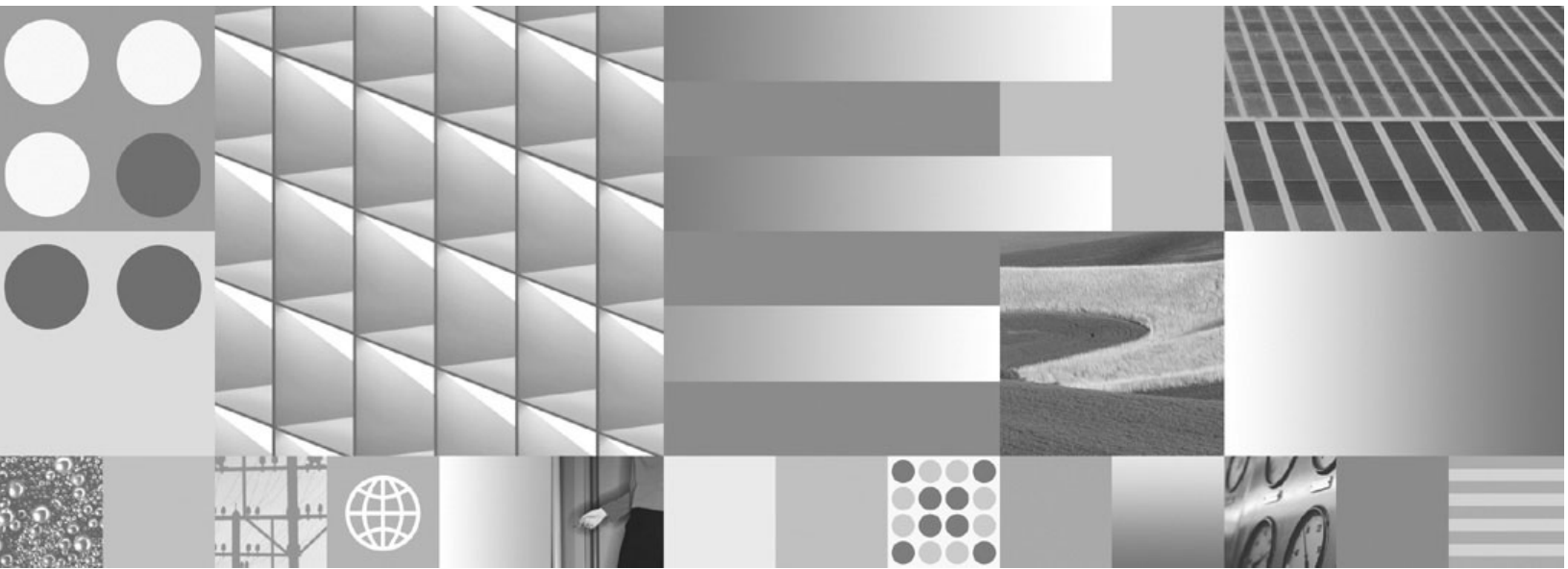


Installation and Upgrade Guide



Installation and Upgrade Guide

Note

Before using this information and the product it supports, read the information in "Notices" on page 55.

This edition applies to version 3.5.0 of IBM FileNet Rendition Engine (product number 5724-S17) and to all subsequent releases and modifications until otherwise indicated in new editions.

© **Copyright International Business Machines Corporation 2001, 2008.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Table of Contents

Table of Contents	5
Typographical Conventions	6
Revision Log	7
About this Document	8
Installation Planning Considerations	10
General Requirements	11
Task 1: Create required groups and users	17
Task 2a: Install Microsoft SQL Server for Rendition Engine	18
Task 2b: Install Oracle Server for Rendition Engine	21
Task 2c: Install Oracle Client for Rendition Engine	24
Task 3: Install and configure FileNet P8 Publishing components	25
Upgrade Overview	46
Upgrade Planning Considerations	47
Gather Pre-upgrade Information	49
Before You Begin the Upgrade	50
Task 1: Upgrade FileNet Publishing Components	51
Remove Rendition Engine	52
FileNet P8 Port Numbers	53
Index	54
Notices	55
Trademarks	57

Typographical Conventions

This document uses the conventions in the following table to distinguish elements of text.

	Usage
UPPERCASE	Environment variables, status codes, utility names.
Bold	Program names and selected terms such as command parameters or environment variables that require emphasis.
Bold Gray	Clickable user-interface elements (such as buttons).
Bold Olive	Paths and file names.
<i>Italic</i>	User-supplied variables and new terms introduced in text, names of additional documents (such as <i>IBM FileNet® P8 Platform Installation and Upgrade Guide</i>).
< <i>italic</i> >	User-supplied variables that replace everything between and including the angle bracket delimiters (< and >).
Monospace	Code samples, examples, display text, and error messages.

NOTE Some path names in this document that are identical (except for the directory-separator character) on both UNIX® and Windows® platforms are specified in UNIX syntax only (that is, with forward-slash directory separators).

WARNING This document contains examples of text to be typed on a command line. Be sure to manually type the command, rather than copying and pasting it from this document. Otherwise, your command line may contain unrecognized characters and will not execute properly.

Revision Log

The following table identifies changes made to this document since the IBM FileNet P8 3.5.0 release.

	Revision
09/08	Updated information about installing in non-English environments in “Installation Planning Considerations” on page 10 and “Install and configure FileNet P8 Publishing components” on page 25.
08/06 (3.5.2b)	Repaired a number of broken links.
01/04/06	The topic “Remove Rendition Engine” on page 52 was changed to correct the utility name for VistaCleaner.
	The topic “Install and configure FileNet P8 Publishing components” on page 25 was changed to correct the directory location for the configuration .xml file, and to direct the user to choose the Content Engine server from available machines when installing on the publishing plug-in server.
10/20/05 (3.5.1)	This new standalone FileNet Rendition Engine Installation and Upgrade Guide was introduced in release 3.5.1 to replace similar topics once found in the 3.5.0 release of the FileNet P8 Platform Installation and Upgrade Guide,
	This 3.5.1 guide incorporates new instructions related to the updated 2.2 version of the embedded Lquent RenderPerfect software.

About this Document

Installation by a FileNet® Certified Professional (FCP) Recommended. For more information on the FCP program, refer to the IBM® web site (<http://www.ibm.com/us>), Products > Software > Information Management > Training and certification > Professional Certification > FileNet Certified Professional Program (FCP).

Every effort has been made to provide you with complete installation instructions. If information becomes available after the creation of the documentation release from which you accessed this guide, we will provide an updated version of the guide. To download this guide from the IBM support page, see “[Access IBM FileNet Documentation, Compatibility Matrices, and Fix Packs](#)” on [page 9](#).

Send your comments by e-mail to comments@us.ibm.com. Be sure to include the name of the product, the version number of the product, and the name and part number of the book (if applicable). If you are commenting on specific text, include the location of the text (for example, a chapter and section title, a table number, a page number, or a help topic title).

This guide provides instructions for installing and/or upgrading the IBM FileNet Rendition Engine to its current released version. Be aware that each release of a IBM FileNet P8 component or expansion product may have multiple service packs, fix packs or interim fixes available for installation, each with potentially different dependencies and installation requirements. Therefore, before you attempt to install or upgrade IBM FileNet Rendition Engine, review the list of releases and their associated dependencies in the *IBM FileNet Compatibility Matrix* on the IBM support page (www.ibm.com/software/data/support/). See “[Access IBM FileNet Documentation, Compatibility Matrices, and Fix Packs](#)” on [page 9](#).

Access IBM FileNet Documentation, Compatibility Matrices, and Fix Packs

To access documentation for IBM FileNet products

1. Access the [Product Documentation for FileNet P8 Platform](http://www.ibm.com/support/docview.wss?rs=3247&uid=swg27010422) support page (www.ibm.com/support/docview.wss?rs=3247&uid=swg27010422).
2. Select the appropriate product link.

To access compatibility matrices and fix packs for IBM FileNet products

1. Access the [Fix Packs for FileNet P8 Platform](http://www.ibm.com/support/docview.wss?&uid=swg27010146) support page (www.ibm.com/support/docview.wss?&uid=swg27010146).
2. From the Fix Pack page:
 - To access the compatibility matrix, under FileNet P8 Compatibility Matrices, click **Matrix**.
 - To access the fix pack you need, under a specific product name, click the release number.

Installation Planning Considerations

This section lists details that will help you prepare your environment for the installation of Rendition Engine and the Publishing Plug-in components. In many cases, the items you see listed will be links to more detailed information. Please review this information thoroughly before you start to set up a Rendition Engine or Publishing Plug-in component or required third-party software.

General Requirements

FileNet P8 3.5.0 must first be installed and configured and the 3.5.1 service pack must have been applied to all components before installing Rendition Engine or Publishing. Follow the installation or upgrade tasks provided in the *IBM FileNet P8 Installation and Upgrade Guide* to either install a new 3.5.0 system, or upgrade an existing 3.0.0 system to 3.5.1. After your system is successfully running 3.5.1, follow the procedures in this guide to install Rendition Engine and associated publishing components.

About Rendition Engine

Rendition Engine is based on the Liquent RenderPerfect software.

Gather auxiliary documentation

NOTE For general instructions on how to navigate to this and other IBM FileNet product documentation on the IBM web site, see [“Access IBM FileNet Documentation, Compatibility Matrices, and Fix Packs” on page 9](#).

