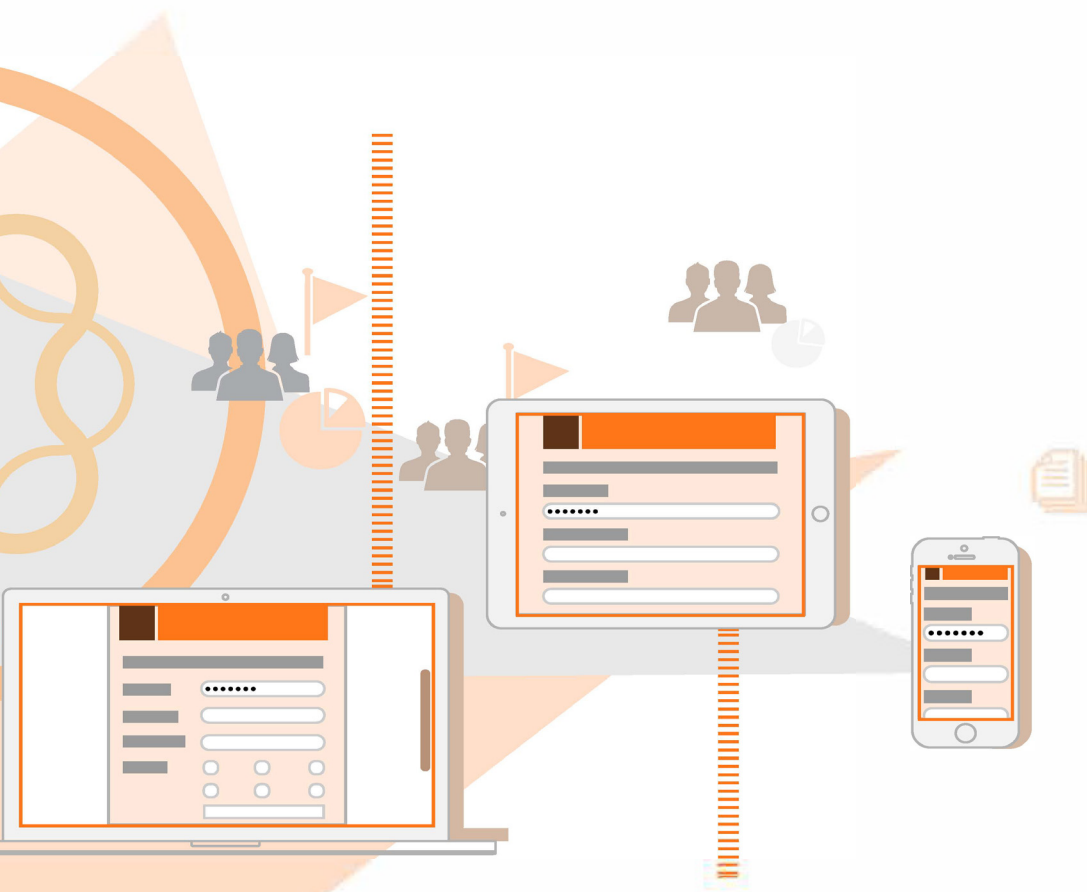


Configuring Adobe Experience Manager Forms on JEE on JBoss Cluster



AEM 6.3 Forms

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1. About this document

AEM Forms on JEE is an enterprise server platform that helps you automate and streamline business processes. AEM Forms on JEE comprises the following components:

- J2EE-based Foundation provides server capabilities and runtime environment
- Tools to design, develop, and test AEM Forms on JEE Applications
- Modules and Services are deployed on AEM Forms on JEE Server, and provide functional services

For more information about the AEM Forms on JEE capabilities, see [Introduction to AEM Forms](#).

1.1. Who should read this document?

This guide provides information for administrators and developers responsible for installing, upgrading, configuring, administering, or deploying AEM forms on JEE. It is assumed that readers are familiar with J2EE application servers, operating systems, database servers, and web environments.

1.2. Conventions used in this document

The installation and configuration documentation for AEM Forms on JEE uses the following naming conventions for common file paths.

Name	Default value	Description
<i>[aem-forms root]</i>	Windows: C:\Adobe\Adobe_Experience_Manager_Forms Linux and Solaris: /opt/adobe/Adobe_Experience_Manager_Forms	The installation directory that is used for all AEM Forms on JEE modules. The installation directory contains subdirectories for Configuration Manager. This directory also includes directories related to the SDK and third-party products.
<i>[appserver root]</i>	JBoss Application Server on Windows: C:\Adobe\Adobe_Experience_Manager_Forms\jboss JBoss Application Server on Linux: /opt/jboss/	The application server directory that is used for all AEM Forms on JEE modules.
<i>[dbserver root]</i>	Depends on the database type and your specification during installation.	The location where the AEM Forms on JEE database server is installed.

Name	Default value	Description
[AEM_temp_dir]	On Windows: C:\Adobe\Adobe_Experience_Manager_Forms\tmp On Linux: /opt/adobe/Adobe_Experience_Manager_Forms/tmp	The temporary directory for AEM Forms on JEE server.
[CRX_home]	On Windows: C:\Adobe\Adobe_Experience_Manager_Forms\crx-repository On Linux: /opt/adobe/Adobe_Experience_Manager_Forms/crx-repository	The directory that is used for installing the CRX repository.

Most of the information about directory locations in this guide is cross-platform (all filenames and paths are case-sensitive on non-Windows operating systems). Any platform-specific information is indicated as required.

1.3. Additional information

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

For information about	See
AEM Forms on JEE and the modules	Introduction to AEM Forms
Preparing to Install AEM Forms on JEE	Preparing to Install AEM forms on JEE (ServerCluster)
Performing administrative tasks	Administrationhelp
All the documentation available for AEM Forms on JEE	AEM Forms on JEEdocumentation
Patch updates, technical notes, and additional information about this product version	Adobe EnterpriseSupport

2. Introduction to Installation, Configuration, and Deployment Process

2.1. Installation, configuration, and deployment overview

Installing, configuring, and deploying AEM Forms on JEE involves the following processes:

- **Installing:** Install AEM Forms on JEE by running the installation program. Installing AEM Forms on JEE places all of the required files onto your computer, within one installation directory structure. The default installation directory is C:\Adobe\Adobe_Experience_Manager_Forms (Windows) or /opt/adobe/Adobe_Experience_Manager_Forms (non-windows); however, you can install the files to a different directory.
- **Configuring:** Configuring AEM forms on JEE modifies various settings that determine how AEM Forms on JEE works. Assembling the product places all of the installed components into several deployable EAR and JAR files, according to your configuration instructions. Configure and assemble the components for deployment by running Configuration Manager. You can configure and assemble multiple AEM Forms on JEE modules at the same time.
- **Deploying:** Deploying the product involves deploying the assembled EAR files and supporting files to your application server on which you plan to run your AEM Forms on JEE. If you have configured multiple modules, the deployable components are packaged within the deployable EAR files. Components and AEM Forms on JEE archive files are packaged as JAR files. ***NOTE:** AEM Forms on JEE archive file use .lca file extension.*
- **Initializing the database:** Initializing the database to be used with AEM Forms on JEE creates tables for use with User Management and other components. Deploying any module that connects to the database requires you to initialize the database after the deployment process.

Before you begin to install and configure AEM Forms on JEE, ensure that you have prepared your environment as described in the applicable Preparing guides.

2.2. Selecting tasks for configuring and deploying

After you have installed AEM Forms on JEE, you can run Configuration Manager to:

- Configure modules in an EAR file for deploying to the application server or cluster of application servers
- Initialize AEM forms on JEE database
- Deploy AEM Forms on JEE components
- Validate AEM Forms on JEE component deployment
- Configure AEM forms on JEE components

2.3. AEM Forms on JEE installation and deployment list

The following list includes the steps that are required for installing AEM Forms on JEE by using the manual method. Your application server or cluster must be installed and configured before you perform the installation.

- Ensure that the required software is installed on each machine and configured in the target environment.
- Ensure that you created and configured the application server cluster in the target environment. You can choose to manually configure JBoss or use the Adobe pre-configured one.
- Run the installation program only on one machine.
- Run Configuration Manager and select the Configure AEM Forms on JEE EARs task. This task configures and assembles AEM Forms on JEE.

Run the manual configuration steps on the machines where AEM Forms on JEE is not installed. For example, copy content repository.

- Deploy the EAR files to the application server or cluster. You must do it manually.
- Run Configuration Manager to initialize the AEM Forms on JEE database and deploy AEM forms on JEE component files.
- Access administration console and User Management.
- (Optional) Configure LDAP access.

3. Configuring JBoss in a Cluster

The JBoss Application Server configuration is defined by a number of configuration files in several directories. To configure JBoss for use in a cluster, you must modify a number of configuration files. You can use any text editor to modify them.

Perform the following tasks to configure your JBoss cluster environment:

- Ensure that you properly prepared all computers in the cluster. (See [Preparing to install](#).)
- Install JBoss Application Server software. (See [Installing JBoss Application Server software](#).)
- Modify the JBoss domain.conf file. (See [Modifying the JBoss domain.conf file](#).)
- Configure database connectivity. (See [Configuring database connectivity](#).)
- Test your JBoss cluster configuration. (See [Testing the JBoss Application Server cluster](#).)

3.1. Preparing to install

Before you install JBoss Application Server on the computers of your cluster, ensure that your system meets the following configuration requirements:

Disk space: Ensure that the partition that will hold the application server has a minimum of 10 GB of free disk space. In addition to the space required to install the product, your environment variable `TEMP` or `TMP` must point to a valid temporary directory with at least 500 MB of free disk space. The downloadable executable requires approximately 500 MB, plus an additional 1.0 GB to unpack the images.

IP address settings: All the computers must have a fixed IP address that is managed through a single DNS.

IP multicast: All the computers must fully support IP multicast packet propagation, which means that all routers and other tunneling technologies must be configured to propagate multicast messages to clustered server instances. The network latency must be low enough to ensure that most multicast messages reach their final destination within 200 to 300 milliseconds. Also, the multicast time-to-live (TTL) value for the cluster must be high enough to ensure that routers do not discard multicast packets before they reach their final destination.

Versions: All the computers in the cluster must have the same version and same service pack of JBoss Application Server software.

Horizontal clustering: If your configuration is horizontally clustered (that is, instances of JBoss Application Server are installed on separate computers), ensure that all computers are on the same network subnet and that the computer clocks are synchronized. (See [Preparing to Install AEM Forms \(Server Cluster\)](#).)

Account privileges: (Only for PDF Generator on Windows) You must install and run JBoss Application Server under a user account that has administrator privileges.

Shared network drive: You must have a secure shared network drive created that all computers in the cluster can access with read and write permissions. (See [Preparing to Install AEM Forms \(Server Cluster\)](#).)

J2SE SDK version: For information on J2SE SDK version, see [Supported Platform Combinations](#) document.

Clocks of all the systems on the cluster might be synchronized to a common time server. In Windows domain, clock synchronization is done automatically. You must set-up Network Time Protocol on non-windows systems.

3.2. Installing JBoss Application Server software

Install and configure JBoss Application Server on each computer of the cluster. The Preparing to Install AEM Forms (Server Cluster) document describes the versions of JBoss Application Server that are supported for AEM Forms.

Install the Adobe-preconfigured JBoss Application Server that is provided on the AEM Forms installation medium under the `third_party` directory. When you extract the `third_party\jboss.zip` file, the following sub-directories are created under the `[appserver root]/` directory along with other default directories:

- (Single server) `standalone`
- (Cluster) `domain`

The standalone folder is for single server installations. For cluster installations navigate to `[appserver root]/domain/configuration` directory to locate the configuration files.

- `domain.xml`
- **(Pre-configured for Microsoft SQL Server)** `domain_mssql.xml`
- **(Pre-configured for MySQL)** `domain_mysql.xml`
- **(Pre-configured for Oracle)** `domain_oracle.xml`

For example, if you plan to use Oracle for Adobe-preconfigured JBoss in a clustering configuration, retain `domain_oracle.xml`.

IMPORTANT: Install only the Adobe-preconfigured JBoss Application Server described above, and then see the following sections of this document to configure the nodes for your cluster. Do not follow the JBoss configuration instructions that are described in [Preparing to Install AEM forms \(Single server\)](#); they apply to a stand-alone configuration and are not appropriate for a clustered configuration.

Installing JBoss Application Server for a horizontal cluster

Install the Adobe-preconfigured JBoss Application Server by extracting the contents of the `JBoss.zip` directory to the location where you intend to install JBoss Application Server on each computer of the cluster. In this setup, the first machine that you setup for cluster acts as a master host and the domain controller runs on this machine. All other machines run as slaves and host controller runs on the slave machines. This installation is fully configured for a horizontal cluster.

Configuring Windows services for JBoss Application Servers

If the JBoss Application Servers of your cluster run on a Windows operating system, you may optionally install Windows services to manage them. The Windows service provides a GUI that simplifies starting and stopping of the application servers of your cluster.

You must install JBoss Application Server before you create the Windows service to manage the application server. You must create a separate Windows service to manage each JBoss Application Server of the cluster. See Appendix-ConfiguringJBossasWindowsService for information about using the JBoss Web Native Connector to configure JBoss as a Windows service.

To start JBoss Application Server as a Windows service:

- 1) On a JBoss Application Server of the cluster, select **Start > Control Panel > Administrative Tools > Services**, then select the Windows service for JBoss Application Server and click **Start**.

NOTE: When starting JBoss Application Server as a Windows service, the console output is redirected to the file server.log. You can inspect the file to discover any errors that occur during service startup.

To stop JBoss Application Server as a Windows service:

- 1) On a JBoss Application Server of the cluster, select **Start > Control Panel > Administrative Tools > Services**, then select the Windows service for JBoss Application Server and click **Stop**.

NOTE: When stopping JBoss Application Server as a Windows service, the console output is redirected to the file server.log. You can inspect the file to discover any errors that occur during service shutdown.

3.3. Modifying the JBoss domain.conf file

Modify the JBoss run file of each JBoss Application Server instance in the AEM Forms on JEE cluster to add AEM Forms on JEE options.

Before you start this procedure, determine how your AEM Forms cluster implements cluster caching so that you can correctly configure an argument for cluster caching. You can implement cluster caching by using either TCP or UDP, but not both. The following factors may affect your choice:

- (Recommended) Use TCP if your cluster is either IPv4-based or IPv6-based. On an IPv6-based cluster, you must use TCP to be IPv6-compliant.
If you implement cluster caching by using TCP, also ensure that you configure the TCP locators correctly. (See “Configuringthecachinglocators(cachingusingTCPonly)” .)
- Option to use UDP is available only for IPv4 based cluster.

TIP: It is recommended to use TCP instead of UDP multicasting for production systems because of the inherent reliability of the TCP protocol.

To modify the JBoss domain.conf file:

- 1) Open the following file in a text editor:
 - (Windows) [appserver root]/bin/domain.conf.bat
 - (UNIX) [appserver root]/bin/domain.conf
- 2) In the JAVA_OPTS line, add or change the following argument:


```
-Dadobeidp.serverName=<server name>
```

NOTE: The value for <server name> can be any value; however, you must configure a unique <server name> value for each node of the AEM Forms cluster, as in this example:

- On one node of the cluster, configure the `-Dadobeidp.serverName=server1` argument
- On another node of the cluster, configure the `-Dadobeidp.serverName=server2` argument.

You can configure additional nodes for the AEM Forms cluster in a similar manner but with unique <server name> values.

- 3) Add the following parameter to all the nodes to overcome the time difference between nodes and the database: `-Doak.documentMK.maxServerTimeDiffMillis=-1`
- 4) In the JAVA_OPTS line, the following argument might already be set for IPv4. If not, then set the argument:

```
-Djava.net.preferIPv4Stack=true
```

For IPv6, Remove `-Djava.net.preferIPv4Stack=true` and add the following arguments:

```
-Djava.net.preferIPv6Addresses=true
```

```
-Djava.net.preferIPv6Stack=true
```

- 5) Configure a JVM argument for cluster caching. In the JAVA_OPTS line, add or change one of the following arguments:

Caching using UDP discovery

- Configure the multicast port argument in the following format:

```
-Dadobe.cache.multicast-port=<port number>
```

NOTE: The value for <port number> can be any available port between 1025 and 65535. The multicast port must be unique to the AEM Forms cluster (that is, the port must not be used by any other cluster on the same network, any attempt to use the same port by any other cluster on the same network would result in bootstrap failure). It is recommended that you configure the same <port number> on all nodes in the AEM Forms cluster, as in this example:

```
-Dadobe.cache.multicast-port=33456
```

- Setting multicast address argument is optional. Default multicast addresses for IPv4 and IPv6 are as following:

```
IPv6 - FF38::1234
```

```
IPv4 - 239.192.81.1
```

If you have restriction on multicast addresses in your network, use following argument to set multicast addresses:

```
-Dadobe.cache.multicast-address=<ip address>
```

The value for <ip address> is the IP address used for multicast networking. The IP address is ignored if `adobe.cache.multicast-port` is zero.

The multicast address must be unique to the AEM Forms cluster and must not be used by any other cluster on the same network. It is recommended that you configure the same <ip address> on all nodes in the AEM Forms cluster. For example:

```
-Dadobe.cache.multicast-address=239.192.81.1
```

- For machines with multiple Network Interfaces

Some machines may be connected to multiple networks via multiple Network Interface Cards (NICs). For such machines, set the JVM property -Dadobe.cache.bind-address to the IP address of the network interface card that you are using for forms server.

-Dadobe.cache.bind-address=<IP Address>

NOTE: It is recommended to set JVM property -Dadobe.cache.bind-address for machines with one Network Interface Card, also.

Caching using TCP only

- For IPv4, configure the cluster locators argument in the following format:

-Dadobe.cache.cluster-locators=<IPAddress>[<port number>],<IPAddress> [<port number>]

For IPv6, configure the cluster locators argument in the following format:

-Dadobe.cache.cluster-locators=<hostname>@<IPv6 address>[<port number>],<hostname>@<IPv6 address>[<port number>]

NOTE: Configure, as a comma-separated list, the locators for all nodes of the cluster. The value for <IPAddress> is the IP address of the computer that is running the locator. The value for <port number> is any unused port between 1025 and 65535. It is recommended that you configure the same <port number> on all nodes in the AEM Forms cluster, as in this example:

-Dadobe.cache.cluster-locators=10.20.30.5[22345],10.20.30.6[22345]

NOTE: Do not run TCP locators on all the nodes of the AEM Forms Cluster. It is good practice to run minimum two locators. One TCP locator serves as a primary locator and other TCP locator serves as a secondary locator to handle failover issues. You can add more than two TCP locators as backup locators but it is not mandatory. For information on configuring TCP locators, see *Configuring the caching locators in clusters (caching using TCP only)*.

- 6) To prevent application server from Denial of Service attacks configure the following JVM argument:
-DentityExpansionLimit=10000
- 7) (Unix only) Open the domain.conf file and search -Dadobe.idp.serverName=server1. The file has multiple instances of searched term, delete an instance.
- 8) Save the edited files.
- 9) Repeat steps 1 to 6 for each node in the cluster.

3.4. Configuring Domain

NOTE: A cluster setup has multiple hosts. One of the host is configured as master and all other hosts are configured as slaves.

Configuring interface on the master node

To configure interface on the master node:

- 1) Login to a host machine to configure it as master node.
- 2) Open the host.xml file from <JBOSS_HOME>\domain\configuration\host.xml directory for editing.
- 3) Locate the following code and
 - Replace the IP address in the `management` tag with IP address of master node to enable slave nodes to connect with the master node.
 - Replace the IP address in the `public` tag with IP address of master node to allows the application to be accessed by non-local HTTP.
 - Replace the IP address in the `management` tag with IP address of master node to allows remote RMI access.

```
<interfaces>
  <interface name="management">
    <inet-address value="{jboss.bind.address.management:127.0.0.1}"/>
  </interface>
  <interface name="public">
    <inet-address value="{jboss.bind.address:127.0.0.1}"/>
  </interface>
  <interface name="unsecured">
    <inet-address value="127.0.0.1" />
  </interface>
</interfaces>
```

Configuring interface for the slave nodes

To configure interface for the slave nodes:

- 1) Login to a host machine to configure it as slave node.
- 2) Delete the domain.xml and domain_<DBType>.xml files from <JBOSS_HOME>/domain/configuration/ directory.
- 3) Open the host.xml file from <JBOSS_HOME>\domain\configuration\host.xml directory for editing.
- 4) In the file, locate <host name="master" xmlns="urn:jboss:domain:1.5"> and change value of the `host name` attribute to slave.

NOTE: If you have multiple nodes in the cluster, then rename the slave nodes as slave1, slave2, slave3, and so on.

- 5) Add the following code between the <domain-controller> </domain-controller> tags.

```
<remote host="<IP address of master node>" port="9999"
security-realm="ManagementRealm"/> NOTE: In the <domain-controller> tag, mark the
<local> tag as a comment.
```

- 6) Locate the following code and
 - Replace the IP address in the `management` tag with IP address of slave node to enable slave nodes to connect with the master node.

- Replace the IP address in the `public` tag with IP address of slave node to allows the application to be accessed by non-local HTTP.
- Replace the IP address in the `management` tag with IP address of slave node to allows remote RMI access.

```
<interfaces>
  <interface name="management">
    <inet-address value="${jboss.bind.address.management:127.0.0.1}"/>
  </interface>
  <interface name="public">
    <inet-address value="${jboss.bind.address:127.0.0.1}"/>
  </interface>
  <interface name="unsecured">
    <inet-address value="127.0.0.1" />
  </interface>
</interfaces>
```

Set up authentication between master and slave nodes

NOTE: Perform the steps to configure a user on the master node and configure slave nodes to the the mater nodes as users only on the master node.

Add a user on the master node

To add new users to the properties file used for domain management authentication, navigate to [JBOSS_HOME/bin] on the master node and run the `add-user.sh/add-user.bat`. A wizard would present a series of questions. Choose the answers as given below:

- For question **What type of user do you wish to add?** choose a) Management User (mgmt-users.properties).
- For question **Enter the details of the new user to add.** Enter your credentials. For example Admin/P@ssw0rd.
- (Optional) For question **What groups do you want this user to belong to?** Enter the group the user belongs to.
- For question **About to add user '<Username>' for realm 'ManagementRealm'. Is this correct?**Type yes and press return.
- For question **Is this new user going to be used for one AS process to connect to another AS process?e.g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls.** Enter yes and press any key to exit from the wizard "

Registering slave nodes to the mater node as users

To add new users to the properties file used for domain management authentication, navigate to [JBOSS_HOME/bin] on the master node and run the `add-user.sh/add-user.bat`. A wizard would present a series of questions. Choose the answers as given below:

- For question **What type of user do you wish to add?** choose a) Management User (mgmt-users.properties).

- For question **Enter the details of the new user to add**. Enter username of the slave nodes. Ensure that the username of the slave nodes is identical to the names configured in step [Configuring interface for the slave nodes](#). For example, slave1, slave2
- (Optional) For question **What groups do you want this user to belong to?** Enter the group the user belongs to.
- For question **About to add user '<Username>' for realm 'ManagementRealm'. Is this correct?** Type yes and press return.
- For question **Is this new user going to be used for one AS process to connect to another AS process? e.g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls**. Enter yes.

After the last step, you are presented with a secret value. The secret value is used to configure authentication for the slave nodes.

NOTE: Repeat above steps for all the slave nodes.

Configure slave nodes for authentication

- 1) Open the [appserver_root]\domain\configuration\host.xml for editing.
- 2) Add the following code in the <security-realm name="ManagementRealm">tag:


```
<server-identities>
    <secret value="UEBzc3cwcmQ="/>
</server-identities>
```
- 3) Replace the secret value with a secret value generated in [Registering slave nodes to the master node as users](#) section

Edit the host.xml file to remove information of extra servers

Perform the following steps on all the nodes of the cluster:

- 1) Open the [appserver_root]\domain\configuration\host.xml for editing.
- 2) Search the <servers> tag and delete the following code from the tag:


```
<server name="server-two" group="main-server-group" auto-start="true">
    <!-- server-two avoids port conflicts by incrementing the ports
in
        the default socket-group declared in the server-group -->
    <socket-bindings port-offset="150"/>
</server>
<server name="server-three" group="other-server-group"
auto-start="false">
    <!-- server-three avoids port conflicts by incrementing the
ports in
        the default socket-group declared in the server-group -->
    <socket-bindings port-offset="250"/>
</server>
```
- 3) Save and close the file.

About JVM Arguments

The memory arguments defined in the `domain.conf.bat` file are applicable to the processes of domain controller and process controller. Ensure that you set these memory arguments on each node of the cluster.

