Preparing to upgrade AEM Forms
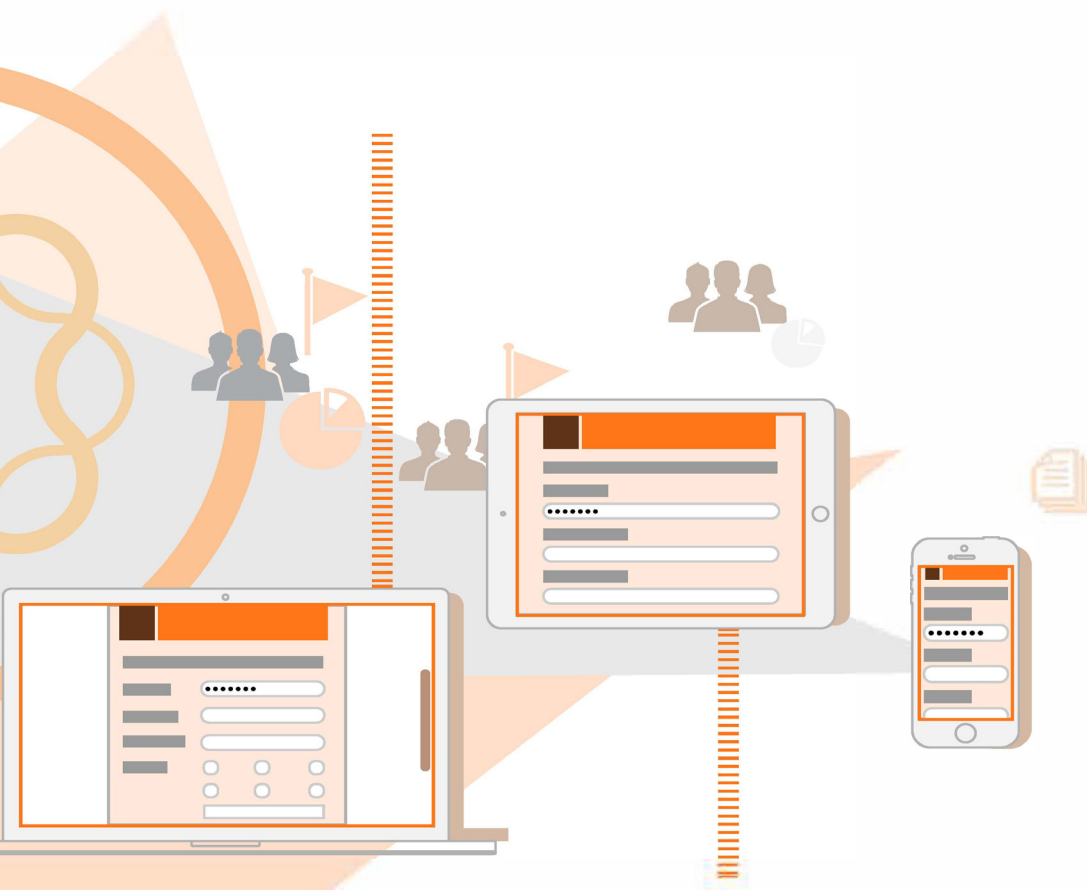
Legal notices

For legal notices, see http://help.adobe.com/en_US/legalnotices/index.html.

Contents

1. About This Document

1.1. What's in this document?

This document contains the following types of information:

- Information about the changes in AEM 6.5 Forms on JEE that may affect your upgrade planning and an overview of how the upgrade process works, including an outline of the tasks involved

- All the tasks that must be performed to ensure that the upgrade runs correctly with minimal server downtime (including backing up the existing forms server and patching the application server as required)

- All hardware and software requirements and configurations that *must* be already in place to ensure a successful AEM 6.5 Forms on JEE upgrade process

    NOTE: If you are planning to perform an upgrade by using the turnkey method for JBoss, you do not need to perform many of the steps in this document. It is recommended that you review the section *UnderstandingtheChangesinAEMFormsonJEE*. However, all preparatory information for a turnkey upgrade, including system requirements, is included in Upgrading to AEM FormsonJEEfor JBoss Turnkey.

    After you complete the tasks in this document, proceed to the Upgrading to AEM Forms on JEE document for your application server.

1.2. Who should read this document?

This document provides information for administrators or developers who are responsible for preparing the application and database servers for development, staging, and production environments prior to installing, configuring, upgrading, administering, and deploying AEM Forms on JEE.

The information provided is based on the assumption that anyone reading this document is familiar with application servers, operating systems, database servers, and web environments.

1.3. Conventions used in this document

This document uses the following naming conventions for common file paths.

Name	Description	Default value
[aem-forms root]	The installation directory used for all AEM Forms on JEE modules. The directory contains subdirectories for Configuration Manager, SDK, and licensed modules (along with the product documentation). This directory also includes directories that relate to third-party technologies.	Windows: C:\Adobe\Adobe_Experience_Manager _Forms Linux and UNIX: /opt/adobe/Adobe_Experience_Manag er_Forms
[appserver root]	The home directory of the application server that runs the services that are part of AEM Forms on JEE.	JBoss on Windows: C:\jboss\ JBoss on Linux: /opt/jboss/ WebSphere on Windows: C:\Program Files\IBM\WebSphere\AppServer\ WebSphere on Linux and UNIX: /opt/IBM/WebSphere/AppServer/ **or** /opt/IBM/WebSphere/AppServer/
[crx_home]	The directory that is used for installing the CRX repository.	On Windows: C:\Adobe\Adobe_Experience_Manager _Forms\crx-repository On Linux and UNIX /opt/adobe/Adobe_Experience_Manag er_Forms/crx-repository

NOTE: This document uses terms Adobe Experience Manager forms and AEM Forms on JEE interchange-ably.

Most of the information about directory locations in this document is cross-platform (all file names and paths are case-sensitive on Linux and UNIX®). Platform-specific information is indicated as required.

1.4. Additional information

The resources in this table can help you learn about Forms on JEE.

For information about	See
Performing the upgrade using the turnkey method	Upgrading to AEM Forms on JEE for JBoss Turnkey
Upgrading from AEM Forms on JEE for JBoss and WebSphere servers	UpgradingtoAEMForms on JEE

For information about	See
All documentation that is available for AEM Forms on JEE	AEMFormsonJEE documentation
Patch updates, technical notes, and additional information about this product version	Adobe®EnterpriseSupport

2. Introduction to Upgrading to AEM Forms on JEE

This section provides information about the documentation that is available to help you understand the upgrade process. It also provides a high-level outline of the tasks that are involved in upgrading previous versions to AEM 6.5 Forms on JEE.