Before you begin installing the software, retrieve the following documents:

- *IBM FileNet Rendition Engine Installation and Upgrade Guide* (This document). This document provides details on how to install and upgrade Rendition Engine components.
- *IBM FileNet P8 Hardware and Software Requirements*. This document provides details for all FileNet P8 system components, as well as the minimum supported levels of third-party software components. The information throughout the IBM FileNet P8 Platform Installation and Upgrade Guide assumes you have met all applicable requirements listed in that document.
- *IBM FileNet P8 Platform Release Notes*. This document provides details on new features, known issues, and resolved problems.
- *IBM FileNet P8 Platform Installation and Upgrade Guide*. This document provides details for installation, upgrade, and configuration of the core components for the FileNet P8 system.
- [FileNet P8 Platform user and group security help](#).

This help topic provides a complete list of the user and group roles, accounts, and responsibilities required to install, configure, and maintain a FileNet P8 system. For more information, see the FileNet P8 Help topic [FileNet P8 Administration > Enterprise-wide Administration > Security > Users and groups](#).

- [FileNet P8 Platform Shutdown and Startup](#).

This help topic describes how to shut down and restart FileNet P8 Platform components and some expansion products. Manual, command line, and some sample batch file procedures are provided. For more information, see the *FileNet P8 Help* topic [FileNet P8 Administration > Enterprise-wide Administration > Shutdown and Startup](#).

- *Installing IBM FileNet P8 Platform in a Non-English Environment Technical Notice*. This document will help you set up the product if your environment is not English-language based.

- *IBM FileNet P8 Platform Deployment Guide*. This document provides details on how to deploy a FileNet P8 system from a staging environment into a full production environment.
- *IBM FileNet P8 Platform Troubleshooting Guide*. This document provides troubleshooting information on all aspects of the product.
- *IBM FileNet P8 Platform Performance Tuning Guide*. This document provides performance tuning information on all aspects of the product.

Operating System Considerations

Content Engine

Windows 2003

- **Configure MSDTC and COM Security.** To create object stores, you must manually configure MSDTC and COM Security on all servers running Content Engine and Microsoft® SQL Server software. Content Engine uses MSCOM+ technology. When a COM+ application requires a transaction to span multiple computers, using MSDTC makes the application more reliable by offering a unified mechanism. Content Engine, therefore, uses MSDTC to accomplish distributed transactions to achieve consistency, reliability and scalability. Refer to Windows Online Help on MSDTC and COM+, or refer to the [FileNet P8 Platform 3.5.1 Installation and Upgrade Guide](#).
- **Enable Microsoft Internet Information Services (IIS).** If you plan to use the Content Engine WebDAV Provider, you must ensure that Microsoft Internet Information Services (IIS) software is enabled on all Content Engine servers. IIS is enabled by default when you install Windows 2000, but you must manually install and enable this service under Windows 2003.

Network Considerations

- **Ensure static IP addresses.** Assign all FileNet P8 servers a static IP address.
- **Ensure TCP/IP settings.** Verify TCP/IP configuration settings on all UNIX and Windows servers and FileNet Enterprise Manager clients.
- **Ensure availability of required port numbers.** Several port numbers are required by the various FileNet P8 components. For a composite list, see “[FileNet P8 Port Numbers](#)” on page 53.

Non-english Environments

Ensure English versions of Microsoft Office. Rendition Engine does not support the use of a localized Microsoft Office and Visio suite with the Rendition Engine software. Use English versions of the Microsoft Office suite for all Rendition Engine installations and deployments.

Windows Domain Considerations

General

- **Consider including all Windows-based FileNet P8 servers in the Windows domain.** In this regard:

- For a list of the components you can install only in a Windows domain, see the following topic [“Content Engine and Rendition Engine” on page 13](#).
 - For all other FileNet P8 components on Windows servers, FileNet recommends installation in the same Windows domain as the Content Engine and Rendition Engine, if only to centralize your administrative tasks in the Active Directory environment. The associated primary DNS server address on each machine must point to the same DNS server as the Content Engine and Rendition Engine.
 - You can use a single FileNet Enterprise Manager instance to administer multiple object stores as long as they are in a single FileNet P8 domain (i.e., a “deployment” domain). You can do this by setting up Terminal Server (with Enterprise Manager installed) on a machine in the FileNet P8 domain and running Enterprise Manager remotely, via Terminal Server Client, on a single machine. Do not install Terminal Services on any Process Engine machine.
- **Be aware that FileNet P8 3.5.X does not support multi-forest configurations.**

Content Engine and Rendition Engine

In FileNet P8 production systems, do not install FileNet P8 software on the domain controller machine.

- **Determine what to install in the Windows domain.** You must install the following software only on machines that are in the Windows domain:
 - Content Engine (all components and services)
 - FileNet Enterprise Manager
 - Microsoft SQL Server
 - Rendition Engine (rendition servers and plug-ins)
- **Be aware that you cannot rename Content Engine servers.** Name your servers carefully. Once you install a Content Engine server component onto a server (Object Store Service, File Store Service, or Content Cache Service) and begin using your FileNet P8 system, you cannot rename the server.
- FileNet recommends you install the FileNet Rendition Engine component on a dedicated server containing no other Content Engine software. This would spread the performance load between Rendition Engine and Publishing Plug-in (Content Engine) servers.
- Install the FileNet Publishing Plug-in component only on a Content Engine server containing an Object Store Service.
- If you use Oracle 9i as your Rendition Engine database, you must run the **Oracle-repository.sql** script on the database server to create a valid user and tablespace prior to performing the following procedures. The script file is located in the **Resources** directory in the *Rendition Engine* software package.
 - The size requirements for the database and the tablespace are specified in **Oracle-repository.sql**.
 - Unless publish jobs are routinely archived/deleted, the tablespace will continue to grow (by default the tablespace is set to autogrow).

- There is no schedule to automatically remove the information in the database. Nor is there any need to manually remove information from the database unless the tablespace grows larger than desired.
- If you intend to have more than five Rendition Engine servers being supported by the Oracle database, contact your FileNet support representative.
- The database used (Microsoft SQL Server or Oracle) can be a local or remote installation. A *local* database can be collocated with either the Publishing Plug-in (Content Engine) or Rendition Engine server components.
- Install the publishing components on a machine that has an NTFS drive partition.
- You must have all applications that your users will run to create and render publication documents installed on Rendition Engine server(s) to ensure proper MIME type recognition (such as Microsoft Word, Excel, PowerPoint, and WordPerfect 2002).

Security Authentication Considerations

General

- **Ensure you have a supported LDAP authentication provider.** You must have one of the following directory services in place for authenticating your FileNet P8 users and groups:
 - Microsoft Windows Active Directory
 - Novell eDirectory
 - Sun Java™ System Directory Server (formerly known as Sun ONE Directory Server)
- NOTE** You must have Microsoft Windows Active Directory for use by the Content Engine, even if your authentication provider for other components is not Active Directory.
- **Check required user and group account privileges.** For purposes of installing, configuring, and running the services for a FileNet P8 system, you must use several user and group accounts with particular access privileges. For example:
 - In some cases, you must use accounts that FileNet software expects (e.g., the four-character fns local-machine user account that you must allow the Process Engine setup program to create).
 - In other cases, you can either use the default user and group names presented by the FileNet P8 setup programs (e.g., Content Engine's FNCE_<machinename> user account), or you can specify comparable accounts you want to use instead, based on your existing security policies and directory service accounts.

NOTE In the case of Rendition Engine, define a user as discussed in the following help topic, where that user is identified as <FNRE_admin>. Be aware that all references in the documentation to this user will be as <FNRE_admin>, however you choose to name that user.

For a complete list of these required accounts and privileges, and the system-generated default names, see the help topic [FileNet P8 Documentation > FileNet P8 Administration > Enterprise-wide Administration > Security > Users and groups](#).

- **Be aware that logons to FileNet P8 applications cannot share user credentials.** The fact that you log on to FileNet Enterprise Manager does not allow you to access Workplace without signing in. However, note that Office Application Integration does honor Workplace sign-ins. Also, some functional expansion add-ons that are Workplace integrated will support Workplace user tokens, and thus will not require a user to perform another sign-in to access Workplace functionality from the functional expansion application.
- For Rendition Engine, note the following:
 - User <FNRE_admin> must be a domain user who exists in the local Administrator's group on each Rendition Engine and Publishing Plug-in server. This account must be used to install and configure the required Liquent third-party software.
 - When you first run Rendition Engine setup program in a Windows domain, you create a new Vista domain—an administrative entity, separate from a Windows domain, to manage Rendition Engine services. For each subsequent execution of Rendition Engine setup program on a machine in the Windows domain, you can either join an existing Vista domain or create another Vista domain.

Database Considerations

All platforms

- **Determine your local vs. remote database engine preference.** The database engine is *local* if it is installed on a server where you will also be installing Content Engine, Process Engine and/or Rendition Engine software. The database is *remote* if it is on a server where no Content Engine, Process Engine or Rendition Engine software is installed. An Oracle database must be remote if it is installed on a Linux® server.
- **Determine what type of database engine you want to use.** Rendition Engine and publishing components support only MS SQL Server and Oracle 9i. Rendition Engines and Content Engines within a Vista domain must use the same database.

Microsoft SQL Server

- **Determine whether you want to use a dedicated or shared database.** In this regard:
 - Content Engine, Process Engine, and Rendition Engine can share a database engine, or they can each have a dedicated database engine.
 - Content Engine, Process Engine, and Rendition Engine components can share a MS SQL Server instance or they can each have a dedicated instance. You can use the default instance or a named instance of your choosing.
 - Content Engine, Process Engine, and Rendition Engine must each have their own databases. Likewise, functional expansions (such as Process Analyzer) must have their own databases.
 - Remote MS SQL connections for Rendition Engine are handled by Microsoft Data Access Components, which is installed by default on Rendition Engine servers. There is no need to install the MS SQL client software on Rendition Engine server.