In a managed domain, the JVM settings are declared in the `host.xml` and the `domain.xml` configuration files. Domain controller components responsible for starting and stopping server processes use these settings. In a standalone server instance, the server startup processes can pass command line settings at startup. These settings can be declared from the command line or from the System Properties screen in the Management Console.

Managed Domain

An important feature of the managed domain is the ability to define JVM settings at multiple levels. You can configure custom JVM settings at the host level, by server group, or by server instance. The more specialized child elements override the parent configuration, allowing for the declaration of specific server configurations without requiring exclusions at the group or host level. This also allows the parent configuration to be inherited by the other levels until settings are either declared in the configuration files or passed at runtime.

JVM settings in the domain configuration file

The following example shows a JVM declaration for a server group in the `domain_db.xml` configuration file.

```
<server-groups>
  <server-group name="main-server-group" profile="default">
    <jvm name="default">
      <heap size="64m " max-size="512m " />
    </jvm >
    <socket-binding-group ref="standard-sockets"/>
  </server-group>
</server-groups>
```

In this instance a server group called `main-server-group` declares a heap size of 64 megabytes, and a maximum heap size of 512 megabytes. Any server that belongs to this group inherits these settings. You can change these settings for the group as a whole, by the host, or the individual server.

The following example shows a JVM declaration for a server group in the `host.xml` configuration file.

```
<servers>
  <server name="server-one" group="main-server-group" auto-start="true">
    <jvm name="default">
      <heap size="64m " max-size="256m " />
    </jvm >
  </server>
</servers>
```

In this instance, a server named `server-one` belongs to the server group named `main-servergroup`, inheriting the JVM settings from the default JVM group. In the previous example, the main heap size for

main-server-group was set at 512 megabytes. By declaring the lower maximum heap size of 256 megabytes, server-one can override the domain.xml settings to fine-tune performance to the required levels.

3.5. Configuring AEM Forms database connectivity

You must enable database connectivity from each JBoss Application Server in the cluster to the AEM Forms database by performing the following tasks:

- Ensure that the correct JDBC driver exists on each instance of JBoss Application Server in the cluster.
- Depending upon the Database you are using, update the corresponding configuration file. The configuration files are at [appserver_root]\domain\configuration

You can simplify this task by following these steps:

- 1) Copy the necessary domain_<db_type>.xml file from your AEM Forms installation medium to any computer.
- 2) Edit the files as described in the following subsections.
- 3) Save the edited files to master node of the cluster.

See one of the following sections for instructions that are relevant to your database:

- ConfiguringOracleforAdobe-preconfiguredJBoss
- ConfiguringSQLServerforAdobe-preconfiguredJBoss
- ConfiguringMySQLforAdobepre-configuredJBoss

Configuring Oracle for Adobe-preconfigured JBoss

Configuring the data source files

Before you configure the Oracle data source, you must have already created the database on Oracle. (See Preparing to Install AEM Forms (Server Cluster).)

To modify the oracle data source file:

- 1) Open the [appserver root]/domain/configuration/domain_oracle.xml file in a text editor and locate the following lines:

```
<connection-url>jdbc:oracle:thin:@localhost:1521:adobe</connection-url>  
<user-name>adobe</user-name>  
<password>adobe</password>
```
- 2) Replace the following text with values that are specific to your database:
 - **localhost**: The name, IP address, or fully qualified path of the computer that hosts the database. The default is localhost.
 - **1521**: The port that is used to access the database. The default port is 1521.

- **adobe**: The System ID (SID) of the Database instance that stores the AEM Forms data. You will need to update the default value **adobe** with your database System ID.
- 3) In the `<user-name>` and `<password>` tags, specify the user name and password that the application server uses to access the database. You will need to update the default values **adobe** and **adobe** with the credentials for your database.
 - 4) Repeat steps 1 to 3 for the remaining elements in **IDP_DS**, **EDC_DS**, and **DefaultDS**.
NOTE: The `com.celequest.metadata.metaDataSource` element is required only if you are using AEM Forms Business Activity Monitoring
 - 5) Save the file.

Create and configure an Oracle pluggable database

Oracle pluggable database on AEM Forms on JEE can be configured manually only and not through Configuration Manager. For introduction to pluggable database and multi-tenant architecture, see [Introduction to the Multitenant Architecture](#).

To create and configure an Oracle pluggable data source, complete the following steps:

- 1) Create a container database using non-interactive/silent mode of Database Configuration Assistant (DBCA).
 - a) Go to your oracle home. For example, on Windows you can run `cd%Oracle_HOME%\bin` to go to your Oracle home.
 - b) Pass the following command to create the container database in non-interactive/silent mode using Database Configuration Assistant (DBCA). Replace the database name in the command with your database name.


```
dbca -silent -createDatabase -templateName General_Purpose.dbc
      -gdbname ordb.corp.adobe.com -sid ordb -createAsContainerDatabase
      true -responseFile NO_VALUE -characterSet AL32UTF8 -memoryPercentage
      30 -emConfiguration LOCAL
```
- 2) Using SQL*Plus®, connect to the new container database as the DBA:


```
sqlplus system/password@localhost:1521/ordb.corp.adobe.com as sysdba
```
- 3) In SQL*Plus®, to create pluggable database with the appropriate name (here **mynewpdb**) and user name and password (here **mynewadm/password**), pass the following command:


```
SQL> CREATE PLUGGABLE DATABASE mynewpdb ADMIN USER mynewadm IDENTIFIED BY
passwordFILE_NAME_CONVERT=('D:\app\oracle\oradata\ordb\pdbseed', 'D:\app\
oracle\oradata\ordb\mynewpdb');
```
- 4) Alter the database by running the following command in SQL*Plus® to open the database in the read-write mode:


```
SQL> alter pluggable database mynewpdb open;
```
- 5) Grant the required access to the admin users of the pluggable database. The minimum access that the admin users require to work with the database are to:
 - Create sessions,
 - Create tables,

- Create views,
- Create sequences, and
- Access unlimited tablespace.

*Following is the sample command for achieving this in SQL*Plus®:*

```
sqlplus mynewadm/password@localhost:1521/mynewpdb.corp.adobe.com as
sysdbaSQL> grant CREATE SESSION to mynewadm;SQL> grant CREATE TABLE to
mynewadm;SQL> grant CREATE VIEW to mynewadm;SQL> grant CREATE SEQUENCE to
mynewadm;SQL> grant UNLIMITED TABLESPACE to mynewadm;
```

- 6) Configure JDBC connectivity manually. For more information on connecting to JDBC, see [Configuring Adobe Experience Manager Forms OnJEEOnWebLogicCluster](#).
 - a) Before clicking Test Configuration, update the JDBC URL for both RM_DS, IDP_DS, and AEM_DS. Replace : (colon) in the URL with a / (forward slash). For example:


```
jdbc:oracle:thin:@localhost:1521/mynewpdb.corp.adobe.com
```
 - b) Click Test Configuration to verify the pluggable database connectivity.

Create a new AEM_DS data source for Oracle

- 1) Start the WebLogic administration console by typing `http://[hostname]:[port]/console` in the URL line of a web browser.
- 2) Type the user name and password that you created for the WebLogic Server domain and click **Log In**.
- 3) Under Change Center, click **Lock & Edit**.
- 4) Under Domain Structure, click **Services > Data Sources** and, in the right pane, click **New**, and select **Generic Data Source** from the drop-down menu.
- 5) On the next screen, set the following properties:
 - In the **Name** box, type `AEM_DS`.
 - In the **JNDI name** box, type `AEM_DS`.
 - In the **Database Type** list, select **Oracle** and click **Next**.
- 6) On the next screen, in the **Database Driver** list, select **Oracle's Driver (Thin) for Instance Connections; Versions: 9.0.1 and later** and click **Next**.

(Oracle RAC only) In the Database Driver list, select Oracle's Driver (Thin) for RAC Service-Instance Connections; Versions: 10 and later and click Next:
- 7) Select **Supports Global Transactions** and **Emulate Two-Phase Commit**.
- 8) Click **Next** and define the following properties that apply to the Oracle database that you created during your AEM Forms on JEE installation preparations:

Database Name: The name of the database you have created.

Host Name: The name or IP address of the computer on which Oracle is running.

Port: Database Port. The default is 1521.

Service Name: The name of the user you created on the Oracle database.
- 9) Click **Next**.

(Oracle RAC only) In the Enter database specific properties for the datasource pane, type the following connection URL in the URL field:

```
jdbc:oracle:thin:@(DESCRIPTION=(ENABLE=broken)
(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP) (HOST=yourhost1) (PORT=1521))
(ADDRESS=(PROTOCOL=TCP) (HOST=yourhost2) (PORT=1521))
(LOAD_BALANCE=on) (FAILOVER=on))
(CONNECT_DATA=(SERVER=dedicated) (SERVICE_NAME=service.yourcompany.com)
) FAILOVER_MODE=(TYPE=session) (METHOD=basic)
(RETRIES=10) (DELAY=3)))
```

NOTE: If you are using a pluggable database, replace the colon (:) after <port> with a forward slash (/).

- 10) click **Test Configuration** to verify the configuration settings
NOTE: If the test is successful, a “Connection test succeeded” message appears. Click **Next**. Otherwise, review the error message that appears and modify the settings as required until the test succeeds.
- 11) On the next screen, select the server that the data source will connect to (in this case, the managed server) and then click **Finish**.

Configure the connection pool settings

- 1) Under Domain Structure, click **Services> JDBC> Data Sources** and, in the right pane, click **AEM_DS**.
- 2) On the next screen, click the **Configuration** tab > **Connection Pool** tab.
- 3) In the **Maximum Capacity** box, type 30.
- 4) In the **Statement Cache Size** box, type 80.
- 5) Click **Save** and then click **Activate Changes**.
- 6) Restart the managed server.

Configuring SQL Server for Adobe-preconfigured JBoss

Configuring the data source files

Before you configure the SQL Server data source, you must have already created the AEM Forms database on SQL Server. (See [Preparing to Install AEM Forms \(Server Cluster\)](#).)

To modify the Microsoft SQL server data source file:

- 1) Open the `[appserver root]/domain/configuration/domain_mssql.xml` file in a text editor and locate these lines:

```
<connection-url>jdbc:sqlserver://localhost:1433;DatabaseName=adobe</connection-url>
<user-name>adobe</user-name>
<password>adobe</password>
```

- 2) Replace the following text with values that are specific to your database:
 - *localhost*: The name, IP address, or fully qualified path of the computer that hosts the database. The default is `localhost`.
 - *1433*: The port that is used to access the database. The default port is `1433`.
 - *adobe*: The name of the database that stores the AEM Forms data. You will need to update the default value `adobe` with your database name.
- 3) In the `<user-name>` and `<password>` tags, specify the user name and password that the application server uses to access the database. You will need to update the default values `adobe` and `adobe` with the credentials for your database.
- 4) Repeat steps 1 to 3 for the remaining elements in `IDP_DS`, `EDC_DS`, and `DefaultDS`

NOTE: The `com.celequest.metadata.metaDataSource` element is required only if you are using AEM Forms Business Activity Monitoring
- 5) Save the file.

To configure Integrated Security on Windows:

- 1) Modify the `domain_mssql.xml` file, located in `[appserver root]/domain/configuration`, to add `integratedSecurity=true` to the connection URL, as in this example:


```
jdbc:sqlserver://<serverhost>:<port>;databaseName=<dbname>;integratedSecurity=true.
```
- 2) Add the `sqljdbc_auth.dll` file to the Windows systems path (`C:\Windows`) on the computer that is running JBoss. The `sqljdbc_auth.dll` file is located with the Microsoft SQL JDBC 4.0 driver installation. You can download the driver from Microsoft Website.
- 3) Open the properties for the JBoss for Adobe Experience Manager Forms 6.3 service and click the **Log On** tab.
- 4) Select **This Account** and type the value of a valid user account. This change is not required if you are running JBoss from the command line.
- 5) Change SQL Server's Security from Mixed mode to Windows Authentication only.

Create a new AEM_DS data source for SQL Server

- 1) Under Change Center, click **Lock & Edit**.
- 2) Under Domain Structure, click **Services > JDBC > click Data Sources** and, in the right pane, click **New**.
- 3) On the next screen, set the following properties:
 - In the **Name** box, type `AEM_DS`.
 - In the **JNDI name** box, type `AEM_DS`.
 - In the **Database Type** list, select **MS SQL Server**.
 - In the **Database Driver** list, select **Microsoft's MS SQL Server Driver (Type 4) Versions:2005**
- 4) Click **Next** and select **Supports Global Transactions** and **Emulate Two-Phase Commit**.
- 5) *(Only for integrated authentication)* Add the `sqljdbc_auth.dll` file to the Windows systems path on the computer that is running the application server. The `sqljdbc_auth.dll` file is located with the

Microsoft SQL JDBC 4.0 driver installation (the default is <InstallDir>/sqljdbc_3.0/enu/auth/x64).

- 6) Click **Next** and define the following properties that apply to the SQL Server database you created during your AEM forms on JEE install preparations:

Database Name: *The name of the database you have created*

Host Name: *The name or IP address of the computer on which SQL Server is running*

Port: *The database port. The default is 1433*

Database User Name: *The name of the user you created on the SQL Server database*

Password and Confirm Password: *The password associated with the user*

- 7) Click **Next** and then click **Test Configuration** to verify the configuration settings.
NOTE: If the test is successful, a “Connection test succeeded” message appears. Click **Next**. Otherwise, review the error message that appears and modify the settings as required until the test succeeds.
- 8) On the next screen, select the server that the data source will connect to (in this case, the managed server.)
- 9) Click **Finish** and then click **Activate Changes**.

Configure the connection pool settings

- 1) Under Domain Structure, click **Services> JDBC> Data Sources** and, in the right pane, click **AEM_DS**.
- 2) On the next screen, click the **Configuration** tab > **Connection Pool** tab.
- 3) In the **Maximum Capacity** box, type 30.
- 4) In the **Statement Cache Size** box, type 80.
- 5) Click **Save** and then click **Activate Changes**.
- 6) Restart the managed server.

Configuring MySQL for Adobe pre-configured JBoss

To enable Adobe pre-configured JBoss to connect to the MySQL database that stores AEM Forms on JEE data, you must create a data source file and deploy it to the instance of JBoss where you will deploy AEM Forms on JEE.

Encrypt the password in the lc_<db-name>.xml file. Use the following command to encrypt the password:

```
java -cp
%JBOSS_HOME%\modules\system\layers\base\.overlays\layer-base-jboss-eap-6.
4.5.CP\org\picketbox\main picketbox-4.1.2.Final-redhat-1.jar
org.picketbox.datasource.security.SecureIdentityLoginModule <password>
```

NOTE: If you do not have the picketbox-4.1.2.Final-redhat-1.jar file, which is used to encrypt datasource passwords for JBoss, then download it from [Index of /techpreview/all/org/picketbox/picketbox/4.1.2.Final-redhat-1](http://techpreview.all.org/picketbox/picketbox/4.1.2.Final-redhat-1). Do not use the JAR file available at <http://wiki.jboss.org>.

Configuring the data source files

Before configuring the MySQL data source, you must have already created the database on MySQL.

- 1) Open the `[appserver root]/domain/configuration/domain_mysql.xml` file in a text editor and locate this line for IDP_DS, EDC_DS, and DefaultDS:


```
<connection-url>jdbc:mysql://localhost:3306/adobe</connection-url>
<user-name>adobe</user-name>
<password>[ENCRYPTED PASSWORD]</password>
```
- 2) Replace the following text in the file with values that are specific to your database:
 - **localhost:** The name, IP address, or fully-qualified path of the computer that hosts the database. The default is `localhost`.
 - **3306:** The port used to access the database. The default port is `3306`.
 - **adobe:** The name of the database that stores the data. Replace the default value, `adobe`, with your database name.
- 3) In the lines that follow the `<connection-url>` settings, locate the `user-name` and `password` settings and replace the default values with the user name and password that the application server uses to access your database.
- 4) Ensure that the minimum and maximum values for the data source connections are set as follows:
 - For IDP_DS:


```
<min-pool-size>1</min-pool-size>
<max-pool-size>30</max-pool-size>
```
 - For EDC_DS:


```
<min-pool-size>1</min-pool-size>
<max-pool-size>20</max-pool-size>
```

NOTE: If your forms server handles heavy load, increase the maximum number of JDBC connections to ensure that all jobs are processed. In such cases, increase `<max-pool-size>` to 50 or more for both IDP_DS and EDC_DS.
- 5) Save and close the file.

Create a new AEM_DS data source for MySQL

- 1) Start the WebLogic administration console by typing `http://[hostname]:[port]/console` in the URL line of a web browser.
- 2) Type the user name and password that you created for the WebLogic Server domain and click **Log In**.
- 3) Under Change Center, click **Lock & Edit**.
- 4) Under Domain Structure, click **Services > JDBC > Data Sources** and, in the right pane, click **New**.
- 5) On the next screen, set the following properties:
 - In the **Name** box, type `AEM_DS`.
 - In the **JNDI name** box, type `AEM_DS`.
 - In the **Database Type** list, select **MySQL** and click **Next**.

- In the **Database Driver** list, select **MySQL's Driver (Type 4) Versions:using com.mysql.jdbc.Driver**.
- 6) Click **Next** and select **Supports Global Transactions** and **Emulate Two-Phase Commit**.
- 7) Click **Next** and define the following properties that apply to the database you created during your AEM Forms on JEE installation preparations:
 - Database Name:** *The name of the database you have created*
 - Host Name:** *The name or IP address of the computer on which MySQL is running*
 - Port:** *Database Port. The default is 3306.*
 - Database User Name:** *The name of the user you created on the MySQL database*
 - Password and Confirm Password:** *The password associated with the user*
- 8) Click **Next** and then click **Test Configuration** to verify the configuration settings
NOTE: If the test is successful, a "Connection test succeeded" message appears. Click **Next**. Otherwise, review the error message that appears and modify the settings as required until the test succeeds.
- 9) On the next screen, select the server that the data source will connect to (in this case, the managed server) and then click **Finish**.

3.6. Configure the connection pool settings

- 1) Under Domain Structure, click **Services > JDBC > Data Sources** and, in the right pane, click **AEM_DS**.
- 2) On the next screen, click the **Configuration** tab > **Connection Pool** tab.
- 3) In the **Maximum Capacity** box, type 30.
- 4) In the **Statement Cache Size** box, type 80.
- 5) Click **Save** and then click **Activate Changes**.
- 6) Restart the managed server.

3.7. Running JBoss in a cluster

Start the JBoss

Start the JBoss Application server by entering the following command:

- 1) From a command prompt, navigate to `[appserver root]/bin`.
- 2) Start the application server by typing the following command:
 - On master node:
 - (Windows)* `domain.bat -b [server_IP_Address] -c [config_file_name]`
 - (Linux and Solaris)* `./domain.sh -c [config_file_name] -b [server_IP_Address]`
 - On slave nodes:

(Windows) `domain.bat -b [server_IP_Address]`

(Linux and Solaris) `./domain.sh -b [server_IP_Address]`

where `[config_file_name]` is the configuration required for your database and `[server_IP_Address]` is the IP address of the server.

NOTE: The `<config_file_name>` file is the name of database specific configuration file located at `[appserver_root]/domain/configuration` directory. **NOTE:** This will start JBoss instance using default cluster and multicast address.

Changing the Multicast address

Some users have a specific set of multicast addresses. To change the default Multicast address to the address of your choice enter the following command:

- On master node:
`/domain.sh -b <ipaddress> -c <config_file_name> -u <UDP group Ip address>`
- On slave node:
`/domain.sh -b <ipaddress> -u <UDP group Ip address>`

NOTE: In the above command, `<UDP group Ip address>` represents UDP Multicast address.

Changing the MultiCast port

To change the Multicast port provide the following jvm argument in the domain.conf file as mentioned in Modifying the JBoss domain.conf file s:

```
-Djboss.jgroups.udp.mcast_port=<port_number>
```

NOTE: By default, JBoss cluster is configured to use UDP based clustering. You can configure cluster to use TCP based clustering. Refer JBoss Clustering, for detailed information about configuring cluster to use TCP based clustering.

3.8. Testing the JBoss Application Server cluster

You can test the JBoss Application Server cluster to ensure that all members are active and that the cluster operates according to your design. You should ensure that the JBoss Application Server cluster functions correctly before you proceed with installing and configuring AEM forms.

To test the JBoss Application Server cluster:

- 1) Start all JBoss Application Server instances of the cluster by entering the appropriate command:
 - On master node:
(For Windows) `/domain.bat -b <ipaddress> -c <config_file_name>`
(For Unix based enviroymnt) `/domain.sh -b <ipaddress> -c <config_file_name>`

- On slave node:

(For Windows) `/domain.bat -b <ipaddress>`

(For Unix based enviroymnt) `./domain.sh -b <ipaddress>`

NOTE: For IPv6, in the commands above, use the IPv6 address or a host name mapped to an IPv6 address in the host file of the system.

NOTE: When you start JBoss Application Server instances, to bind to all addresses on the computer (including the local host), you can specify `-b 0.0.0.0` *instead of the IP address or host name.*

For clusters, it is recommended that you bind to a particular IP address and not all IP addresses.

- 2) View the server.log file located in `[appserver root]\domain\servers\server-<No>\log`. Messages such as this one confirm the active members of the cluster:

```
[Host Controller] 21:30:52,042 INFO [org.jboss.as.domain]
(management-handler-threads - 1) JBAS010918: Registered remote slave host
slave
```

The message assures that all the configurations are correct and the two hosts are running in domain mode as expected.

4. Installing AEM Forms modules

4.1. Before you begin

Checking the installer

Observe the following best practices with the installer files before you begin the installation process.

Check the downloaded files

If you downloaded the installer from the Adobe website, verify the integrity of the installer file using the MD5 checksum. Do one of the following to calculate and compare the MD5 checksum of the downloaded file with the checksum published on the Adobe licensing website:

- **Linux:** Use the `md5sum` command
- **Solaris:** Use the `digest` command
- **Windows:** Use a tool such as WinMD5

Expand the downloaded archive files

If you downloaded the ESD from the Adobe website, extract the entire `aemforms_server_6_3_0_jboss_all_win.zip` (Windows) or `aemforms_server_6_3_0_jboss_all_unix.tar.gz` (Linux or Solaris) archive file to your computer. For Solaris, use the `gunzip` command to extract the `.gz` file.

NOTE: Be sure to keep the directory hierarchy unchanged from the original ESD file.

4.2. Installation considerations

Installation paths

To successfully install, you need read, write, and execute permissions on the installation directory. The following also apply to the installation paths:

- When installing AEM Forms on JEE, do not use double-byte or extended Latin characters (such as àâçéèêëïîôùûÄÖÛ) in the installation path.
- On Windows, the AEM Forms on JEE installation directory path must not contain any non-ASCII characters (for example, international characters such as é or ñ).

- On UNIX-based systems, you must be logged in as the root user to successfully install the modules. If you are logged in as a non-root user, change the installation directory to one on which you have permissions (read-write-execute privileges).
- On Windows, you must have administrator privileges to install AEM Forms on JEE.

Temporary directories

Temporary files are generated in the temp directory. In certain instances, the generated temporary files may remain after the installer is closed. You can remove these files manually.

When installing on Linux, the installation program uses the logged-in user's home directory as a temporary directory for storing files. As a result, messages such as the following may appear in the console:

```
WARNING: could not delete temporary file /home/<username>/ismp001/1556006
```

When you complete the installation, you must manually delete the temporary files from the following directories:

- (Windows) TMP or TEMP path as set in the environment variables
- (Linux or Solaris) Logged-in user's home directory

On UNIX-based systems, a non-root user can use the following directory as the temporary directory:

- (Linux) /var/tmp or /usr/tmp
- (Solaris) /var/tmp or /usr/tmp

Installing on a Windows staging platform for Linux or UNIX

AEM Forms on JEE can be installed and configured on Windows for deployment on a Linux or UNIX platform. You can use this functionality for installing on a locked-down Linux or UNIX environment. A locked-down environment does not have a graphical user interface installed. For the Linux or UNIX platform, the installation program installs binaries that are used by Configuration Manager to configure the product.

The computer running Windows can then be used as a staging location for the deployable objects, which can be copied to a Linux or UNIX computer for deployment to the application server. The application server on the Windows-based computer, and the Linux or UNIX target computer on which you want to install AEM forms on JEE must be the same.

General installation notes

- On Windows, improve the speed of installation by disabling any on-access virus scanning software during installation. For details, see [Using an antivirus on server running AEM Forms](#).
- If you are installing on UNIX-based systems and are not installing directly from a release DVD, set executable permissions on the installation file.
- To avoid permission issues during deployment, ensure that you run the AEM Forms on JEE installer and Configuration Manager as the same user who will run the application server.

