploy the DMS hotfix on top of PPM Center version 9.14. 5. Run `kConfig.sh` to fix broken documents (if any).

High-Level Steps for Upgrading and Migrating a DMS solution, continued

Current Setup	Target Setup	How to Migrate
		6. Migrate the Documentum-based DMS to PPM Database DMS using the Administration Console tool DMS Configuration. 7. Upgrade PPM to version 9.40. 8. Enable Full Text Search functionality (optional).
PPM version 8.0X, 9.10, 9.11, or 9.12 with document management based on stand-alone instance of Documentum Content Server EE 6.5 SP2	PPM version 9.40 with PPM Database DMS	1. (PPM Center version 8.0x only) Upgrade PPM to version 9.10. 2. Upgrade PPM to version 9.14. 3. Deploy the DMS hotfix on top of PPM Center version 9.14. 4. Fix broken documents in Documentum (if any) by contacting HPE Software Support. 5. Migrate the Documentum-based DMS to PPM Database DMS using the Administration Console tool DMS Configuration. 6. Upgrade PPM to version 9.40. 7. Enable Full Text Search functionality (optional).
PPM 7.5 with document management based on embedded Documentum Content Server EE 5.3 SP2	PPM version 9.40 with PPM Database DMS	1. Run `kConfig.sh` to verify that the integration works fine. 2. Upgrade to PPM version 8.00. 3. Upgrade the stand-alone Content Server from version 5.3 to version 6.5. 4. Run `kConfig.sh` to upgrade the stand-alone Content Server 6.5 software. 5. Upgrade PPM to version 9.10, then 9.14. 6. Deploy the DMS hotfix on top of PPM Center version 9.14. 7. Run `kConfig.sh` to fix broken documents in Documentum (if any). 8. Migrate the Documentum-based DMS to PPM Database DMS using the Administration Console tool DMS Configuration. 9. Upgrade PPM to version 9.40.

High-Level Steps for Upgrading and Migrating a DMS solution, continued

Current Setup	Target Setup	How to Migrate
		10. Enable Full Text Search functionality (optional).

Migrating DMS Using the Administrator Console Tool

This section provides information about step-by-step instructions on DMS migration, using PPM Database DMS as the example target DMS solution.

- "Advantages of the DMS Migration feature" below
- "Before the Migration" on the next page
- "Preparing for the Migration" on page 41
- "Step-by-step DMS Migration " on page 44

Advantages of the DMS Migration feature

The DMS Migration feature introduced since PPM 9.13 (**Administration Console > DMS Configuration**) allows you to migrate easily from a current DMS solution to a target DMS solution:

- Migration occurs while PPM Server is online, and has almost no impact on PPM users. They can keep on checking in and checking out files, and adding new attachments.
- Once the migration is completed, you are able to test the new solution during a "transition period" while the old solution is still available. If you meet any issue with the new DMS system, you can always cancel the migration and go back to the old solution, and no document is lost in the process.
- You can schedule the time at which the migration is running, and adjust different parameters to control what load the migration can have on the PPM system. Note however that migration process has a relatively limited impact on PPM Server performance under standard server load.

Before the Migration

Though migrating DMS is practically as simple as clicking a button in the Administration Console, there are a few things of interest to know before proceeding. Before you start the migration, read the following carefully and take necessary actions:

Update Tablespaces before the Migration

If your DBA wants to change the tablespace used to store the document contents, this should preferably be done before the migration, as there is no data in the tables at that point. If you already started a migration before but cancelled it, there are already some data in the PPM Database DMS DB tables; you can safely truncate these tables. But do NOT change anything in the KNTA_ DOCUMENTS table, as it is used by all three DMS solutions to store document information and should never be modified manually.

Create Indexes on Tables AFTER the Migration

If you plan on using Full Text search, do NOT create the indexes on the tables before the migration. The reasons are:

- Performance impact on migration, additional load on Database Server CPU during the migration due to indexes update.
- Updating the index while new documents are being added can result in more fragmented indexes, especially if the indexes are set to SYNC (ON COMMIT). You can get better results by creating the index after all documents are added.
- Trying to remove a document (which can happen during the migration) while the TEXT index is currently being constructed can result in an Oracle error (`ORA-29861: domain index is marked LOADING/FAILED/UNUSABLE`).

Configure to Relieve Load on PPM Service Nodes during the Migration

The default DMS Migration settings provides a good migration speed, but might result in a heavy load on PPM Service nodes and PPM database. The easy way to relieve the load during peak hours is to pause the migration (this can be easily done from the migration page in the Administration Console).

However, if you want to alleviate the overall load on PPM Server during the migration process, you can:

- Update the following parameters from the Administration Console of PPM before starting the migration (No PPM Server restart needed)

Parameter name	Description, Usage	Default and Valid Values
DMS_MIGRATION_DELAY_BETWEEN_DOCUMENT	Specifies duration (in seconds) that a thread will wait between two documents to migrate. To lighten the load of the migration process on the PPM Server, increase the value of this parameter.	Default: `0` Valid values: `integer`
DMS_MIGRATION_THREAD_COUNT	Specifies number of threads that will be migrating documents on a given PPM Service node.	Default: `3` Valid values: integer
DMS_MIGRATION_DOCUMENTS_BATCH_SIZE	Specifies the number of documents that to be queued for migration on a given PPM Service node. Every time the DMS Migration Engine Service runs on a Service node, the queue of documents to migrate is filled up.	Default: `1000` Valid values: integer

- Change the scheduling of the DMS Migration Engine Service on the Schedule Services page. This dedicated heavy service runs regularly and fills a queue of documents to migrate on the PPM Server node where the service runs (which could be any node configured to run heavy services). Default setting is to run the service every 30 seconds. However, do NOT enable or disable that service manually from this page.