- There is no need to create a SQL database prior to installation of Rendition Engine software. The Rendition Engine installer will prompt for appropriate database information and will create the necessary database.
- **Verify that a SQL Login exists for Rendition Engine purposes.** Under MS SQL Server, you must ensure that a SQL Login account exists before you install the first Rendition Engine. Initially that user must have the create-database privilege. For SQL Authentication, you can use any database user. You must grant the account the Database Creators roles.

Oracle

General

- **Determine whether you want to use a dedicated or shared database.** In this regard:
 - Content Engine, Process Engine, and Rendition Engine can share a database engine, or they can each have a dedicated (i.e., unique) database engine.
 - Content Engine, Process Engine, and Rendition Engine can each have a dedicated Oracle database instance, or they can share a database instance with one another or with non-FileNet applications.
 - Content Engine, Process Engine, and Rendition Engine must each have their own tablespaces.
- **Be aware of database client software requirements.** For Rendition Engine if the database is remote, you must install database client software on the Rendition Engine server. While the Content Engine also requires installation of the database client software, that installation and configuration will have already been completed during installation of the FileNet P8 system.
- Unlike with SQL database, the Rendition Engine installer requires that an Oracle database already exists for its use. You will be directed to create that database by executing an Oracle SQL script prior to installing the first Rendition Engine. See [“Install Oracle Server for Rendition Engine” on page 21](#) for more information on that script.

Task 1: Create required groups and users

All FileNet P8 environments require a Windows Active Directory domain/forest, including a Windows domain controller and Windows accounts that are used for Content Engine services. This requirement applies regardless of the authentication provider you use (e.g., Windows Active Directory, Sun, or Novell). This task assumes that an authentication provider is properly installed and configured.

NOTES

- Under Windows Active Directory authentication, FileNet P8 supports only security groups, not distribution groups. Supported groups can have a scope of domain local (as long as they are in the same domain as Content Engine), global, or universal.
- The following table lists the user and group accounts needed for installing Rendition Engine and Publishing components, including the minimum permissions required.
- For more details on these accounts and the roles and security permissions required for each, see the [FileNet P8 Platform user and group security help](#) found at: FileNet P8 Administration > Enterprise-wide Administration > Security > Users and groups. This help topic provides a complete list of the user and group roles, accounts, and responsibilities required to install, configure, and maintain a FileNet P8 system.

	Description
<SQL Login>	<p>Any user with SQL Server's "Create Database" permission. Any SQL Server user with SQL Server's "Database Creators" server role.</p> <p>In SQL Server Enterprise Manager, navigate to Security > Logins. Right-click the user's name and select Properties. Click the Server Roles tab and select at least Database Creators.</p> <p>This user is a safer alternative to using SQL Server's SA or SYS users, which will also satisfy the configuration requirements. (This user is not the same as the <FNRE_admin> user.)</p> <p>Validate that you can successfully log on to the SQL database using this user name and password.</p>
<FNRE_Admin>	<p>A Windows domain user account that must be added to the local Administrators group on all Rendition Engine servers.</p> <p>Permissions: Domain privileges in the Windows domain that contains the FileNet P8 domain and local administrator privileges on the machine where Rendition Engine is installed.</p>

Task 2a: Install Microsoft SQL Server for Rendition Engine

This task uses 3rd-party software. Be sure to read all pertinent documentation from the 3rd-party software vendor. Contact your system/network/database administrator with 3rd-party vendor or environment questions before continuing.

NOTES

- Install Microsoft SQL Server on either the computer where Rendition Engine software will be installed (subsequently referred to as a local database) or on a separate server (subsequently referred to as a remote database).
- The Microsoft SQL Server must be in the same Active Directory forest if you want to use Windows authentication for connecting to the SQL Server database instance. Otherwise, if using SQL Authentication, there is no need to be in the same forest.
- Rendition Engine requires mixed mode authentication (Windows Authentication and SQL Server Authentication).
- The MS SQL instance can optionally be shared by the Content Engine, Process Engine, and Rendition Engine components.
- If you are using Microsoft SQL Server with Windows Authentication, a Windows Active Directory group account (default: Content Engine Servers) must be configured as a valid Microsoft SQL Server Login.
- Database creation for Rendition Engine will be handled automatically when you install and configure Rendition Engine.
- You do not need to install MS SQL client software on the Rendition Engine server.
- Record the values for the following settings as you work through the database installation. This information must be entered during subsequent installations. Be aware that Process Engine Setup allows only alphanumeric characters and underscores.
 - Server name
 - Instance (e.g. P8_inst)
 - TCP/IP port number assigned

To install and configure Microsoft SQL Server

Refer to Microsoft's SQL Server 2000 installation instructions, which are available at <http://www.microsoft.com>. In addition, when installing Microsoft SQL Server software:

- Log on as a local user with Administrator privileges on the computer where the database will be installed.
- Create a database instance for use by Rendition Engine or Publishing, or verify that such an instance already exists.

- If creating a new instance, indicate an appropriate name based on whether Content Engine or Rendition Engine will use the instance, and whether the database is local or remote. Be aware of the following rules for instance names:
 - The name cannot exceed 16 characters
 - The first character cannot be numeric or '\$
 - The name cannot contain special characters, except an underscore or period.
 - The name cannot contain spaces
 - The name cannot be "Default" or "MSSQLServer"
- Verify a Custom Microsoft SQL Server installation.
- Verify a Mixed Mode Microsoft SQL Server installation and verify the sa password for your site.
- Verify the Collation Settings. Dictionary order, case-insensitive, for use with 1252 Character Set (or any case-insensitive MS-SQL collation) should be used.
- Assign a TCP/IP port number for the instance.
 - If your instance is the only instance on the server, you can accept port 1433 (default value) in the TCP/IP port number box. If you already have a default or other instance on the server, set 0 as the port number to allow dynamic assignment at instance startup, or set a specific port number.
 - If the instance is for Content Engine and you have defined a static port number that is anything but 1433, you must also follow the steps in [“Configure a server alias” on page 20](#).
- Verify that the required Microsoft SQL Server 2000 Service Pack is installed. See the *IBM FileNet P8 Hardware and Software Requirements* document.

To configure Microsoft SQL Login for Rendition Engine

On the Microsoft SQL database computer, use Microsoft SQL Server Enterprise Manager to create a Microsoft SQL Login.

1. Start the Microsoft SQL Enterprise Manager.
2. Expand the Microsoft SQL Server <Server name>[<Instance name>] node.
3. Expand the Security folder, right-click **Logins** and select **New Login**.
4. Choose SQL Server Authentication and create a new user and password (take note of this information for when installing and configuring Rendition Engine and Publishing Plug-in components).
5. Grant the SQL login created in the step above the Database Creator server role.
6. Click **OK** to save the new login.

Configure a server alias

If the database instance is for Content Engine and has a static TCP/IP port defined that is anything other than the default port 1433, you must take the following steps.

1. On the server that has MS SQL Server installed, determine the TCP/IP port assignment of the MS SQL Server instance.
2. Open the MS SQL Server Client Network Utility application.
3. Select the *DB-Library Options* tab, de-select Automatic ANSI to OEM conversion.
4. Select the Alias tab and click the **Add** button.
5. Select the TCP/IP option from the Network libraries.
6. Uncheck the *Dynamically determine port* option.
7. Enter the Server alias: (e.g., <server_name>\<instance_name>)
8. Enter the Server name: (e.g., <server_name>\<instance_name>)
9. Enter the Port number determined during setup.

Task 2b: Install Oracle Server for Rendition Engine

The procedures in this task describe how to install and configure an Oracle database that is dedicated or shared by one or more of the following FileNet P8 components:

- dedicated to Rendition Engine
- shared by two or more of Content Engine, Process Engine, and Rendition Engine

In the shared configuration, the FileNet P8 components use the same database instance. You can also share the database with other (non-FileNet) applications. In the dedicated configuration, the Content Engine, Process Engine, and Rendition Engine use separate database instances.

A database is *local* if it is on a machine where you will also be installing Content Engine, Process Engine, or Rendition Engine. A database is *remote* if it is on a machine where no Content Engine, Process Engine, Rendition Engine is installed.

NOTES

- Perform this task on the UNIX, Linux, or Windows machine that will host the Oracle database to be used by the Content Engine, Process Engine, or Rendition Engine.
- Make sure that the machine that will host the database satisfies all pre-installation requirements specified in the Oracle 9i installation documentation.
- If the machine where you install the Oracle database will also host an installation of Rendition Engine, the machine must meet the Rendition Engine requirements listed in *FileNet P8 Hardware and Software Requirements*.
- Refer to *FileNet P8 Hardware and Software Requirements* for operating-system service pack and Oracle 9i version and patch set requirements. The Oracle patches are available at [OracleMetalink](#). The Oracle patch-installation procedure may be less complicated if done before you create any databases.
- If your Oracle database will be remote, then after completing the procedures in this topic you must also complete the procedures in "[Install Oracle Client for Rendition Engine](#)" on page 24 on each machine where you will install Rendition Engine.

To Install an Oracle database engine

The following procedure shows the minimal choices for installing a database engine. Consult the Oracle 9i installation documentation for complete preinstallation requirements and instructions. The size requirement for a database dedicated to Rendition Engine is specified in the file **Oracle-Repository.sql** (located in the Rendition Engine installation software package).

1. Launch the Oracle 9i installer.
2. From the Available Products dialog, select Oracle 9i Database.
3. From the Installation Types dialog, choose the type of Oracle installation. Click **Enterprise Edition** and skip to [Step 5](#), or click **Custom** (if you don't need all the components in Enterprise Edition).