Before you read this document, ensure that you have read the Upgrade Checklist and Planning guide.

2.1. Upgrading to AEM 6.5 Forms on JEE

Documents Upgrading to AEM Forms on JEE for JBoss and Upgrading to AEM Forms on JEE for WebSphere provide the information that you need to perform the actual installation and migration steps that make up the upgrade process. Each guide is specific to the application server you are using.

Upgrading to AEM Forms on JEE for JBoss Turnkey

The Upgrading to AEM Forms on JEE for JBoss Turnkey document includes all the steps that are required to upgrade to AEM Forms on JEE for JBoss and MySQL by using the turnkey method. The turnkey method installs, configures, and upgrades the product.

You can upgrade using the turnkey method if you installed previous versions using JBoss turnkey and if the modules are deployed to the JBoss instance that was included as part of the turnkey installation.

NOTE: The AEM Forms on JEE turnkey option runs on **JBoss** only. The AEM Forms on JEE installation installs and configures this product. Your existing JBoss server instance can be removed once you have verified that your upgraded environment is working.

Perform this type of upgrade to rapidly get a AEM Forms on JEE system up and running for small-scale production, demonstration, evaluation, development, or training purposes. The turnkey method installs and configures a default set of Adobe and third-party products that provide a functioning AEM Forms on JEE environment.

NOTE: To perform an upgrade by using the turnkey method, you do not need to perform many of the steps in this document (Preparing to Upgrade to AEM Forms on JEE). It is recommended that you review the section *UnderstandingtheChangesinAEMFormsonJEE* . However, all preparatory information for turnkey upgrades, including system requirements, are included in Upgrading to AEM Forms on JEE for JBoss Turnkey.

You can also upgrade using the turnkey method if your AEM Forms on JEE system will reside on a different computer. In this case, however, you will need to configure your database and global document storage (GDS) directory separately. The major tasks involved are:

• Manually copy the GDS directory to the new computer.
• Manually copy the crx-repository.
• Manually restore your database backup to the new database server.
• Provide the details of the new GDS directory and database during configuration.

NOTE: While upgrading to AEM Forms on JEE using turnkey method, you must specify the same database credentials as for your previous turnkey installation.

NOTE: AEM 6.5 Forms upgrade does not migrate the repository. You have to manually migrate the repository after performing the upgrade.

Configuration Manager Help

Part of the upgrade is completed by using Configuration Manager, a wizard-like tool that leads you through the upgrade process, prompting you to provide the required information. On each Configuration Manager screen, you can press the F1 key to view the Help dialog box for that screen.

For more information about Configuration Manager, see the Upgrading to AEM Forms on JEE document for your application server, mentioned earlier in this section.

2.2. Upgrading task outline

This section outlines the tasks that are involved in the upgrade process, from the planning stage to the post-deployment stage.

To upgrade from previous versions to AEM Forms on JEE, you must complete the following tasks.

Task	See
Understand the upgrade process (high-level section).	*UnderstandingtheChangesinAEMFormsonJEE*
Read the Upgrade Checklist and Planning guide	Upgrade Checklist andPlanning
(In-place) Reuse or patch the existing application server instance to ensure that you have the supported version. (Out-of-place) Procure the appropriate operating system, database server version, and application server version.	*Systemrequirements*
Ensure that you have all the information about passwords, directory locations, and credentials that you need.	*Gatheringrequiredinformationbefore you start*
Back up all existing data, resources, directories.	Upgrade Checklist andPlanning guide
Install AEM Forms on JEE.	Upgrading to AEM Forms on JEE for your application server

Task	See
Run Configuration Manager to upgrade to and configure AEM Forms on JEE.	• Upgrading to AEM Forms on JEE for your application server *Configuration Manager Help (Press F1 on the Configuration Manager screen)*

3. Understanding the Changes in AEM Forms on JEE

To successfully upgrade to AEM Forms on JEE from previous versions, you must first understand which parts of your IT organization are involved. This section provides the high-level information that is required to plan for your upgrade.

3.1. How the AEM Forms on JEE upgrade protects your IT investment

The upgrade to AEM Forms on JEE is designed to provide an automated experience with minimal manual tasks. It continues to protect your investment in the forms, processes, and applications that you have built around previous versions. By protecting that investment, an IT administrator can upgrade to AEM Forms on JEE without help from the form authors who created your forms, the process authors who created your processes, and the Java™ developers who created custom applications for AEM Forms.

The AEM Forms on JEE upgrade limits the changes so that they affect only the middle tier of your enterprise infrastructure. For example, if you are using Adobe Reader®, your organization can continue to use the existing version of Adobe Reader that you deployed across your clients. Keeping the AEM Forms on JEE upgrade restricted to your middle tier minimizes the disruption to the remainder of your enterprise infrastructure.

3.2. Adobe Reader compatibility

One of the key features of the upgrade is that the version of Adobe Reader on the client is independent of the version of AEM Forms on JEE on the server. When AEM Forms on JEE renders a form, it renders it in the version of PDF that you specify. You can create forms that work best with Adobe Acrobat Reader DC. Form authors are warned if they choose to use a feature that is not appropriate for the particular version of Acrobat Reader.

All forms render in AEM Forms on JEE in the same way they rendered in previous versions. All the scripts that you added to your forms will work in AEM Forms on JEE. In addition to the AEM Forms on JEE features that support multiple versions of Acrobat Reader, Acrobat Reader itself also works with multiple versions of AEM Forms. You can roll out Adobe Reader DC to your clients without upgrading your server.

3.3. Overview of the upgrade process

Upgrading from previous versions to AEM Forms on JEE involves installing AEM Forms on JEE software that is subsequently configured using settings from the existing server. Configuration settings, user data, and job information are migrated to the AEM Forms on JEE system.

Most of the tasks in the upgrade process are automated and performed (with some user input) by Configuration Manager. *Configuration Manager* is a tool used to configure, deploy, and validate AEM Forms on

JEE components for deployment to the application server. When run in upgrade mode, Configuration Manager also performs upgrade specific tasks such as updating configuration settings and data.

The GDS directory and database must be accessible to Configuration Manager during the upgrade process.

You can continue to use your existing database if it is a version that is compatible with AEM Forms on JEE. If your current database version is no longer supported, back up the data and restore it to a compatible version.