  For details about configuring the DMS Migration Engine Service, see the "Configure the Migration Background Service " on page 42.

Special Notes When Documentum is the Current DMS

If you are migrating from Documentum-based DMS to PPM Database DMS, you might run out of Documentum sessions during the migration with the default configuration (including default Documentum Server configuration).

The reason is that documents operations are asynchronous, and Documentum sessions can be busy for some time even when the document operation on PPM Server has completed. As the DMS Migration is a very demanding process, sometimes you might run out of Documentum sessions, which results in failure of some documents to be migrated.

This is not a blocking issue as you can retry migrating failed documents until they are successfully migrated. However, it results in unneeded manual operations. You can reduce the probability of running into such an issue by resorting to the following options:

- Use one migration thread only.
- Add a delay between documents to migrate (of 1 second or more). This gives time for the asynchronous operations to complete. Considering the performance impact, you should only resort to this option after you have tried to migrate all documents at least once.
- Reduce the documents migration batch size so there can be some idle time between two migration service triggering.
- Increase the maximum number of Documentum sessions on Documentum server. To do so, edit the `$DOCUMENTUM/dba/config/<`*DOCBASE_NAME*`>/server.ini` file, and increase the value of `concurrent_sessions` (default: `100`).

Preparing for the Migration

The number of threads to be used for migration should be set before the migration starts. The migration service scheduling or the maximum size of documents migration queue can however be modified in the middle of the migration.

You can adjust different parameters to control when the migration runs, and how much load on PPM Server it might generate.

In addition, you can do the follows.

Estimate the Migration Duration

To help estimate how long the migration may take, you may run some SQLs to count documents and to estimate total size of files in the system:

- To count how many documents are in the system, run the following:

  ```
  SELECT COUNT(*) FROM KNTA_DOCUMENTS
  ```

- To count how many document versions are in the system, run the following:

  ```
  SELECT SUM(VERSION_NUMBER) FROM KNTA_DOCUMENTS
  ```

- To estimate the total size of files in the system, run the following:

  ```
  SELECT SUM(FILESIZE*VERSION_NUMBER) FROM KNTA_DOCUMENTS
  ```

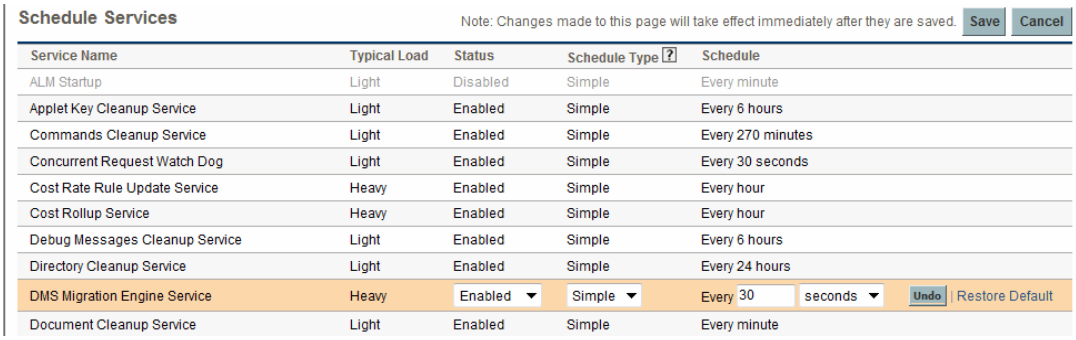
> **Note:** Normally 1 GB of data (around 3000 documents with the average document size of 333 KB) can be migrated in less than 10 minutes.

Configure the Migration Background Service

To schedule the DMS Migration Engine Service,

1. Log on to PPM.
2. On the **Open** menu, click **Administration > Schedule Services.**

   The Schedule Services page lists all of the available services, and shows the typical load each service manages, whether the service is enabled, the type of expression used to schedule the service, and the current run schedule.
3. Locate and click the **DMS Migration Engine Service**.
4. From the drop-down list in the **Status** column, select **Enabled**.



5. To select a schedule type, do one of the following:
   - To use a simple expression such as hours, minutes, or seconds to schedule the service, in the **Schedule Type** list, leave **Simple** selected.
   - To use a cron expression to schedule the service, from the **Schedule Type** list, select **Cron**.

     > **Note:** For detailed help with scheduling the service, next to the **Schedule Type** list heading, click the help icon after the **Schedule Type** column heading.

6. In the **Schedule** column, provide the simple or cron value to specify the DMS Migration Engine Service run interval.
7. In the top right corner of the page, click **Save**.

> **Notes:**
>
> - All the nodes configured to run PPM heavy services will eventually run migration service as scheduled. So migration will eventually run on multiple PPM nodes if more than one node is configured to run heavy services.
> - The DMS Migration Engine Service is automatically enabled when you click **Start Migration** in the Administration Console, and disabled when you click **Cancel Migration** or **Commit**.
> - The schedule should be set in accordance with the migration batch size. It can negatively impact the speed of migration if the documents migration queue runs out of documents to migrate before the service is re-invoked.
> - If the migration service is invoked on a node where the documents migration queue is not empty, it will fill the queue so that the total number of documents in the queue matches the migration batch size.
> - When a migration is in progress, disabling the DMS Migration Engine Service terminates the migration. However, you should use the **Pause** button if you want to pause the migration. This is more efficient, as simply disabling the service would still need to wait for all documents in the

queue to be processed.