- If you are installing on UNIX-based computers, the installation directory you specify should not contain any spaces.
- If errors occur during installation, the installation program creates the `install.log` file, which contains the error messages. This log file is created in the `[aem-forms root]/log` directory.

4.3. Installing AEM Forms on JEE

- 1) Start the installation program:
 - (Windows) Navigate to the `\server\Disk1\InstData\Windows_64\VM` directory on the installation media or folder on your hard disk where you copied the installer. Right-click the `install.exe` file and select **Run as administrator**.
 - (Non-Windows) Navigate to the appropriate directory, and from a command prompt, type `./install.bin`.
 - (Linux) `/server/Disk1/InstData/Linux/NoVM`
 - (Solaris) `/server/Disk1/InstData/Solaris/NoVM`
- 2) When prompted, select the language for the installation to use and click **OK**.
- 3) On the Introduction screen, click **Next**.
- 4) On the Choose Install Folder screen, accept the default directory or click **Choose** and navigate to the directory where you intend to install AEM Forms on JEE, and then click **Next**. If you type the name of a directory that does not exist, it is created for you.
*Click **Restore Default Folder** to restore the default directory path.*
- 5) On the Choose Installation Type screen, select **Custom > Manual**, and click **Next**.
- 6) **(Windows only)** On the Manual Installation Options screen, select the target deployment option and click **Next**:
 - **Windows (Local)**: Select this option if you are installing and deploying AEM Forms on JEE on the local server.
 - **Staged (Installed on Windows, targeting remote systems)**: Select this option if you plan to use Windows as a staging platform for your deployment and then select the target operating system on the remote server. You can select a UNIX operating system as the target for deployment even if you are installing on Windows. (See [Installing on a Windows staging platform for Linux or UNIX](#).)
- 7) Read the AEM Forms on JEE License Agreement, select **I accept** to accept the terms of the license agreement, and then click **Next**. If you do not accept the license agreement, you cannot continue.
- 8) On the Pre-Installation Summary screen, review the details and click **Install**. The installation program displays the progress of the installation.
- 9) Review the Release Notes information and click **Next**.
- 10) Review the details on the Install Complete screen.
- 11) The **Start Configuration Manager** checkbox is selected by default. Click **Done** to run the Configuration Manager.

NOTE: (PDF Generator for Windows only) If Acrobat is not installed on all nodes in the cluster, install it now. Then complete the steps in Configuring PDF Generator listed in the post-deployment section.

4.4. Configuring the caching locators in clusters (caching using TCP only)

If you implement caching for your AEM Forms cluster by using TCP, configure the TCP locators to find other members of the AEM Forms cluster.

NOTE: This section does not apply if you implement caching for your AEM Forms cluster by using UDP (See *ModifyingtheJBossrunfile* to configure caching for your AEM Forms cluster using UDP.)

Do the following to enable AEM Forms cluster caching using TCP:

- Ensure that the TCP locators are installed and configured. TCP locators are installed in the *[aem_forms root]/lib/caching* directory, with a default configuration, when you install AEM Forms. You can change the default configuration. (See *ModifyingtheTCPlocators*.)
- Configure each node in the AEM Forms cluster to use the locators. (See *ModifyingtheJBossrunfile*.)
- Ensure that TCP locators are running.

Modifying TCP locators

The AEM Forms installer creates a default configuration of the TCP locators that is ready to use without modification. You can move the locators to any computer on your network and run them on that computer. The locators do not have to reside on a computer that is a member of the AEM Forms cluster. You can also create additional failover locators to support high availability in your cluster. (See *InstallTCP-locators*.)

You can also modify the TCP locators to use a port other than the default port (22345). (See *Modifythedefaultlocatorport(Windows)*; or *Modifythedefaultlocatorport(UNIX):.*)

Install TCP locators

- 1) Log on to the computer where you installed AEM Forms and navigate to the *[aem_forms]\lib\caching\bin* caching directory.
- 2) Copy the caching directory and its contents to the computer on which you want to run the locators. *You can start TCP locator from default location. You should copy the caching directory to another location, only if:*
 - You want to run TCP locator on a machine that does not have AEM Forms.
 - You do not want to start TCP locator from default location.

NOTE: Do not run TCP locators on all the nodes of the AEM Forms Cluster. It is good practice to run minimum two locators. One TCP locator serves as a primary locator and other TCP locator serves as

a secondary locator to handle failover issues. You can add more than two TCP locators as backup locators but it is not mandatory.

Modify the default locator port (Windows)

- 1) Open the startlocator.bat file in a text editor. The *startlocator* file for a default installation is on the computer where you installed AEM Forms, in the *[aem_forms root]/lib/caching* directory.
- 2) Change the default port number (22345) to your preferred port number in the following properties:

```
set port=22345
```

The port number can be any available port between 1025 and 65535. NOTE: Ensure that the port number that is configured here matches the port number that is configured in the JVM argument of each node of the AEM Forms cluster. The port number can be any available port between 1025 and 65535.

- 3) If you are using more than one locator for failover, assign all of such locators to JVM argument `-Dlocators` listed at the end of the startlocator.bat file.

```
-Dlocators=localhost[22345]
```

- 4) (Computers with multiple network cards only) If the computer hosting the locator has multiple network cards, set the following properties in the script:

```
set bindaddr=<bind IP address>
```

Where <bind IP address> is the IP address that the locator will listen on. You must specify the <bind IP address> for the JVM argument `adobe.cache.cluster-locators` on each node in your AEM Forms cluster.

NOTE: If you do not specify the bind address and the bind port in the *startlocator* script, you will be prompted to input these values when you execute the script. However, for IPv6, you must specify the bind address and the bind port in the *startlocator* script itself.

- 5) Save the edited file.
- 6) Repeat steps 1 to 4 on any additional locators for your AEM Forms cluster.

Create the properties file

- 1) Create a GemFire.properties file.
- 2) Pass the parameters required in the GemFire.properties file:
 - `name=TCPLocator1`
 - `locators=10.131.96.64[22345],10.131.96.217[22345]`
- 3) Pass the file using the `-DgemfirePropertyFile` by starting the locator as following:


```
java -cp .\gemfire.jar com.gemstone.gemfire.internal.SystemAdmin
start-locator -port=%port% -address=%bindaddr%
-DgemfirePropertyFile=gemfire.properties -Djava.io.tmpdir=%TEMPDIR%
-Dgemfire.log-file=GFLocator.log -Dgemfire.license-type=production
-Dgemfire.license-file=gemfireLicense.zip
```

RELATED LINKS:

Modify the default locator port (UNIX)

- 1) Open the `startlocator.sh` file in a text editor. The `startlocator` file for a default installation is located on the computer where you installed AEM Forms, in the `[aem_forms root]/lib/caching` directory.
- 2) Change the default port number (22345) to your preferred port number in the following properties:

```
GF_PORT=22345
```

The port number can be any available port between 1025 and 65535.

IMPORTANT: Ensure that the port number that is configured here matches the port number that is configured in the JVM argument of each node of the AEM Forms cluster.

- 3) If you are using more than one locator for failover, assign all of such locators to JVM argument `-Dlocators` listed at the end of the `startlocator.sh` file.

```
-Dlocators=localhost[22345]
```

- 4) (*Computers with multiple network cards only*) If the computer hosting the locators has multiple network cards, modify the following argument:

```
GF_BIND_ADDRESS="<bind IP address>"
```

Where `<bind IP address>` is the IP address that the locator will listen on. You must specify the `<bind IP address>` for the JVM argument `adobe.cache.cluster-locators` on each node in your AEM Forms cluster.

NOTE: For IPv6, it is recommended that you specify the bind address and the bind port in the `startlocator` script itself.

- 5) Save the edited file.
- 6) Repeat steps on any additional locators for your AEM Forms cluster.

Start the TCP locators

To use TCP-based caching for AEM Forms Cluster using TCP locator, you must start the TCP locators before you start your cluster. If the TCP locators are not running when you start the members of the AEM Forms cluster, the AEM Forms cluster will not function.

- 1) On the computer where the TCP locators are installed, navigate to the caching directory. For a default installation, the TCP locators are installed on the computer where you installed AEM Forms, in the `[aem_forms]\lib\caching\bin\` directory.
- 2) (*IPv6 only*) Modify `gfsh.bat` (Windows) or `gfsh.sh` (UNIX) and add the following JVM arguments:

```
-Djava.net.preferIPv6Stack=true
```

```
-Djava.net.preferIPv6Addresses=true
```

- 3) Run the appropriate file:
 - (Windows) `gfsh.bat`
 - (UNIX) `gfsh.sh.sh`
- 4) Run the following command:

```
start locator --name=<locator name> --port=<port number>
```

NOTE: It is recommended to start the locator process as a background process. For example, in UNIX use the `nphup` command to start the background locator process: `nohup ./gfsh.sh start locator -name=<locator_name> -port=<port_number> &`

- 5) Repeat above steps on any additional locators for your AEM Forms cluster.

NOTE: (Windows Only) On running `startlocator` script, you would be prompted to change the default value. You can choose to keep the default values provided in the script or you can provide new values.

Stop TCP locators

- 1) On the computer where the TCP locators are installed, navigate to the caching directory. For a default installation, the TCP locators are installed on the computer where you installed AEM Forms, in the `[aem_forms]\lib\caching\bin` directory.

- 2) Run the following command:

```
stop locator --name=<locator name>
```

- 3) Repeat steps 1 to 2 on any additional locators for your AEM Forms cluster.

NOTE: If you are not using the default values in the `startlocator` script and mentioned specific IP address and port values, specify the same values in the `stoplocator` script. Otherwise, the `stoplocator` script may fail to stop the locators.

Install gfsh tcp locator as windows service

To install TCP locator as windows service, complete the following steps:

- 1) Download YAJSW from <http://sourceforge.net/projects/yajsw/files/>

- 2) Unpack the zip file to a folder: **yajsw**.

NOTE: Do not remove or copy files from this folder to any another folder. Do not rename any folders within **yajsw**.

- 3) Call `java -version` and ensure that your default java installation is 1.5 or higher.

- 4) Run the following command:

```
start locator --name=<locator name> --port=<port number>
```

- 5) Check the process id of the TCP Locator Java process. We need the pid of the Java process not of the batch file which started TCP Locator.

- 6) Go to `yajsw/bat` and execute `genConfig.bat <pid>`.

This generates the file `yajsw/conf/wrapper.conf` which is the configuration file for wrapping TCP Locator.

- 7) Create a file `gemfire.properties`. Add the following parameter to the file.

- 8) `locators= [host] [[port]]`

*The parameter specifies hostname and port of the second locator. For example,
`locators=10.42.86.25[22345]`*

- 9) Open `conf/wrapper.conf` with a text editor and make the following changes.
 - `wrapper.ntservice.name=TCPLocatorServiceForLiveCycle`
 - `wrapper.ntservice.displayname=TCP Locator Service For LiveCycle`
 - `wrapper.ntservice.description=Starts TCP Locator`
 - `wrapper.java.additional.2 = -DgemfirePropertyFile=[path of the gemfire.properties file]`
- 10) Run the following command to stop the TCP Locator:

```
stop locator --locator=<locator name>
```
- 11) Go to `yajsw/bat` and execute `installService.bat` to install the Windows service for TCP Locator.
- 12) To uninstall the Windows service execute `uninstallService.bat`.
- 13) Before performing next steps, perform step 1-10 on all the nodes that contain TCP Locator.

4.5. Global Document Storage Directory (GDS)

On cluster configurations, create a shared file system for GDS directory accessible to each node on the AEM Forms cluster. This shared file system can be a local storage on a computer or a share on the dedicated network storage system. Ensure that all the nodes of the cluster have read and write permissions on the shared storage. The GDS directory should have low access time, high up time, and should be accessible as UNC style path. For example, `\\storagename\shared\GDS`.

4.6. Installing the font directories in cluster nodes

You must install the font directories for each node in the cluster, including the AEM forms fonts that are installed in the `[aem_forms root]\fonts` directory.

The fonts must exist in the same path on each node, and the directory must have identical contents on all nodes in the cluster. To ensure this, use one of the following options:

- Use a shared directory that all nodes in the cluster can access. Copy fonts from `[aem_forms root]\fonts` to the shared directory. Using shared fonts directories can slow down the access to the fonts and induces performance issues.
- Copy the `[aem_forms root]\fonts` directory to each node in the cluster in an identical path.

Record the location where you create these shared directories for later use when you configure AEM Forms using Configuration Manager.

NOTE: The font directories must be distinct from the GDS directory. However, they may be distinct sibling subdirectories of a single shared parent directory. The requirements and steps mentioned above are applicable to the custom font directories.

4.7. Next steps

You must now configure AEM Forms on JEE for deployment. You can also choose to run Configuration Manager later by using the ConfigurationManager.bat or ConfigurationManager.sh file located in *[aem-forms root]\configurationManager\bin*.

5. Configuring AEM Forms for deployment

5.1. Considerations when configuring and deploying AEM Forms on JEE

General Considerations

- While configuring, you must provide the location of the JDBC drivers for your database. Oracle and SQL Server drivers are in the `[aem-forms root]/lib/db/[database]` directory. You can download IBM DB2 driver from IBM website. Also, copy the JDBC driver jar files to all nodes while maintaining identical directory structure for all nodes. For the complete list of supported driver versions and download locations, see [Supported Platform Combination](#).
If you have manually configured JBoss, download the database driver and copy in the `[appserver root]/modules/system/layers/base` directory.
- Temporary directory: It is recommended to use local directory as a temporary directory. The temporary directory should exist on every node of the cluster and the path of the temporary directory must be same for every node in the cluster.
- Global Document Storage (GDS) directory: Specify the GDS directory that meets the requirements outlined in the Preparing to Install (Single Server or Server Cluster). For latest documentation, see http://www.adobe.com/go/learn_aemforms_tutorials_63_en.
- On cluster environments, several steps need to be performed manually in addition to the automatic configuration that Configuration Manager performs.

Considerations while configuring AEM Forms on JEE Server Clusters

- You cannot configure settings for IPv6-based clusters using Configuration Manager.
- It is recommended to have local server fonts and customer fonts directories at the same path on each node in the cluster. Shared fonts directories instead of local fonts directories may cause performance issues.

5.2. AEM Forms on JEE pre-configuration tasks

NOTE: Press **F1** in Configuration Manager to view Help information for the screen you are viewing. You can view the configuration progress at any time by clicking View Progress Log.

- 1) If you did not start Configuration Manager automatically from the installation program, navigate to the `[aem-forms root]/configurationManager/bin` directory and run the `ConfigurationManager.bat/ConfigurationManager.sh` script.
- 2) If prompted, select a language for Configuration Manager to use and click **OK**.
- 3) On the Welcome screen, click **Next**.
- 4) Do not select any option on the Upgrade Task Selection screen and click **Next**.
- 5) On the Modules screen, select AEM Forms on JEE modules you wish to configure and click **Next**.

NOTE: Some modules have technical dependencies on other modules for proper configuration and functioning. Configuration Manager displays a dialog and does not allow to proceed further if mutually dependent modules are not selected. For example, you must select Content Repository modules if you are configuring Forms Workflow

- In AEM Forms, Adaptive Forms, Correspondence Management, HTML5 Forms , Forms Portal, HTML Workspace, Process Reporting, Forms centric workflows on OSGi, capabilities use crx-repository. If you plan to use AEM Forms for these capabilities, then crx-repository is required.
- You do not require crx-repository for AEM Forms Document Security.

- 6) On the Task Selection screen, select all the tasks you want to perform and click **Next**.

NOTE: Tasks Configure Application Server, Validate Application Server, and Deploy EAR files are not available for JBoss application server.

NOTE: If you are using Oracle RAC, do not select the Package JDBC modules into Adobe Experience Manager Forms EAR files (secure datasources) option.

5.3. Configuring and deploying AEM Forms on JEE

Configuring AEM Forms on JEE

- 1) On the Configure Adobe Experience Manager Forms (1 of 5) screen, click **Configure** and click **Next** when done.
- 2) On the Configure Adobe Experience Manager Forms (2 of 5) screen, set the directories that AEM Forms on JEE will use to access fonts and then click **Next**.

TIP: Click **Edit configuration** to change any values on this screen. This button is not available when Configuration Manager is run for the first time, but is available on the second and subsequent runs.

- (Optional) To change the default location of the **Adobe server fonts directory**, type the path or browse to the directory.
- To change the default location of the **Customer fonts directory**, click **Browse** or specify a new location for customer fonts.
NOTE: Your right to use fonts provided by parties other than Adobe is governed by the license agreements provided to you by such parties with those fonts, and is not covered under your license to use Adobe software. Adobe recommends that you review and ensure that you are in compliance with all applicable non-Adobe license agreements before using non-Adobe fonts with Adobe software, particularly with respect to use of fonts in a server environment.
- (Optional) To change the default location of the **System fonts directory**, type the path or browse to the directory. To add more directories to the list, click **Add**.
- (Optional) To enable FIPS, ensure that **Enable Federal Information Processing Standards (FIPS) 140-2 cryptography** is selected. Select this option only to enforce the Federal Information Processing Standards (FIPS).

- 3) Click **Browse** on the Configure Adobe Experience Manager forms (3 of 5) screen to specify the **Location of the temporary directory**.

NOTE: Ensure that the temporary directory is located on the local file system.

NOTE: If you do not specify the temporary directory, the default system-configured temp location is used. The temporary directory must exist and the path to the temporary directory must be the same on every node in the cluster.

- 4) On the Configure Adobe Experience Manager Forms (4 of 5) screen, click **Browse** to specify the path for the Global Document Storage (GDS) directory.

NOTE: If you leave the GDS directory field empty, AEM Forms on JEE will create the directory in a default location in the application server directory tree. After you finish the configuration steps, you can access the location from administration console > Settings > Core System Settings > Configurations.

NOTE: Ensure that GDS directory is accessible from all the nodes in the cluster. For cluster, do not leave the directory field empty.

- **Use GDS:** Use the file system-based GDS for all persistent document storage. This option provides the best performance, and a single location for GDS.
- **Use database:** Use the AEM Forms on JEE database for storing persistent documents and long-lived artifacts. However, the file-system based GDS is also required. Using the database simplifies backup and restore procedures.

Click **Configure** to configure the EARs with this directory information. After the configuration is complete, click **Next**.

Configure CRX

- 1) The CRX Configuration screen allows you to configure the CRX repository and install it into the adobe-livecycle-cq-author.ear EAR file.
- 2) Specify the path to the repository. The default location is *[aem-forms root]/crx-repository*.

NOTE: Ensure that the CRX repository path does not contain spaces and the content repository is available on all the nodes in the cluster. After the configuration is complete, copy the content repository from local node to all the nodes on the same location (as specified on the CRX configuration screen).

- 3) Select the repository type, as appropriate, and keep a note of the following points:
 - CRX3 TAR is not supported in clustered deployments.
 - If selecting CRX3 Mongo DB, specify the Mongo database name and URL to the database. The format of the URL is: `mongodb://<HOST>:<Port>`.
HOST: IP address of the machine running MongoDB.
Port: Port number used for the MongoDB. The default port number is 27017.
 - Selecting this option sets the CRX repository persistence to RDB MK (document MK).
- 4) Click **Configure** to create the required repository files at the specified location.
 Click **Next** to continue.

(Remote host only) CRX Configuration Summary

- 1) For a remote deployment, copy the content from the `[aem-forms root]/configurationManager/export/crx-quickstart/` directory to the location on the remote host you specified on the CRX Configuration screen.

Configuring Acrobat for PDF Generator

- 1) **(Windows only)** On the Configure Acrobat For PDF Generator screen, click **Configure** to run the script that configures Adobe Acrobat and required environment settings. Click **Next** when complete.
NOTE: This screen performs the desired configuration only when Configuration Manager is running locally. You must have Adobe Acrobat DC Pro already installed or this step will fail.
NOTE: You should manually configure Acrobat for PDF generator on all other nodes in the cluster. See *ConfiguringPDFGenerator* in the Post Deployment chapter.

Configuration Summary

- 1) On the Configure Adobe Experience Manager forms Summary screen, click **Next**. Configured archives are placed in the `[aem-forms root]/configurationManager/export` directory.
NOTE: Stop each JBoss Application Server instance in the cluster.

Copy CRX Content

Copy all content from the `[aem-forms root]/configurationManager/export/crx-quickstart/` directory to the location specified on the CRX Configuration screen on all the cluster nodes.

Deploying Adobe Experience Manager Forms EARs

- 1) Without exiting Configuration Manager, manually deploy the Adobe Experience Manager Forms EAR files to JBoss by copying the following files from the *[aem-forms root]/configurationManager/export* directory to the specified directories below:

- *adobe-lifecycle-native-jboss-[OS].ear*
- *adobe-lifecycle-jboss.ear*
- *adobe-workspace-client.ear* (forms workflow only)
- *adobe-lifecycle-cq-author.ear*
- (optional) *adobe-assembler-ivs.ear*
- (optional) *adobe-forms-ivs-jboss.ear*
- (optional) *adobe-output-ivs-jboss.ear*

Perform the following steps to manually deploy EAR files from application server management Console:

- a) Shut down all nodes except the master node.
NOTE: After Configuration Manager completes configuring AEM Forms, restart all nodes of the cluster. Do not restart all nodes simultaneously but one-by-one. For example, start node1 and wait for it to be up and running, and then start node 2.
- b) Copy the configured EAR files from *[aem_root]\configurationManager\export* to a local directory on the server.
- c) Open the management console, click Runtime, and then click Manage Deployments. The default URL is *http://<Ip_Address>:9990/console/* and the default port is 9990. A Content Repository window opens. It has Add, Remove, Assign, and Replace options.
- d) To deploy EAR files:
 - i) Click Add, click Browse, and navigate to the local directory that contains EAR files. Select an EAR file to add, click Next, and then click Save. The added EAR file appears in the Content Repository window. Repeat the step for all EAR files.
 - ii) On the Content Repository page, select an EAR files one-by-one. On the select server groups, select the assign option, leave the Enable <ear file> option checked, and click Save. The value in the assignment column changes from 0 to 1. Repeat the step for all EAR files.
 - iii) After all the EAR files are deployed, return to the configuration management window, and continue from the Initializing Adobe Experience Manager Forms database section.

You can optionally deploy the Forms Standard, Output, Mobile Forms, and Assembler IVS EARs.

*To create publish instance for Correspondence Management, deploy *adobe-lifecycle-cq-publish.ear*. Ensure that the EAR file is deployed on a different server outside of this setup. Do not deploy *adobe-lifecycle-cq-publish.ear* on forms server. For detailed information about configuring the publish instance, see *ConfigurethePublishinstance**

NOTE: Modify the data source definition files to point to the database server and database. For more information, see *Appendix-ManuallyConfiguringDataSources*.

IMPORTANT: Deploying IVS EAR files to a production environment is not recommended.

Initializing Adobe Experience Manager Forms database

- 1) On the Adobe Experience Manager forms Database Initialization screen, verify that the hostname and port number for your application server is correct and click **Initialize**. The database initialization task creates tables in the database, adds default data to the tables, and creates basic roles in the database. When the initialization is completed successfully, click **Next**.

***NOTE:** Initialize the database against only one server in the cluster. Subsequent steps are performed only on initialized server.*

Restart the application server manually if prompted.

- 2) On the Adobe Experience Manager forms Information screen, specify **Adobe Experience Manager forms User ID** and **Password** whose default values are *administrator* and *password*, respectively. Click **Verify Server Connection**, and when complete, click **Next**.
If the connection test passes but deployment or validation fails in the next few steps, troubleshoot the connectivity issues.

Deploying Central Migration Bridge Service

- 1) On the Central Migration Bridge Service Deployment Configuration screen, if applicable, select **Include Central Migration Bridge Service in deployment** in the deployment option and click **Next**.

Deploying Adobe Experience Manager Forms components

- 1) On the Adobe Experience Manager Forms Component Deployment screen, click **Deploy**. The components that are deployed at this time are Java archive files that plug into the AEM Forms service container for the purposes of deploying, orchestrating, and executing services. When the deployment completes successfully, click **Next**.
- 2) On the Adobe Experience Manager forms Component Deployment Validation screen, click **Validate**. When the validation completes successfully, click **Next**.

Configuring Adobe Experience Manager Forms components

- 1) On the Configure Adobe Experience Manager forms Components screen, select the tasks to run using Configuration Manager and click **Next**.

Connector for EMC Documentum

NOTE: In case of remote Adobe Experience Manager Forms deployment, you cannot configure the Connector for EMC Documentum using Configuration Manager.