4. If you clicked **Custom** in [Step 3](#), then on the Available Product Components dialog select as a minimum the following components to be installed:
 - Oracle 9i Server
 - Oracle Net Services
 - Oracle Net Listener
 - Oracle 9i Development Kit
 - Oracle Call Interface (OCI)
 - (Windows) Oracle Windows Interfaces
 - Oracle Services for Microsoft Transaction Server
 - Oracle 9i Documentation (recommended)
5. (Windows) From the Oracle Services for Microsoft Transaction Server screen, type a valid port number (default: 2030). If Microsoft Transaction Server is not detected on the machine, you will be prompted to install it after installing the database engine.
6. From the Create Database dialog, click **No** to defer creation of a new database.
7. Follow the steps in the Oracle Net Configuration Assistant to configure the listener.
8. Install the latest Oracle patch sets, as specified in the *FileNet P8 3.5.1 Hardware and Software Requirements* document.
9. Start the listener and the Oracle database service/processes (Windows/UNIX) if they haven't started automatically.

To Create an Oracle database

Oracle documentation describes several ways to create a database, one of them being the Database Configuration Assistant (DBCA).

1. Launch DBCA (choose Start > Programs > Oracle - OraHome92 > Configuration and Migration Tools > Database Configuration Assistant).
2. On the Welcome screen, click **Next**.
3. On the Operations screen, click **Create a database**.
4. When creating the database, specify the following settings:
 - Database configuration type
 - If this database is dedicated to Content Engine, or if it will be shared by Content Engine and Process Engine, then Transaction Processing (also known as OLTP) is the required configuration type.
 - Server process type
 - Dedicated Server Mode offers better performance than Shared Server Mode.
 - Database character set

Choose a database character set as specified “FileNet P8 Database Character Sets in the in *IBM FileNet P8 Platform 3.5.1 Installation and Upgrade Guide*.

- On the Creation Options screen, click **Create Database**.

To create a tablespace for Rendition Engine

Log on as an Oracle administrative user and run the script file **Oracle-Repository.sql** (located in the Rendition Engine installation software package). This script will create a user and tablespaces for use by Rendition Engine. These tablespaces are for the exclusive use of Rendition Engine and should not be shared with any other FileNet P8 component.

Several parameters in the script could be modified to meet specific business requirements. The following table shows those parameters and the default values. Make note of the actual values that are assigned. Specifically, note the user name and the password that is assigned when the script is run. That user name and password must be supplied later when installing the Rendition Engine software.

	Default Value	Actual Value Assigned
data tablespace	VISTADAT1	
index tablespace	VISTAIND1	
user name	VISTAUSER	
password	none (assigned at runtime)	

To configure automatic transaction recovery

In a distributed database environment, Oracle MTS Recovery Service (automatically installed with Oracle Services for Microsoft Transaction Server) can resolve in-doubt transactions on the computer that started the failed transaction.

To enable automatic transaction recovery, perform the tasks shown in the section "Scheduling Automatic Microsoft Transaction Server Recovery" in *Oracle Services for Microsoft Transaction Server Developer's Guide* (Oracle Part Number A95496-01).

In addition, if you are using an Oracle Fail Safe configuration, perform the procedure shown in “Modifying Registry Values for Oracle Fail Safe Configurations” in *Oracle Services for Microsoft Transaction Server Developer's Guide* (Oracle Part Number A95496-01).

To edit the listener.ora file

Use the Oracle utilities to configure the listener, which creates the **listener.ora** file.

Task 2c: Install Oracle Client for Rendition Engine

The procedure in this task describe how to install the Oracle Client software to prepare for the installation of Rendition Engine.

NOTES

- Install Oracle Client on any machine that will host Rendition Engine, or any other FileNet P8 component that needs to access an Oracle database.
- Make sure that the machine where you will install Oracle Client satisfies all pre-installation requirements specified in the Oracle 9i installation documentation.
- Refer to *FileNet P8 Hardware and Software Requirements* for operating-system service pack and Oracle 9i version and patch set requirements.

To install the Oracle client

The following procedure shows the minimal choices you need for installing Oracle Client. Consult the Oracle 9i installation documentation for complete instructions and pre-installation requirements.

1. Log on with an appropriate local account to install and configure the Oracle Client software.

NOTE It is strongly recommended that you log on to the machine locally (not via a Windows domain) to install the Oracle Client software.

2. If the machine where you are installing Oracle Client does not use DNS to resolve host names, place in its hosts file the IP address of the machine where the Oracle database is installed.
3. Launch the Oracle 9i Client installation.
4. From the Available Products dialog, click **Oracle 9i Client**.
5. From the Installation Types dialog, click **Administrator** or **Custom**.
6. If you clicked **Custom**, select the following components from the list in the Available Product Components dialog:
 - Oracle 9i Client
 - Oracle Network Utilities
 - Oracle Database Utilities
 - SQL*PLUS
 - Microsoft Transaction Server (MTS)
7. Using Oracle Net Configuration Assistant, test the connection to the Oracle database server with the user name and password created in [“To create a tablespace for Rendition Engine” on page 23](#).
8. Install all required Oracle patches, as specified in the *IBM FileNet P8 Hardware and Software Requirements* document. These patches are available at [OracleMetaLink](#).

Task 3: Install and configure FileNet P8 Publishing components

This task includes installing and configuring the FileNet Publishing components:

- FileNet Rendition Engine
- FileNet Publishing Plug-in (collocated on Content Engine servers)

The following table shows on what machine(s) each of the following topics should be run:

	Install or configure on:
To create the Publishing user account	Windows Domain Controller or other server configured to modify domain-wide accounts.
To configure Publishing user account	Rendition Engine and Plug-in servers (Content Engine)
To configure native applications. There are a number of additional topics related to configuring native applications, generally broken out by application.	Rendition Engine servers (all)
To install Publishing software on the first Rendition Engine	Rendition Engine server (first)
To test the connection to the database	Rendition Engine and Plug-in servers (Content Engine)
To configure the BusinessServiceServer service	Rendition Engine and Plug-in servers (Content Engine)
To set security on VistaPubDir shared folder	Rendition Engine and Plug-in servers (Content Engine)
To install Publishing software on the Publishing Plug-in server	Publishing Plug-in server (Content Engine)
To create folders to be used by publishing	Plug-in servers (Content Engine)
To configure the Service Controller	Plug-in servers (Content Engine)
To create Publishing Templates	Using Workplace
To add and publish a test document	Using Workplace
To add additional Rendition Engine or Publishing Plug-in servers	any additional Rendition Engine or Publishing Plug-in servers (Content Engine)

This procedure is designed to first install and configure a single Rendition Engine server, then install and configure a single Publishing Plug-in server. It is possible to configure multiple Rendition Engine and Publishing Plug-in servers. To do that, some steps will need to be repeated on those additional servers. For the additional servers, there will be some variations in the steps. Information specific to adding additional servers is detailed at the end of this procedure.

NOTES

- The Rendition Engine server must be a member of the same Windows domain that contains the Content Engine server.
- To ensure that the Lipient-based Rendition Engine properly converts MS Word and MS Excel documents containing hyperlinks, external links, image links, etc., set the Web Options check box “Use long file names whenever possible” presented in the Tools or Properties of those applications.

For example, in MS Word 2000 choose Tools > Options and click **Web Options**. In the Files tab set the Web Options check box “Use long file names whenever possible”. Do this wherever the MS Office applications reside — on the Rendition Engine server *and* on each client machine from which source documents are added and rendering is initiated. By default, MS Office 2000 has this Web Options check box cleared, while MS Office 2003 and MS Office XP have it set.

Be aware that under MS Office 2000 only, if you open an MS Word document that has this Web Options check box cleared, that setting will be used during the publishing operation even if the Web Options check box in your client Office 2000 application is set by default. This override does not occur under MS Office 2003 or MS Office XP.

- Ensure English versions of Microsoft Office. Rendition Engine does not support the use of a localized Microsoft Office and Visio suite with the Rendition Engine software. Use English versions of the Microsoft Office suite for all Rendition Engine installations and deployments.
- When you add a new Rendition Engine or Publishing Plug-in server to a FileNet P8 domain, you must manually restart the BusinessServiceServer service on all existing Rendition Engine and Publishing Plug-in servers.
- You may be prompted to install additional Microsoft software. Specifically, if the .NET Framework 1.1 or XML Parser 4.0 software is not already on your server, the Rendition Engine installer will do that installation.
- If you will be installing with an Oracle database, you will be prompted for the user name and password assigned in “[Install Oracle Server for Rendition Engine](#)” on page 21, in the section covering “[To create a tablespace for Rendition Engine](#)” on page 23.

To create the Publishing user account

From the domain controller (or other server within the Windows domain that is configured to modify Users and Groups), run the Windows Active Directory Users and Computers snap-in to create the following domain user account (if the account does not already exist):

- <FNRE_admin>

To configure Publishing user account

On all servers where you intend to install Publishing components (Publishing Plug-in servers and Rendition Engine servers that will contain the publishing software), log on as a local administrator and add the *domain\<FNRE_admin>* account to the local Administrators group. To do so, right-click the **My Computer** icon on the desktop and select Manage.

To configure native applications

You must change the following native application configuration settings on the Rendition Engine server where you will publish documents. See the specific steps below for any of the applications that apply to your environment.