Step-by-step DMS Migration

The DMS migration is a wizard-driven process. The DMS Migration wizard walks you step-by-step through the entire migration process, including the following stages:

- Select target DMS
- Configure target DMS
- DMS migration in progress
- Start DMS Transition
- DMS Transition in progress
- Commit the migration

To migrate a DMS,

1. Log in to PPM and launch the Administration Console.
2. From the Administration Console Actions pane of the Administration Console window, click **Administration Task > DMS Configuration**.
3. On the DMS Configuration page, click **Migrate**.

   The wizard displays the "Select target DMS" page.
4. From the **Target DMS** drop-down list, select a target DMS.

   The available options vary with your current DMS. For example, if you migrate from PPM File System, the available options for **Target DMS**include:

   - **PPM Database DMS**
   - **External Database (JDBC) DMS Driver**
   - **External Database (JNDI Datasource) DMS Driver**

   Note: The latter two options are two ways of defining the external database for the PPM External Database DMS solution. For more information, see "Configuring PPM External Database DMS Solution" on page 20.

> **Note:** If you migrate your current DMS (Documentum or PPM Database DMS) to PPM File System, a warning message shows up stating that some document information might not be preserved due to unsupported functionalities by the target DMS.

5. Click **Next**.

   The wizard displays the "Configure target DMS" page.

6. On the "Configure target DMS" page, provide values for all required fields.

   - If you selected **PPM Database DMS** as the target DMS, there are no empty fields on this page. Proceed to next step.
   - If you selected **External Database (JDBC) DMS Driver** as the target DMS, provide values as described in the table below.

Field (*required)	Description, Sample Value
dms.database.JDBC.ServerAddress	Address (IP address or machine host name) of the DB Server where to you plan to store DMS documents.
dms.database.JDBC.ServerPort	Port of the DB Server where you plan to store DMS Documents.
*dms.database.JDBC.DB_SID	SID of the DB server where you plan to store DMS documents.
dms.database.JDBC.Username	Username of the DB server where you plan to store DMS documents
dms.database.JDBC.Password	Password of the DB server where you plan to store DMS documents

   - If you selected **External Database (JNDI Datasource) DMS Driver** as the target DMS, make sure you have created your JNDI datasource, then provide values as described in the table below.

     For information about how to create JNDI datasource, see "Creating JNDI Datasource" on page 22.

Field (*required)	Description, Sample Value
*dms.database.JNDI.Datasource	Specify the JNDI name of the datasource used to store documents. Note: Make sure you prefix your value with "`java:`". For example, `java:dms`, or `java:/dms`.

Field (*required)	Description, Sample Value
dms.database.JNDI.Username	Specify the username you use to connect to the JDNI datasource. Leave it blank if username and password are already defined in the datasource definition.
dms.database.JNDI.Password	Specify the password you use to connect to the JDNI datasource. Leave it blank if username and password are already defined in the datasource definition.

7. Click **Next**.

   Clicking **Next** tests your configuration right away and proceeds to the next page when the configuration is valid, and the new page summarizes the target DMS configuration.

   As part of the validation, it tries to create and delete some temporary documents on your new DMS environment.

8. Click **Start Migration** if you are sure you want to migrate the current DMS to the specified target DMS.

   Upon migration start, the DMS Migration Engine Service is enabled and the documents are migrated in batches.

   > **Note:** There can be a delay of less than one minute between clicking **Start Migration** and the moment where the document starts to be actually migrated; this is due to the default scheduling of the DMS Migration service, which starts every 30 seconds.

9. After clicking **Start Migration**, the wizard displays the "DMS migration is IN PROGRESS" page.

   While the DMS Migration is in progress, the DMS Migration Engine Service is running in the background to migrate the documents. If a PPM User checks in new documents or edits the existing documents, these documents are also migrated.

   The DMS Migration Engine Service has no impact on the working of the current DMS system. When PPM Users perform DMS actions, such as checking in or out documents, they are working with the current DMS system.

10. Click **Refresh** to update the migration progress status.

    > **Note:** The progress bar is not updated automatically. You need to click **Refresh** to update the migration progress status.

    The migration status contains the following information:

Item	Description
Status	Status of the migration, shown by a progress bar reflecting the percentage of **Files processed**.
Start time	The migration start time, it is recorded when you click **Start Migration**.
Files processed	The number of the files that have been processed. It represents the number of both **Successful** and **Failed** documents.
Successful	The number of documents that have been migrated successfully.
Failed	The number of documents which migration failed. You can click **Retry failed files** to retry migrating them again once the migration completes.
Files total	The total number of documents in the system.

11. You can also perform the following actions on this page:
    - **Retry failed files:** Once the migration is completed, if there are any files that failed to be migrated, you can click this button to retry to migrate them until they succeed. All failed files will be re-migrated.

      > **Note:**
      >
      > - If there are some failed documents, you need either retry to migrate them until they succeed, or delete them from the system. These failed documents will not be migrated if you go to the next step, and should be considered lost documents once you move to transition period, even if you cancel migration during the transition period.
      > - The migration log (`<`*PPM_Home*`>/server/<`*PPM_Instance*`>/log/dms.log`) contains detailed information about migration operations, activities, status, and issues.
      >
      >   The `com.kintana.dms` parameter in `logging.conf` specifies logging these information by default. However, you can modify the logging level if needed

    - **View failed files logs:** View the migration log for a list of failed files. If a file fails to be migrated, the whole exception details are included in the logs. You can search migration logs based on the time the error occurred.
    - **Pause** | **Resume:** When migration is under way, you can pause it. If migration is paused, you can resume it.
    - **Cancel Migration:** Clicking this button cancels the migration immediately and brings you back to the current DMS Configuration screen. The target DMS environment is left as-is. Documents already migrated to the target DMS system will remain there unless manually removed.