- 1) On the Specify Client for EMC Documentum screen, select **Configure Connector for EMC Documentum Content Server**, and specify the following settings, click **Verify**, and when complete, click **Next** to continue.
 - **Choose EMC Documentum Client Version:** Select the client version to use with the EMC Documentum Content Server.

- **EMC Documentum Client Installation Directory Path:** Click **Browse** to select the directory path.
- 2) On the Specify EMC Documentum Content Server Settings screen, specify the EMC Documentum Server details, and click **Next**. Press F1 for information about the details.
- 3) On the Configure Connector for EMC Documentum screen, click **Configure Documentum Connector**. When completed, click **Next**.
- 4) On the Required Manual Configurations for Connector for EMC Documentum screen, review and perform the manual steps listed and click **Next**.

Connector for IBM Content Manager

NOTE: In case of remote Adobe Experience Manager Forms deployment, you cannot configure the Connector for IBM Content Manager using Configuration Manager.

- 1) On the Specify Client for IBM Content Manager screen, select **Configure Connector for IBM Content Manager**, and specify a value for IBM Content Manager Client Installation Directory Path. Click **Verify** and when complete, click **Next** to continue.
- 2) On the Specify IBM Content Manager Server Settings screen, specify the details of the IBM Content Manager Server, and click **Next**.
- 3) On the Configure Connector for IBM Content Manager screen, click **Configure IBM Content Manager Connector**. When complete, click **Next**.
- 4) On the Required Manual Configurations for Connector for IBM Content Manager screen, review and perform the manual steps listed and click **Next**.

Connector for IBM FileNet

NOTE: In case of a remote Adobe Experience Manager Forms deployment, you cannot configure the Connector for IBM FileNet using Configuration Manager.

- 1) On the Specify Client for IBM FileNet screen, select **Configure Connector for IBM FileNet Content Manager**, and specify the following.
 - **Choose IBM FileNet Client Version:** Select the client version you want to use with the IBM FileNet Content Server.
 - **IBM FileNet Client Installation Directory Path:** Click **Browse** to select the directory path.

NOTE: The validation of IBM FileNet may fail if there are special characters, such as hyphen (-), underscore (_), comma (,), or dot (.) in the directory name containing the IBM FileNet client.

*Click **Verify**, and when complete, click **Next** to continue.*

- 2) On the Specify IBM FileNet Content Server Settings screen, specify the required details, and click **Next**.
- 3) On the Specify Client for IBM FileNet Process Engine screen, specify the required details, and click **Verify**. When complete, click **Next**.
- 4) On the Specify IBM FileNet Process Engine Server Settings screen, specify the required details and click **Next**.

- 5) On the Configure Connector for IBM FileNet screen, click **Configure FileNet Connector**. When complete, click **Next**.
- 6) On the Required Manual Configurations for Connector for IBM FileNet screen, review and perform the manual steps listed and click **Next**.

Connector for Microsoft SharePoint

NOTE: In case of remote Adobe Experience Manager Forms deployment, you cannot configure the Connector for Microsoft SharePoint using Configuration Manager.

NOTE: You can skip this step if you want to configure the Connector for Microsoft SharePoint later using Administration Console.

On the Configure Adobe Experience Manager forms Connector for Microsoft SharePoint screen, do one of the following tasks:

- De-select the **Configure Adobe Experience Manager forms Connector for Microsoft SharePoint** option to manually configure Microsoft Sharepoint later and click **Next**.
- Leave the **Configure Adobe Experience Manager forms Connector for Microsoft SharePoint** option selected. Specify the required values and click Configure SharePoint Connector. When complete, click **Next**.

Configuring Adobe Experience Manager Forms Server for native file conversions

- 1) **(PDF Generator only)** On the **Admin user credentials for native PDF conversions** screen, specify the user name and password of a user with administrative privileges on the server computer and click **Add user**.

NOTE: You must add at least one administrative user for Windows Server. On Windows Server, User Account Control (UAC) must be disabled for the users you add. To disable UAC, click **Control Panel > User Accounts > Turn User Account Control on or off** and de-select Use User Account Control (UAC) to help protect your computer, and click **OK**. Restart the computer to apply these changes.

System readiness test for PDF Generator

- 1) On the **Document Services PDF Generator System Readiness Test** screen, click **Start** to validate if the system has been appropriately configured for PDF Generator. Review the System Readiness Tool Report and click **Next**. Note that the system readiness test fails if AEM Forms on JEE is deployed on a remote machine.

Configuring Acrobat Reader DC extensions

- 1) On the Acrobat Reader DC extensions Credential Configuration screen, specify the details associated with the Acrobat Reader DC extensions credential that activates the module services:
NOTE: You can skip this step at this time by selecting **Configure later using administration console**. You can configure the Acrobat Reader DC extensions credential by using Administration Console

after you complete the deployment. In the administration console, click **Home > Settings > Trust Store Management > Local Credentials**.

Click **Configure** and click **Next**.

Summary, and Next Steps

- 1) Review the Configuration Manager task summary list and choose appropriate options:
 - Select Launch Next Steps to view information about AEM Forms on JEE users and administrative interfaces.

NOTE: After the Configuration Manager completes configuring AEM Forms, restart all nodes of the cluster. Do not restart all the nodes simultaneously but one-by-one. For example, start node1 and wait for it to be up and running and then start node 2.

6. Post-deployment tasks

6.1. General tasks

Install Microsoft Visual C++ redistributable library

AEM Forms Configuration Manager installs Microsoft Visual C++ redistributable library only on the master node of the cluster. You have to manually install the library on all slave nodes. Perform the following steps on all slave nodes of the cluster:

- 1) Open the command prompt.
- 2) Navigate to the [Appserver_DVD]\third_party\msvc redistrib_2010_SP1 folder.
- 3) Run the following command to install Microsoft Visual C++ redistributable library:

(For English Language) vcredist_x86.exe /q /lang 1033

(For French Language) vcredist_x86.exe /q /lang 1036

(For German Language) vcredist_x86.exe /q /lang 1031

(For Japanese Language) vcredist_x86.exe /q /lang 1041

Configure Allowed Referrers

When you run Configuration Manager, the default host, IPv4 address, IPv6 address, loopback address, and localhost address are added to the Allowed Referrer list. These addresses are added only for the machine where Configuration Manager is run. For AEM Forms on JEE cluster, manually add all other cluster nodes to the list:

- 1) In administration console, click **Settings > User Management > Configuration > Configure Allowed Referrer URL's**. The Allowed Referrer list appears at the bottom of the page. The default URL of administration console is `http://[server]:[host]/adminui`.
- 2) To add an allowed referrer:
 - a) Type a host name or IP address in the Allowed Referrers box. To add more than one allowed referrer at a time, type each host name or IP address on a new line. Provide hostName and IP address of all cluster nodes/load balancer.
 - b) In the HTTP Port and HTTPS Ports boxes, specify the ports to allow for HTTP, HTTPS, or both. If you leave those boxes empty, the default ports (port 80 for HTTP and port 443 for HTTPS) are used. If you enter 0 (zero) in the boxes, all ports on that server are enabled. You can also enter a specific port number to enable only that port.
 - c) Click Add.

- 3) Click **Save**.
If the Allowed Referrer List is empty, the CSRF feature stops working and the system becomes insecure.
- 4) After changing the Allowed Referrer list, restart the AEM Forms JEE cluster.

Configure the serialization agent

AEM Forms requires the `sun.util.calendar` package to be whitelisted. Perform the following steps to add the package to the whitelist:

- 1) Open the Web Console in a browser window. The default URL is `http://[server]:[port]/system/console/configMgr`.
- 2) Search and open Deserialization Firewall Configuration.
- 3) In the whitelist field, add the `sun.util.calendar` package and click Save.

Setting the correct date, time, and time zone

Setting the correct date, time, and time zone on all servers connected to your AEM Forms on JEE environment will ensure that time-dependent modules, such as Digital Signatures and Acrobat Reader DC extensions function correctly. For example, if a signature appears to have been created in the future, it will not validate.

Servers that require synchronization are database servers, LDAP servers, HTTP servers, and J2EE servers.

Configure URL and port number for client SDK

Perform the following section, only if you have installed CRX repository:

The default URL of AEM Forms client SDK (CSDK) is `http://localhost:8080`. Change the default URL to the current URL of your AEM Forms environment. The current URL is required to enable and configure authentication between AEM configuration manager and CRX-repository:

- 1) Open the configuration manager URL, `http://<server>:<port>/lc/system/console/configMgr`, in a browser window.
- 2) Search and open the Adobe LiveCycle Client SDK Configuration service for editing.
- 3) In the Server URL field, specify current URL of your AEM Forms environment, and click Save.

Boot delegate RSA and BouncyCastle libraries

Perform the following section, only if you have installed CRX repository:

AEM Forms requires RSA and BouncyCastle libraries to be installed with AEM Forms add-on package. Perform the following steps to boot delegate these libraries:

- 1) Stop the AEM instance.
- 2) Navigate to the `[AEM installation directory]\crx-repository\launchpad\` folder and open the `slings.properties` file for editing.

- 3) Add the following properties to the `slings.properties` file:

```
sling.bootdelegation.class.com.rsa.jsafe.provider.JsafeJCE=com.rsa.*slin
g.bootdelegation.class.org.bouncycastle.jce.provider.BouncyCastleProvide
r=org.bouncycastle.*
```

- 4) Save and close the file. Restart the AEM instance.

NOTE: Before restarting the AEM Forms server, wait until the `ServiceEvent REGISTERED` and `ServiceEvent UNREGISTERED` messages stop appearing in the `<crx-repository>/error.log` file and the log is stable.

Restart the application server

When you first deploy AEM Forms on JEE, the server is in a deployment mode in which most modules are in memory. As a result, the memory consumption is high and the server is not in typical production state. You must restart the application server to get the server back into a clean state.

NOTE: You may skip to restart the AEM Forms on JEE server, if you have restarted the server after configuring CRX clustering or after updating Allowed Referrer list

NOTE: When you upgrade the AEM Forms on JEE Server, ensure that you delete the `[Jboss_root]\stand-alone\tmp` folder on single server installation or `[Jboss_root]\domain\servers<server name>\tmp` folders on cluster-based installations before restarting the application server.

Verify the deployment

You can verify the deployment by logging in to Administration Console. If you log in successfully, it means AEM Forms on JEE is running on the application server and the default user is created in the database. To verify the CRX repository deployment, access the CRX welcome page.

You can review the application server log files to ensure that components were deployed correctly or to determine the cause of any deployment issues you may encounter.

Accessing administration console

- 1) Type the following URL in a web browser:

```
http://[hostname]:[port]/adminui
```

For example: `http://localhost:8080/adminui`

- 2) If you have upgraded to AEM Forms on JEE, enter the same administrator username and password as that of your previous installation. In case of a fresh installation, enter the default username and password.
- 3) After you log in, click **Services** to access the service administration pages or click **Settings** to access the pages on which you can administer settings for different modules.

Accessing OSGi Management Console

OSGi console provides a way to manage OSGi bundles and services configurations. To, access the OSGi Management console:

- 1) Type the following URL in a web browser:
`http://[hostname]:[port]/lc/system/console`
- 2) Enter the CRX Administrator username and password. The default username and password for logging in is admin and admin (same as CRX Administrator).
NOTE: You cannot log into OSGi Management Console using the credentials of AEM Forms on JEE Administrator or AEM Super Administrator.
- 3) After you log in, you can access various components, services, bundles, and other configurations.

View the log files

Events, such as run-time or startup errors, are recorded to the application server log files. If you have problems deploying to the application server, you can use the log files to find the problem. You can open the log files using any text editor.

Log files for manually-configured JBoss are located at:

- **(Standalone JBoss)** `[appserver root]/standalone/log` directory
- **(Cluster)** `[appserver root]\domain\servers\server-one\log` directory

Log files for Adobe-preconfigured JBoss are located at:

- **(Standalone)** `[appserver root]/standalone/log` directory
- **(Cluster)** `[appserver root]\domain\servers\server-one\log` directory

The log files are:

- `server.log`

Following CRX log files are located at `[CRX_home]/logs`

- `error.log`
- `audit.log`
- `access.log`
- `request.log`
- `update.log`

Configure Author and Publish instance

Perform the following tasks to configure Author and Publish instance only if you have installed and configured the CRX repository:

Configure the Author instance

Author instance is embedded within the AEM Forms on JEE server. It implies that you do not need to make any configuration updates to the Author instance. The instance inherits all configuration settings from the AEM Forms on JEE instance.

Configure the Publish instance

You must run separate author and publish instances. You can configure the instances on different machines.

NOTE: The cluster topology is not recommended for the publish instance. Use a single publish instance or configure a farm of publish instances.

NOTE: By default, the publish instance is configured to run the mode similar to corresponding author instance. The mode can be TarMK, MongoMK, or RDBMK. Run the publish instance on TarMK mode.

Configure the Publish Node

- 1) Create a new appserver profile for the publish instance on the same or on a different machine.
- 2) On the author instance, navigate to the `[aem-forms root]/configurationManager/export/` directory.
- 3) Copy the `adobe-lifecycle-cq-publish.ear` file and deploy it to the appserver profile created in step 1.
- 4) Copy the content of the `[aem-forms root]/configurationManager/export/crx-quickstart` directory to the file server for the publish instance.
- 5) **(If author instance is configured to run RDBMK)** Delete the following files from the install directory copied to the publish instance:
 - `org.apache.jackrabbit.oak.plugins.document.DocumentNodeStoreService.cfg`
 - `org.apache.sling.datasource.JNDIDataSourceFactory-oak.cfg`
- 6) Start the publish server with `-Dcom.adobe.livecycle.crx.home=<location for crx-repository>` parameter, where `<location for crx-repository>` is the location where you copied the `crx-repository` directory for the publish instance. For example, if the content of the `cq-quickstart` directory are copied to the `C:\CM-publish\crx-repository` directory, then the `<location for crx-repository>` parameter will be `Dcom.adobe.livecycle.crx.home=C:\CM-publish\crx-repository`.

NOTE: If author and publish instances are on the same machine, ensure that you start the publish instance using a different port.

IMPORTANT: Ensure that the CRX repository path does not contain spaces.

Communicating between the Author and Publish instances

Enable two-way communication between Author and Publish instances:

Define Publish instance URL

- 1) Go to `http://<authorHost>:<authorPort>/lc/etc/replication/agents.author/publish.html`.
- 2) Click **Edit**. The Agent Settings dialog opens.
- 3) Click the **Transport** tab and specify the URL to the publish server in the URI field.

`http://<publishHost>:<publishPort>/lc/bin/receive?sling:authRequestLogin=1`

NOTE: If there are multiple publish instances managed by a Load Balancer, specify the URL to the load balancer in the URI field.

- 4) Click **OK**.

NOTE: For author clusters, these steps need to be performed on one author instance (preferably a master instance).

Define publish instance URL for ActivationManagerImpl

- 1) Go to `http://<authorHost>:<authorPort>/lc/system/console/configMgr`. The default username and password for logging in are admin and admin (same as CRX Administrator).
- 2) Find and click the Edit icon next to the `com.adobe.livecycle.content.activate.impl.ActivationManagerImpl.name` setting.
- 3) In the ActivationManager Publish URL field, specify the URL for the corresponding publish instance.
- 4) Click **Save**.

Configure reverse replication queue

- 1) Go to `http://<authorHost>:<authorPort>/lc/etc/replication/agents.author/publish_reverse.html`.
- 2) Click **Edit**. The Agent Settings dialog opens.
- 3) Click the **Transport** tab and specify the URL to the corresponding publish server in the URI field.
NOTE: If there are multiple publish instances managed by a Load Balancer, specify the URL to the load balancer in the URI field.
- 4) Click **OK**.

Define author instance URL

- 1) Go to `http://<publishHost>:<publishPort>/lc/system/console/configMgr`. The default username and password for logging in are admin and admin (same as CRX Administrator).
- 2) Find and click the Edit icon next to the `com.adobe.livecycle.content.activate.impl.VersionRestoreManagerImpl.name` setting.
- 3) In the VersionRestoreManager Author URL field, specify the URL for the corresponding author instance.
NOTE: If there are multiple author instances managed by a Load Balancer, specify the URL to the load balancer in the VersionRestoreManager Author URL field.
- 4) Click **Save**.

Configure IPv6 implementation

NOTE: Perform these steps only if the machine/server is using an IPv6 address.

To map the IPv6 address to a hostname on the server and client machines:

- 1) Navigate to the `C:\Windows\System32\drivers\etc` directory.
- 2) Open the `hosts` file in a text editor.
- 3) Add a mapping for the IPv6 address to a host name. For example:
`2001:1890:110b:712b:d1d:9c99:37ef:7281 <ipv6_hostname>`
- 4) Save and close the file.

Ensure that you use the mapped host name instead of the IPv6 address to access the machine.

Install Japanese fonts for Adobe Reader

If your document fragments use Japanese fonts, you must install the Japanese Language Support Package for Adobe Reader. Otherwise, your letters and forms will not render and function properly. For installing language packs, visit the downloads page for Adobe Reader.

Upgrading to Workbench

Once you have completed your AEM Forms on JEE server upgrade and verified that it is working properly, install the new version of Workbench in order to continue creating and modifying your AEM Forms on JEE applications.

Configure CSlv2 inbound transport

On the default Global Security enabled installation of IBM WebSphere, CSlv2 inbound transport option is set to SSL-required. This configuration causes Output and Forms components to fail. Ensure that you change CSlv2 inbound transport option to SSL-Supported: To change the option:

- 1) Log in to IBM WebSphere administration console.
- 2) Expand **Security**, and then click **Global security**.
- 3) In the Authentication section, expand **RMI/IIOP security**, and then click **CSlv2 inbound communications**
- 4) In CSlv2 Transport Layer section, set value of **Transport** to **SSL-Supported**.
- 5) Click **Apply**.

Isolating JBoss Clusters

There are a lot of JBoss services that create multiple JGroup channels services. These channels should only communicate with specific channels. Isolate JGroups clusters from other clusters on the network to ensure that the communication happens only with specific channels. See application server documentation for steps to isolate JBoss clusters.

Enabling JMS for JBoss

JMS services are disabled, by default. Perform the following steps to enable JMS services:

- 1) Copy the following tags from standalone_full.xml to the lc_turnkey.xml.

```
<extension module="org.jboss.as.messaging">...</extension>
<subsystem xmlns="urn:jboss:domain:messaging:1.4"> </subsystem>
```
- 2) Run the add-user.bat script to create an application user. Add the application user to the Guest group.
NOTE: The JMS DSC component requires a connection username and password. Ensure that the newly added application user has permissions to use JMS Queue/Topic for Send/Receive operation.

NOTE: By default, the `lc_turnkey.xml` file the `security-setting match="#">.....`
`</security-settings>` snippet has a guest role with ready JMS Send/Receive privileges. You must create an application user.

- 3) Change the JMS DSC configuration to include the newly created application user.
- 4) In the JMS Service configuration, change the `org.jnp.interfaces.NamingContextFactory` to `org.jboss.as.naming.InitialContextFactory`.

Migrate adaptive forms and Correspondence Management assets

The migration utility makes assets of earlier versions compatible with AEM 6.3 forms. You can download the utility from AEM package share. For detailed steps, see <https://helpx.adobe.com/aem-forms/6-3/migration-utility.html>.

Reconfigure analytics and reports

In AEM 6.3 Forms, traffic variable for source and success event for impression are not available. So, when you upgrade to AEM 6.3 Forms, AEM Forms stops sending data to Adobe Analytics server and analytics reports for adaptive forms and adaptive document are not available. Moreover, AEM 6.3 Forms introduces traffic variable for the version of form analytics and success event for the amount of time spent on a field. So, reconfigure analytics and reports for your AEM Forms environment. For detailed steps, see <https://helpx.adobe.com/content/help/en/aem-forms/6-3/configure-analytics-forms-documents.html>.

Methods to calculate average fill time for forms and average read time for adaptive documents have changed. So, when you upgrade to AEM 6.3 forms, the old data from previous AEM Forms release for these metrics is available only in Adobe Analytics. It is not visible in AEM Forms analytics reports. For these metrics, AEM Forms analytics reports display data which is captured after performing the upgrade.

Disable Draft and Submission workflows

If you are using AEM Forms with JBoss application server and database is MongoDB, disable the Draft and Submission workflows on a publish nodes of the cluster. Perform the following steps to disable the workflows:

- 1) Open the following URL: `http://[host]:[port]/lc/libs/cq/workflow/content/console.html`
- 2) Open the Launchers tab. A list of launchers is displayed
- 3) Double-click the launcher with description "Replicate all the drafts/submissions that are just modified".
- 4) In the Properties window, set the value of the Activate field to Disabled, and click OK.
- 5) Repeat step 3 and 4 for the launcher with description "Replicate all the drafts/submissions that are just created".

Now, the Draft and Submission workflows are disabled.

Configure the ContentRepositoryConnector service

By default, the ContentRepositoryConnector service is configured to use URL `http://localhost:8080/lc/crx/server/`. Perform the following steps to configure the service for your environment:

- 1) Log in to AEM Forms Admin UI using credentials `administrator/password`. The default URL of Admin UI is `http://[IP]:[Port]/adminui`.
- 2) Navigate to `Services > Application and Services > Service Management`.
- 3) Search and open the ContentRepositoryConnector service for editing.
- 4) Open the Configuration tab and replace the default URL in the Experience Management Server field with the URL of your environment.

IP

IP address of the machine on which application server is running.

Port

Port number which AEM Forms is using. The default port number for JBoss, WebLogic, and WebSphere 8080, 8001, and 9080, respectively.

6.2. Verify the AEM Forms cluster

- 1) View the `Gemfire.log` file, located in the directory appropriate to your application server:
 - *Jboss:* `[lc_temp_dir]/adobejb_[idp_server_name]/caching`
NOTE: `idp_server_name` is the value of the JVM argument `-Dadobeidp.serverName` passed to the JBoss instance.
- 2) Messages such as the following confirm that the cache is connected to all servers of the cluster:

```
[info 2008/01/22 14:24:31.109 EST GemfireCacheAdapter <UDP mcast
receiver> nid=0x5b611c24] Membership: received new view
[server-0:2916|1] [server-0:2916/2913, server-1:3168/3165]
[info 2008/01/22 14:24:31.125 EST GemfireCacheAdapter <View Message
Processor> nid=0x7574d1dc] DMMembership: admitting member
<server-1:3168/3165>; now there are 2 non-admin member(s)
```

NOTE: Ensure that the number of non-admin members (two in the example log entry above) matches the number of members in your cluster. A discrepancy indicates that some members of the cluster are not connected to the cache.

6.3. Configure Author and Publish instance

Perform the following tasks to configure Author and Publish instance only if you have installed and configured the CRX repository:

Configure the Author instance

Author instance is embedded within the AEM Forms on JEE server. It implies that you do not need to make any configuration updates to the Author instance. The instance inherits all configuration settings from the AEM Forms on JEE instance.

Configure the Publish instance

You must run separate author and publish instances. You can configure the instances on different machines.

NOTE: The cluster topology is not recommended for the publish instance. Use a single publish instance or configure a farm of publish instances.

NOTE: By default, the publish instance is configured to run the mode similar to corresponding author instance. The mode can be TarMK, MongoMK, or RDBMK. Run the publish instance on TarMK mode.

Configure the Publish Node

- 1) Create a new appserver profile for the publish instance on the same or on a different machine.
- 2) On the author instance, navigate to the `[aem-forms root]/configurationManager/export/` directory.
- 3) Copy the `adobe-lifecycle-cq-publish.ear` file and deploy it to the appserver profile created in step 1.
- 4) Copy the content of the `[aem-forms root]/configurationManager/export/crx-quickstart` directory to the file server for the publish instance.
- 5) **(If author instance is configured to run RDBMK)** Delete the following files from the install directory copied to the publish instance:
 - `org.apache.jackrabbit.oak.plugins.document.DocumentNodeStoreService.cfg`
 - `org.apache.sling.datasource.JNDIDataSourceFactory-oak.cfg`
- 6) Start the publish server with `-Dcom.adobe.livecycle.crx.home=<location for crx-repository>` parameter, where `<location for crx-repository>` is the location where you copied the `crx-repository` directory for the publish instance. For example, if the content of the `cq-quickstart` directory are copied to the `C:\CM-publish\crx-repository` directory, then the `<location for crx-repository>` parameter will be `Dcom.adobe.livecycle.crx.home=C:\CM-publish\crx-repository`.

NOTE: If author and publish instances are on the same machine, ensure that you start the publish instance using a different port.

IMPORTANT: Ensure that the CRX repository path does not contain spaces.