To configure Microsoft Word 2000, 2003, and XP

1. Prior to installing Rendition Engine software, ensure the following folders contain no files:

\\Program Files\Microsoft Office\Office\Startup

\\Program Files\Microsoft Office\Office\XLStart

2. In Microsoft Word, choose Tools > Options > View and uncheck the following options:

- Startup Task Pane
- Highlight
- Status Bar
- Screen Tips
- Smart Tags
- Animated Text
- Windows in Taskbar
- Field Codes
- Hidden Text
- All
- Background Colors and Images (Version 2003)

3. Select the General tab and uncheck the following:

- Provide feedback with Animation
- Confirm conversion at Open
- Update automatic links at Open
- Mail as attachment
- Automatically create drawing canvas when inserting AutoShapes
- Allow starting in reading layout (Version 2003)

4. Select the Edit tab and uncheck the following:
 - Typing replaces selection
 - Drag-and-drop text editing
 - Use smart paragraph selection
 - Use CTRL + Click to follow hyperlink
 - When selecting, automatically select entire word
 - Keep track of formatting
 - Show paste Options buttons
 - Smart cut and paste
 - Use smart cursoring (Version 2003)
5. Select the Print tab and uncheck the following:
 - Update fields
 - Allow A4/Letter paper resizing
 - Background printing
 - Field Codes
 - Hidden Text
 - XML Tags (Version 2003)
 - Background Colors and Images (Version 2003)
6. Select the Save tab and uncheck the following:
 - Allow fast saves
 - Allow background saves
 - Save AutoRecover info every:
 - Embed smart tags
7. Select the Spelling & Grammar tab and uncheck the following:
 - Check spelling as you type
 - Always suggest Corrections
 - Check grammar as you type
 - Check grammar with spelling

To configure Microsoft Excel

1. In Microsoft Excel, choose Tools > Options > View and uncheck the following options:
 - Startup Task Pane

- Status Bar
 - Windows in Taskbar
 - List Data Validation (Version 2003)
2. Select the General tab and uncheck the following:
 - Function tooltips
 3. Select the Edit tab and uncheck the following:
 - Show paste Options buttons
 - Show Insert Options buttons
 - Ask to update automatic links
 - Provide feedback with animation
 4. Select the International tab and uncheck the following:
 - Allow A4/Letter paper resizing
 5. Select the Save tab and uncheck the following:
 - Save AutoRecover info every:
 6. Select the Error Checking tab and uncheck the following:
 - Enable background error checking

To configure Microsoft PowerPoint

1. In Microsoft PowerPoint, choose Tools > Options > View and uncheck the following options:
 - Startup Task Pane
 - Slide Layout task pane when inserting new slides
 - Status Bar
 - Windows in Taskbar
 - Popup menu on right mouse click (Version XP)
 - Show menu on Right Click (Version 2003)
 - End with blank slide
2. Select the General tab and uncheck the following:
 - Provide feedback with sound to screen elements
3. Select the Edit tab and uncheck the following:
 - Show paste Options buttons
 - Use smart cut and paste
 - When selecting, automatically select entire word

- Drag-and-drop text editing
4. Select the Print tab and uncheck the following:
 - Background printing
 5. Select the Save tab and uncheck the following:
 - Allow fast saves
 - Save AutoRecover info every:
 6. Select the Spelling and Style tab and uncheck the following:
 - Check spelling as you type
 - Always suggest corrections

To configure Microsoft Project

1. In Microsoft Project, choose Tools > Options > View and uncheck the following options:
 - Project Screen tips
2. Select the General tab and uncheck the following:
 - Show startup Task Pane
 - Advice from Planning Wizard
 - Automatically add new resources and tasks
3. Select the Edit tab and uncheck the following:
 - Ask to update automatic links
4. Select the Scheduling Options tab and uncheck the following:
 - Show scheduling messages
5. Select the Spelling Options tab and uncheck the following:
 - Always suggest

To configure Microsoft Visio

1. In Microsoft Visio, choose Tools > Options > Save Options and uncheck the following options:
 - Prompt for document properties
 - Save preview with file
 - Show XML file save warnings (Version 2003)
 - Show XML file open warnings (Version 2003)
2. Select Spelling Options and uncheck the following:
 - Check spelling as you type

- Ignore words with number should be checked

To configure WordPerfect

1. In Corel WordPerfect, choose Tools > Settings.
2. Choose Settings > Environment > Prompts and set the following options:
 - Confirm Deletion of Table Formulas (Deselect)
 - Beep on Hyphenation (Deselect)
3. Choose Settings > Environment > Interface and set the following options:
 - Save workspace > Never (Select)
 - Quick Tips (Deselect)
4. Choose Settings > Files > Documents and set the following options:
 - Timed document backup every (Deselect)
 - Use Enhanced File Dialogs (Deselect)
5. Choose Tools > Proofread and set the following options:
 - Prompt as you go (Deselect)
 - Off (Selected)
6. Choose Tools > Workplace Manager and set the following options:
 - Show at Startup (Deselect)

For information on these options, see your WordPerfect documentation.

To Configure WordPerfect Office 12

For WordPerfect Office 12, you must disable the Corel Office DAD system tray icons and remove CorelCentral from the Startup folder.

To disable the Corel Office DAD components

1. In the System tray, right-click on any of the DAD icons.
2. Deselect Display DAD on Startup.
3. Select Exit DAD.

Additional native application configuration

You must change the following Microsoft Office configuration setting on the Rendition Engine server in any Office application in which you will publish documents. This ensures that hyperlinks are not updated but kept relative. If this is not done, a document with an HTML link would point back to the location where the source document was copied during publishing.

NOTE This change will take effect on all installed Microsoft Office applications.

Perform this procedure on all Rendition Engine servers:

1. Open all native applications (Word, Excel, etc.) at least once. The first time you start the application, from the Office Assistant, select to Start the program.
2. Open Microsoft Word or other supported Microsoft Office (Excel, PowerPoint) application.
3. From the menu bar, choose Tools > Options...
4. Select the General tab.
5. Click the **Web Options...** button.
6. Select the Files tab.
7. Uncheck the Update links on save item.
8. Click **OK**.
9. Click **OK**.
10. Close the application.

To install Publishing software on the first Rendition Engine

Perform this procedure on the Rendition Engine server. First install and configure the publishing software on the Rendition Engine server, then install and configure the publishing software on the Publishing Plug-in server.

1. Log on as the <FNRE_admin> user.
NOTE Use this <FNRE_admin> account to install and configure all the Publishing components, unless otherwise directed.
2. If it isn't already running, start the Print Spooler service.
3. Access the *Rendition Engine* software package and start the **\\install\setup.exe** program.

Do not run this setup program on multiple servers concurrently.

CAUTION If you enter invalid database user credentials and complete the Rendition Engine installation, you will not be able to enter them correctly later. Instead, you will have to uninstall and reinstall Rendition Engine.

In this screen...	Perform this action...
Customer Information	Enter a value in the User Name and Company Name fields, select the Anyone who uses this computer (all user) option, and click Next .
License Agreement	Review and accept the license agreement for FileNet P8 software products and then proceed with the installation.
Choose Destination Location	Accept the default installation location and click Next . NOTE You can click Browse and change the destination folder location.

In this screen...	Perform this action...
Select the features you want to install	Choose the default to install Administrative Tools and Framework and click Next .
Vista License File	Browse to the location of the license file. It is located in the <i>Rendition Engine</i> software package in the Resources directory. Click Open . Click Next .
Vista User Information	<ul style="list-style-type: none"> • The Windows Domain field should default to the domain that this server is a member of. • The User field should default to <FNRE_admin>. If it does not, correct it. • Enter the <FNRE_admin> password in the password field. • Confirm the <FNRE_admin> password and click Next.
Add Server to an Existing Vista Domain	Because this is the first Rendition Engine, choose Leave as a stand alone Server and click Next . This will create a new Vista domain. The Publishing Plug-in server and any additional Rendition Engine servers will later be joined to this Vista domain.
Vista Database Type	Choose either Microsoft SQL or Oracle 9i. Depending upon your choice you will be prompted for additional information appropriate to that database type
Oracle Database Information (displays if you chose Oracle 9i)	<ul style="list-style-type: none"> • Oracle Service Name <p>NOTES</p> <ul style="list-style-type: none"> • If this is an upgrade you can not use a database that was used for an earlier version of Rendition Engine software. You must identify a new database. <ul style="list-style-type: none"> – Oracle user name – Oracle user's password – Click Next. • There is a warning on this screen that you must already have the Vista database tables created. All necessary tables were created when you executed the Oracle-repository.sql script earlier. The user name and password requested here are those that were assigned when that script ran.

In this screen...	Perform this action...
SQL Database Information (displays if you chose Microsoft SQL Server)	<ul style="list-style-type: none"> Machine Name: Enter the machine name where the SQL Server database will be installed. If you will use a named instance rather than the default instance, that value should be entered here too. Enter the value in the following format: <code>machine name \<instance name></code> Database name: Enter the database name to be created for Rendition Engine use. <p>NOTE If this is an upgrade you can not use a database that was used for an earlier version of Rendition Engine software. You must identify a new database.</p> <ul style="list-style-type: none"> User name: This is a SQL Server user name. Password: This is the SQL Server user's password. Click Next.
Start Copying Files	Confirm your settings and click Next .

- Once the file-copy process has completed, select Yes, I want to restart my computer now, and click **Finish**.
- Once the Content Engine/Publishing Plug-in server has restarted, log back on as the <FNRE_admin> account.
- Browse to the installation directory. The default installation location is *Program Files\Liquent\filenet*. Execute the file called **RP22-VistaConfig.exe**.
- In the Configuration File field, browse to the Resources subdirectory in the Rendition Engine installation software package and select **FileNetP8RenditionEngineConfig.xml**.
- From the Available Machine Configurations list, choose Rendition Engine Server and click **Select**.
- Launch the Microsoft Word application.
- Check the Always trust... checkbox. Then click **Disable Macros**.

To test the connection to the database

Perform the following steps on the Rendition Engine server.