If you are not changing major application server version and are performing an in-place upgrade, your existing application server must be running to deploy the new EAR files. For all other upgrades, the old application server does not need to run during the process. For more information on in-place or out-of-place upgrades, see *In-placeorOut-of-placeupgrades*

Upgrading to AEM Forms on JEE using Configuration Manager

Upgrading to AEM Forms on JEE modules involves these tasks:

1) Installing AEM Forms on JEE product files.
2) Running Configuration Manager to initiate the configuration, upgrading, and deployment process. The remaining steps (below) are included in this process.
3) Updating and deploying AEM Forms on JEE EAR files to the application server.

   NOTE: For an in-place upgrade, you must manually undeploy the existing AEM Forms EAR files from the application server.
4) Starting AEM Forms on JEE on the application server, so that it is available to accept user requests. This is done automatically after the EAR files are deployed. However, you must start the server manually if it does not start automatically.
5) Initializing the AEM Forms on JEE database so that AEM Forms on JEE specific schema changes are incorporated in the database without affecting the existing data.

   NOTE: This step is mandatory and must not be skipped during an upgrade. It does not affect existing data in any way.
6) Patching existing AEM Forms on JEE components with new versions and deploying new AEM Forms on JEE components, if any.
7) Migrating to the database, essential data, as well as all remaining data, such as audit records that are submitted or historical data that are associated with forms workflow.

3.4. Updating client libraries

JBoss Application Server

If your custom applications use JAR files (client-libs) that are specific to JBoss, you must ensure that the JBoss-specific client-lib files are also updated within the custom applications to avoid seeing any issues while using them.

The JBoss client libraries are located in the *client* directory in `third_party/jboss.zip` on the AEM Forms on JEE installation media (DVD or ESD).

General Issues

If your custom applications uses the `adobe-livecycle-client.jar` file, after upgrade, you may see an exception in your application server logs while using custom applications. The exception may look similar to:

```
java.io.FileNotFoundException: Response: '403: Forbidden' for url:
'http://localhost:8080/DocumentManager'
```

To avoid these errors when running your custom applications, do one of the following tasks (the first task is the preferred method):

- Replace the adobe-livecycle-client.jar file used in your custom application with the AEM Forms on JEE adobe-livecycle-client.jar file located in *[aem-forms root]*/sdk/client-libs/common

- Log in to administration console and click **Settings > Core System Settings > Configurations**. Select the options **Allow non secured document upload from Flex applications** and **Allow non secured document upload from Java SDK applications**, click **OK** and restart your application server.

3.5. Upgrading the Connectors for ECM

Upgrading connectors is supported in all scenarios. However, the steps are different, depending on support for the server version of your connector, in AEM Forms on JEE. Upgrading connectors for ECM is supported:

- If your current ECM server is a version supported in AEM Forms on JEE, you can upgrade without any issues.

- If your current ECM server is an unsupported version, run the AEM Forms on JEE upgrade first. After upgrading AEM Forms on JEE, you can then upgrade your ECM server to a supported version. Install the new ECM client and then configure your applications to work with the client.

NOTE: If the ECM content server is upgraded before Connector for IBM FileNet or Connector for EMC Documentum is upgraded to AEM Forms on JEE, run-time configuration information for AEM Forms on JEE, such as shared locks on the resources, will not be available and migrated to AEM Forms on JEE.

See the appropriate section in *Systemrequirements* to verify supported ECM versions.

4. Preparing your environment for upgrading

4.1. Before you begin upgrade

Before you begin the upgrade, perform the following tasks to prepare your environment:

- Ensure that your existing platform (that is, application server, database, operating system, and hardware) is supported for AEM Forms on JEE. For more information, refer to the AEM Forms Supported Platform Combinations document.

- Read the Upgrade Checklist and Planning guide and complete all the verification tasks and validation checks on your existing environment.

- Based on the findings of the Upgrade Checklist and Planning document, update any QPAC-based workflows to DSC-based workflows. To do this, either use the Workbench (versions 9.0 or later) Process Upgrade Tool or manually write DSC/Service operations.

- The architecture and topologies recommended for AEM Forms are different from LiveCycle. You may require a change in the current topology. For architecture and recommended topologies, see Architecture and deployment topologies for AEMForms.

4.2. Backing up the existing AEM Forms environment

Before you start the upgrade process, you must back up all the files and directories that are associated with the previous deployment, including the Java SDK, installation files, and watched folder contents. You must use cold backup strategies to backup your existing AEM Forms environment.

The files and directories that must be backed up are outlined in the "Files to backup and recover" section of the administrationhelp.

For more information on how to backup the necessary files and folder, see the "AEM forms Backup and Recovery" section of the administrationhelp.

IMPORTANT: Ensure that the forms server has been shut down before attempting a backup of your files and directories. Also, ensure that you perform a backup of the database first, and then of the GDS directory.

4.3. Gathering required information before you start

This section serves as a checklist for the information that you need during the upgrade process. During the upgrade, you will be instructed or prompted to provide this information. If you ensure that it is available before you begin, you can speed up the process and minimize any server downtime.

Determining important ports

Note the JNDI port number for your application server (JBoss or WebSphere) and listener port for your database instance, which you plan to use for upgrading to AEM Forms.

If you are not sure which ports the database uses, contact your database administrator.

JBoss:

1) Navigate to the correct directory:
   – When upgrading to AEM Forms on JEE for JBoss, navigate to the right folder:
     • If using JBoss Turnkey, navigate to the [appserver root]/server/lc_<database type>/conf directory
     • If using Adobe pre-configured JBoss, navigate to the [appserver root]/server/lc_<database type>/conf directory
     • If using JBoss downloaded from the Internet, navigate to the [appserver root]/server/lc_<database type>/conf directory

2) Open the standalone.xml file.

3) Find the `socket-binding-group` element. The JNDI server port should be listed in it.

WebSphere

1) Log in to the WebSphere Administrative Console.

2) In the navigation tree, click **Servers** >**Server Types > WebSphere application servers.**

3) On the right pane, click the server name.

4) Under Communications, click **Ports**, and find the value of BOOTSTRAP_ADDRESS.

Server names

If you are performing a staged installation of AEM Forms product files, and running Configuration Manager from a different computer than the target server, you must know the hostname of the system that AEM Forms will be deployed on.