12. When the progress state reaches 100%, click **Refresh**.

    The wizard displays the "DMS Migration is COMPLETED" message.

    > **Note:** Once you see the message, make sure that no document is in **Failed** state, as failed documents are not available once you start using the new DMS.

    Before moving to the next step (Transition Period), this is a good time to enable full-text search if you plan to use the feature.

    If you move to Transition Period without enabling full-text search, the full-text search feature will not be available to PPM users and they cannot search documents by **Document Key Words**.

    To enable full-text search in PPM Database DMS:

    a. Create TEXT indexes, as described in "Creating and Maintaining Oracle TEXT Indexes" on page 25.

       Note that this step can take a long time (over 1 hour per 5 GB of documents to index).

    b. In PPM Administration Console, go to **Application Configuration**, set the parameter `DMS_DB_ENABLE_FULLTEXT_SEARCH` to `true`, and then save the change.

    Once the migration is completed, you can move to "Transition Period", during which PPM Database DMS becomes active, but your old DMS solution (File System or Documentum) is still active in the background and save copies of newly created documents. This way, you can try PPM Database DMS for some time. If you find that the new DMS solution does not meet your requirements, or if you encounter any issue with the new DMS solution, you can always switch back to the previous DMS solution without causing loss of any documents to PPM users.

13. Click **Start Transition**.

    Starting the transition replaces the current DMS solution with the new target DMS solution. It takes a few seconds to a few minutes to complete this switching action, during which the wizard displays a temporary page.

    During the transition, the PPM DMS system becomes read-only for a few seconds while the DMS Driver is reloaded on all PPM Server nodes. If PPM users try to add a new document or check in a new version while the system is locked, they receive a message similar to the follows:

    ```
    PPM Document Management System is currently under maintenance. Please try again later.
    ```

    For this reason, and to minimize the potential impact on PPM Users, it is recommended to move to transition while the PPM Server system is not under heavy load.

14. The wizard displays the "Transition" page.

In the transition stage, your DMS system is already switched to the target DMS system, and all documents in the legacy DMS System were already migrated.

The DMS Transition period allows you to start using the new DMS solution while the old DMS is still available. PPM Users are performing DMS actions on the target DMS solution, such as check in, check out, and save documents. Meanwhile, any new documents added or modified documents checked in to the new DMS system by PPM users are synchronized back to the old DMS system as well. This way, if you choose to cancel the migration and move back to the legacy DMS solution for any reason, you are not losing any documents changes occurred during in the transition process.

15. Click **Refresh** to update transition synchronization status.

    The transition status information includes:

    - Transition status
      - Number of Failed documents
    - Documents Migration Summary
      - Start time
      - File processed
      - End time

16. You can perform some other actions on this page:

    - **Retry failed files:** Just like during the migration, some files may fail to be synchronized back to the legacy DMS solution. This has no impact if you choose to continue with the new DMS system, but make sure that these documents are synchronized successfully back to the legacy DMS system if you plan to cancel the migration.
    - **View failed files logs:** Errors occurred during synchronization of documents changes are logged along with exception details. Click this button to view detailed log.
    - **Cancel Migration:** Clicking this button during the transition period results in synchronizing any new documents or new versions of documents added or checked in to the new system but not yet synchronized back to the legacy system, and then switching back to the legacy system.

      > **Note:** If PPM Users create and save new entities with attachments in the time lapse between a PPM administrator clicking **Cancel Migration** and the completion of the cancellation process, these entities might fail to be created as the DMS is locked during that time window. This is similar to what might happen after the transition period starts.

17. Click **Commit.**

By clicking **Commit**, you stop synchronizing new documents to the old DMS. Once you click **Commit**, the DMS Migration Engine Service stops, you are officially moved to the PPM Database DMS, and the old DMS is retired.

> **Note:**
>
> - You can stay in Transition period for as long as you feel necessary to ascertain the stability and performance of the new DMS system.
> - All error log for failed documents are cleaned once you click **Commit**.
> - The DMS Migration Engine Service is disabled automatically after you click **Commit**. Do NOT try to start it manually.
> - PPM does not delete any of your documents from the old DMS solution (Documentum or File System) after a DMS Migration, you need to manually remove them once the migration is committed.

Migrating from Documentum-Based DMS on PPM Version 9.13 or 9.14

You can migrate your current DMS on PPM Center version 9.13 or 9.14 directly to a supported DMS on PPM Center version 9.40.

To migrate from a Documentum-based DMS on PPM Center version 9.13 or 9.14,

1. Fix broken documents (if any).
   - *For DMS based on stand-alone Documentum Content Server*

     Launch the enhanced `kConfig.sh` tool, select the only available option **Integrate PPM Center with EMC Documentum Content Server**, and run the tool.
   - *For DMS based on embedded Documentum Content Server*

     Contact HPE Software Support for a tool to fix broken documents. The option for HPE version of Documentum DMS is not available in the `kConfig.sh` tool on PPM Center version 9.13 or 9.14.
2. Obtain the DMS hotfix under the following reference from HPE Support and deploy it on top of PPM Center version 9.13 or 9.14:

   `HOTFIX_-_DMS_9.13_9.14_-_QCCR1L45846_-_QCCR1L45466`

3. Migrate the Documentum-based DMS to PPM Database DMS using the Administrator Console tool DMS Configuration.

   For detailed instructions, see "Migrating DMS Using the Administrator Console Tool" on page 38.