Communicating between the Author and Publish instances

Enable two-way communication between Author and Publish instances:

Define Publish instance URL

- 1) Go to `http://<authorHost>:<authorPort>/lc/etc/replication/agents.author/publish.html`.
- 2) Click **Edit**. The Agent Settings dialog opens.
- 3) Click the **Transport** tab and specify the URL to the publish server in the URI field.

`http://<publishHost>:<publishPort>/lc/bin/receive?slingshot:authRequestLogin=1`

NOTE: If there are multiple publish instances managed by a Load Balancer, specify the URL to the load balancer in the URI field.

- 4) Click **OK**.

NOTE: For author clusters, these steps need to be performed on one author instance (preferably a master instance).

Define publish instance URL for ActivationManagerImpl

- 1) Go to `http://<authorHost>:<authorPort>/lc/system/console/configMgr`. The default username and password for logging in are admin and admin (same as CRX Administrator).
- 2) Find and click the Edit icon next to the `com.adobe.livecycle.content.activate.impl.ActivationManagerImpl.name` setting.
- 3) In the ActivationManager Publish URL field, specify the URL for the corresponding publish instance.
- 4) Click **Save**.

Configure reverse replication queue

- 1) Go to `http://<authorHost>:<authorPort>/lc/etc/replication/agents.author/publish_reverse.html`.
- 2) Click **Edit**. The Agent Settings dialog opens.
- 3) Click the **Transport** tab and specify the URL to the corresponding publish server in the URI field.
NOTE: If there are multiple publish instances managed by a Load Balancer, specify the URL to the load balancer in the URI field.
- 4) Click **OK**.

Define author instance URL

- 1) Go to `http://<publishHost>:<publishPort>/lc/system/console/configMgr`. The default username and password for logging in are admin and admin (same as CRX Administrator).
- 2) Find and click the Edit icon next to the `com.adobe.livecycle.content.activate.impl.VersionRestoreManagerImpl.name` setting.
- 3) In the VersionRestoreManager Author URL field, specify the URL for the corresponding author instance.
NOTE: If there are multiple author instances managed by a Load Balancer, specify the URL to the load balancer in the VersionRestoreManager Author URL field.
- 4) Click **Save**.

Configure IPv6 implementation

NOTE: Perform these steps only if the machine/server is using an IPv6 address.

To map the IPv6 address to a hostname on the server and client machines:

- 1) Navigate to the C:\Windows\System32\drivers\etc directory.
- 2) Open the `hosts` file in a text editor.
- 3) Add a mapping for the IPv6 address to a host name. For example:
`2001:1890:110b:712b:d1d:9c99:37ef:7281 <ipv6_hostname>`
- 4) Save and close the file.

Ensure that you use the mapped host name instead of the IPv6 address to access the machine.

Install Japanese fonts for Adobe Reader

If your document fragments use Japanese fonts, you must install the Japanese Language Support Package for Adobe Reader. Otherwise, your letters and forms will not render and function properly. For installing language packs, visit the downloads page for Adobe Reader.

6.4. Configuring PDF Generator

If you installed PDF Generator, complete the following tasks:

Environment variables

If you configured PDF Generator to convert files to PDF, for some file formats, you must manually set environment variables that contain the absolute path of the executable that is used to start the corresponding application. The table below lists the environment variables for the native applications.

NOTE: Ensure that the required applications are installed on all nodes in the cluster.

NOTE: All environment variables and respective paths are case-sensitive.

Application	Environment variable	Example
Adobe Acrobat	Acrobat_PATH	C:\Program Files (x86)\Adobe\Acrobat 2015\Acrobat\Acrobat.exe
Notepad	Notepad_PATH	C:\WINDOWS\notepad.exe You can leave the Notepad_PATH variable blank.
OpenOffice	OpenOffice_PATH	C:\Program Files (x86)\OpenOffice 4

NOTE: These environment variables must be set for all nodes in the cluster.

NOTE: The environment variable `OpenOffice_PATH` is set to the installation folder instead of the path to the executable.

Configuring the application server to use HTTP proxy server

If the computer that AEM Forms on JEE is running on uses proxy settings to access external web sites, the application server should be started with the following values set as Java virtual machine (JVM) arguments:

```
-Dhttp.proxyHost=[server host]
-Dhttp.proxyPort=[server port]
```

Complete the following procedure to start your application server with HTTP proxy host setting.

1) From a command line, edit the run script in the *[appserver root]/bin/* directory:

- (Windows)
 - standalone.conf.bat
- (Linux, UNIX)
 - standalone.conf

2) Add the following text to the script file:

```
Set JAVA_OPTS=%JAVA_OPTS%
-Dhttp.proxyHost=[server host]
-Dhttp.proxyPort=[server port]
```

3) Save and close the file.

Setting the Adobe PDF Printer as the default printer

You must set the Adobe PDF Printer to be the default printer on the server. If the Adobe PDF Printer is not set as the default, PDF Generator cannot convert files successfully.

For clusters, you must set Adobe PDF Printer as the default printer on all nodes.

Set the default printer

- 1) Select **Start > Printers and Faxes**.
- 2) In the Printers and Faxes window, right-click **Adobe PDF** and select **Set as Default Printer**.

Configuring Acrobat Professional (Windows-based Computers Only)

NOTE: This procedure is required only if you upgraded to or installed Acrobat after you completed the AEM Forms on JEE installation. Upgrading Acrobat can be completed after you run Configuration Manager and deploy AEM Forms on JEE to the application server. Acrobat Professional root directory is designated as *[Acrobat root]*. Typically, the root directory is *C:\Program Files (x86)\Adobe\Acrobat 2015\Acrobat*.

Configure Acrobat for use with PDF Generator

- 1) 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) Navigate to the additional\scripts folder on the AEM Forms on JEE installation media.
- 4) Run the following batch file.

```
Acrobat_for_PDFG_Configuration.bat [aem_forms root]/pdfg_config
```

NOTE: On clusters, you must run the command on the cluster node where AEM forms on JEE is installed.

- 5) On other cluster nodes on which you do not run AEM Forms on JEE Configuration Manager, do the following:
 - Add a new registry DWORD entry named SplWOW64TimeOut at HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Print. Set its value to 60000.
 - Copy `PDFGen.api` from the `[aem-forms root]/plugins/x86_win32` directory on the node where AEM Forms on JEE is installed to the `[Acrobat root]/plug_ins` directory on the node being currently configured.
- 6) Open Acrobat and select **Help > Check for updates > Preferences**.
- 7) De-select **Automatically check for Adobe updates**.

Validate the Acrobat installation

- 1) Navigate to a PDF file on your system and double-click it to open it in Acrobat. If the PDF file opens successfully, Acrobat is installed correctly.
- 2) If the PDF file does not open correctly, uninstall Acrobat and reinstall it.

NOTE: Ensure that you dismiss all Acrobat dialog boxes that are displayed after Acrobat installation is complete and disable the automatic updates for Acrobat. Set the `Acrobat_PATH` environment variable to point to Acrobat.exe. For example, `C:\Program Files (x86)\Adobe\Acrobat 2015\Acrobat\Acrobat.exe`.

Add temporary directories to trusted directories list in Acrobat

The `OptimizePDF` service uses Adobe Acrobat and mandates that AEM Forms on JEE temporary directory and PDF Generator temporary directory are listed in the trusted directories list of Acrobat.

If AEM Forms on JEE temporary directory and PDF Generator temporary directory are not listed in the trusted directories list, the `OptimizePDF` service fails to run. Perform the following steps to add directories to the temporary directory list:

- 1) Open Acrobat, Choose **Edit > Preferences**.
- 2) From the Categories on the left, select **Security (Enhanced)**, and then select the **Enable Enhanced Security** option.
- 3) To add AEM Forms on JEE temporary directory and PDF Generator temporary directory to the trusted directories list, click **Add Folder Path**, select directories, and click **OK**.

Adding fonts to PDF Generator

AEM Forms on JEE provides a central repository of fonts, which is accessible to all AEM Forms on JEE modules. Make any extra fonts available to non-AEM Forms on JEE applications on the server so that PDF Generator can use these fonts to create PDF documents created with these applications.

NOTE: Restart the application server after adding new fonts to the specified fonts folder.

Non-AEM Forms on JEE applications

The following list contains non-AEM Forms on JEE applications that PDF Generator can use for PDF generation on the server side:

Windows-only Applications

- Microsoft Office Word
- Microsoft Office Excel
- Microsoft Office PowerPoint
- Microsoft Office Project
- Microsoft Office Publisher
- Adobe FrameMaker
- Adobe PageMaker
- Adobe Acrobat Professional

Multi-platform applications

- OpenOffice Writer
- OpenOffice Calc
- OpenOffice Draw
- OpenOffice Impress

NOTE: In addition to these applications, your list may include additional applications that you added.

Of the above applications, the OpenOffice Suite (which includes Writer, Calc, Draw, and Impress) is available on Windows, Solaris, and Linux platforms, whereas other applications are available on Windows only.

Adding new fonts to Windows applications only

All Windows-only applications that are mentioned above can access all the fonts available in the C:\Windows\Fonts (or equivalent) folder. In addition to C:\Windows\Fonts, each of these applications may have its own private fonts folders.

Therefore, if you plan to add any custom fonts to the AEM Forms on JEE fonts repository, ensure that the same fonts are available to the Windows-only applications also by copying these fonts to either C:\Windows\Fonts or to an equivalent folder.

Your custom fonts must be licensed under an agreement that allows you to use them with the applications that have access to these fonts.

Adding new fonts to other applications

If you added support for PDF creation in other applications, see the Help for these applications to add new fonts. In Windows, copying your custom fonts to the C:\Windows\Fonts (or equivalent) folder should be sufficient.

Adding new fonts to OpenOffice Suite

Adding custom fonts to OpenOffice Suite is explained on the OpenOffice *Fonts-FAQ* page at <http://wiki.services.openoffice.org>.

Configuring HTML to PDF conversions

The HTML-to-PDF conversion process is designed to use the settings from Acrobat DC Pro that override the settings from PDF Generator.

NOTE: This configuration is required to enable the HTML-to-PDF conversion process, otherwise this conversion type will fail.

Configure the HTML-to-PDF conversion

- 1) Install and validate Acrobat as described in *ConfiguringAcrobatProfessional*.
- 2) Locate the pdfgen.api file in the *[aem-forms root]\plugins\x86_win32* directory and copy it to *[Acrobat root]\Acrobat\plug_ins* directory.

Enable support for Unicode fonts in HTML to PDF conversions

IMPORTANT: The HTML-to-PDF conversion fails if the zipped input file contains HTML files with double-byte characters in filenames. To avoid this problem, do not use double-byte characters when naming HTML files.

- 1) Copy the Unicode font to any of the following directories as appropriate for your system:
 - Windows
 - [Windows root]\Windows\fonts*
 - [Windows root]\WINNT\fonts*
 - UNIX
 - /usr/lib/X11/fonts/TrueType*
 - /usr/openwin/lib/X11/fonts/TrueType*
 - /usr/share/fonts/default/TrueType*
 - /usr/X11R6/lib/X11/fonts/ttf*
 - /usr/X11R6/lib/X11/fonts/truetype*
 - /usr/X11R6/lib/X11/fonts/TrueType*
 - /usr/X11R6/lib/X11/fonts/TTF*

```

/Users/cfqouser/Library/Fonts
/System/Library/Fonts
/Library/Fonts
/Users/ + System.getProperty(<username>, root) + /Library/Fonts
System.getProperty(JAVA_HOME) + /lib/fonts
/usr/share/fonts (Solaris)

```

NOTE: Ensure that the directory `/usr/lib/X11/fonts` exists. If it does not exist, create a symbolic link from `/usr/share/X11/fonts` to `/usr/lib/X11/fonts` using the `ln` command.

NOTE: Ensure that the fonts are present in either `/usr/share/fonts` or `/usr/share/X11/fonts` directory.

- 2) Unzip the IBM type1 courier font to the `/usr/share/X11/fonts/font-ibm-type1-1.0.3` folder.
- 3) Create a symbolic link from `/usr/share/fonts` to `/usr/share/X11/fonts`.
- 4) Modify the font-name mapping in the `cffont.properties` file located in the `[aem-forms root]/deploy/adobe-generatepdf-dsc.jar` file:
 - Extract the archive file, and locate the `cffont.properties` file and open it in an editor.
 - In the comma-separated list of Java font names, add a map to your Unicode system font for each font type. In the example below, `kochi mincho` is the name of your Unicode system font.


```

dialog=Arial, Helvetica, kochi mincho
dialog.bold=Arial Bold, Helvetica-Bold, kochi mincho ...

```
 - Save and close the properties file, and then repackage and redeploy the `adobe-generatepdf-dsc.jar` file.

NOTE: On a Japanese operating system, specify the font mapping in the `cffont.properties.ja` file as well, which takes precedence over the standard `cffont.properties` file.

TIP: Fonts in the list are searched from left to right, using the first font found. HTML-to-PDF conversion logs return a list of all the font names that are found in the system. To determine the font name you need to map, add the font to one of the directories above, restart the server, and run a conversion. You can determine from the log files the font name to use for mapping.

To embed the font in the generated PDF files, set the `embedFonts` property in the `cffont.properties` file to `true` (the default is `false`).

Installing the Network Printer Client

PDF Generator includes an executable file to install the PDF Generator network printer on a client computer. After the installation is complete, a PDF Generator printer is added to the list of existing printers on the client computer. This printer can then be used to send documents for conversion to PDF.

NOTE: The Network Printer Client installation wizard available in the administration console is supported only on Windows operating system. Ensure that you use a 32-bit JVM to launch the Network Printer Client installation wizard. You will encounter an error if you use a 64-bit JVM.

If the PDFG Network Printer fails to install on Windows or if you want to install the printer on UNIX or Linux platforms, use the operating system's native Add Printer utility and configure it as described in [ConfigurePDFGNetworkPrinteronWindowsusingthenativeAddPrinterwizard](#)

Install the PDF Generator Network Printer Client

NOTE: Before installing the PDF Generator network printer client on Windows Server 2012, ensure that you have the Internet Printing Client feature installed on your Windows Server 2012. For installing the feature, see Windows Server 2012 Help.

- 1) Ensure that you have successfully installed PDF Generator on your server.
- 2) Do one of the following:
 - From a Windows client computer, open the following URL in your web browser, where *[host]* is the name of the server where you installed PDF Generator and *[port]* is the application server port used.
`http://[host]:[port]/pdfg-ipp/install`
 - In administration console, click **Home > Services > PDF Generator > PDFG Network Printer**. In the **PDFG Network Printer Installation** section, click **Click here** to launch the PDFG Network Printer Installation.
- 3) On the Configure Internet Port screen, select **Use the specified user account** option, and provide the credentials of a AEM Forms on JEE user who has the PDFG Administrator/User role. This user must also have an email address that can be used to receive the converted files. To have this security setting apply to all users on the client computer, select **Use the same security options for all users**, and then click **OK**.

NOTE: If the user's password changes, then users will need to reinstall the PDFG Network Printer on their computers. You cannot update the password from administration console.

Upon successful installation, a dialog box appears, indicating that the printer is successfully installed.

- 4) Click **OK**. You will now have a PDF Generator printer available in your list of printers.

Configure PDFG Network Printer on Windows using the native Add Printer wizard

- 1) Click **Start > Printers and Faxes** and double-click **Add Printer**.
- 2) Click **Next**, select **A network printer, or a printer attached to another computer**, and then click **Next**.
- 3) Select **Connect to a printer on the Internet or on a home or office network** and type the following URL for the PDFG printer, where *[host]* is the server name and *[port]* is the port number where the server is running:
`http://[host]:[port]/pdfg-ipp/printer`
- 4) On the Configure Internet Port screen, select **Use the specified user account** and provide valid User credentials.
- 5) In the **Printer Driver Select** box, choose any standard PostScript-based printer driver (for example, HP Color LaserJet PS).
- 6) Complete the installation by choosing appropriate options (for example, setting this printer as default).

NOTE: The user credentials used while adding the printer must have a valid email ID configured in User Management to receive the response.

- 7) Configure the email service's sendmail service. Provide a valid SMTP server and authentication information in the service's configuration options.

Install and configure the PDF Generator Network Printer Client using Proxy server port forwarding

- 1) Configure port forwarding on the CC Proxy server on a particular port to the AEM forms on JEE Server, and disable the authentication at proxy server level (because AEM Forms on JEE uses its own authentication). If a client connects to this Proxy server on the forwarded port, then all the requests will be forwarded to the AEM Forms on JEE Server.
- 2) Install PDFG Network Printer using the following URL:
`http://[proxy server]:[forwarded port]/pdfg-ipp/install.`
- 3) Provide the necessary credentials for authentication of the PDFG Network Printer.
- 4) The PDFG Network Printer will be installed on the client machine which you can use for PDF conversion using the firewall protected AEM Forms on JEE Server.

Changing File Block Settings

Change Microsoft Office trust center settings to enable PDFG to convert older versions of Microsoft office documents.

- 1) Click the **File tab** in any Office 2013 application. Under **File**, click **Options**; the Options dialog box appears
- 2) Click **Trust Center**, and then click **Trust Center Settings**.
- 3) In the **Trust Center settings**, click **File Block Settings**.
- 4) In the File Type list, uncheck open for the file type that you want PDF Generator to convert.

Watched folder performance parameters

To avoid `java.io.IOException` error messages indicating that not enough disk space is available to perform PDF conversions by using a watched folder, you can modify the settings for PDF Generator in administration console.

Set performance parameters for PDF Generator

- 1) Log in to administration console and click **Services > Applications and Services > Service Management**.
- 2) In the list of services, navigate to and click **PDFGConfigService**, and then set the following values:
 - **PDFG Cleanup Scan Seconds:** 1800
 - **Job Expiration Seconds:** 6000
 - **Server Conversion Timeout:** Change the default of 270 to a higher value, such as 450.
- 3) Click **Save** and restart the server.

Enable PDF Conversion for Microsoft Word document containing protected fields

PDF Generator supports Microsoft Word documents containing protected fields. To enable PDF Conversion for Microsoft Word document containing protected fields, change the file type settings:

- 1) In the **administration console**, navigate to **Services > PDF Generator > File Type Settings**, and open your file type settings profile.
- 2) Expand the **Microsoft Word** option and select the **Preserve document markup in Adobe PDF (for Microsoft Office 2003 or later)** option.
- 3) Click **Save As**, specify name of the file type setting, and click **OK**.

6.5. Configure SSL for Document Security

Document Security requires the application server to be configured to use SSL. See [administrationhelp](#).

6.6. Enable FIPS mode

NOTE: If you have configured it in the previous version, skip the following section:

AEM Forms on JEE provides a FIPS mode to restrict data protection to Federal Information Processing Standard (FIPS) 140-2 approved algorithms using the RSA BSAFE Crypto-C 2.1 encryption module.

If you did not enable this option by using Configuration Manager during AEM Forms on JEE configuration or if you enabled it but want to turn it off, you can change this setting through Administration Console.

Modifying FIPS mode requires you to restart the server.

FIPS mode does not support Acrobat versions earlier than 7.0. If FIPS mode is enabled and the Encrypt With Password and Remove Password processes include the Acrobat 5 setting, the process fails.

In general, when FIPS is enabled, the Assembler service does not apply password encryption to any document. If this is attempted, a `FIPSMODEException` is thrown, indicating that “Password encryption is not permitted in FIPS mode.” Additionally, the `PDFsFromBookmarks` element is not supported in FIPS mode when the base document is password-encrypted.

Turn FIPS mode on or off

- 1) Log in to administration console.
- 2) Click **Settings > Core System Settings > Configurations**.
- 3) Select **Enable FIPS** to enable FIPS mode or deselect to disable FIPS mode.
- 4) Click **OK** and restart the application server.

NOTE: AEM forms on JEE software does not validate code to ensure FIPS compatibility. It provides a FIPS operation mode so that FIPS-approved algorithms are used for cryptographic services from the FIPS-approved libraries (RSA).

6.7.

6.8.

6.9. Configuring Connector for EMC Documentum

NOTE: AEM Forms on JEE supports EMC Documentum 6.7 SP1 and 7.0 with minor updates only. Make sure your ECM is upgraded accordingly.

NOTE: Ensure that installing client for the connectors, copying the JAR file, and configuration changes tasks are performed on all the nodes of the cluster.

If you installed Connector for EMC Documentum as part of your AEM Forms on JEE, complete the following procedure to configure the service to connect to the Documentum repository.

Configure Connector for EMC Documentum

- 1) Locate the `adobe-component-ext.properties` file in the `[appserver root]/bin` folder (if the file does not exist, create it).
- 2) Add a new system property that provides the following Documentum Foundation Classes JAR files:
 - `dfc.jar`
 - `aspectjrt.jar`
 - `log4j.jar`
 - `jaxb-api.jar`
 - `configservice-impl.jar`
 - `configservice-api.jar`
 - `commons-codec-1.3.jar`
 - `commons-lang-2.4.jar`

The new system property should take on this form:

`[component id].ext=[JAR files and/or folders]`

For example, using default Content Server and Documentum Foundation Classes installations, add to the file one of the following system properties on a new line, with no line breaks, and end the line with a carriage return:

- Connector for EMC Documentum 6.7 SP1 and 7.0 only:
`com.adobe.livecycle.ConnectorforEMCDocumentum.ext=
C:/Program Files/Documentum/Shared/dfc.jar,
C:/ProgramFiles/Documentum/Shared/aspectjrt.jar,
C:/Program Files/Documentum/Shared/log4j.jar,
C:/Program Files/Documentum/Shared/jaxb-api.jar,
C:/Program Files/Documentum/Shared/configservice-impl.jar,`

```
C:/Program Files/Documentum/Shared/configservice-api.jar  
C:/Program Files/Documentum/Shared/commons-codec-1.3.jar  
C:/Program Files/Documentum/Shared/commons-lang-2.4.jar
```

NOTE: The above text contains formatting characters for line breaks. If you copy and paste this text, you must remove the formatting characters.

- 3) Repeat previous steps on each application server instance of the cluster.
- 4) Open a web browser and enter this URL:
`http://[host]:[port]/adminui`
- 5) Log in using the default user name and password:
User name: *administrator*
Password: *password*
- 6) Navigate to **Services > Connector for EMC Documentum > Configuration Settings** and perform these tasks:
 - Type all the required Documentum repository information.
 - To use Documentum as your repository provider, under Repository Service Provider Information, select **EMC Documentum Repository Provider**, and then click **Save**. For more information, click the Help link in the upper-right corner of the page in the [Administration](#) Help.
- 7) (Optional) Navigate to **Services > Connector for EMC Documentum > Repository Credentials Settings**, click **Add**, specify the Docbase information, and then click **Save**. (For more information, click **Help** in the upper-right corner.)
- 8) If the application server is not currently running, start the server. Otherwise, stop and then restart the server.
- 9) Open a web browser and enter this URL.
`http://[host]:[port]/adminui`
- 10) Log in using the default user name and password:
User name: *administrator*
Password: *password*
- 11) Navigate to **Services > Applications and Services > Service Management** and select these services:
 - EMCDocumentumAuthProviderService
 - EMCDocumentumContentRepositoryConnector
 - EMCDocumentumRepositoryProvider
 - EMCDocumentumECMUpgradeService
- 12) Click **Start**. If any of the services do not start correctly, check the settings you completed earlier.
- 13) Do one of the following tasks:
 - To use the Documentum Authorization service (EMCDocumentumAuthProviderService) to display content from a Documentum repository in the Resources view of Workbench, continue with this procedure. Using the Documentum Authorization service overrides the default AEM Forms on JEE authorization and must be configured to log in to Workbench using Documentum credentials.

- To use the AEM Forms on JEE repository, log in to Workbench by using the AEM Forms on JEE super administrator credentials (by default, *administrator* and *password*).

You have now completed the required steps for this procedure. Use the credentials provided in this step for accessing the default repository in this case and use the default AEM Forms on JEE authorization service.

- 14) Restart the application server.
- 15) Log in to administration console and click **Settings > User Management > Domain Management**.
- 16) Click **New Enterprise Domain**, and type a domain ID and name. The domain ID is the unique identifier for the domain. The name is a descriptive name for the domain.

NOTE: When using MySQL for your AEM Forms on JEE database, use only single-byte (ASCII) characters for the ID. (See “Adding enterprise domains” in AEM Forms on JEE administration help.)

- 17) Add a custom authentication provider:
 - Click **Add Authentication**.
 - In the Authentication Provider list, select **Custom**.
 - Select **EMCDocumentumAuthProvider** and then click **OK**.
- 18) Add an LDAP authentication provider:
 - Click **Add Authentication**.
 - In the Authentication Provider list, select **LDAP**, and then click **OK**.
- 19) Add an LDAP directory:
 - Click **Add Directory**.
 - In the Profile Name box, type a unique name, and then click **Next**.
 - Specify values for the **Server**, **Port**, **SSL**, **Binding**, and **Populate page with** options. If you select User for the Binding option, you must also specify values for the **Name** and **Password** fields.
 - (Optional) Select **Retrieve Base DN** to retrieve base domain names, as required.
 - Click **Next**, configure the user settings, click **Next**, configure group settings, as required, and then click **Next**.