5. System requirements

5.1. Prepare your server environment

Do the following tasks to prepare your server environment:

1) Read the AEM Forms on JEE Supported Platforms document and ensure that your software, hardware, operating systems, application server, databases, JDKs, and other infrastructure are compliant.

2) Install and configure the operating system, and update with the necessary patches and service packs.

3) Install and configure database server.

4) Install and configure the application server.

5.2. In-place or out-of-place upgrades

If you are performing an out-of-place upgrade, prepare the application server according to the instructions in this document.

When you are ready to upgrade to AEM Forms on JEE, refer to the following document for instructions on performing the upgrade:

• Upgrading to AEM Forms on JEE for JBoss

• Upgrading to AEM Forms on JEE for WebSphere

• Upgrading to AEM Forms on JEE for JBoss Turnkey

Supported platforms for an in-place upgrade

The ability to perform an in-place upgrade to AEM Forms on JEE depends on the previous version of server you are upgrading from.

If AEM 6.2 Forms or AEM 6.3 Forms are installed in an environment described in the Supported Platform Combinations document, you can perform an in-place upgrade.

5.3. Supported Platforms

5.4. Privileges required to install on Windows

When installing on Windows, you must use an account that has administrator privileges. If you run the installer using a non-administrator account, provide the credentials of an account that has administrator

privileges, when asked. Also, turn off the Windows UAC. AEM Forms installation and configuration processes require the UAC to be disabled.

5.5. Minimum database user permissions

Database	Initialization permissions	Runtime permissions
Oracle	CREATE SESSION CREATE CLUSTER CREATE TABLE CREATE VIEW CREATE SEQUENCE UNLIMITED TABLE SPACE	CREATE SESSION UNLIMITED TABLE SPACE (only needed if you do not configure user quotas) CREATE TABLE
SQL Server - DB level	Create Table Create View Connect	Connect
SQL Server - Schema level	Alter Insert References Select Update Delete	Insert Select Update Delete

5.6. Synchronizing clock times

You must ensure that all computers in a horizontal cluster synchronize their clock times regularly. Your AEM Forms on JEE installation may encounter problems if the node times differ by more than a few seconds.

Apply the standard time synchronization practices employed by your network to all computers of the AEM Forms on JEE cluster.

5.7. (Optional) Additional system requirements

Certain capabilities/platforms have a few additional requirements for:

• Linux

• PDF Generator

• AEM Forms IPv6 support

• Connectors for IBM File Net, Documentum, and IBM Content Manager

• Forms, Output, and ConvertPDF services

- AEM Forms on JEE with a Luna HSM cluster
- LDAP Configuration
- Processes with document form variables and digital signatures
- *AEMFormsCredentialsandCertificates*

6. Appendix - Additional system requirements

PDF Generator, AEM Forms IPv6 support, Connectors for IBM File Net, Documentum, IBM Content Manager, and Forms, Output and ConvertPDF services, and some other components require a few additional settings. Perform these settings only if you are configuring these capabilities.

6.1. Additional requirements for Linux and UNIX based platforms

NOTE: On Linux and UNIX platforms, AEM Forms on JEE installer uses the JDK installed on the machine. Therefore, you must ensure to install the supported JDK version. On other operating systems, the installer uses the JVM bundled with the installer.

Installing and configuring UTF-8

When installing AEM Forms on JEE on Linux and UNIX based operating systems, you must install and configure the US English version of UTF-8 locale if it is not already installed. You will need the install media (CDs or DVDs) for the operating system to perform this task.

NOTE: On Linux platforms, this locale is installed by default and is called en_US.utf8. It can be verified by using the `locale -a` command.

Installing UTF-8 on AIX

1) Verify the US English UTF-8 locale is not installed by typing `locale -a` in a command prompt. Verify that the command output does not contain the entry *EN_US.UTF-8*.

2) Access the AIX SMIT utility (in text mode) by typing `smitty mle_add_lang` at the root in the command prompt.

3) On the screen that appears, select **UTF-8 US English (United States) [EN_US]** from both the **CULTURAL CONVENTION** and **LANGUAGE TRANSLATION** drop-down lists.

   NOTE: Keep the INPUT DEVICE/DIRECTORY as the default /dev/cd0 setting.

4) Press **Enter** to proceed. A message such as the following will appear:

   ```
   installp: Device /dev/cd0 not ready for operation.
   Please insert media and press Enter to continue.
   ```

5) Insert the appropriate AIX install disk in the disk drive.

6) When the command is complete, exit the SMIT utility and type `locale -a`to verify that EN_US.UTF-8 is set as the locale.

Linux

On Linux operating systems, ensure the following:

• **All Linux distributions:**

–   Ensure that X Window libraries are installed on your operating system. This is required for PDF Generator and Forms. See documentation for your operating system for more information.

–   Install the latest version of 32-bit libcurl, libcrypto, and libssl libraries.

–   Ensure that the directories /usr/lib/X11/fonts and /usr/share/fonts exists. If the directories do not exist, then use the ln command to create a symbolic link from /usr/share/X11/fonts to /usr/lib/X11/fonts and another symbolic link from /usr/share/fonts to /usr/share/X11/fonts. Also ensure that the courier fonts are available at /usr/lib/X11/fonts

–   Ensure that all the fonts (Unicode and non-unicode) are available in the /usr/share/fonts or /usr/share/X11/fonts directory.

–   On RedHat Enterprise Linux 7.x, the courier fonts are not available, download the font-ibm type1-1.0.3.zip archive. Extract the archive at /usr/share/fonts. Create a symbolic link from /usr/share/X11/fonts to /usr/share/fonts. Delete all the .lst font cache files from the Html2PdfSvc/bin and /usr/share/fonts directories.

•   **SUSE Linux:** You must install the glibc-locale-32bit library that ships with SUSE Linux Enterprise Server; otherwise, AEM Forms on JEE will not generate PDF files. This library file is not installed by default, you must use YaST to install it. (See the SUSE Linux Enterprise Server documentation for details.)

Configuring the file limit values on non-Windows operating systems

To avoid StuckThread issues on a non-Windows operating systems environment, add or increase the rlim values in the /etc/system file.

1) (**Linux**) Locate and open the /etc/security/limits.conf file.

2) (**Linux**) Add the following lines to the /etc/security/limits.conf file:

```
<app_group> soft nofile 65553
<app_group> hard nofile 65553
```

Replace <app_group> with the user group who will run the application server. You may also replace < app_group > with an asterisk (*) to match all users and user groups.

3) Save and close the file.