- Select Start > All Programs > Liquent > Domain Manager.
- Right click on the **Domain** node.
- Select Properties.
- Select the Database tab.

5. Click the **Test Database** button. You should receive a message saying the connection was successful.
6. Click **OK** once the test is completed.

To configure the BusinessServiceServer service

Perform this procedure on the Rendition Engine server.

1. Select Start > All Programs > Administrative Tools > Services.
2. Right-click **BusinessServiceServer** and select Properties.
3. Set Startup type to Automatic, and then Start the service.
4. Click the **Log On** tab.

NOTE Windows cannot set the XML Printer for Rendition Engine as the default printer unless you set the Rendition user account (<FNRE_admin>) for the BusinessServiceServer service.

5. Select This account and click **Browse**.
6. For the Look in field, select the correct domain.
7. Select the proper Rendition Engine user account (<FNRE_admin>) and password, then click **OK**.

NOTE If prompted that the account has been granted *Log On As A Service* right, click **OK**.

8. Click **OK** if prompted that the new logon name will not take effect until you stop and restart the service, otherwise, click **OK** to close the BusinessServiceServer Properties window.
9. Right-click the **BusinessServiceServer** service and click **Restart**.
10. Close the Services application.

NOTE When a Rendition Engine or Publishing Plug-in server is added to the FileNet P8 Platform domain, the BusinessServiceServer services must be manually restarted on every Rendition Engine and Publishing Plug-in server.

To set security on VistaTempDir shared folder

Perform this procedure on the Rendition Engine server.

1. Run Windows Explorer and open the temp folder defined for the server (typically **drive:\WINNT\Temp** on Windows 2000, **drive:\WINDOWS\Temp** on Windows 2003).

NOTE To determine the location for the temp folder, Rendition Engine uses a standard Windows call that checks, in order, the environment variables TMP, TEMP, and USERPROFILE. If no values are found, use the Windows program directory.

2. Right-click the \VistaTempDir folder and select **Properties**.
3. Verify the \VistaTempDir folder is shared. If it is not, select the Sharing tab and select Share this folder.
4. Select the Security tab and click **Advanced**.

NOTE A missing Security tab generally means that the drive where the **VistaTempDir** folder is located, is not a Windows NTFS partition.

5. Uncheck Allow inheritance permissions, and then click **Remove**.

NOTE On Windows 2003, you must click the **Advanced** button to see the checkbox.

6. Add the <FNRE_admin> and Content Engine Servers accounts.
7. Give the accounts Full Control access rights.
8. Click **Apply** and then **OK**.
9. Close all programs.

To install Publishing software on the Publishing Plug-in server

Perform this procedure on the Publishing Plug-in server.

1. Log on as the <FNRE_admin> user.
2. If it isn't already running, start the Print Spooler service.
3. Access the *Rendition Engine* software package and start the **Install\setup.exe** program.

Do not run this setup program on multiple servers concurrently.

CAUTION If you enter invalid database user credentials and complete the Rendition Engine installation, you will not be able to enter them correctly later. Instead, you will have to uninstall and reinstall Rendition Engine.

In this screen...	Perform this action...
Customer Information	Enter a value in the User Name and Company Name fields, select the Anyone who uses this computer (all user) option, and click Next .
License Agreement	Review and accept the license agreement for FileNet P8 software products and then proceed with installation
Choose Destination Location	Accept the default installation location and click Next . NOTE You can click Browse and change the destination folder location.
Select the features you want to install	Choose the default to install Administrative Tools and Framework and click Next .
Vista License File	Browse to the location of the license file. It is located in the <i>Rendition Engine</i> software package in the Resources directory. Click Next .

In this screen...	Perform this action...
Vista User Information	<ul style="list-style-type: none"> The Windows Domain field should default to the domain that this server is a member of. The User field should default to <FNRE_admin>. If it does not, correct it. Enter the <FNRE_admin> password in the password field. Confirm the <FNRE_admin> password and click Next.
Add Server to an Existing Vista Domain	Choose Add to an existing domain.
Start Copying Files	Confirm your settings and click Next .
Move Repository	Join the existing Vista Domain by choosing your database type and entering appropriate database information as entered in the Database Type dialog when the first Rendition Engine was installed. See "Vista Database Type" on page 33 , "Oracle Database Information (displays if you chose Oracle 9i)" on page 33 , and "SQL Database Information (displays if you chose Microsoft SQL Server)" on page 34 for more information. The information entered here must be the same as you entered when installing the first Rendition Engine. Click OK and files will continue copying.

- Once the file-copy process has completed, select Yes, I want to restart my computer now, and click **Finish**.
- Once the Rendition Engine server has restarted, log back on as the <FNRE_admin> account.
- Browse to the installation directory. The default installation location is **Program Files\Liquent\filenet**. Execute the file called **RP22-VistaConfig.exe**.
- In the Configuration File field, browse to the Resources subdirectory on the installation software package and select **FileNetP8RenditionEngineConfig.xml**.
- From the Available Machine Configurations list, choose Content Engine Server and click **Select**.

To test the connection to the database

Perform the following steps on the Publishing Plug-in (Content Engine) server.

- Select Start > All Programs > Liquent > Domain Manager.
- Right click on the Domain node.
- Select Properties.
- Select the Database tab.
- Click the **Test Database** button. You should receive a message saying the connection was successful.

6. Click **OK** once the test is completed.

To configure the BusinessServiceServer service

Perform the following steps on the Publishing Plug-in (Content Engine) server.

1. Select Start > All Programs > Administrative Tools > Services.
2. Right-click BusinessServiceServer and select Properties.
3. Set Startup type to Automatic, and then Start the service.
4. Click the **Log On** tab.

NOTE Windows cannot set the XML Printer for Rendition Engine as the default printer unless you set the Rendition user account (<FNRE_admin>) for the BusinessServiceServer service.

5. Select This account and click **Browse**.
6. For the Look in field, select the correct domain.
7. Select the proper Rendition Engine user account (<FNRE_admin>) and password, then click **OK**.

NOTE If prompted that the account has been granted *Log On As A Service* right, click **OK**.

8. Click **OK** if prompted that the new logon name will not take effect until you stop and restart the service, otherwise, click **OK** to close the BusinessServiceServer Properties window.
9. Right-click the **BusinessServiceServer** service and click **Restart**.
10. Close the Services application.

NOTE When a Rendition Engine or Publishing Plug-in server is added to the FileNet P8 Platform domain, the BusinessServiceServer services must be manually restarted on every Rendition Engine and Publishing Plug-in server.

To set security on VistaTempDir shared folder

Perform the following steps on the Publishing Plug-in (Content Engine) server.

1. Run Windows Explorer and open the temp folder defined for the server (typically **drive:\WINNT\Temp** on Windows 2000, **drive:\WINDOWS\Temp** on Windows 2003).

NOTE To determine the location for the temp folder, Rendition Engine uses a standard Windows call that checks, in order, the environment variables TMP, TEMP, and USERPROFILE. If no values are found, use the Windows program directory.

2. Right-click the \VistaTempDir folder and select **Properties**.
3. Verify the **\VistaTempDir** folder is shared. If it is not, select the Sharing tab and select Share this folder.
4. Select the Security tab and click **Advanced**.

NOTE A missing Security tab generally means that the drive where the **\VistaTempDir** folder is located, is not a Windows NTFS partition.

5. Uncheck Allow inheritance permissions, and then click **Remove**.

NOTE On Windows 2003, you must click the **Advanced** button to see the checkbox.

6. Add the <FNRE_admin> and Content Engine Servers accounts.

7. Give the accounts Full Control access rights.

8. Click **Apply** and then **OK**.

9. Close all programs.

To create folders to be used by publishing

In order to publish to either PDF or HTML formats, you must first configure the FileNet P8 Platform environment for publishing by creating folders to support publishing.

From a Publishing Plug-in server (Content Engine server or FileNet Enterprise Manager only machine):

1. Open the FileNet Enterprise Manager and log on as a FileNet P8 domain administrator.
2. Create or navigate to the object store to be used for publishing.

From the Root folder or other subfolder of the object store, create the following folders:

- **Templates**
- **Documents**
- **Published**
- **Published\PDF**
- **Published\HTML**

To configure the Service Controller

From a Publishing Plug-in server (Content Engine server) where the Service Controller is installed:

1. Select Start > Programs > FileNet P8 Platform > Publishing > Service Controller and log on as a FileNet P8 domain administrator if prompted.
2. In the Services drop-down, select the Publishing PDF Plug-in Service.
3. Click **Start** and select (check) the Auto start service when OS starts option.
4. Click the **Select...** button.

NOTE This process may take some time depending on the number of object stores in the system that have Style Templates associated with them.

5. Once the Add/Remove Object Stores dialog box opens, move all of the publishing object stores to the Select Object Stores pane and click **OK**.
6. Click **Yes** to restart the service.

7. Perform [Step 2](#) through [Step 6](#) for the HTML Plug-in.
8. Exit the Service Controller.

To create Publishing Templates

You will use the FileNet P8 Workplace to create publish templates for PDF and HTML renditions.

The FileNet P8 Platform publishing feature is delivered with default style templates for both PDF and HTML renditions. You will be using those default style templates for this procedure. After you have completed these publishing procedures, you may want to read the Publishing Designer help located at [FileNet P8 Documentation > Workplace > Advanced Author Tools > Publishing Designer](#) for more details.

NOTE The sample object store and subfolder names used in this procedure were created in the previous procedure. If you made changes to the object store folder or subfolder names, substitute the names you used.

From a server that can access FileNet P8 Workplace:

1. Open Workplace and sign in as a FileNet P8 domain administrator.
2. Select Author and then select Advanced Tools.
3. Click **Publishing Designer**. At the Security dialog, choose **Always**.