*For details about the settings, click **User Management Help** in the upper-right corner of the page.*

- 20) Click **OK** to exit the Add Directory page and then click OK again.
- 21) Select the new enterprise domain and click **Sync Now**. Depending on the number of users and groups in your LDAP network and the speed on your connection, the synchronization process may take several minutes.

*(Optional) To verify the status of the synchronization, click **Refresh** and view the status in the **Current Sync State** column.*

- 22) Navigate to **Settings > User Management > Users and Groups**.
- 23) Search for users that were synchronized from LDAP and perform these tasks:
 - Select one or more users and click **Assign Role**.
 - Select one or more AEM Forms on JEE roles and click **OK**.
 - Click **OK** a second time to confirm the role assignment.

*Repeat this step for all users that you assign roles to. For more information, click **User Management Help** in the upper-right corner of the page.*

- 24) Start Workbench and log in by using the credentials for the Documentum repository:

Username: *[username]@[repository_name]*

Password: *[password]*

After you log in, the Documentum repository appears in the Resources view within Workbench. If you do not log in using the username@repository_name, Workbench attempts to log in to the default repository.

- 25) (Optional) To install the AEM Forms on JEE Samples for Connector for EMC Documentum, create a Documentum repository named Samples, and then install the samples in that repository.

After you configure the Connector for EMC Documentum service, see *AEM Forms on JEE administration help* for information about configuring Workbench with your Documentum repository.

Creating the XDP MIME format in a Documentum repository

Before users can store and retrieve XDP files from a Documentum repository, you must do one of these tasks:

- Create a corresponding XDP format in each repository where users will access XDP files.
- Configure the Connector for EMC Documentum service to use a Documentum Administrator account when accessing the Documentum repository. In this case, the Connector for EMC Documentum service uses the XDP format whenever it is required.

Create the XDP format on Documentum Content Server using Documentum Administrator

- 1) Log in to Documentum Administrator.
- 2) Click **Formats** and then select **File > New > Format**.
- 3) Type the following information in the corresponding fields:
Name: *xdp*
Default File Extension: *xdp*
Mime Type: *application/xdp*
- 4) Repeat steps 1 to 3 for all other Documentum repositories where users will store XDP files.

Configure the Connector for EMC Documentum service to use a Documentum Administrator

- 1) Open a web browser and enter this URL:
http://[host]:[port]/adminui
- 2) Log in using the default user name and password:
User name: *administrator*
Password: *password*
- 3) Click **Services > Connector for EMC Documentum > Configuration Settings**.
- 4) Under Documentum Principal Credentials Information, update the following information and then click **Save**:

User Name: *[Documentum Administrator user name]*

Password: *[Documentum Administrator password]*

- 5) Click **Repository Credentials Settings**, select a repository from the list or, if none exist, click **Add**.
- 6) Provide the appropriate information in the corresponding fields and then click **Save**:

Repository Name: *[Repository Name]*

Repository Credentials User Name: *[Documentum Administrator user name]*

Repository Credentials Password: *[Documentum Administrator password]*

- 7) Repeat steps 5 and 6 for all repositories where users will store XDP files.

Add support for multiple connection brokers

AEM Forms on JEE Configuration Manager supports configuring only one connection broker. Use AEM Forms on JEE Administrator Console to add support for multiple connection brokers:

- 1) Open AEM Forms on JEE Administrator Console.
- 2) Navigate to Home > Services > Connector for EMC Documentum > Configuration Settings.
- 3) In the **Connection broker Host Name or IP Address**, enter comma separated list of hostnames of different connection brokers. For example, host1, host2, host3.
- 4) In the **Port Number of Connection broker**, enter comma separated list of the ports of corresponding connection brokers. For example, 1489, 1491, 1489.
- 5) Click **Save**.

6.10. Configuring the Connector for IBM Content Manager

NOTE: AEM forms supports IBM Content Manager. See the [Supported Platform Combinations](#) document and make sure your ECM is upgraded to the supported version.

NOTE: Ensure that installing client for the connectors, copying the JAR file, and configuration changes tasks are performed on all the nodes of the cluster.

If you installed the Connector for IBM Content Manager as part of your AEM Forms installation, complete the following procedure to configure the service to connect to the IBM Content Manager datastore.

Configure Connector for IBM Content Manager

- 1) Locate the adobe-component-ext.properties file in the *[appserver root]/bin* folder. If the file does not exist, create it.
- 2) Add a new system property that provides the location of the following IBM IIC JAR files:
 - cmb81.jar
 - cmbcm81.jar
 - cmbicm81.jar
 - cmblog4j81.jar
 - cmbsdk81.jar

- cmbutil81.jar
- cmbutilicm81.jar
- cmbview81.jar
- cmbwas81.jar
- cmbwcm81.jar
- cmgmt

NOTE: cmgmt is not a JAR file. On Windows, by default, this folder is at C:\Program Files\IBM\db2cmv8\.

- common.jar
- db2jcc.jar
- db2jcc_license_cisuz.jar
- db2jcc_license_cu.jar
- ecore.jar
- ibmjgssprovider.jar
- ibmjsseprovider2.jar
- ibmpkcs.jar
- icrm81.jar
- jcache.jar
- log4j-1.2.8.jar
- xerces.jar
- xml.jar
- xsd.jar

The new system property looks similar to the following:

```
[component id].ext=[JAR files and/or folders]
```

For example, using a default DB2 Universal Database Client and I14C installation, in the file, add the following system property on a new line, with no line breaks, and end the line with a carriage return:

```
C:/Program Files/IBM/db2cmv8/cmgmt,
C:/Program Files/IBM/db2cmv8/java/jre/lib/ibmjsseprovider2.jar,
C:/Program Files/IBM/db2cmv8/java/jre/lib/ibmjgssprovider.jar,
C:/Program Files/IBM/db2cmv8/java/jre/lib/ibmpkcs.jar,
C:/Program Files/IBM/db2cmv8/java/jre/lib/xml.jar,
C:/Program Files/IBM/db2cmv8/lib/cmbview81.jar,
C:/Program Files/IBM/db2cmv8/lib/cmb81.jar,
C:/Program Files/IBM/db2cmv8/lib/cmbcm81.jar,
C:/Program Files/IBM/db2cmv8/lib/xsd.jar,
C:/Program Files/IBM/db2cmv8/lib/common.jar,
C:/Program Files/IBM/db2cmv8/lib/ecore.jar,
C:/Program Files/IBM/db2cmv8/lib/cmbicm81.jar,
C:/Program Files/IBM/db2cmv8/lib/cmbwcm81.jar,
```

```
C:/Program Files/IBM/db2cmv8/lib/jcachel.jar,  
C:/Program Files/IBM/db2cmv8/lib/cmbutil81.jar,  
C:/Program Files/IBM/db2cmv8/lib/cmbutilicm81.jar,  
C:/Program Files/IBM/db2cmv8/lib/icmrm81.jar,  
C:/Program Files/IBM/db2cmv8/lib/db2jcc.jar,  
C:/Program Files/IBM/db2cmv8/lib/db2jcc_license_cu.jar,  
C:/Program Files/IBM/db2cmv8/lib/db2jcc_license_cisuz.jar,  
C:/Program Files/IBM/db2cmv8/lib/xerces.jar,  
C:/Program Files/IBM/db2cmv8/lib/cmblog4j81.jar,  
C:/Program Files/IBM/db2cmv8/lib/log4j-1.2.8.jar,  
C:/Program Files/IBM/db2cmv8/lib/cmbsdk81.jar,  
C:/Program Files/IBM/db2cmv8/lib/cmbwas81.jar
```

- 3) If the application server is not currently running, start the server; otherwise, stop and then restart the server.

You can now connect to the IBM Content Manager datastore from the IBMCMConnectorService Property Sheets by using the Use User Credentials as the login mode.

You have now completed the required steps for this procedure.

(Optional) If you want to connect to IBM Content Manager datastore from IBMCMConnectorService Property Sheets by using the Use Credentials From Process Context as the login mode, complete the following procedure.

Connect using Use Credentials from process context login mode

- 1) Open a web browser and enter this URL:
http://[host]:[port]/adminui
- 2) Log in using the super administrator credentials. Default values set during installation are:
User name: *administrator*
Password: *password*
- 3) Click **Services > Connector for IBM Content Manager**
- 4) Type all of the required repository information and click **Save**. For more information about the IBM Content Manager repository information, click the **Help** link in the upper-right corner of the page.
- 5) Do one of these tasks:
 - To use the IBM Content Manager Authorization service IBMCMAuthProvider to use content from an IBM Content Manager datastore, in the Processes view of Workbench, continue with this procedure. Using the IBM Content Manager Authorization service overrides the default AEM Forms authorization and must be configured to log in to Workbench by using IBM Content Manager credentials.
 - To use the System Credentials provided in step 4 to use content from an IBM Content Manager datastore, in the Processes view of Workbench, log in to Workbench by using the AEM Forms super administrator credentials (by default, *administrator* and *password*). You have now completed the required steps for this procedure. The System Credentials that are provided in step 4 use the default AEM Forms authorization service for accessing the default repository in this case.

- 6) Log in to the administration console, and click **Settings > User Management > Domain Management**.
- 7) Click **New Enterprise Domain** and type a domain ID and name. The domain ID is the unique identifier for the domain. The name is a descriptive name for the domain.
NOTE: When using MySQL for your AEM Forms database, use only single-byte (ASCII) characters for the ID. (See Adding enterprise domains in [administration help](#).)
- 8) Add a custom authentication provider:
 - Click **Add Authentication**.
 - In the **Authentication Provider** list, select **Custom**, and then select **IBMCMAuthProviderService** and click **OK**.
- 9) Add an LDAP authentication provider:
 - Click **Add Authentication**.
 - In the **Authentication Provider** list, select **LDAP** and then click **OK**.
- 10) Add an LDAP directory:
 - Click **Add Directory**.
 - In the **Profile Name** box, type a unique name, and then click **Next**.
 - Specify values for the **Server**, **Port**, **SSL**, **Binding**, and **Populate page with** options. If you select **User** for the **Binding** option, you must also specify values for the **Name** and **Password** fields. (Optional) Select **Retrieve Base DN** to retrieve base domain names, as required. When finished, click **Next**.
 - Configure the user settings, click **Next**, configure group settings as required, and then click **Next**.

*For details about the above settings, click the **Help** link in the upper-right corner of the page.*

- 11) Click **OK** to exit the Add Directory page and click **OK** again.
- 12) Select the new enterprise domain and click **Sync Now**. Depending on the number of users and groups in your LDAP network and the speed on your connection, the synchronization process may take several minutes.
- 13) To verify the status of the synchronization, click **Refresh** and view the status in the **Current Sync State** column.
- 14) Navigate to **Settings > User Management > Users and Groups**.
- 15) Search for users that were synchronized from LDAP and do these tasks:
 - Select one or more users and click **Assign Role**.
 - Select one or more AEM Forms roles and click **OK**.
 - Click **OK** a second time to confirm the role assignment.

*Repeat this step for all users that you want to assign roles to. For more information, click the **Help** link in the upper-right corner of the page.*

- 16) Start Workbench and log in using the following credentials for IBM Content Manager datastore:
Username: `[username]@[repository_name]`
Password: `[password]`

*The IBM Content Manager datastore can now be used in the Processes view within Workbench when the login mode for IBMCMConnectorService orchestrable components is selected as **Use Credentials from process context**.*

6.11. Configuring the Connector for IBM FileNet

AEM forms supports IBM FileNet 5.0 and 5.2 only. Make sure your ECM is upgraded accordingly.

NOTE: AEM Forms supports FileNet 5.2 Content Engine; FileNet 5.2 Process Engine is not supported.

If you installed Connector for IBM FileNet as part of your AEM Forms, you must configure the service to connect to the FileNet object store.

NOTE: Ensure that installing client for the connectors, copying of JAR file, and configuration changes tasks are performed on all the nodes of the cluster.

Complete the following procedure to configure Connector for IBM FileNet.

- 1) Locate the adobe-component-ext.properties file in the *[appserver root]* folder (if the file does not exist, create it).
- 2) Add a new system property that provides the location of these FileNet Application Engine JAR files:

For FileNet 5.x add following JAR files

- Jace.jar
- javaapi.jar
- log4j.jar
- pe.jar
- stax-api.jar
- xlsxScanner.jar
- xlsxScannerUtils.jar

NOTE: Add the pe.jar file only if your deployment uses the IBMFileNetProcessEngineConnector service. The new system property should reflect this structure:

```
[component id].ext=[JAR files and/or folders]
```

For example, using a default FileNet Application Engine installation on a Windows operating system, add the following system property on a new line with no line breaks and end the line with a carriage return:

NOTE: The following text contains formatting characters for line breaks. If you copy this text to a location outside this document, remove the formatting characters when you paste it to the new location.

```
com.adobe.livecycle.ConnectorforIBMFileNet.ext=
C:/Program Files/FileNet/AE/CE_API/lib2/javaapi.jar,
C:/Program Files/FileNet/AE/CE_API/lib2/log4j-1.2.13.jar
```

- 3) (FileNet Process Engine Connector only) Configure the connection properties for the process engine as follows:
 - Using a text editor, create a file with the following content as a single line and end the line with a carriage return:

(FileNet 5.0 only)

```
RemoteServerUrl =
comp:http://[contentserver_IP]:[contentengine_port]/wsi/FNCEWS40DIME
/
```

(FileNet 5.2 only)

```
RemoteServerUrl =
comp:http://[contentserver_IP]:[contentengine_port]/wsi/FNCEWS40MTOM
/
```

- Save the file as `WcmApiConfig.properties` in a separate folder, and add the location of the folder that contains the `WcmApiConfig.properties` file to the `adobe-component-ext.properties` file.

For example, if you save the file as `c:/pe_config/WcmApiConfig.properties`, add the path `c:/pe_config` to the `adobe-component-ext.properties` file.

NOTE: The filename is case-sensitive.

- 4) Locate the `lc_turnkey.xml` file in the following folder and add the following application policy as a child of the `<security-domains>` node:

- **(Manually-configured JBoss, single server)** `[appserver root]/[appserver root]/stand-alone/configuration`
- **(Adobe-preconfigured JBoss, single server)** `[appserver root]/standalone/configuration`

```
<security-domain name = "FileNetP8WSI">
  <authentication>
    <login-module code = "com.filenet.api.util.WSILoginModule" flag =
      "required">
    </login-module>
  </authentication>
</security-domain>
```

If you are using process engine then add the following code after the `</security-domain>` node:

```
<security-domain name = "FileNetP8">
  <authentication>
    <login-module code = "com.filenet.api.util.WSILoginModule" flag
= "required">
    </login-module>
  </authentication>
</security-domain>
```

- Locate the `domain_<db_name>.xml` file in the following folder and add the following application policy as a child of the `<security-domains>` node:

(Manually-configured JBoss, cluster) `[appserver root]/domain/configuration`

- **(Adobe-preconfigured JBoss, cluster)** `[appserver root]/domain/configuration/`

```
<security-domain name = "FileNetP8WSI">
  <authentication>
    <login-module code = "com.filenet.api.util.WSILoginModule" flag =
      "required">
    </login-module>
```



```
</authentication>
</security-domain>
```

If you are using process engine then add the following code after the </security-domain> node:

```
<security-domain name = "FileNetP8">
  <authentication>
    <login-module code = "com.filenet.api.util.WSILoginModule" flag
= "required">
      </login-module>
    </authentication>
  </security-domain>
```

- 5) If the application server is not currently running, start the server. Otherwise, stop and then restart the server.
- 6) If JBoss runs as a service, start (or restart) the JBoss for Adobe Experience Manager Forms 6.2 service.
- 7) (**Cluster only**) Repeat all previous steps on each instance on the cluster.
- 8) Open a web browser and enter this URL:
`http://[host]:[port]/adminui`
- 9) Log in using the default user name and password:
User name: *administrator*
Password: *password*
- 10) Click **Services > Connector for IBM FileNet**.
- 11) Provide the Content Engine URL. For example,
`cemp:http://ContentEngineHostNameorIP:port/wsi/FNCEWS40MTOM?jaasConfigurationName=FileNetP8WSI`
- 12) Provide all the required FileNet repository information and, under Repository Service Provider Information, select **IBM FileNet Repository Provider**.
*If your deployment uses the optional process engine service, under Process Engine Settings, select **Use Process Engine Connector Service** and specify the process engine settings. For more information, click the **Help** link in the upper-right corner of the page.*
NOTE: The credentials that you provide in this step are validated later when you start the IBM FileNet repository services. If the credentials are not valid, an error is thrown and the services will not start.
- 13) Click **Save** and navigate to **Services > Applications and Services > Service Management**.
- 14)
- 15) Select the check box next to each of these services and click **Start**:
 - IBMFileNetAuthProviderService
 - IBMFileNetContentRepositoryConnector
 - IBMFileNetRepositoryProvider
 - IBMFileNetProcessEngineConnector (if configured)

If any of the services do not start correctly, verify the Process Engine settings.

- 16) Do one of the following tasks:
 - To use the FileNet Authorization service (IBMFileNetAuthProviderService) to display content from a FileNet object store in the Resources view of Workbench, continue with this procedure. Using the FileNet Authorization service overrides the default AEM Forms authorization and must be configured to log in to Workbench by using FileNet credentials.
 - To use the AEM forms repository, log in to Workbench by using the super administrator credentials (by default, *administrator* and *password*). The credentials provided in step 16 use the default AEM Forms authorization service for accessing the default repository in this case.
- 17) Restart your application server.
- 18) Log in to administration console and click **Settings > User Management > Domain Management**.
- 19) Click **New Enterprise Domain** and then type a domain ID and name. The domain ID is the unique identifier for the domain. The name is a descriptive name for the domain.

When using MySQL for your AEM Forms database, use only single-byte (ASCII) characters for the ID. (See “Adding enterprise domains” in [Administration Help](#)
- 20) Add a custom authentication provider:
 - Click **Add Authentication**.
 - In the **Authentication Provider** list, select **Custom**.
 - Select **IBMFileNetAuthProviderService** and then click **OK**.
- 21) Add an LDAP authentication provider:
 - Click **Add Authentication**.
 - In the **Authentication Provider** list, select **LDAP** and then click **OK**.
- 22) Add an LDAP directory:
 - Click **Add Directory** and, in the **Profile Name** box, type a unique name, and then click **Next**.
 - Specify values for the **Server**, **Port**, **SSL**, **Binding**, and **Populate page with** options. If you select **User** for the **Binding** option, you must also specify values for the **Name** and **Password** fields.
 - (Optional) Select **Retrieve Base DN** to retrieve base domain names, as required. When finished, click **Next**.
 - Configure the user settings, click **Next**, configure group settings as required, and then click **Next**.

*For details about the settings, click **Help** link in the upper-right corner of the page.*
- 23) Click **OK** to exit the Add Directory page, and then click **OK** again.
- 24) Select the new enterprise domain and click **Sync Now**. Depending on the number of users and groups in your LDAP network and the speed on your connection, the synchronization process may take several minutes.

*(Optional) To verify the status of the synchronization, click **Refresh** and view the status in the **Current Sync State** column.*
- 25) Navigate to **Settings > User Management > Users and Groups**.
- 26) Search for users that were synchronized from LDAP and perform these tasks:
 - Select one or more users and click **Assign Role**.

- Select one or more AEM Forms roles and click **OK**.
- Click **OK** a second time to confirm the role assignment.

*Repeat this step for all users you want to assign roles to. For more information, click the **Help** link in the upper-right corner of the page.*

- 27) Start Workbench and log in using the following credentials for the IBM FileNet repository:

User name: [username]@[repository_name]

Password: [password]

The FileNet object store should now be visible in the Resources view within Workbench. If you do not log in using the username@repository name, Workbench attempts to log in to the default repository specified in step 16.

- 28) (Optional) If you intend to install the AEM Forms Samples for Connector for IBM FileNet, create a FileNet object store named *Samples* and install the samples in that object store.

After you configure Connector for IBM FileNet, it is recommended that you see administration help for information about configuring Workbench functions properly with your FileNet repository.

6.12. Enable messaging on standalone JBoss

To enable messaging on a standalone JBoss server for AEM Forms on JEE:

- 1) Enable the messaging module on the JBOSS if it is not enabled yet.

Copy the following tags from the `standalone_full.xml` file to the specified location in the `lc_turnkey.xml` file. Both the files are located in the `<aem-forms root>/jboss/standalone/configuration` directory.

- Copy the entire tag with its content `<extension module="org.jboss.as.messaging">...</extension>` from the `standalone_full.xml` file and put it after the `<extensions>` tag in the `lc_turnkey.xml` file
- Copy the entire tag with its content `<subsystem xmlns="urn:jboss:domain:messaging:1.4">...</subsystem>` from the `standalone_full.xml` file and put it after the `<profile>` tag in the `lc_turnkey.xml` file

- 2) Run the `add-user.bat` script located at `<aem-forms root>/jboss/bin` to create an application user and add the user to the **guest** group. The JMS DSC component on AEM Forms on JEE expects a Connection Username and Password to be specified. This user must have permission to use JMS Queue/Topic for performing the Send/Receive operation.

NOTE: *In the `lc_turnkey.xml` file, a user with a guest role is already defined under the `<security-setting match="#">..... </security-settings>` tag. The default user has the privilege to send-receive messages via JMS. However, you must create an application user on the JBoss server with the above role to send-receive JMS messages. While creating a user using the `add-user.bat` script, you can assign it the guest group.*

- 3) Change the JMS DSC Configuration with the user created in step 2.
 - a) Log in to the administration console for AEM Forms on JEE.
 - b) Navigate to **Services > Application and Services > Service Management**.
 - c) Search JMS service.
 - d) In the configuration tab, change the JMS configuration.

6.13. Disable Draft and Submission workflows

If you are using AEM Forms with JBoss application server and database is MongoDB, disable the Draft and Submission workflows on a publish nodes of the cluster. Perform the following steps to disable the workflows:

- 1) Open the following URL: [http://\[host\]:\[port\]/lc/libs/cq/workflow/content/console.html](http://[host]:[port]/lc/libs/cq/workflow/content/console.html)
- 2) Open the Launchers tab. A list of launchers is displayed
- 3) Double-click the launcher with description "Replicate all the drafts/submissions that are just modified".
- 4) In the Properties window, set the value of the Activate field to Disabled, and click OK.
- 5) Repeat step 3 and 4 for the launcher with description "Replicate all the drafts/submissions that are just created".

Now, the Draft and Submission workflows are disabled.

7. Configuring Load Balancing

You can configure your JBoss cluster to provide load-balancing functionality. You can use a load balancer to distribute the workload evenly across all nodes of your cluster. Apache web server and various plug-in are used to implement load balancing for the cluster. LiveCycle Cluster supports only stickiness enabled load balancer.

Obtain the Apache web server software that is applicable to your operating system:

- For Windows, download the Apache web server from the Apache HTTP Server Project site.
- For Solaris 64 bit, download the Apache web server from the Sunfreeware for Solaris Website.
- For Linux, the Apache web server is preinstalled on a Linux system.

Apache can communicate to JBoss using HTTP or AJP protocol. The following are configurations for Load balancing using both protocols.

NOTE: Session affinity associates all the requests coming from an end-user with a specific node of the application server cluster. It is required to keep the session affinity enabled for cluster environments. For detailed instructions to configure session affinity, see documentation of corresponding application server.

7.1. HTTP Connector Based Load Balancing

Using mod_proxy

This configuration uses Apache proxy balancer module along with proxy module to load balance JBoss cluster on HTTP protocol.

Uncomment the following module configurations in `APACHE_HOME/conf/httpd.conf` file

```
LoadModule proxy_balancer_module modules/mod_proxy_balancer.so
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_http_module modules/mod_proxy_http.so
```

NOTE: For Linux, the default `APACHE_HOME` is `/etc/httpd/`

There are two methods to implement mod_proxy based load balancing:

- Using mod_headers
- Using JSESSIONID

Using mod_headers

This configuration provides a way for load balancing with stickiness using mod_headers.