4. Upgrade PPM to version 9.40.

   For detailed instructions, see the Upgrade Guide.

5. (Optional) Migrate from PPM Database DMS to PPM Center File System or PPM External Database DMS.

   For detailed instructions, see "Migrating DMS Using the Administrator Console Tool" on page 38.

6. (Optional) Enable full text search functionality if you use PPM Database DMS or PPM External Database DMS.

   For detailed instructions, see "Configuring Full Text Search in Database-Based DMS Solutions" on page 23.

Upgrading and Migrating from Documentum-Based DMS on PPM Version 9.12 or Earlier

This section provides detailed instructions on how to upgrade and migrate a Documentum-based DMS solution on PPM version 9.12 or earlier to PPM Database DMS on PPM version 9.40.

> **Caution:** Make sure you read carefully the "Special Notes When Documentum is the Current DMS" on page 41.

Documentum-based DMS solutions are not available as target DMS options in PPM version 9.40, and the PPM External Database DMS solution is only available in PPM version 9.40. Therefore, if you want to maintain all your documents and their properties information, make sure you migrate your Documentum-based DMS solution to PPM Database DMS before you upgrade PPM to version 9.40.

Once you are on PPM Database DMS, you can use the Administration Console tool DMS Configuration to easily migrate the current DMS to PPM File System or PPM External Database DMS. For more information, see "Migrating DMS Using the Administrator Console Tool" on page 38.

To migrate your Documentum-based DMS on PPM version 9.12 or earlier to PPM Database DMS on PPM version 9.40,

1. (DMS based on embedded Documentum Content Server only) Run the PPM Center server configuration utility (the `kConfig.sh` script) to verify that the integration works fine.
2. (PPM version 7.5 only) Upgrade to PPM version 8.00.

   For detailed instructions, see the Upgrade Guide for PPM version 8.00.
3. (Documentum Content Server version 5.3 only) Upgrade the embedded or stand-alone Documentum Content Server from version 5.3 to version 6.5.

   > **Note:** If you have Documentum Content Server version 5.3 software in your system, contact HPE Software Support Web site (https://softwaresupport.hp.com) for assistance with upgrading.

   For more information, see the Document Management Guide and Reference for PPM version 9.10 or earlier.
4. Run `kConfig.sh` to upgrade the Documentum Content Server 6.5 software to version 6.5 SP2.

   For detailed instructions, see the Document Management Guide and Reference for PPM version 9.10 or earlier.
5. Upgrade PPM to version 9.10, then version 9.14.

   For detailed instructions, see the Upgrade Guide for PPM version 9.10 and Release Notes for PPM version 9.14.
6. Obtain the hotfix under the following reference from HPE Support and deploy it on top of PPM Center version 9.14:

   `HOTFIX_-_DMS_9.13_9.14_-_QCCR1L45846_-_QCCR1L45466`
7. Fix broken documents in Documentum-based DMS.
   - *For DMS based on embedded Documentum Content Server*
     i. Run the `kConfig.sh` script to verify that the integration works fine.
     ii. Contact HPE Software Support for a tool to fix broken documents (if any).
   - *For DMS based on stand-alone Documentum Content Server*

     Launch the `kConfig.sh` tool, select the **Integrate PPM Center with EMC Documentum Content Server** option, and run the tool to fix broken documents in one run.
8. Migrate the Documentum-based DMS to PPM Database DMS using the Administrator Console tool DMS Configuration in PPM Center 9.14.

For step-by-step instructions on how to migrate your DMS, see "Migrating DMS Using the Administrator Console Tool" on page 38.

> **Note:** Documentum-based DMS solutions are not available in PPM version 9.40. Therefore, you need to migrate your Documentum-based DMS to PPM Database DMS before you upgrade PPM to version 9.40.

9. Upgrade PPM to version 9.40.

   For detailed instructions, see the Upgrade Guide.

10. (Optional) Migrate from PPM Database DMS to PPM Center File System or PPM External Database DMS.

    For detailed instructions, see "Migrating DMS Using the Administrator Console Tool" on page 38.

11. (Optional) Enable full text search functionality if you use PPM Database DMS or PPM External Database DMS.

    For detailed instructions, see "Configuring Full Text Search in Database-Based DMS Solutions" on page 23.

Chapter 4: What Document Management Users Need to Know

This section provides the basic information PPM users need to know about HPE document management system and how to use it. The following sections include information about how to:

- Attach files to PPM entities
- Edit document attachment information
- Check documents in and out
- Search for entities based on keywords specified for documents

Attaching Documents to PPM Entities

This section contains the procedure to use to attach documents to a PPM entity such as a request or a project, in a PPM instance.

The following sections provide instructions on how to attach documents to an entity in one of following ways:

- Attach a document to a user data field of an entity (for which one or more user data fields have been created).
- Attach a document as a reference to any entity that supports references.

> **Caution:** Due to a third-party product limitation, you can not attach documents to PPM entities while PPM Center Database DMS full text index creation is in progress. If you do so, you may receive an error message.

- "Attaching Documents to User Data Fields" on the next page
- "Adding a Document as a Reference" on page 56

Attaching Documents to User Data Fields

User data fields are customized fields that you can create to capture information about a PPM entity that is not captured by standard fields. If a user data field for an entity has a validation value set to Attachment, then users can attach documents to that field.