4) Restart your computer.

Verify the updated settings

1) Launch a new shell.

2) Type `ulimit -n` and press **Enter**.

3) Verify the value returned matches the `rlim` values you have set.

6.2. LDAP configuration

This configuration is optional and required only if you are using an LDAP directory to authenticate users.

When you upgrade Rights Management, LDAP configuration settings are automatically migrated.

If you do not have an existing LDAP server and database, install and configure your LDAP server and database according to the vendor's documentation. Make note of the LDAP administrator name and password to use during the AEM Forms on JEE configuration process. Configure AEM Forms on JEE to connect with the LDAP database after you install and deploy your services that are part of AEM Forms on JEE. This configuration is done by using the User Manager service.

See the Upgrading to AEM Forms on JEE document for your application server.

6.3. Upgrade: Processes with document form variables and digital signatures

If you are upgrading from a previous version of AEM Forms on JEE and changing your AEM Forms on JEE Server, you may disrupt any processes that use the document form variable or digital signatures. This is because these forms are rendered only once, setting the submit URL. Changing the server breaks the certificate.

Choose the solution that is most appropriate for your AEM Forms on JEE environment from the following solutions:

Solution 1: Complete all processes that use a form document variable before you upgrade or move to the remote server. Use this method if you maintain legacy AEM Forms on JEE servers after the upgrade. This approach also eliminates the need for*throw-away* work to be done to manage the redirection of the form submissions. This method is not practical if you have many outstanding processes.

Solution 2: If the server being upgraded is not being decommissioned, a reverse proxy approach is preferable. With this method, you maintain the reverse proxy on the old system until all the migrated processes are completed.

S olution 3: You can use the Apache `mod_rewrite` module to modify the embedded URLs in each form as they are delivered to the client.

NOTE: If your AEM Forms on JEE implementation is on IPv6, clients using EJB invocation for PDF creation report exceptions. This is a known issue attributed to Sun JDK 6.

6.4. Additional requirements for PDF Generator

NOTE: You cannot use the Shared Printer Protocol for the `SendToPrinter` API on Windows 2016 machines that have PDF Generator deployed on them. Use alternate protocols like CIFS or Direct IP.

User account for Windows

You must use a user account with administrator privileges for the following tasks:
- Installing Microsoft Office
- Installing PDF Generator
- Installing Acrobat for PDF Generator (Windows only)
- Running the application server process

NOTE: When you add users for PDF Generator, grant the user running the application server with the Replace a process level token privilege.

User account for non-Windows operating systems

You must use a user account with administrator privileges for the following tasks:

• Installing PDF Generator

• Running the application server process

• Running the `sudo` command

NOTE: When you add users for PDF Generator, grant the user running the application server with the Replace a process level token privilege.

Native file conversion software installation

Before you install PDF Generator, install the software that supports the file formats for which PDF conversion support is required and manually activate the licenses for the software using the user account that is used for running the application server process.

Refer to the individual licensing agreement for each native application that your AEM Forms on JEE deployment will support, and ensure that your AEM Forms on JEE deployment meets the licensing requirements specified. Typically, each AEM Forms on JEE user who will use native application support must also have an activated license on their own computer for the native application.

PDF Generator can be extended to convert additional file types to PDF files by using third party native file conversion applications. For the complete list of supported application and file formats, see Supported Platform Combinations document.

NOTE: PDF Generator uses native applications to convert the supported file formats to PDF. Unless otherwise indicated, only the German, French, English, and Japanese versions of these applications and platforms (operating systems) are supported. Also, ensure that the supported languages are installed on underlying platform (operating system).

NOTE: AEM Forms on JEE supports only 32-bit editions of all the above mentioned software.

NOTE: OpenOffice 3.4 or later must be installed on the server to convert the documents created in version 3.4.

NOTE: Native file conversion software might have initial registration/activation dialogs. Dismiss all the initial registration/activation dialogs for all the PDFG user accounts configured on the server.

NOTE: On Linux platform, OpenOffice must be installed under `/root` user. If OpenOffice is installed for specific users, PDFG might not be able to convert OpenOffice documents.

NOTE: End users should not use software applications used by PDF Generator on the server. This can lead to interference with PDF Generator conversions.

You do not need to install a native software application to convert the following native file formats:

• Print files (PS, PRN, EPS)

• Web files (HTML)

- Image files (JPEG, GIF, BMP, TIFF, PNG)

Installing Acrobat for PDF Generator (Windows only)

Install Acrobat DC Pro before running the AEM Forms on JEE installer. Ensure that you launch Acrobat at least once after installing it to avoid PDF Generator configuration issues. Dismiss all modal dialog boxes that appear on launching Acrobat. *NOTE: Ensure that Acrobat is installed using the same user account that you will use to install AEM Forms on JEE.*

However, if AEM Forms on JEE is installed and Acrobat DC Pro is not installed, install Acrobat DC Pro and then run the Acrobat_for_PDFG_Configuration.bat script, located in the folder *[aem-forms root]*\pdfg_-config. Otherwise, PDF conversions will fail.

The Configuration Manager sets the Acrobat_PATH (case-sensitive) environment variable automatically. You can also choose to set it manually, see *Settingenvironmentvariables*. Restart your application server after setting the environment variable.

Configure Acrobat to use SHX fonts (Windows only)

NOTE: Perform these steps to configure Acrobat if you want PDF Generator to use SHX fonts to convert AutoCAD DWG files without installing AutoCAD. Also, these steps need to be performed for all user accounts configured in administration console.

1) Open Acrobat.
2) Select **Edit > Configurations**.
3) Select **Convert to PDF > Autodesk AutoCAD**.
4) Click **Edit Settings**.
5) Click **Configuration Preferences**.
6) Click **Browse** next to the SHX Font File Search Path and specify the path to the SHX font file.
7) Click **OK** on each opened dialog.

QuickTime 7

PDF Generator requires that QuickTime 7.7.9 or later (Player or Pro) be installed if you want to convert video embedded in files, such as PowerPoint presentations to PDF multimedia files. This application is available from the Apple Downloads site.

Setting environment variables (Windows only)

You must set the environment variables in Windows if you plan to create PDF documents from applications such as Photoshop and WordPerfect.

The names of these environment variables are listed here:

- `Notepad_PATH`
- `OpenOffice_PATH` (This variable is applicable for both, Windows and Linux.)