NOTE This dialog only displays the first time you click **Publishing Designer**.
4. From the Object Store to host publish operation using this template drop-down, select the Publishing Object Store (or other object store to be use for publishing).
5. From the Destination Folder object, click **Browse** and select the **Published\PDF** subfolder and click **Select**.
6. Under Optional Settings, select Use a Style Template to transform the content, select the Default PDF Style Template and click **OK**.
7. Click the **Add New...(+)** button.
8. Click **Browse** and navigate to the published document Templates folder.
9. Click **Select** and then click **Next**.
10. Enter Publish Template Properties (Document Title and Description) and click **Next**.
11. Verify the Security Settings and click **Finish**.
12. Perform [Step 4](#) through [Step 11](#) for the HTML Publish Template.

NOTE In [Step 5](#) and [Step 6](#), be sure to browse to the **Published\HTML** subfolder and select the default HTML Style Template.
13. From the Publishing Designer, select File > Exit.
14. Close your browser window.

To add and publish a test document

This procedure shows you how to add and publish a test document. This provides you a quick way to verify that you have correctly installed and configured the publishing components. For more details on adding and publishing documents through Workplace, refer to the Workplace help topic [FileNet P8 Documentation > Workplace > Workplace User Help > Manage Documents](#).

1. Set the site preferences on the Application Engine to use path-based URLs:
 - a. Sign in to Workplace as a member of the Application Engine Administrators group.
 - b. Choose Admin > Site Preferences.
 - c. Under General Settings > Application section, set Use path based URLs to Yes.
 - d. Click **Apply** to save the setting.
 - e. Click **Exit**.

NOTE If you choose not to use path-based URLs, graphics and other internal references will not be resolved when viewing documents that have been published to HTML.

2. Add a test document to publish, as follows:
 - a. Open Workplace and sign in as FileNet P8 domain administrator.
 - b. Select Author and then select the General Tools.
 - c. Click **Add Document**.
 - d. Click the **Publishing** object store.
 - e. Click the **Documents** subfolder.
 - f. Click **Next** twice.
 - g. Enter the Document Title and click **Next**.

NOTE If you do not enter the document title, Workplace will default to the file name.

- h. At Security Settings dialog, click **Next**.
- i. Browse for the document and select Open, then click **Finish**.
- j. Click **OK**.
3. Publish the test document, as follows:
 - a. In Workplace under Browse, click the object store.
 - b. Click the **Documents** folder.
 - c. Right-click the document and select **Publish**.
 - d. Click **Publish New**.
 - e. Click **Select** under the PDF (or HTML) template.
 - f. Click **Next**.

- g. Click **Finish**.
4. Go to the destination folder defined above in “To create Publishing Templates” on page 40 and verify that the document was successfully published.

To install additional Rendition Engine or Publishing Plug-in Servers

1. Log on as the <FNRE_admin> user.
2. If it isn’t already running, start the Print Spooler service.
3. Access the *Rendition Engine* software package and start the **Install\setup.exe** program.

Do not run this setup program on multiple servers concurrently.

CAUTION If you enter invalid database user credentials and complete the Rendition Engine installation, you will not be able to enter them correctly later. Instead, you will have to uninstall and reinstall Rendition Engine.

In this screen...	Perform this action...
Customer Information	Enter a value in the User Name and Company Name fields, select the Anyone who uses this computer (all user) option, and click Next .
License Agreement	Review and accept the license agreement for FileNet P8 software products and then proceed with installation
Choose Destination Location	Accept the default installation location and click Next . NOTE You can click Browse and change the destination folder location.
Select the features you want to install	Choose the default to install Administrative Tools and Framework and click Next .
Vista License File	Browse to the location of the license file. It is located in the <i>Rendition Engine</i> software package in the Resources directory. Click Next .
Vista User Information	<ul style="list-style-type: none"> • The Windows Domain field should default to the domain that this server is a member of. • The User field should default to <FNRE_admin>. If it does not, correct it. • Enter the <FNRE_admin> password in the password field. • Confirm the <FNRE_admin> password and click Next.
Add Server to an Existing Vista Domain	Choose Add to an existing domain.
Start Copying Files	Confirm your settings and click Next .

In this screen...	Perform this action...
Move Repository	Join the existing Vista domain by choosing your database type and entering appropriate database information as entered in the Database Type dialog when the first Rendition Engine was installed. See “Vista Database Type” on page 33 , “Oracle Database Information (displays if you chose Oracle 9i)” on page 33 , and “SQL Database Information (displays if you chose Microsoft SQL Server)” on page 34 for more information. The information entered here must be the same as you entered when installing the first Rendition Engine. Click OK and files will continue copying.

4. Once the file-copy process has completed, select Yes, I want to restart my computer now, and click Finish.
5. Once the Rendition Engine server has restarted, log back on as the <FNRE_admin> account.
6. Browse to the installation directory. The default installation location is *Program Files\Liquent\filenet*. Execute the file called **RP22-VistaConfig.exe**.
7. In the Configuration File field, browse to the Resources subdirectory in the installation software package and select **FileNetP8RenditionEngineConfig.xml**.
8. From the Available Machine Configurations list, choose Rendition Engine Server and click **Select**.
9. If this is a Rendition Engine server, proceed to steps 10-11. Otherwise, proceed to [“To test the connection to the database” on page 43](#).
10. Launch the Microsoft Word application.
11. Check the Always trust... checkbox. Then click **Disable Macros**.

To test the connection to the database

Perform the following steps on Rendition Engine and Publishing Plug-in (Content Engine) servers.

1. Select Start > All Programs > Liquent > Domain Manager
2. Right click on the **Domain** node.
3. Select Properties.
4. Select the Database tab.
5. Click the **Test Database** button. You should receive a message saying the connection was successful.
6. Click **OK** once the test is completed.

To configure the BusinessServiceServer service

Perform the following steps on Rendition Engine and Publishing Plug-in (Content Engine) servers.

1. Select Start > All Programs > Administrative Tools > Services.
2. Right-click BusinessServiceServer and select **Properties**.
3. Set Startup type to Automatic, and then Start the service.
4. Click the **Log On** tab.

NOTE Windows cannot set the XML Printer for Rendition Engine as the default printer unless you set the Rendition user account (<FNRE_admin>) for the BusinessServiceServer service.

5. Select This account and click **Browse**.
6. For the Look in field, select the correct domain.
7. Select the proper Rendition Engine user account (<FNRE_admin>) and password, then click **OK**.

NOTE If prompted that the account has been granted *Log On As A Service* right, click **OK**.

8. Click **OK** if prompted that the new logon name will not take effect until you stop and restart the service, otherwise, click **OK** to close the BusinessServiceServer Properties window.
9. Right-click the **BusinessServiceServer** service and click **Restart**.
10. Close the Services application.

NOTE When a Rendition Engine or Publishing Plug-in server is added to the FileNet P8 Platform domain, the BusinessServiceServer services must be manually restarted on every Rendition Engine and Publishing Plug-in server.

To set security on VistaTempDir shared folder

Perform the following steps on Rendition Engine and Publishing Plug-in (Content Engine) servers.

1. Run Windows Explorer and open the temp folder defined for the server (typically **drive:\WINNT\Temp** on Windows 2000, **drive:\WINDOWS\Temp** on Windows 2003).

NOTE To determine the location for the temp folder, Rendition Engine uses a standard Windows call that checks, in order, the environment variables TMP, TEMP, and USERPROFILE. If no values are found, use the Windows program directory.

2. Right-click the \VistaTempDir folder and select **Properties**.
3. Verify the \VistaTempDir folder is shared. If it is not, select the Sharing tab and select Share this folder.
4. Select the Security tab and click **Advanced**.

NOTE A missing Security tab generally means that the drive where the \VistaTempDir folder is located, is not a Windows NTFS partition.

5. Uncheck Allow inheritance permissions, and then click **Remove**.

NOTE On Windows 2003, you must click the **Advanced** button to see the checkbox.

6. Add the <FNRE_admin> and Content Engine Servers accounts.
7. Give the accounts Full Control access rights.
8. Click **Apply** and then **OK**.
9. Close all programs.

Upgrade Overview

This section lists details that will help you prepare your environment for the upgrade of a Rendition Engine and the FileNet Publishing Plug-in components. In many cases, the items you see listed will be links to more detailed information, which will help you plan a system upgrade. Please review this information thoroughly before you start to upgrade FileNet P8 components or required third-party software.

NOTE

- This guide does *not* address migrations to different operating systems, databases, or directory services. To migrate from one platform to another (for example, from MS SQL Server database engine to Oracle), contact your FileNet support representative.
- The upgrades described in the guide assume that you will:
 - retain your basic platform configuration from the previous release.
 - make no changes to user or group definitions during the upgrade.
 - apply only the necessary supported software updates and patches, as noted in this guide and in the *IBM FileNet P8 Hardware and Software Requirements* document.
- If you are running FileNet P8 3.0.0 with Rendition Engine and Publishing Plug-in components, you must first upgrade to 3.5.0 and apply the 3.5.1 service pack.
- If you are running FileNet 3.5.0 with Rendition Engine and Publishing Plug-in components, you must first apply the 3.5.1 service pack.

Upgrade Planning Considerations

Gather auxiliary documentation

NOTE For general instructions on how to navigate to this and other IBM FileNet product documentation on the IBM web site, see [“Access IBM FileNet Documentation, Compatibility Matrices, and Fix Packs”](#) on page 9.