> **Note:** For information about creating user data fields, see the *Demand Management Configuration Guide.*

To add an attachment to a user data field:

1. Log on to PPM and open or create an entity that has a user data field to which you want to attach a document.
2. In the attachment section for the user field, click **Add.**

   The Add Document window opens.
3. In the **File** field, click **Choose File** to select the document.

   > **Note:** The file you specify must reside in a directory on the Project and Portfolio Management Center server.
4. (Optional) Provide information for the boxes listed in the following table.

Box	Description
Initial Version Comment	Type notes on the initial version of the document you are attaching.
Author	Type the name of the document author or authors.
Description	Type a description of the document and its purpose.
Key Words	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. Note that users cannot search non-text attachments such as image files unless you specify keywords. For information about fulltext indexing, see "Configuring Full Text Search in Database-Based DMS Solutions" on page 23.

5. Click **Add.**

   The document is attached and is now listed in the **User Data** section of the entity page.

6. (Optional) You can replace or remove the document you just uploaded. To do so, click **Replace**.

   The Replace Document window opens.

   - To remove the document, simply click **Remove Document** and then click **OK** when prompted.
   - To replace the document,
     i. In the **File** field, type the full directory path of the file to attach. Alternatively, you can click **Browse,** and then navigate to and select the file.
     ii. Provide information in other fields as necessary.
     iii. Click **Replace**.

7. Click **Save** on the entity page.

   The document is loaded into the document management system.

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.

   > **Note:** You can also attach a document to an entity that you are creating and have not yet submitted.

2. Expand the **References** section or go to the **References** tab.
3. In the **New Reference** list, leave **Attachment** selected.
4. Click **Add.**

   The Add Document window opens.

5. In the **File** field, click **Choose File** to select the document.

> **Note:** The file you specify must reside in a directory on the Project and Portfolio Management Center server.

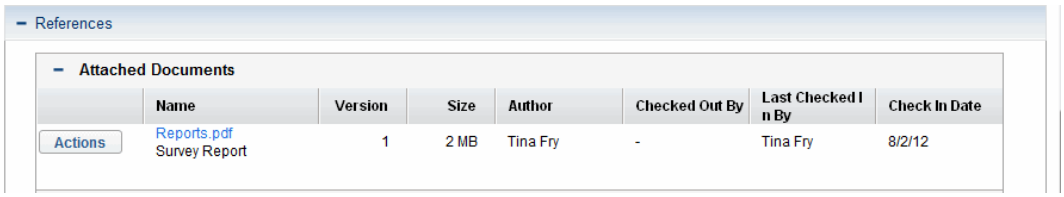
6. (Optional) Provide information for the boxes listed in the following table.

Box	Description
Initial Version Comment	Type notes on the initial version of the document you are attaching
Author	Type the name of the document author or authors
Description	Type a description of the document and its purpose.
Key Words	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. Note that users cannot search non-text attachments such as image files unless you specify keywords. For information about the fulltext indexing, see "Configuring Full Text Search in Database-Based DMS Solutions" on page 23.

7. Click **Add.**

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

8. Click **Save.**



   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

> **Note:** Any errors that occur while the PPM Server communicates with its database 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 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 the *Installation and Administration Guide.*

Editing Document Attachment Information

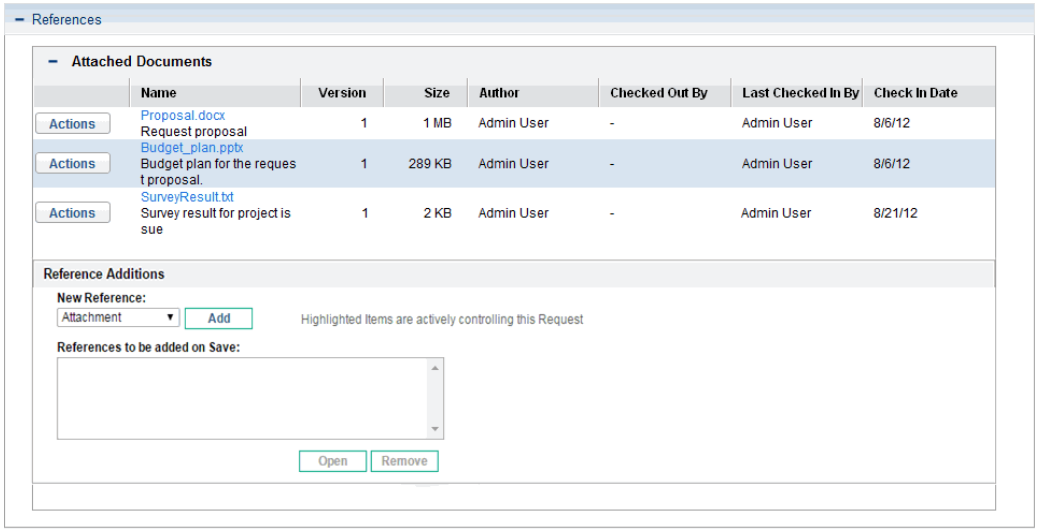
You can edit document attachment information in one of the following two ways:

- If the entity has a custom attachment field, you can edit the information from that field.
- You can edit the information from the **References** section of the entity page.

To edit document attachment information from the attachment section for a user field or the **References** section of an entity page:

1. In the standard interface, on an entity page,
   - Expand the user field section.

   - Expand the **References** section, then expand the **Attached Documents** section.



2. Click the **Actions** button for the document that has associated attachment information you want to edit.

   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.

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.