- `WordPerfect_PATH`
- `Acrobat_PATH`

These environment variables are optional and need to be set only if you plan to use the corresponding application to convert PDF files through PDF Generator. The value of the environment variable should contain the absolute path of the executable that is used to start the corresponding application.

Configuring PDF Generator on a Remote Machine

In case of a cluster, AEM Forms on JEE is installed only on one machine. Perform the following steps to configure PDF Generator on other machines in the cluster:

1) On the remote machine, if an earlier version of Acrobat is installed, uninstall it by using Add or Remove Programs in the Windows Control Panel.

2) Install Acrobat DC Pro by running the installer.

3) From the machine where AEM Forms on JEE is installed, copy `pdfg_config` and `plugins` folders to the remote machine under any directory.

4) On the remote machine, open /pdfg_config/ Acrobat_for_PDFG_Configuration.bat file for editing.

5) Locate and comment the `goto locationerror` line.
   Before
   `goto locationerror`
   After
   `rem goto locationerror`

6) Save and close the Acrobat_for_PDFG_Configuration.bat file.

7) Open the command prompt and run the following command:
   `Acrobat_for_PDFG_Configuration.bat <Path of the pdfg_Configuration folder>`

Service Control Manager command line tool

Before you complete an automatic installation of PDF Generator on Windows, ensure that the Service Control Manager command line tool, sc.exe, is installed in the Windows environment. Some Windows servers do not have this software preinstalled. By default, the sc.exe file is installed in the C:\Windows\system32 directory. Most OS installations have this tool installed. If you do not have the tool installed, it is available in the Windows Resource Kit for your specific version of Windows. To confirm that the tool is installed on your server, type `sc.exe` from a command prompt. The tools usage is returned.

NOTE: For PDF Generator to work properly, ensure that AEM Forms on JEE is running as a Windows service and the service must run under the Local System account.

Headless mode configuration

If you are running PDF Generator in a headless mode environment (that is, on a server without a monitor, keyboard, or mouse), the x11 libraries must be installed. Some flavors of Linux do not install these libraries by default; therefore, you must obtain the libraries and install them manually.

NOTE: Activating x11 forwarding on a shell session causes the SOAP UI to create UI elements during SOAP requests, leading to request failures. To avoid request failures, you must add the `-Djava.awt.headless=true` *JVM argument to application server startup parameters. For specific steps, see application server documentation.*

Enabling multi-threaded file conversions and multi-user support for PDF Generator

By default, PDF Generator can convert only one OpenOffice, Microsoft Word, or PowerPoint document at a time. If you enable multi-threaded conversions, PDF Generator can convert more than one of the documents concurrently by launching multiple instances of OpenOffice or PDFMaker (which is used to perform the Word and PowerPoint conversions).

NOTE: Multi-threaded file conversions (through Microsoft Office) are only supported for Microsoft Word and Microsoft PowerPoint.

NOTE: Microsoft Excel, Publisher, and Project files are not converted simultaneously. During conversion, EXCEL.exe, PUBLISHER.exe, and PROJECT.exe are watched in the task manager.

Each instance of OpenOffice or PDFMaker is launched using a separate user account. Each user account that you add must be a valid user with administrative privileges on the AEM Forms on JEE Server computer. For more information, see ConfiguringWindowsinstallation

After your AEM Forms on JEE Server is configured, add AEM Forms on JEE user accounts in administration console. See the User accounts for multi-threaded file conversions section in the AEM Forms on JEE installation guide for your application server. To enable multiuser support for native files and OpenOffice files on a Windows environment, add a minimum of three users with the following permissions.

When you add users for PDF Generator native conversions, grant the user running the application server with the Replace a process level token privilege.For more information, see *Granting the Replace a process level token privilege (Windows only)*

Dismiss initial dialogs and disable automatic updates for native applications

Converting native files from PDF Generator requires dismissing any initial registration, activation, and Improvement program dialogs with the option to not show them again. Automatic updates for these applications also needs to be disabled as these update dialogs can cause failures on a running server.

The dialogs and automatic update need to be disabled for the user running the server and all user accounts configured under PDFG Accounts for multi-user support. The dialogs need to be dismissed for all third-party applications if installed on the server:

NOTE: Ensure that you launch Adobe Acrobat Distiller at least once for all the PDFG user accounts configured on the server.

Disable error reporting on Windows Server 2016 (Optional but recommended)

While converting a document to PDF using PDF Generator on Windows Server 2016 Windows may report that the executable has encoutered a problem and needs to close. However, it does not impact the PDF conversion as it continues in the background.

To avoid receiving the error, you can disable the Windows error reporting. For more information on disabling error reporting, see https://technet.micro-soft.com/en-us/library/gg232692%28v=ws.10%29.aspx.

Additional configuration required for OpenOffice on non-Windows operating systems

1) Add entries for additional users (other than the administrator who runs the AEM Forms on JEE Server) in the /etc/sudoers file. For example, if you are running AEM Forms on JEE as a user named lcadm and a server named myhost, and you want to impersonate user1 and user2, add the following entries to /etc/sudoers:

    lcadm myhost=(user1) NOPASSWD: ALL

    lcadm myhost=(user2) NOPASSWD: ALL

    This configuration enables lcadm to run any command on host 'myhost' as 'user1' or 'user2' without prompting for password.

2) Allow all the AEM Forms on JEE users to make connections to the AEM Forms on JEE Server. For example, to allow a local user named user1 the permission of making the connection to the AEM Forms on JEE Server, use the following command:

    xhost +local:user1@

    Ensure that the session with which the application server started should not get closed.

    For more details, refer to xhost command documentation.

3) Restart the server.

Multi-user support for PDF Generator

To enable multi-user support for native files and OpenOffice files on a Windows environment, a minimum of three users with the following permissions must be added. On a non-Windows operating systems platform, create at least one user.

Platform	User permissions
Windows Server	Users with administrative privileges, Read/write permission on AEM Forms on JEE temporary directory, PDF Generator temporary directory and application server installation directory.

non-Windows operating systems	Users with `sudo` privileges Read/write permission on AEM Forms on JEE temporary directory, PDF Generator temporary directory, and application server installation directory.

When you add users for PDF Generator native conversions, you must grant the user running the application server with the *Replace a process level token* privilege. See *Granting the Replace a process level token privilege (Windows only)*.

Granting the Replace a process level token privilege (Windows only)

User account that are used to start the application server should be part of the local administrators group and requires the *Replace a process level token* privilege. To provide *Replace a process level token*privilege:

1)   Click Start > Run, and then type `gpedit.msc`.