Before you begin installing the software, retrieve the following documents:

- *IBM FileNet Rendition Engine Installation and Upgrade Guide* (This document). This document provides details on how to install and upgrade Rendition Engine components.
- *IBM FileNet P8 Hardware and Software Requirements*. This document provides details for all FileNet P8 system components, as well as the minimum supported levels of third-party software components. The information throughout the IBM FileNet P8 Platform Installation and Upgrade Guide assumes you have met all applicable requirements listed in that document.
- *IBM FileNet P8 Platform Release Notes*. This document provides details on new features, known issues, and resolved problems.
- *IBM FileNet P8 Platform Installation and Upgrade Guide*. This document provides details for installation, upgrade, and configuration of the core components for the FileNet P8 system.
- [FileNet P8 Platform user and group security help](#).

This help topic provides a complete list of the user and group roles, accounts, and responsibilities required to install, configure, and maintain a FileNet P8 system. For more information, see the FileNet P8 Help topic [FileNet P8 Administration > Enterprise-wide Administration > Security > Users and groups](#).

- [FileNet P8 Platform Shutdown and Startup](#).
This help topic describes how to shut down and restart FileNet P8 Platform components and some expansion products. Manual, command line, and some sample batch file procedures are provided. For more information, see the *FileNet P8 Help* topic [FileNet P8 Administration > Enterprise-wide Administration > Shutdown and Startup](#).
- *Installing IBM FileNet P8 Platform in a Non-English Environment Technical Notice*. This document will help you set up the product if your environment is not English-language based.
- *IBM FileNet P8 Platform Deployment Guide*. This document provides details on how to deploy a FileNet P8 system from a staging environment into a full production environment.
- *IBM FileNet P8 Platform Troubleshooting Guide*. This document provides troubleshooting information on all aspects of the product.
- *IBM FileNet P8 Platform Performance Tuning Guide*. This document provides performance tuning information on all aspects of the product.

General Requirements for all FileNet P8 Systems

- **Plan and test the upgrade on a designated test system first.** Verify the upgrade is successful by running functionality and stress tests.
- **Complete any pending publishing jobs before upgrading.**

Network Security Considerations

- **Ensure availability of required port numbers.** For a composite list of port numbers required for FileNet P8 3.5.X, see "[FileNet P8 Port Numbers](#)" on page 53.

Database Considerations

General

Update to the appropriate patches BEFORE you upgrade FileNet P8 components.

Oracle

Ensure you have applied appropriate Oracle patches to Oracle clients as well as servers. Be sure that clients remote to an Oracle database engines have comparable patches to the database server. Oracle clients include any machines remote from the Oracle database server where Content Engine, Rendition Engine, Process Engine, and FileNet Enterprise Manager software is installed. You can download all the required Oracle 9i database server patches from [OracleMetaLink](#) and install them.

Gather Pre-upgrade Information

Content Engine

- **Ensure that you have the necessary local administrative user accounts and passwords** to run the upgrade program on the various Rendition Engine and Publishing Plug-in (Content Engine) servers.
- **You must know the password of the user (e.g. <FNRE_admin>) that runs Rendition Engine services.** If this is not available, you must reset the password to a known string *before* running the upgrade process.

Rendition Engine

You will need to identify new databases for use by the 3.5.1 version of Rendition Engine. You cannot use existing databases after the upgrade.

Before You Begin the Upgrade

- Be sure to read the “What’s New” topic in the *FileNet P8 Platform Release Notes*. Many of the new features may be interesting for your implementation of FileNet P8 Platform.
- Make sure the site has restorable backups of system and data. In case of an emergency, you may need to back out of the upgrade. For details on what to back up for FileNet P8 components, see the topic FileNet P8 Documentation > Enterprise-wide Administration > Backup and Restore in the general FileNet P8 Platform help.
- Before beginning the upgrade, make sure no users or processes are accessing the FileNet P8 system.
- Before beginning the upgrade, make sure you disable tasks such as:
 - scheduled automated backups (Windows)
 - cron jobs (UNIX)
 - virus scanning

Task 1: Upgrade FileNet Publishing Components

This topic covers upgrades of the Rendition Engine software from the 3.0.0 release to the 3.5.1 release. The upgrade involves uninstalling and reinstalling the associated software.

- You will need to upgrade the FileNet Publishing components on the following servers:
 - Publishing Plug-in (Content Engine) servers
 - FileNet Rendition Engine servers
- You will need to verify the values for the Rendition Engine temporary directory.
- You will need to verify or upgrade the embedded Lquent Vista software license key.

To uninstall existing Lquent Vista Component Server server software

You must uninstall the existing Lquent Vista Component Server software from all Rendition Engine or Publishing plug-in 3.0.0 servers before upgrading (re-installing) the Publishing components for 3.5.1.

1. Log on to the server as *<FNRE_admin>*.
2. Stop the Vista Component Server BusinessServiceServer service prior to uninstalling the software.
3. Select Start > Settings > Control Panel and double-click Add/Remove Programs.
4. Select the Vista Component Server item and click **Change/Remove**.
5. Follow the screen prompts to remove the Vista Component Server software.
6. Select Start > Settings > Control Panel and double-click **Printers**.
7. On the Printers window, delete the printer Lquent XML Printer, then select File > Server Properties.
8. On the Print Server Properties dialog box, select the **Ports** tab and delete the local ports that point to **Program Files\Common Files\Lquent\lquent.xml** and **Program Files\Lquent\Vista\ESPS.PS**.
9. Select the **Drivers** tab, remove the printer driver Lquent XML Printer, and then click **OK**.
10. Run the *VistaCleaner.exe* located in the Rendition Engine software package in **\Resources\Lquent\Unsupported Apps\Xtent2.0**.
11. Reboot the server.

To install the 3.5.1 version of Rendition Engine, follow the procedures in [“Install and configure FileNet P8 Publishing components” on page 25](#).

You can not use an existing Rendition Engine database. When you install and configure the new software you must also identify a new database for use.

Remove Rendition Engine

Remove a Rendition Engine from a Vista Domain

To uninstall existing Rendition Engine software you must first remove the server from the Vista domain, then uninstall the software.

1. Log in as <FNRE_admin>.
2. In the Vista Domain Manager application, select the Configuration tab in the left navigation pane, then expand Domain and Repositories to view the server machines in the domain.
3. Click on the server name to be removed from the Liquent domain. Select Delete from the Edit menu.
4. Confirm the deletion and select Save from the File menu.

Remove Rendition Engine software from a Rendition Engine or Publishing Plug-in server

1. Stop the Vista Component Server BusinessServiceServer service prior to uninstalling the software.
2. Select Start > Settings > Control Panel and double-click **Add/Remove Programs**.
3. Select FileNet P8 Rendition Engine 3.0.0a/3.5.1 and click **Change/Remove**.
4. Follow the screen prompts to remove the software. At the final screen, click **Finish**.
5. Select Start > Settings > Control Panel. Double-click Printers.
6. On the Printers window, select File > Server Properties.
7. On the Print Server Properties dialog box, select the Ports tab and delete the local ports that point to:
 - Program Files\Liquent\filenet\liquent.xml**
 - Program Files\Liquent\filenet\ESPS.PS**
8. Select the Drivers tab, remove the printer driver Liquent XML Printer. Click **OK**.
9. If the following word macro is present on the Rendition Engine server, remove it:
 - cdmacros.dot**
10. Run the **VistaCleaner.exe** located in the Rendition Engine software package in:
 - Resources\Liquent\Unsupported Apps\Vista2.x**
11. Click the **Cleanup** button.
12. Click **OK** to close the program when it has completed.
13. Reboot the server.

FileNet P8 Port Numbers

The table below lists the port numbers used by Rendition Engine and Publishing Plug-in components.

Liquent / Print Server on Local Port 1	Program Files\Common Files\Liquent\liquent.xml
Liquent / Print Server on Local Port 2	Program Files\Liquent\Vista\ESPS.PS
Liquent notify port	2868
Liquent event port	2869
Liquent admin port	2870
MSSQL Server / Oracle	1433 / 1521
Web Content Manager	5000

Index

A

access compatibility matrices and fix packs [9](#)
 access documentation [9](#)
 authentication security considerations [12, 14](#)
 Automatic ANSI to OEM conversion [20](#)

C

Content Engine
 Rendition Services [51](#)

D

database considerations [15](#)
 database, local [18](#)
 database, remote [18](#)
 documentation
 access [9](#)

F

FileNet P8 Platform Installation and Upgrade Guide
[11, 47](#)
 FileNet Rendition Engine Installation and Upgrade
 Guide [11, 47](#)
 fix packs [8](#)
 access [9](#)

I

installation
 non-English environments [11, 12, 47](#)
 interim fixes [8](#)
 IP address
 Process Engine [12](#)

L

local database [18](#)

M

MS SQL Server
 install for FileNet P8 [18](#)

N

network security considerations [12](#)

O

operating system considerations [12](#)

P

Performance Tuning Guide [12, 47](#)
 Process Engine

static IP address [12](#)
 publishing components
 create and configure the publishing user ac-
 count [26](#)
 install and configure [25](#)
 Publishing Plug-in [25](#)
 publishing templates [25](#)

R

release notes [11, 47](#)
 remote database [18](#)
 Rendition Engine [25](#)
 upgrade procedure [51](#)
 requirements
 hardware and software [11, 47](#)

S

service packs [8](#)
 SQL Server
 install for FileNet P8 [18](#)

T

troubleshooting [12, 47](#)
 tuning product performance [12, 47](#)

V

VistaPubDir shared folder for publishing [25](#)

W

Windows domain considerations [12](#)

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106-0032, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
J46A/G4
555 Bailey Avenue
San Jose, CA 95141-1003
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.



Program Number: 5724-S17

Printed in USA

GC31-5614-00