Checking Attached Documents Out and In

To check an attached document in or out, use one of the following methods:

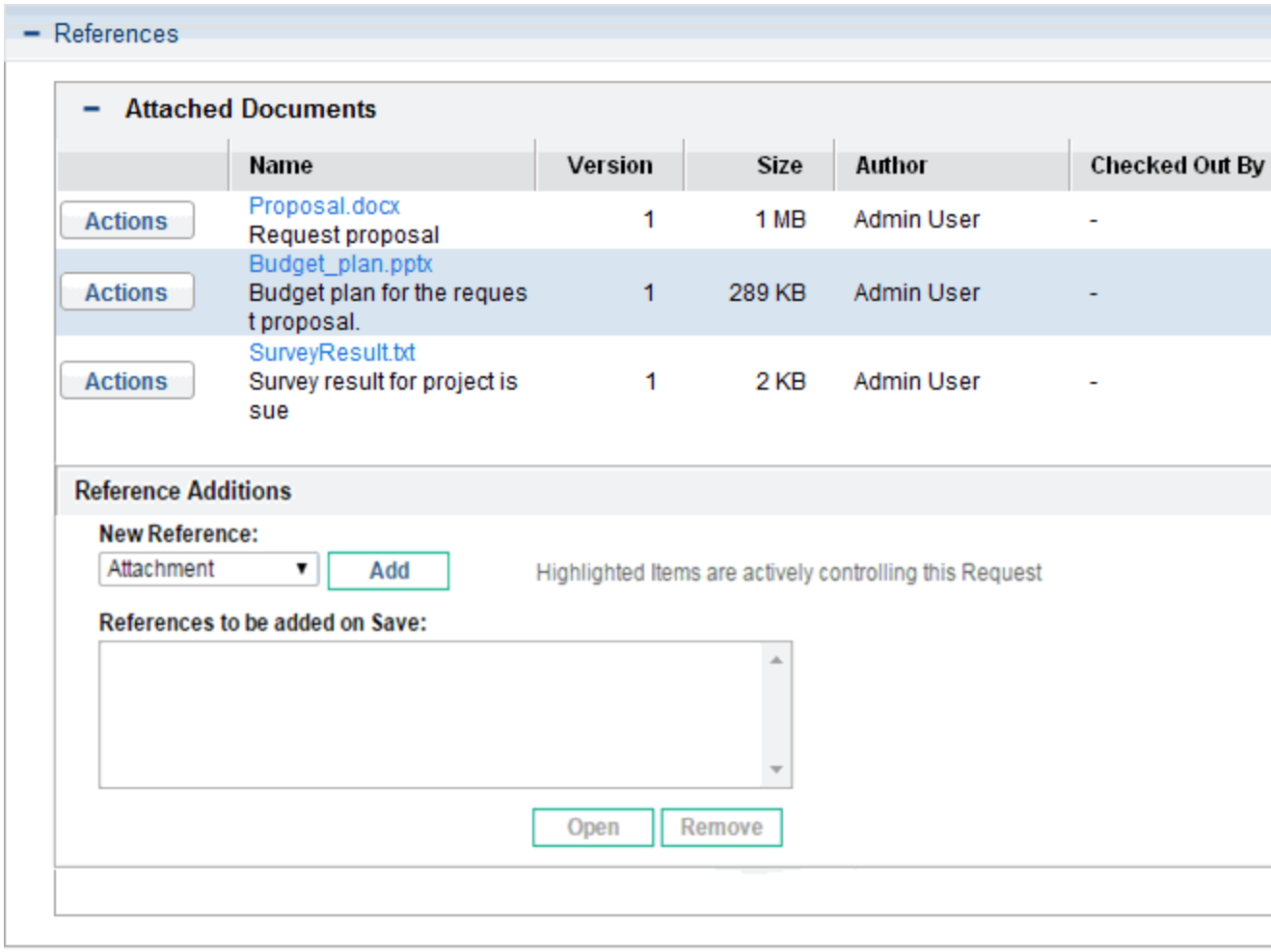
- If the entity has a custom attachment field, use that field to check the document in or out.
- Use the **References** section of the entity page.

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 user field section.

- Expand the **References** section, then expand the **Attached Documents** section.



2. Click the **Actions** button for the document that you want to check out.

   The Document Actions window opens.

3. Click **Check Out.**

   The document opens for editing or saving, and the Document Actions window closes.

4. After you finish making changes, save and close the document in a known location.

5. Still on the same entity page, under the attachment section for a user field or the **Attached Documents** section, click the **Actions** button for the document that you want to check in.

   The Document Actions window opens again. It now displays the Check In button.