2)   On the Group Policy dialog box, select **Computer Configuration** > **Windows Settings** > **Security Settings** > **Local Policies** > **User Rights Assignment**, and double click **Replace a process level token**.

3)   Click **Add User or Group**, add the Windows user account that is used to open the command prompt from which the application server is started.

4)   Restart Windows, and then start the application server.

Symbolic link on Linux platform

To substitute required fonts in a HTML-to-PDF conversion on the Linux platform, PDF Generator creates a symbolic link that point to the /usr/share/X11/fonts directory.

Sometimes the user running the application server might not possess permissions that are necessary to create a symbolic link. On such systems; create a symbolic link `/usr/lib/X11/fonts` that point to the `/usr/share/X11/fonts` directory.

Additional requirements for Red Hat Enterprise Linux

PDF Generator requires additional RPM packages and fonts to perform conversions on RHEL. Perform the following steps to configure the PDF Generator on RHEL:

1)   Install the RPM packages for your RHEL version. The following versions are for RHEL7:
  –   glibc-2.12-1.25.el6.i686.rpm
  –   nss-softokn-freebl-3.12.9-3.el6.i686.rpm
  –   libX11-1.3-2.el6.i686.rpm
  –   libxcb-1.5-1.el6.i686.rpm
  –   libXau-1.0.5-1.el6.i686.rpm
  –   zlib-1.2.3-25.el6.i686.rpm

- libXext-1.1-3.el6.i686.rpm
- fontconfig-2.8.0-3.el6.i686.rpm
- expat-2.0.1-9.1.el6.i686.rpm
- freetype-2.3.11-6.el6_0.2.i686.rpm
- libSM-1.1.0-7.1.el6.i686.rpm
- libICE-1.0.6-1.el6.i686.rpm
- libuuid-2.17.2-12.el6.i686.rpm
- libXrandr-1.3.0-4.el6.i686.rpm
- libXrender-0.9.5-1.el6.i686.rpm
- libXinerama-1.1-1.el6.i686.rpm

2) In your browser, open website
   `http://cgit.freedesktop.org/xorg/font/ibm-type1/`
3) Download the compressed file `font-ibm-type1-1.0.3.tar.gz`or
   `font-ibm-type1-1.0.3.zip.`The compressed file contains required fonts.
4) Extract the downloaded zip file to the `/usr/share/fonts` directory.

Configuring user accounts for multi-threaded file conversions

By default, PDF Generator can convert only one OpenOffice, Microsoft Word, or PowerPoint document at a time. If you enable multi-threaded conversions, PDF Generator can convert more than one of the documents concurrently by launching multiple instances of OpenOffice or PDFMaker (which is used to perform the Word and PowerPoint conversions).

If you need to enable multi-threaded file conversion, you must first perform the tasks outlined in the "Enabling multi-threaded file conversions" section of the Preparing to Install or Upgrade guide available on the AEM Forms on JEE documentation.

For non-Windows operating systems users, you must create users and configure the system to remove the password prompts. The following section outlines the method to create a user and perform additional configurations.

Add user account

1) In administration console, click **Services** > **PDF Generator**> **User Accounts.**
2) Click **Add** and enter the user name and password of a user who has administrative privileges on the AEM Forms on JEE Server. If you are configuring users for OpenOffice, dismiss the initial OpenOffice activation dialogs.

   NOTE: If you are configuring users for OpenOffice, the number of instances of OpenOffice cannot be greater than number of user accounts specified in this step.
3) Restart the AEM Forms on JEE Server.

Manual use of Acrobat restricted

If you installed the PDF Generator for native document conversion, use of the bundled Acrobat installation is restricted to the Generate PDF service and is not licensed for any other use.

6.5. Additional requirements for Connector for Documentum

If AEM Forms on JEE is connecting to Documentum, you must install Document Foundation Classes on machine hosting AEM Forms on JEE.

6.6. Additional requirements for Connector for IBM Content Manager

NOTE: For upgrade, these configurations are only required if you do not have Connector for IBM® Content Manager installed on your existing installation but will license it on AEM Forms on JEE or if you are performing an out-of-place upgrade on a new operating system.

Connector for IBM Content Manager requires the following software installed (both available from the IBM website):

• DB2 Universal Database Client
• IBM Information Integrator for Content (II4C)

See "Post-Deployment Activities" chapter in the Upgrading AEM Forms on JEE document for your application server.

Configure the connection for a single IBM Content Manager datastore

1) Start the DB2 Configuration Assistant.
2) Click **Selected>Add Database Using Wizard**.
3) Select **Manually Configure a Connection to a Database** and click **Next**.
4) Select **TCP/IP** and click **Next**.
5) Specify the following TCP/IP communication options and then click **Next**:
   – In the **Host Name** box, type the host name of the server hosting DB2 Content Manager.
   – Leave the Service Name box empty.
   – In the **Port Number** box, type the port number. The default DB2 Content Manager port number is 50000.
6) In the **Database Name** box, type the IBM Content Manager datastore name and, in the **Database Alias** box, type the alias name for the datastore and then click **Next**.
7) Click **Next** to accept the default data source settings.
8) In the **Operating System** list, select the operating system you are using and then click **Next**.
9) Specify the following system options and then click **Next**:

- In the **System Name** box, type the server name hosting DB2. If you click Discover, DB2 Content Manager searches for the system name you specified and, if the system is not found, all of the DB2 instances are listed.

- In the **Host Name** box, type the name of the host, or click View Details to show the domain and IP address of the system you named in the previous step.

- In the **Operating System** list, select the operating system on which you deployed DB2 Content Manager.

10) (Optional) To specify Security options, select **Use Authentication Value in Server's DBM Configuration** and click **Finish**.

11) In the Test Connection dialog box, test the connection as required.

Configure connections for multiple IBM Content Manager datastores

1) Configure the initial connection by following the steps in *ToconfiguretheconnectionforasingleIBM-ContentManagerdatastore:*.

2) Add additional database connections by modifying the cmbicmsrvs.ini file (the file that stores the datastore information) as follows:

- From a command prompt window, change the directory to *[II4C home]*/bin (for example, C:\Program Files\db2cmv8\ on Windows **or** /opt/IBM/db2cmv8 on non-Windows operating systems).

- Run the cmbenv81.bat (Windows) or cmbenv81.sh (non-Windows operating systems) file to set the environment and the classpath for the Java Utilities of II4C.