Add following configuration in `APACHE_HOME/conf/httpd.conf` configuration file.

```

LoadModule headers_module modules/mod_headers.so
<VirtualHost *:80>
  ServerName lb.xyz.com
  ServerAlias lb.xyz.com
  ProxyRequests Off
  ProxyPreserveHost On
  Header add Set-Cookie "ROUTEID=.%{BALANCER_WORKER_ROUTE}e; path=/"
  env=BALANCER_ROUTE_CHANGED
  <Proxy balancer://cluster>
    BalancerMember http://abc.com:8080 route=1
    BalancerMember http://xyz.com:8080 route=2
    ProxySet stickysession=ROUTEID
  </Proxy>
  ProxyPass / balancer://cluster/
  ProxyPassReverse / balancer://cluster/

</VirtualHost>

```

Using JSESSIONID

This configuration provides a way for load balancing using JSESSIONID.

In JBoss application server, tomcat container adds the name of the instance to the end of its session id cookie, separated with a dot (.) from the session id. Thus if the Apache web server finds a dot in the value of the session persistence cookie, it only uses the part behind the dot to search for the route. For Tomcat Server instance to be aware of its instance name, set the attribute `jvmRoute` inside the JBoss configuration file `deploy/jbossweb.sar/server.xml` to the value of the route of the worker that connects to the respective JBoss. The name of the session cookie used here is JSESSIONID.

Add following configuration to `APACHE_HOME/conf/httpd.conf` file.

```

<VirtualHost *:80>
  ServerName lb.xyz.com
  ServerAlias lb.xyz.com
  ProxyRequests Off
  ProxyPreserveHost On
  <Proxy balancer://cluster>
    BalancerMember http:// abc.com:8080 route=node1
    BalancerMember http:// xyz.com:8080 route=node2
  </Proxy>
  ProxyPass / balancer://cluster/ stickysession=JSESSIONID|jsessionid
  ProxyPassReverse / balancer://cluster/
</VirtualHost>

```

Server-Side Configuration

- 1) For each node in the cluster, open the `server.xml` file in a text editor from this location: `[appserver root]/server/<profile_name>/deploy/jbossweb.sar`
- 2) Search the `server.xml` file for the Engine name element and add a `jvmRoute` attribute. For example, on a node named `node1`, edit the element to read as follows: `<Engine name="jboss.web" defaultHost="localhost" jvmRoute="node1">`

- 3) Save the edited server.xml file.

NOTE: : For each cluster node, the value of jvmRoute must be unique and match to the value of the route of the worker that connects to the respective JBoss Server(See BalancerMember Configuration in httpd.conf).

7.2. AJP Connector Based Load Balancing

Using mod_jk

This configuration uses Apache mod_jk plug-in to load balance JBoss cluster on AJP protocol. It provides support for the Apache JServ Protocol (AJP).

Perform following steps to configure:

- 1) From the Apache Tomcat Connector site, download the mod_jk plug-in file for your operating system. **NOTE:** *Ensure that your Apache server supports downloaded mod_jk plug-in file.*
- 2) Rename the downloaded file to mod_jk.so and save it in the APACHE_HOME/modules/ directory.
- 3) In a text editor, open the httpd.conf file located in APACHE_HOME/conf and add the following line at the end of the file: `Include conf/mod-jk.conf`
- 4) Create a new file APACHE_HOME/conf/mod-jk.conf with the following content :

```
# Load mod_jk module
# Specify the filename of the mod_jk lib
LoadModule jk_module modules/mod_jk.so
# Where to find workers.properties
JkWorkersFile conf/workers.properties
# Where to put jk logs
JkLogFile logs/mod_jk.log
# Set the jk log level [debug/error/info]
JkLogLevel info
# Select the log format
JkLogStampFormat "[%a %b %d %H:%M:%S %Y]"
# JkOptions indicates to send SSK KEY SIZE
JkOptions +ForwardKeySize +ForwardURICompat -ForwardDirectories
# JkRequestLogFormat
JkRequestLogFormat "%w %V %T"
# Mount your applications
JkMount /* loadbalancer
# You can use external file for mount points.
# It will be checked for updates each 60 seconds.
# The format of the file is: /url=worker
# /examples/*=loadbalancer
#JkMountFile conf/uriworkermap.properties
# Add shared memory.
```

```
# This directive is present with 1.2.10 and
# later versions of mod_jk, and is needed
# for load balancing to work properly
JkShmFile logs/jk.shm
# Add jkstatus for managing run-time data
<Location /jkstatus/>
JkMount status
Order deny,allow
Deny from all
Allow from 127.0.0.1
</Location>
```

5) Create a file at `conf/workers.properties` with following content

```
# for mapping requests
worker.list=loadbalancer,status
# Define Node1
# modify the host as your host IP or DNS name.
worker.node1.port=8009
worker.node1.host=node1.mydomain.com
worker.node1.type=ajp13
worker.node1.lbfactor=1
worker.node1.cachesize=10
# Define Node2
# modify the host as your host IP or DNS name.
worker.node2.port=8009
worker.node2.host= node2.mydomain.com
worker.node2.type=ajp13
worker.node2.lbfactor=1
worker.node2.cachesize=10
# Load-balancing behavior
worker.loadbalancer.type=lb
worker.loadbalancer.balance_workers=node1,node2
worker.loadbalancer.sticky_session=1
#worker.list=loadbalancer
# Status worker for managing load balancer
worker.status.type=status
```

6) In the file, define following items:

- Each node of the cluster (in this example, two nodes named node1 and node2)
- Add all the nodes defined in the file to the **worker.loadbalancer.balance_workers** entry.

7) For each node in the cluster, open the `server.xml` file located at `[appserver root]/server/<profile_name>/deploy/jbossweb.sar` for editing.

8) Search the `server.xml` file for the Engine name element and add a `jvmRoute` attribute. For example, on a node named node1 should be: `<Engine name="jboss.web" defaultHost="localhost" jvmRoute="node1">`

9) Save the edited `server.xml` file. **NOTE:** For each cluster node value of `jvmRoute` must be unique and match to the value of the worker that connects to the respective JBoss.

Using mod_proxy_ajp

This configuration uses Apache mod_proxy_ajp plugin to load balance JBoss cluster on AJP protocol. This module requires the service of [mod_proxy](#). Thus, in order to get the ability of handling AJP protocol, mod_proxy and mod_proxy_ajp should be present in the server.

This module is used to reverse proxy to a backend application server using the AJP protocol. The usage is similar to an HTTP reverse proxy, but uses the ajp:// prefix:

Uncomment the following module configurations in APACHE_HOME/conf/httpd.conf file

```
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_balancer_module modules/mod_proxy_balancer.so
LoadModule proxy_ajp_module modules/mod_proxy_ajp.so
```

Add following configuration to the APACHE_HOME/conf/httpd.conf file.

```
<VirtualHost *:80>
ServerName lb.xyz.com
ServerAlias lb.xyz.com
ProxyRequests Off
ProxyPreserveHost On
<Proxy balancer://cluster>
BalancerMember ajp://abc.com:8009 route=node1
BalancerMember ajp://xyz.com:8009 route=node2
ProxySet lbmethod=byrequests
</Proxy>
ProxyPass / balancer://cluster/ stickysession=JSESSIONID|jsessionid
</VirtualHost>
```

Usually, no ProxyPassReverse directive is necessary. The AJP request includes the original host header given to the proxy, and the application server can be expected to generate self-referential headers relative to this host, so no rewriting is required.

Server-Side Configuration:

- 1) For each node in the cluster, open the server.xml file located at [appserver root]/server/<profile_name>/deploy/jbossweb.sar for editing.
- 2) Search the server.xml file for the Engine name element and add a jvmRoute attribute. For example, on a node named node1, edit the element to read as follows: <Engine name="jboss.web" defaultHost="localhost" jvmRoute="node1">
- 3) Save the edited server.xml file.

NOTE: For each cluster, the node value of jvmRoute must be unique and match to the value of the route of the worker that connects to the respective JBoss (See BalancerMember Configuration in httpd.conf).

8. Advanced Production Configuration

This section describes advanced tuning for Output, Forms Standard, and PDF Generator modules. This section should be completed only on a production system by an advanced application server administrator.

8.1. Configuring pool size for Output and Forms

The current default value for PoolMax is 4. The actual value to set depends on the hardware configuration and the expected usage in your environment.

For optimal use, we recommend that the lower limit of PoolMax not be less than the number of CPU cores that are available. The upper limit must be determined by the load pattern on your server. Generally, the upper limit should be set to twice the number of CPUs cores on your server.

Modify the existing PoolMax value

- 1) Using a text editor, edit the JBoss startup script.
- 2) Add the following properties for `ConvertPdf`:
 - `com.adobe.convertpdf.bmc.POOL_MAX=[new value]`
 - `com.adobe.convertpdf.bmc.MAXIMUM_REUSE_COUNT=5000`
 - `com.adobe.convertpdf.bmc.REPORT_TIMING_INFORMATION=true`
 - `com.adobe.convertpdf.bmc.CT_ALLOW_SYSTEM_FONTS=true`
- 3) Add the following properties for `XMLFM`:
 - `com.adobe.xmlform.bmc.POOL_MAX=[new value]`
 - `com.adobe.xmlform.bmc.MAXIMUM_REUSE_COUNT=5000`
 - `com.adobe.xmlform.bmc.REPORT_TIMING_INFORMATION=true`
 - `com.adobe.xmlform.bmc.CT_ALLOW_SYSTEM_FONTS=true`

8.2. PDF Generator

PDF Generator is capable of doing multiple PDF conversions simultaneously for some types of input files. This is enforced through the use of stateless session beans.

Configuring EJB Pool Size

Four different stateless session beans exist for enforcing independent pool sizes for the following types of input files:

- Adobe PostScript® and Encapsulated PostScript (EPS) files

- Image files, such as BMP, TIFF, PNG, and JPEG files
- OpenOffice files
- All other file types (except HTML files), such as Microsoft Office, PageMaker®, and FrameMaker® files

The pool size for HTML-to-PDF conversions is not managed through the use of stateless session beans.

The default pool size for PostScript and EPS files and for image files is set to 3, and the default pool size for OpenOffice and other file types (except HTML) is set to 1.

You can configure the PS/EPS and image pool size to a different value based on your server hardware configuration, such as the number of CPUs, the number of cores within each CPU, and so on. However, it is mandatory that the pool size for the OpenOffice and other file types be left unchanged at 1 for proper functioning of PDF Generator.

This section describes how the pool size for PS2PDF and Image2PDF can be configured for each of the supported application servers.

The text that follows assumes that the following two AEM Forms on JEE application EARs are deployed on the application server:

- adobe-lifecycle-jboss.ear
- adobe-lifecycle-native-jboss-[platform].ear
where [platform] should be replaced with one of the following strings, depending on your operating system:
- (Windows) x86_win32
- (Linux) x86_linux
- (SunOS™) sparc_sunos

Configure the pool size for PS2PDF and Image2PDF

8.3. Enabling CIFS on Windows

You will need to manually configure the Windows Server machine that host AEM Forms on JEE.

NOTE: Ensure that the server has a static IP address.

On Windows machines, you need to do the following:

Enable NetBIOS over TCP/IP

You need to enable NetBIOS over TCP/IP so that clients connecting to the AEM Forms on JEE Server can have their requests resolved for the server host name.

- 1) In the **Local Area Connection Properties** dialog box, on the **General** tab, select **Internet Protocol**, and then click **Properties**.
- 2) In the **General** tab of the **Internet Protocol (TCP/IP) Properties** dialog box, ensure that the server has a static IP address. Click **Advanced**.

- 3) In the **Advanced TCP/IP Settings** dialog box, select the **WINS** tab and select **Enable NetBIOS over TCP/IP**.

Add additional IP addresses

- 1) In the **Local Area Connection Properties** dialog box, on the **General** tab, select **Internet Protocol**, and then click **Properties**.
- 2) In the **General** tab of the **Internet Protocol (TCP/IP) Properties** dialog box, ensure that the server has a static IP address. Click **Advanced**.
- 3) In the **Advanced TCP/IP Settings** dialog box, select the **IP Settings** tab and click **Add**.
- 4) Specify a static IP address and click **Add**.

Disable File and Printer Sharing on Windows Server 2008

- Go to **Network Settings**, deselect **File and Printer Sharing for Microsoft Clients**, and click **Apply**.

Disable File and Printer Sharing on Windows Server 2012 only)

- Go to **Control Panel > Network and Internet > Network and Sharing Center > Advanced sharing settings**, and turn off **File and Printer Sharing**.

9. Appendix - Install using the Command Line Interface

9.1. Overview

AEM Forms on JEE provides a command line interface (CLI) for the installation program. The CLI is intended to be used by advanced users of AEM Forms on JEE or in server environments which do not support the use of the Graphical User Interface (GUI) of the installation program. The CLI runs in console mode with one interactive session for all install operations.

After you start the installation process, follow the on-screen instructions to choose your installation options. Respond to each prompt to proceed to the next step in the installation.

NOTE: If you want to change a choice that you made on a previous step, type `back`. You can cancel the installation at any time by typing `quit`.

9.2. Install AEM Forms on JEE

- 1) Open a command prompt and navigate to the folder in the installation media or your hard disk that contains the installer executable:
 - (Windows) `server\Disk1\InstData\Windows_64\NoVM`
 - (Linux) `server/Disk1/InstData/Linux/NoVM`
 - (Solaris) `server/Disk1/InstData/Solaris/NoVM`
- 2) Open a command prompt and run the following command:
 - (Windows) `install.exe -i console`
 - (Non-Windows) `./install.bin -i console`

NOTE: Entering the command without the `-i console` option launches the GUI-based installer.
- 3) Respond to the prompts as described in the following table:

Prompt	Description
Choose Locale	Select the locale for the installation to use by entering a value between 1 and 3. You can select the default value by pressing Enter . The options are Deutsch, English, and Français. English is the default locale.

Prompt	Description
Choose Install Folder	On the Destination screen, press Enter to accept the default directory or type the new installation directory location. Do not use accented characters in the directory name. Otherwise, the CLI will ignore the accents and create a directory after modifying the accented characters.
Choose Operating System	(Windows only) Select the operating system that you want to install AEM Forms on JEE to.
AEM forms on JEE Server License Agreement	Press Enter to read through the pages of the license agreement. If you agree to the agreement, type Y and press Enter .
Pre-Installation Summary	Press Enter to continue installation with the choices you have made. Type back to go back to previous steps and change any of the settings.
Ready To Install	Press Enter to start the installation process.
Installing	During the installation process, the progress bar advances to indicate the progress of installation.
Configuration Manager	Press Enter to complete the installation of AEM Forms on JEE. You can run the Configuration Manager in GUI mode by invoking the following script: (Windows): C:\Adobe\Adobe_Experience_Manager_Forms\configurationManager\bin\ConfigurationManager.bat (Non-Windows): /opt/adobe/Adobe_Experience_Manager_Forms/configurationManager/bin/ConfigurationManager.sh
Installation Complete	Press Enter to exit the installer.

9.3. Error logs

If an error occurs, you can review the `install.log` in the log directory of your installation:

- (Windows) `[aem-forms root]\log`

10. Appendix - Configuration Manager Command Line Interface

The CLI is intended to be used in server environments that do not support the use of the Graphical User Interface (GUI) of the Configuration Manager.

10.1. Order of operations

The Configuration Manager CLI must follow the same order of operations as the GUI version of the Configuration Manager. Ensure that you use the CLI operations in this order:

- 1) Configure AEM Forms on JEE.
- 2) Configure CRX.
- 3) Migrate existing turnkey database. (Upgrade Turnkey only)
- 4) Manually deploy the configured EAR files.
- 5) Initialize AEM forms on JEE.
- 6) Validate AEM Forms on JEE.
- 7) Deploy the AEM Forms on JEE modules.
- 8) Validate the AEM Forms on JEE module deployment.
- 9) Check system readiness for PDF Generator.
- 10) Add administrator user for PDF Generator.
- 11) Configure Connector for IBM Content Manager.
- 12) Configure Connector for IBM FileNet.
- 13) Configure Connector for EMC Documentum.
- 14) Configure Connector for SharePoint.

IMPORTANT: You must restart each of your cluster nodes after you complete Configuration Manager CLI operations.

10.2. Command Line Interface property file

- Use the property file `cli_propertyFile_template.txt` file as a template and edit the values based on the Configuration Manager operations you intend to use.
- Use the GUI of the Configuration Manager and then use the property file created by the GUI version as the CLI version property file. When you run the `[aem-forms root]/configurationManager/bin/ConfigurationManager.bat/sh` file, the `userValuesForCLI.properties` file is created in the `[aem-forms root]/configurationManager/config` directory. You can use this file as input for the Configuration Manager CLI.

NOTE: The file does not contain the properties listed below, which are optional. If required, you can manually add these properties to the file:

- `ApplicationServerRestartRequired`
- `lcGdsLocation`
- `lcPrevGdsLocation`

NOTE: In the CLI properties file, you must use the escape character (\) for Windows paths directory separator (\). For example, if the Fonts folder to be mentioned is C:\Windows\Fonts, in the Configuration Manager CLI script, you should enter it as C:\\Windows\\Fonts.

NOTE: The following modules depend on ALC-LFS-ContentRepository. If you are using the cli_propertyFile_template.txt as template then either remove the ALC-LFS-ContentRepository from excludedSolutionComponents list or add the following LFS in excludedSolutionComponents list:

- *ALC-LFS-ProcessManagement*
- *ALC-LFS-CorrespondenceManagement*
- *ALC-LFS-ContentRepository*
- *ALC-LFS-MobileForms*
- *ALC-LFS_FormsManager*

10.3. General configuration properties

Common properties

Common properties are:

AEM Forms on JEE Server specific properties: Required for the Initialize AEM Forms on JEE and Deploy AEM Forms on JEE Components operations.

These properties are required for the following operations:

- Initialize AEM Forms on JEE
- Deploy AEM Forms on JEE components.

Property	Values	Description
<i>AEM Forms on JEE Server specific properties</i>		
LCHost	String	The hostname of the server where AEM Forms on JEE will be deployed. For cluster deployments, hostname of any one of the cluster nodes where the application server is running.

Property	Values	Description
LCPort	Integer	The web port number where AEM Forms on JEE will be deployed.
excludedSolutionComponents	String. Values include: ALC-LFS-Forms, ALC-LFS-ConnectorEMCDocu- mentum, ALC-LFS-ConnectorIBMFileNet, ALC-LFS-ConnectorIBMContent Manager, ALC-LFS-DigitalSignatures, ALC-LFS-DataCapture, ALC-LFS-Output, ALC-LFS-PDFGenerator, ALC-LFS-ProcessManagement, ALC-LFS-ReaderExtensions, ALC-LFS-RightsManagement ALC-LFS-CorrespondenceManag- ement, ALC-LFS-ContentRepository, ALC-LFS-MobileForms, ALC-LFS_FormsManager	(Optional) List the AEM Forms on JEE modules you do not want to configure. Specify the excluded modules in a comma separated list.
includeCentralMigrationService	true: to include service false: to exclude service	The property to include or exclude Central Migration Bridge Service.
CRX Content repository The following properties are specified in the <code>cli_propertyFile_crx_</code> <code>template.txt</code> file.	true: false:	
contentRepository.rootDir		Path of the CRX repository.
use.crx3.mongo	true: false:	If you have performed a fresh installation, to use Mongo DB with CRX3 set value to true. If the value is false CRX3 TAR is configured.
mongo.db.uri	<URI of Mongo DB>	If you are using Mongo DB, set URI of Mongo DB

Property	Values	Description
mongo.db.name	<name of Mongo DB>	If you are using Mongo DB, provide name of Mongo DB instance
use.crx3.rdb.mk	true: false:	When the value of this property is true, the CRX repository is configured with RDB MK. The default value is false where the repository is configured as CRX3 TAR.

Configure AEM Forms on JEE properties

These properties only apply to the configure AEM Forms on JEE operation.

Property	Values	Description
AdobeFontsDir	String	Location of the Adobe server fonts directory. This path must be accessible from all cluster nodes being deployed to.
customerFontsDir	String	Location of the customer fonts directory. This path must be accessible from all cluster nodes being deployed to.
systemFontsDir	String	Location of the system fonts directory. This path must be accessible from all cluster nodes being deployed to.
LCTempDir	String	Location of the temporary directory. This path must be accessible from all cluster nodes being deployed to.

Property	Values	Description
LCGlobalDocStorageDir	String	The global document storage root directory. Specify a path to an NFS shared directory used to store long-lived documents and to share them among all cluster nodes. This path must be accessible from all cluster nodes being deployed to.
EnableDocumentDBStorage	true or false Default: false	Enables or disables document storage in database for persistent documents. Even if you enable document storage in database, you will need the file system directory for GDS.

Configure or validate application server properties

Configure JBoss properties

If you are installing AEM Forms on JEE with a JBoss application server, you must manually configure JBoss. See Manually configuring JBoss section in, [Preparing to Install AEM Forms on JEE \(SingleServer\)](#) Guide. Use the Adobe pre-configured JBoss provided on the AEM Forms on JEE DVD, download from the internet, or use the JBoss turnkey option.

Initialize AEM Forms on JEE properties

These initialize AEM Forms on JEE properties only apply to the initialize AEM Forms on JEE operation.

Property	Values	Description
<i>For more information, see Common properties.</i>		

Deploy AEM Forms on JEE Components properties

These properties apply to the following operations:

- Deploy AEM Forms on JEE Components
- Validate AEM Forms on JEE Component Deployment

- Validate AEM Forms on JEE Server.

Property	Values	Description
<i>You must configure the AEM Forms on JEE Server Information section. For more information, see Common properties</i>		
LCAdminUserID	String	The user ID to assign to the AEM Forms on JEE Administrator user. This User ID is used to login to the Administrator Console.
LCAdminPassword	String	The password to assign to the AEM Forms on JEE Administrator user. This password is used to login to the Administrator Console.

Add administrator user for PDF Generator

These properties apply only to the adding administrator user for PDF Generator operation. These properties are present in cli_propertyFile_pdfg_template.txt

Property	Values	Description
LCHost	String	Hostname where AEM Forms on JEE Server is installed.
LCPort	Integer	Port number where AEM Forms on JEE application server is configured
LCAdminUserID	String	The user ID to assign to the AEM Forms on JEE Administrator user. This User ID is used to login to the Administrator Console.
LCAdminPassword	String	The password to assign to the AEM Forms on JEE Administrator user. This password is used to login to the Administrator Console.
LCServerMachineAdminUser	String	The user ID of the Administrator user of the Operation System hosting AEM forms on JEE

Property	Values	Description
LCServerMachineAdminUserPassword	String	The password of the Administrator user of the Operation System hosting AEM forms on JEE

Configure Connector for IBM Content Manager

Property	Values	Description
LCHost	String	Hostname where AEM Forms on JEE Server is installed.
LCPort	Integer	Port number where AEM Forms on JEE application server is configured
LCAdminUserID	String	The user ID to assign to the AEM Forms on JEE Administrator user. This User ID is used to login to the Administrator Console.
LCAdminPassword	String	The password to assign to the AEM Forms on JEE Administrator user. This password is used to login to the Administrator Console.
CDVTopology.appserverrootdir	String	The root directory of the application server instance that you are configuring on a remote server (on which you plan to deploy AEM Forms on JEE)
ConfigureIBMCM	true or false	Specify true to configure Connector for IBM Content Manager
IBMCMClientPathDirectory	String	Location of IBM Content Manager client installation directory.
DataStoreName	String	Name of the DataStore of IBM Content Manager Server that you want to connect to

Property	Values	Description
IBMCMUsername	String	The user name assign to the IBM Content Manager Administrator user. This User ID is used to login to the IBM Content Manager.
IBMCMPassword	String	The password to assign to the IBM Content Manager Administrator user. This password is used to login to the IBM Content Manager.
ConnectionString	String	Additional arguments used in the connection string to connect to IBM Content Manager(Optional).