6. Click **Check In.**

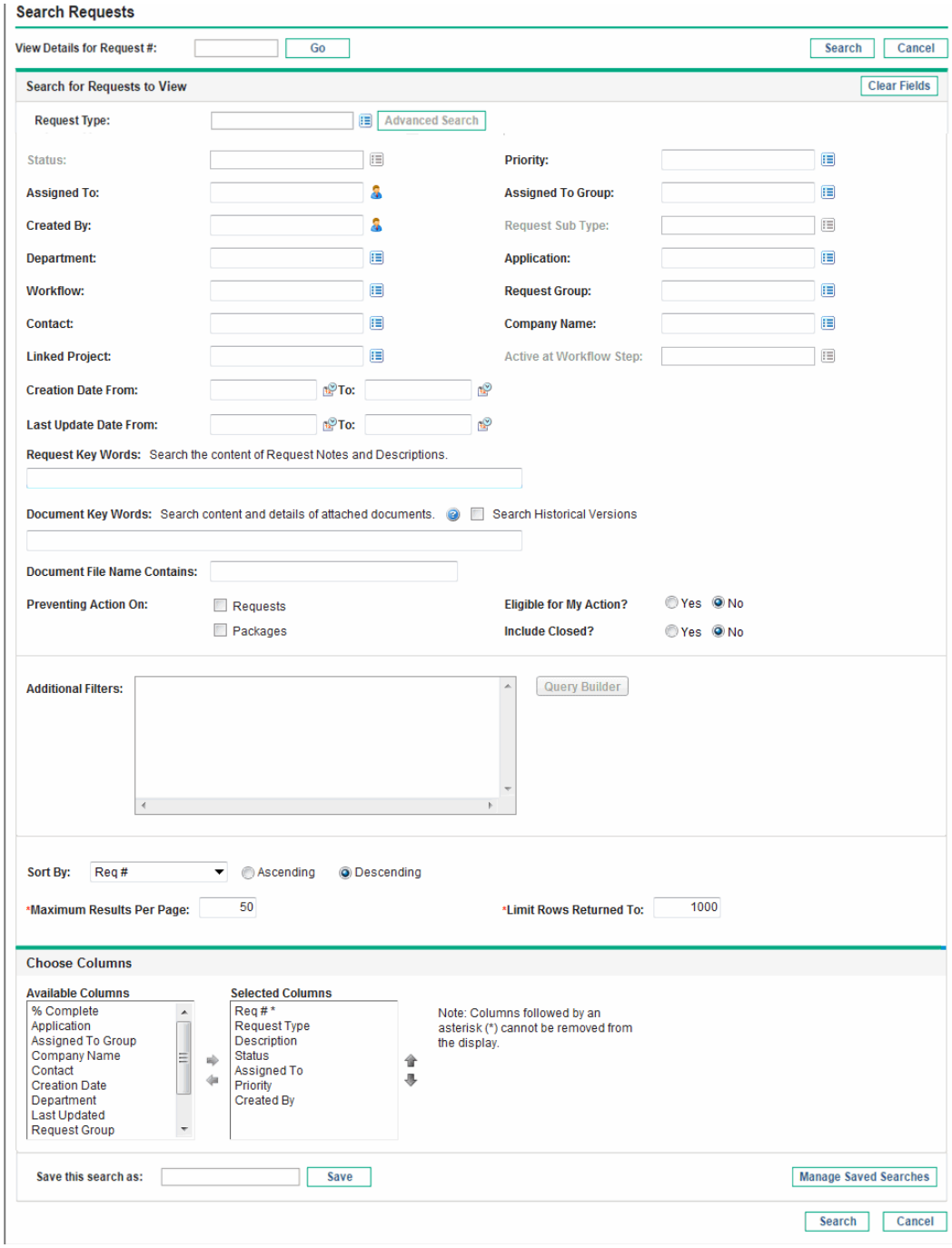
Note that, in the **References Added** section of the entity page, the document version number displayed has increased by one.

Searching for Entities by Document Key Words

In the PPM standard interface, you can search for entities based on key words in referenced documents. The database-based DMS solutions search the properties for the document (author, description, key words, file name, and version comment) and document content. The document properties 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** box, type one or more words, separated by spaces, to use as search criteria.

> **Note:** 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" below.

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. For more information about creating TEXT indexes, see "Creating and Maintaining Oracle TEXT Indexes" on page 25

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.

"AND" Queries

If you want to search for documents containing multiple keywords, you can insert the word "`and`" (case-insensitive) or "`&`" character between the search words. All specified words must exist in the document content or document properties for the document to be considered as a match. Keywords need not be together or in the order entered for a document to be considered as a match.

Example: `greece and olympic`; `Greece & olympic`

Searching by Phrase

By default, each query is a "phrase" query. You can search for documents containing a specific phrase, or a set of words in a specific order.

Example: `gold medal`

Excluding Documents that Contain a Specific Text String

To specifically exclude documents that contain a particular word, preface the keyword with a NOT (~) sign. In this manner, all documents that contain the specified word are excluded from the results, even if they match other key words in your query.

You can exclude phrases from your search as well as single words.

For example, to include documents with "greece", but not those with "olympic," type **greece ~olympic**.

> **Note:** The words to be excluded from the search (prefaced with the "~" sign) should not appear alone or in the beginning of the key words text string you specified. For example, searching "`~olympic`" or "`~olympic greece`" will return an error.

"OR" Queries

If you want to search for documents containing one `OR` another keyword, you can insert the word "`or`" (case-insensitive) or "`|`" character between the search words. In this manner, a document is considered as a match if either of the keywords is found.

Example: `volleyball **or** softball`; `volleyball | softball`

Combination Searches

You may perform combination searches for documents by combining "`AND`", "`OR`", and "`~`" queries. If you want to search for documents containing both "`AND`" and "`OR`" queries, make sure to wrap sub-queries with parentheses "`(`" and "`)`". For example, `A and (B | C)`.

Example: `gold medal and (volleyball | softball)`

Search Historical Versions

The **Search Historical Versions** option allows you to search both or either of content and version comments of documents historical versions in addition to full text search (including document content and document properties) of their current version.

Tokens Associated with Document Management

The following table lists the tokens related to document management. You can use these tokens to reference documents, version history, and metadata.

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

You reference these tokens in a different way than you reference normal fields.

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 user who added or last checked in the document.
LAST_CHECKED_IN_BY	Resolves to the ID of the PPM 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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Feedback on Document Management Guide and Reference (Project and Portfolio Management Center 9.40)

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to your_IE_team_PDL@hpe.com.

We appreciate your feedback!