- Change the directory to *[II4C working directory]*/cmgmt/connectors where *[II4C working directory]* is one of the following paths:

   (Windows) C:/Program Files/db2cmv8

   (Linux) /home/ibmcmadm

- Run the command

   ```
   java com.ibm.mm.sdk.util.cmbsrvsicm –a add –s <library server database
   name> -sm <database schema name>
   ```

   where `<library server database name>` *is the same as* `Database Alias` *configured in step 6 above.*

NOTE: The following procedure allows users without DB2 rights to share the connection credentials through the cmbicmenv.ini file.

Configure a multiuser connection to the IBM Content Manager datastore

1) From a command prompt window, change the directory to *[II4C home]*/bin (for example, C:\Program Files\db2cmv8\ on Windows **or** /opt/IBM/db2cmv8 on non-Windows operating systems).

2) Run the cmbenv81.bat (Windows) or cmbenv81.sh (non-Windows operating systems) file to set the environment and the classpath for the Java Utilities of II4C.

3)   Change the directory to *[II4C working directory]*/cmgmt/connectors, where *[II4C working directory]* is one of the following paths:

(Windows) C:/Program Files/db2cmv8

(Linux) /home/ibmcmadm

4)   Run the command

```
java com.ibm.mm.sdk.util.cmbenvicm -a add -s <library server database
name> -u <database user ID> -p <database password>
```

where `<library server database name>` *is the same as* `Database alias` *configured in step 6 above.*

6.7. Additional requirements for Connector for IBM FileNet

These requirements are optional and required only if you are installing Connector for IBM® FileNet.

NOTE: For upgrade, these configurations are only required if you do not have Connector for IBM FileNet installed on your existing installation but will license it on AEM 6.4 Forms or if you are performing an out-of-place upgrade on a new operating system.

IBM FileNet 5.x

If AEM Forms on JEE is connecting to IBM FileNet Content Engine, you must install the Content Engine Java Client. Use the IBM FileNet content engine client installer located by default in C:\Program Files\FileNet\CEClient. During installation, select at least one of the components from Application Engine or Process Engine on the component selection screen.

For IBM FileNet Process Engine, you must install the IBM FileNet Process Engine Client located by default in C:\Program Files\FileNet\BPMClient. During installation, select the Other option on the component selection screen.

NOTE: IBM FileNet 5.2 and IBM FileNet 5.5.2 are supported.

6.8. AEM Forms on JEE IPv6 support

AEM Forms on JEE includes IPv6 support. The default configurations defined in the installation documentation for AEM Forms on JEE set IPv4 as the default IP protocol because this protocol has the most compatibility with third-party infrastructure.

Do not enable IPv6 unless your deployment must use it. The number of supported platform configurations is reduced when enabling IPv6 support with AEM Forms on JEE. You should verify that all third-party software, hardware, and networks that you plan to use have IPv6 support before you attempt to enable IPv6.

NOTE: If you are enabling CIFS in an IPv6 environment, you must explicitly enable IPv6 configuration after you configure your AEM Forms on JEE installation using Configuration Manager. See "Enabling CIFS in IPv6 mode" in the guide for your application server.

Supported IPv6 configurations

Not all infrastructure components support IPv6. For example, Oracle database does not support IPv6. You can use these databases by configuring the connection between the application server and the databases with IPv4, and the remaining communications over IPv6.

Check with your component vendor if IPv6 is supported.

IPv6 implementation guidelines

When you use IPv6 implementation either partially or fully, keep the following points in mind:

- After installing AEM Forms on JEE, do not use the option to start the Configuration Manager directly from the AEM Forms on JEE installer. Instead, navigate to the *[aem-forms root]*\configurationManager\bin\IPv6 directory, and run the IPv6-specific script (`ConfigurationManager_IPv6.bat` or `ConfigurationManager_IPv6.sh`) to launch the Configuration Manager.

- If you have chosen to validate the application server configuration using the Configuration Manager, the validation will fail after you enable IPv6 for the application server. You can ignore this error message during the process. After you restart the application server in the IPv6 mode, the application server can connect to the database.

- To have a pure IPv6 communication with the database server, modify EDC_DS, AEM_DS, and IDP_DS connection settings to use the hostname of the database which resolves to a numeric IPv6 address.

- Many software components such as database drivers do not completely support numeric IPv6 addresses. So, it is recommended that you use a DNS-resolved hostname instead of numeric IPv6 addresses.

- Ensure that name used for mapping IPv6 is added to the CSRF filter section. If the name is not added, see Preventing CSRF attacks section in administration help.

  NOTE: Name used for mapping IPv6 must not contain square brackets ([]).

- In an IPv6 environment, if you are using Microsoft SQL Server, you should specify the database server IP address in the following format. Note that in this string, *;serverName* is a keyword, and so must not be replaced with the actual server name.

  ```
  jdbc:sqlserver://;serverName=<IPv6 address>;
  portNumber=<port>;databaseName=<db_name>
  ```

  Here, instead of the numeric IPv6 address, you can specify the hostname of the SQL Server database.

Configuring IPv6 for JBoss

1) You can download and install JBoss from http://www.jboss.org/jbossas/downloads/ or obtain the jboss.zip file from the third-party directory on the installation media and extract the bundled JBoss.

2) Modify lc_turnkey.xml and the database-specific data source configuration file to connect to the AEM Forms on JEE database.

3) Modify the lc-turnkey.xml file to connect to the AEM Forms on JEE database.

4) Modify the following files to enable IPv6:

– ***(JBoss on Windows)*** [appserver root]\bin\standalone.conf.bat

(JBoss on other platforms) *[appserver root]\bin\standalone.conf*

- Change `-Djava.net.preferIPv4Stack=true` to `-Djava.net.preferIPv6Stack=true`.

- Add the `-Djava.net.preferIPv6Addresses=true` argument.

5) Launch Configuration Manager by invoking the *[aem-forms root]*\configurationManager\bin\IPv6\ConfigurationManager_IPv6.bat or ConfigurationManager_IPv6.sh script.

6) In the Configuration Manager, select the steps to configure EAR files, bootstrap and deploy AEM Forms on JEE modules.

7) After the Configuration Manager process is completed, copy these EAR files to the *[appserver root]*standalone\deployments directory.

8) Start JBoss from a command line.

9) Provide Configuration Manager hostname of the computer that is mapped to its IPv6 address and then bootstrap the application server to deploy the AEM Forms on JEE modules.