Configure Connector for IBM FileNet

Property	Values	Description
LCHost	String	Host name of the machine where AEM Forms on JEE Server is installed.
LCPort	Integer	Port number where AEM Forms on JEE application server is configured
LCAdminUserID	String	The user ID to assign to the AEM Forms on JEE Administrator user. This User ID is used to login to the Administrator Console.
LCAdminPassword	String	The password to assign to the AEM Forms on JEE Administrator user. This password is used to login to the Administrator Console.
CDVTopology.appserverrootdir	String	The root directory of the application server instance that you are configuring on a remote server (on which you plan to deploy AEM Forms on JEE)

Property	Values	Description
ConfigureFilenetCE	true or false	Specify true to configure Connector for IBM Filenet
FilenetConfigureCEVersion	String	The FileNet client version to configure. Specify FilenetClientVersion5.0 or FilenetClientVersion5.2
FilenetCEClientPathDirectory	String	Location of IBM Filenet Content Manager client installation directory.
ContentEngineName	String	Host name or IP address of the machine where IBM Filenet Content Engine is installed
ContentEnginePort	String	The port number used by IBM Filenet Content Engine
CredentialProtectionSchema	CLEAR or SYMMETRIC	Specify the level of protection.
EncryptionFileLocation	String	Location of the encryption file. This is required only when you select SYMMETRIC option for CredentialProtectionSchema attribute. Use a forward slash (/) or double backward slashes (\\) as a path separator.
DefaultObjectStore	String	Name of the ObjectStore for the Connector for IBM Filenet Content Server.
FilenetContentEngineUsername	String	The user ID to connect to the IBM FileNet Content server. The user ID with read-access privileges would be allowed to connect to the Default object Store.
FilenetContentEnginePassword	String	The password to assigned to the IBM FileNet user. This password is used to connect to Default object Store.
ConfigureFilenetPE	true or false	Specify true to configure Connector for IBM FileNet

Property	Values	Description
FileNetPEClientPathDirectory	String	Location of IBM FileNet client installation directory
FileNetProcessEngineHostname	String	Host name or IP address of the process router.
FileNetProcessEnginePortNumber	Integer	Port number for IBM FileNet Content Server
FileNetPERouterURLConnectionPoint	String	Name of the process router.
FileNetProcessEngineUsername	String	The user ID to connect to the IBM FileNet Content Server
FileNetProcessEnginePassword	String	The password to connect to the IBM FileNet Content Server

Configure Connector for EMC Documentum

Property	Values	Description
LCHost	String	Host name where AEM Forms on JEE Server is installed.
LCPort	Integer	Port number where AEM Forms on JEE application server is configured
LCAdminUserID	String	The user ID to assign to the AEM Forms on JEE Administrator user. This User ID is used to login to the Administrator Console.
LCAdminPassword	String	The password to assign to the AEM Forms on JEE Administrator user. This password is used to login to the Administrator Console.
CDVTopology.appserverrootdir	String	The root directory of the application server instance that you are configuring on a remote server (on which you plan to deploy AEM Forms on JEE)

Property	Values	Description
ConfigureDocumentum	true or false	Specify true to configure Connector for EMC Documentum
DocumentumClientVersion	String	The EMC Documentum client version to configure. Specify DocumentumClientVersion6.7 or DocumentumClientVersion7.0
DocumentumClientPathDirectory	String	Location of EMC Documentum client installation directory
ConnectionBrokerHostName	String	Host name or IP address of the EMC Documentum Content Server.
ConnectionBrokerPortNumber	String	Port number for EMC Documentum Content Server
DocumentumUsername	String	The user ID to connect to the EMC Documentum Content Server.
DocumentumPassword	String	The password ID to connect to the EMC Documentum Content Server.
DocumentumDefaultRepositoryName	String	Name of the default repository of MC Documentum Content Server

Configure Connector for Microsoft SharePoint

Property	Values	Description
LCHost	String	Host name where AEM Forms on JEE Server is installed.
LCPort	Integer	Port number where AEM Forms on JEE application server is configured
LCAdminUserID	String	The user ID to assign to the AEM Forms on JEE Administrator user. This User ID is used to login to the Administrator Console.

Property	Values	Description
LCAdminPassword	String	The password to assign to the AEM Forms on JEE Administrator user. This password is used to login to the Administrator Console.
CDVTopology.appserverrootdir	String	The root directory of the application server instance that you are configuring on a remote server (on which you plan to deploy AEM Forms on JEE)
ConfigureSharePoint	true or false	Specify true to configure Connector for Microsoft SharePoint
SharePointServerAddress	String	Host name or IP address of the Sharepoint Server
SharePointUsername	String	The user ID to connect to the Sharepoint Server
SharePointPassword	String	The password to connect to the Sharepoint Server
SharePointDomain	String	The Domain Name of the Sharepoint Server
ConnectionString	String	Additional arguments used in the connection string to connect to the Sharepoint Server(optional

Command Line Interface Usage

Once you have configured your property file, you must navigate to the *[AEM Forms on JEE root]/configurationManager/bin* folder.

To view a complete description of the Configuration Manager CLI commands, type:

```
ConfigurationManagerCLI help <command name>.
```

Configure CRX CLI Usage

The Configure CRX Repository requires the following syntax:

```
configureCRXRepository -f <propertyFile>
```

Manually deploy configured EAR files

For detailed instructions to manually deploy configured ear files, see [Deploying to JBoss Application server](#)

Initialize AEM Forms on JEE CLI Usage

The initialize AEM Forms on JEE operation requires the following syntax:

```
initializeLiveCycle -f <propertyFile>
```

Validate AEM Forms on JEE Server CLI Usage

The Validate AEM Forms on JEE Server operation is optional and requires the following syntax:

```
validateLiveCycleServer -f <propertyFile> -LCAdminPassword <password>
```

Where:

- `-LCAdminPassword <password>`: Allows you to set the Admin password on the command line. If this argument is present, it will override the `targetServer.adminPassword` property in the property file.

Deploy AEM Forms on JEE Components CLI Usage

The Deploy AEM Forms on JEE Components operation requires the following syntax:

```
deployLiveCycleComponents -f <propertyFile> -LCAdminPassword <password>
```

Validate AEM Forms on JEE Component Deployment CLI Usage

The Validate AEM Forms on JEE Component Deployment operation is optional and requires the following syntax:

```
validateLiveCycleComponentDeployment -f <propertyFile> -LCAdminPassword <password>
```

Check system readiness for PDF Generator

The Checking system readiness for PDF Generator operation requires the following syntax:

```
pdfg-checkSystemReadiness
```

Adding administrator user for PDF Generator

The adding administrator user for PDF Generator operation requires the following syntax:

```
pdfg-addAdminUser -f <propertyFile>
```

Where:

- `-f <propertyFile>`: A property file containing the required arguments. For more information on creating a property file, see [Command Line Interface property file](#).

Configure Connector for IBM Content Manager

The Configure Connector for IBM Content Manager operation is optional and requires the following syntax:

`IBMCM-configurationCLI -f <propertyFile>`

IMPORTANT: Modify the <propertyFile> called `cli_propertyFile_ecm_ibmcm_template.txt` located in the `[aem-forms root]\configurationManager\bin\` directory.

- 1) Copy the *adobe-component-ext.properties* file from `[aem-forms root]/configurationManager/configure-ecm/jboss` to the following `[appserver root]` directory.
- 2) Restart the Application Server.
- 3) Start the following services from administration console
 - IBMCMAuthProviderService
 - IBMCMConnectorService

Configure Connector for IBM FileNet

The Configure Connector for IBM FileNet operation is optional and requires the following syntax:

`filenet-configurationCLI -f <propertyFile>`

IMPORTANT: Modify the <propertyFile> called `cli_propertyFile_ecm_filenet_template.txt` located in the `[aem-forms root]\configurationManager\bin\` directory.

Perform the following steps manually to complete the configuration for Connector for IBM Content Manager.

- 1) Copy the *adobe-component-ext.properties* file from `[aem-forms root]/configurationManager/configure-ecm/jboss` to the following `[appserver root]/bin` directory.
- 2) Locate the `lc_db.xml` file in the `[appserver root]/standalone/configuration` folder. In the file search for `<security-domains>`. Below this tag add and the contents of `lc_turnkey.xml` file available in `[aem-forms root]/configurationManager/configure-ecm/jboss` directory.
Default jboss setup comes up with a [profile] value as "all". However, for Adobe Configured Jboss use [lc_DatabaseName] (e.g. lc_mysql, lc_oracle).
- 3) Restart the Application Server.
- 4) Start the following services from administration console
 - IBMFileNetAuthProviderService
 - IBMFileNetContentRepositoryConnector
 - IBMFileNetRepositoryProvider
 - IBMFileNetProcessEngineConnector(If configured)

Configure Connector for EMC Documentum

The Configure Connector for EMC Documentum operation is optional and requires the following syntax:

`documentum-configurationCLI -f <propertyFile>`

IMPORTANT: Modify the <propertyFile> called `cli_propertyFile_ecm_documentum_template.txt` located in the `[aem-forms root]\configurationManager\bin\` directory.

Perform the following steps manually to complete the configuration for Connector for EMC Documentum.

- 1) Copy the *adobe-component-ext.properties* file from *[aem-forms root]/configurationManager/configure-ecm/jboss* to the following *[appserver root]/bin* directory.
- 2) Restart the Application Server.
- 3) Start the following services from administration console
 - EMCDocumentumAuthProviderService
 - EMCDocumentumRepositoryProvider
 - EMCDocumentumContentRepositoryConnector

Configure Connector for Microsoft SharePoint

The Configure Connector for Microsoft SharePoint operation is optional and requires the following syntax:

```
sharepoint-configurationCLI -f <propertyFile>
```

Where:

IMPORTANT: Modify the <propertyFile> called *cli_propertyFile_ecm_sharepoint_template.txt* located in the *[aem-forms root]\configurationManager\bin* directory.

10.4. Examples Usage

From the *C:\Adobe\Adobe_Experience_Manager_Forms\configurationManager\bin*, type:

```
ConfigurationManagerCLI configureLiveCycle -f cli_propertyFile.txt
```

Where *cli_propertyFile.txt* is the name of the property file you created.

10.5. Configuration Manager CLI Logs

If an error occurs, you can review the CLI logs located here in the *[aem-forms root]\configurationManager\log* folder. The log file generated will have a naming convention such as *lcmCLI.0.log* where the number in the filename (0) will increment when the log files are rolled over.

10.6. Next steps

If you used Configuration Manager CLI to configure and deploy AEM Forms on JEE, then do the following tasks now:

- Perform post deployment configurations

11. Appendix - Configuring JBoss as a Windows Service

This appendix describes how you can configure the JBoss application server to run as a Windows service using the JBoss Web Native Connectors. Use this procedure on Windows Server 2012 64-bit version.

11.1. Download the Web Native Connector

- 1) Download the JBoss Web Native Connector for Windows from the *JBoss Web Native Connectors - Current packages* download page. Depending upon your Windows version, download either of the following files:

(64-bit) <https://access.redhat.com/jbossnetwork/restricted/softwareDetail.html?softwareId=26703&product=appplatform&version=6.2.0&downloadType=distributions>

- 2) Extract the ZIP file and copy all contents of the `\modules\system\layers\base\native` folder to the `[appserver root]\modules\system\layers\base\native` folder of your JBoss installation folder.
- 3) Open the `service.bat` file in a text editor and update the variables.

You should update the variables for Service Name (SHORTNAME) Service Display (DISPLAYNAME) and Service Description (DESCRIPTION) with values that reflect your JBoss environment. For example, if your JBoss version is 6.4.0, enter the following:

```
set SHORTNAME=JBOSS_FOR_Adobe_Experience_Manager_FORMS
set DISPLAYNAME="JBoss for Adobe Experience Manager Forms"
set DESCRIPTION="JBoss for Adobe Experience Manager Forms"
```

- 4) In the `service.bat` file, add the following code after the `setlocal EnableExtensions EnableDelayedExpansion` line:

```
for /f "delims=" %%a in ('hostname') do @set HOSTNAME=%%a
```

- 5) On the master node, in the `service.bat` file, modify the `set STARTPARAM="/c \"set NOPAUSE=Y ^^^&^^^& standalone.bat\"` line as follows:

```
if /I "%IS_DOMAIN%" == "true" ( set STARTPARAM="/c \"set NOPAUSE=Y
^^&^^& domain.bat\" -b <master node IP or hostname> -c
domain_mssql.xml "
```

- 6) To shutdown master/slave node, in the `service.bat` file of the relevant node, modify the `set STARTPARAM="/c \"set NOPAUSE=Y ^^&^^& domain.bat\"` -b <node IP or machine name> " line as follows:

For master machine: `set STOPPARAM="/c \"set NOPAUSE=Y ^^&^^& jboss-cli.bat --controller=<node IP or master machine name>:<port> --connect /host=master:shutdown"`

For slave machine: `set STOPPARAM="/c \"set NOPAUSE=Y ^^&^^& jboss-cli.bat --controller=<node IP or machine name>:<port> --connect /host=slave:shutdown"`

NOTE: JBoss controller default port is 9999.

- 7) For auto start, add `--Startup=auto` in the following line in the `service.bat` file:

```
%PRUNSRV% install %SHORTNAME% %RUNAS% --Startup=auto
--DisplayName=%DISPLAYNAME% --Description %DESCRIPTION%
--LogLevel=%LOGLEVEL% --LogPath="%LOGPATH%" --LogPrefix=service
--StdOutput=auto --StdError=auto --StartMode=exe --StartImage=cmd.exe
--StartPath="%JBOSS_HOME%\bin" ++StartParams=%STARTPARAM%
--StopMode=exe --StopImage=cmd.exe --StopPath="%JBOSS_HOME%\bin"
++StopParams=%STOPPARAM%
```

- 8) Save and close the file.

NOTE: Specify JBoss cluster arguments in Step 4 and 5 to include the JBoss instance in the cluster. For detailed information about JBoss cluster arguments, see [RunningJBossinacluster](#)

11.2. Install the Windows service

- 1) From the `\sbin` folder of JBoss, create the Windows service using the following command:
For master machine: `service.bat install /host <master machine IP or hostname>`
For slave machine: `service.bat install /host <slave machine IP or hostname>`
If the command is successful, you will return command prompt without failure.
- 2) Check the Services applet in Windows Control Panel for a new service listed as *JBoss for Adobe Experience Manager forms* which is the value of the `DISPLAYNAME` variable in the `service.bat` file.
- 3) Using the Services applet in Windows Control Panel, set the *Startup type* to `Automatic`.
- 4) (Optional) In the *Recovery* tab, set the *First failure* and *Second failure* recovery options such as *Restart the Service* and *Restart the Computer* respectively.

NOTE: If necessary, you can change the Logon as value from the default Local System account to another user or service account.

11.3. Start and stop JBoss Application Server as a Windows service

Start JBoss as a Windows service

- 1) On the Windows server, select **Start > Control Panel > Administrative Tools > Services**, then select the Windows service for JBoss Application Server and click **Start**.

NOTE: When starting JBoss Application Server as a Windows service, the console output is redirected to the file

```
jboss_for_adobe_experience_manager_forms-stderr.<date>.log and
jboss_for_adobe_experience_manager_forms-stdout.<date>.log at
```


<JBOSS_HOME>\domain\log. You can inspect the file to discover any errors that occur during service startup.

Stop JBoss as a Windows service

- 1) On the Windows server, select **Start > Control Panel > Administrative Tools > Services**, then select the Windows service for JBoss Application Server and click **Stop**.

NOTE: When stopping JBoss Application Server as a Windows service, the console output is redirected to the file

jboss_for_adobe_experience_manager_forms-stderr.<date>.log and
jboss_for_adobe_experience_manager_forms-stdout.<date>.log at
<JBOSS_HOME>\domain\log. You can inspect the file to discover any errors that occur during service shutdown.

11.4. Verify the installation

- 1) Start the service from the Services applet in Windows Control Panel.
- 2) Watch (tail) the [appserver root]\domain\servers\<server-name>\log file to make sure that the service starts successfully.
- 3) Shutdown the service from the Services applet in Windows Control Panel and verify that it is shut down successfully.
- 4) Make sure that you are able to restart the service from the Services applet in Windows Control Panel.

11.5. Additional configuration

In addition to these steps, you can also perform additional configuration steps using either the Services applet in Windows Control Panel or by using the built-in Windows Service Configuration utility (sc).

For example, if you have a Microsoft SQL Server as the database, and the database service runs on the same machine instance, you can create a dependency on that service with the following command:

```
sc config JBOSS_FOR_Adobe_Experience_Manager_FORMS depend= MSSQL$MYSERVER
```

Update the MSSQL\$MYSERVER variable with service name of the Microsoft SQL Server 2016 service running on the same server instance.

NOTE: Ensure that there is no space before the =sign but after the =sign.

If the command is successful, you will get a response such as follows:

```
[SC] ChangeServiceConfig SUCCESS
```

12. Appendix - Manually Configuring JBoss

This appendix describes the configuration that is required for JBoss EAP that you can download from Red Hat. This option should be considered for advanced installations only. Advanced knowledge of JBoss is typically required.

AEM Forms runs on JBoss Windows Server 2012 (Enterprise or Standard Edition), Red Hat Linux ES/AS 6.5 or 7, SUSE Linux ES 12 platforms, and Solaris 11.

12.1. Installing the JDK for JBoss

You must download and install Oracle JDK 8.0 or later updates versions from <http://www.oracle.com/technetwork/java/javase/downloads/index.html>

Create or set the `JAVA_HOME` environment variable to point to the location where the JDK is installed.

Set the `JAVA_HOME` environment variable (Windows)

- 1) Select **Start > Control Panel>System**.
- 2) Click the **Advanced** tab.
- 3) Click **Environment Variables** and, under System Variables, click **New**.
- 4) In the **New System Variable** box, type `JAVA_HOME` as the variable name and enter the directory where you installed the JDK. This directory is the directory that contains the `/bin` subdirectory. For example, type the following path:

```
C:\Program Files\Java\jdk1.8.0_74
```

Set the `PATH` environment variable (Windows)

- 1) Select **Start > Control Panel>System**.
- 2) Click the **Advanced** tab and click **Environment Variables**.
- 3) In the System Variables area, select the `PATH` variable and then click **Edit**.
- 4) Append the following text to the beginning of the variable value:

```
%JAVA_HOME%\bin;
```

Set the `JAVA_HOME` environment (Linux and Solaris)

- It is recommended that you set the `JAVA_HOME` variable for Bourne and Bash as shown in the following example:

```
JAVA_HOME=/usr/java
export JAVA_HOME
```

Set the PATH environment variable (Linux and Solaris)

- Set the PATH variable for Bourne and Bash as shown in the following example:

```
PATH=$JAVA_HOME/bin:$PATH
export PATH
```

Verify JAVA_HOME environment variable setting (Windows, Linux, or Solaris)

(Optional) Open a command prompt and run the following command:

```
java -version
```

The command returns the Java version installed on your system.

12.2. Manually installing JBoss

You can download and install JBoss EAP from <http://www.jboss.org/jbossas/downloads/>.

12.3. Starting and stopping JBoss

Several procedures in this appendix require you to stop and start the instance of JBoss where you want to deploy the product.

Start JBoss

- From a command prompt, navigate to *[appserver root]/bin*.
- Start the application server by typing the following command:
 - On master node:
(Windows) `domain.bat -b [server_IP_Address] -c [config_file_name]`
(Linux and Solaris) `./domain.sh -c [config_file_name] -b [server_IP_Address]`
 - On slave nodes:
(Windows) `domain.bat -b [server_IP_Address]`
(Linux and Solaris) `./domain.sh -b [server_IP_Address]`

where [config_file_name] is the configuration required for your database and [server_IP_Address] is the IP address of the server.

Stop JBoss

- From a command prompt, navigate to *[appserver root]/bin*.
- Stop the application server by typing the following command:

- (Windows) `jboss-cli.bat --controller=<Host_IP or Host_Name>:9999 --connect`
- (Linux and Solaris) `shutdown --host=master`

12.4. Modifying the JBoss configuration

The JBoss Application Server is configured using various XML configuration files. JBoss must be shut down before editing any of these configuration files. If JBoss is running and these files are changed, JBoss will probably crash. JBoss also has a few configuration files that are formatted as .property files. You must ensure that the .property files are saved as UNIX text files on Linux or Solaris if you edit these files on Windows environments at any time.

For single-server installations, you may use jboss profile located at *[appserver root]\standalone\configuration* as a template. For cluster installations, use jboss profile located at *[appserver root]\domain* as a template.

It is recommended that you make a copy of the profile (all or standard) and make changes to the copied profile.

Modify the JBoss configuration

Perform the following steps to modify the JBoss configuration to customize JBoss for Adobe Experience Manager Forms.

- Modify domain.conf.bat file (windows)
- Modify jboss.cli.bat (windows)
- Modify domain.conf file (Linux and Solaris)
- Modify domain.xml file (Windows and Unix Both)
- Modify host.xml file
- Modify EAR file class-loading isolation
- Modify the standalone.conf.bat file (Windows)
- Modify standalone.conf (Linux and Solaris)

Modify the domain.conf.bat file (Windows only)

- 1) Open the *[appserver root]/bin/domain.conf.bat* file in an editor.
- 2) Delete the text in bold in the following line and add the memory arguments for 64-bit JVM.

```
set "JAVA_OPTS=-Xms64M -Xmx512M -XX:MaxPermSize=256M"
```

- Memory argument for 64-bit JVM:

```
set "JAVA_OPTS=%JAVA_OPTS% -Xms1024M -Xmx2048M -XX:MaxPermSize=768M"
```

- 3) Add the following argument for 64-bit JVM:

```

set "JAVA_OPTS=%JAVA_OPTS% -Dadobeidp.serverName=server1
-Dadobe.cache.multicast-port=33891 -Dfile.encoding=utf8
-Djava.net.preferIPv4Stack=true"
set "JAVA_OPTS=%JAVA_OPTS% -DentityExpansionLimit=10000"
set "JAVA_OPTS=%JAVA_OPTS% -XX:+HeapDumpOnOutOfMemoryError"
set "JAVA_OPTS=%JAVA_OPTS% -Dorg.jboss.net.protocol.file.useURI=false
-Dorg.jboss.as.logging.per-deployment=false"
set "JAVA_OPTS=%JAVA_OPTS% -XX:+UseCompressedOops"

```

4) (Optional) Modify JBoss Application Server to run in IPv6 mode as follows:

- Locate and modify `-Djava.net.preferIPv4Stack=false`
- Insert the string `-Djava.net.preferIPv6Stack=true`

NOTE: If the application server log contains the following error on startup, remove the value for the IPv6 stack and set the IPV4 value back to `true` :

"13:37:44,488 WARN [HANamingService] Failed to start AutomaticDiscovery java.net.SocketException: bad argument for IP_MULTICAST_IF: address not bound to any interface at java.net.PlainDatagramSocketImpl.socketSetOption(Native Method)at java.net.PlainDatagramSocketImpl.setOption(PlainDatagramSocketImpl.java:260)"

5) Save and close the file.

Modify jboss.cli.bat (windows)

- 1) Open the `[JBoss_root]\bin\jboss-cli.bat` file for editing.
- 2) Add double-quotes (" ") to the text in bold in the following line:

```

set "JAVA_OPTS=%JAVA_OPTS%
-Djboss.modules.system.pkgs=com.sun.java.swing
-Dlogging.configuration=file:
%JBoss_HOME%\bin\jboss-cli-logging.properties"

```

3) Save and close the file.

Modify the domain.conf file (JBoss with Solaris 11, Red Hat 6.5 or 7, 64-bit only)

Solaris JDKs from Sun require an additional argument to use 64-bit features. Without this configuration change, the Sun JDK defaults to 32-bit support only.

NOTE: If you're running JBoss as a non-root user, use `-Djava.io.tmpdir="location"` to set the location of the temporary directory to a directory to which you have access.

- 1) Open the `[appserver root]/bin/domain.conf` file in an editor.
- 2) Locate the section starting with:

if ["x\$JAVA_OPTS" = "x"]; then

Modify the section to look like:

```

if [ "x$JAVA_OPTS" = "x" ]; then
JAVA_OPTS="$JAVA_OPTS -Dadobeidp.serverName=server1
-Dadobe.cache.multicast-port=33891 -Dfile.encoding=utf8
-Djava.net.preferIPv4Stack=true"
    JAVA_OPTS="$JAVA_OPTS
-Djboss.modules.system.pkgs=$JBoss_MODULES_SYSTEM_PKGS

```

```
-Djava.awt.headless=true"
  JAVA_OPTS="$JAVA_OPTS -Xms1024m -Xmx2048m -XX:MaxPermSize=768m
-Dorg.jboss.resolver.warning=true
-Dsun.rmi.dgc.client.gcInterval=3600000
-Dsun.rmi.dgc.server.gcInterval=3600000"
  JAVA_OPTS="$JAVA_OPTS -XX:+UseCompressedOops
-XX:+HeapDumpOnOutOfMemoryError"
  JAVA_OPTS="$JAVA_OPTS -Dfile.encoding=utf8
-Djava.net.preferIPv4Stack=true"
  JAVA_OPTS="$JAVA_OPTS -DentityExpansionLimit=10000"
  JAVA_OPTS="$JAVA_OPTS -Dorg.jboss.net.protocol.file.useURI=false
-Dorg.jboss.as.logging.per-deployment=false"
```

NOTE: Ensure that this entry appears as a single line in the domain.conf file.

3) (optional) Modify JBoss Application Server to run in IPv6 mode as follows:

- Locate and modify `-Djava.net.preferIPv4Stack=false`
- Add `-Djava.net.preferIPv6Stack=true`

4) Save and close the file.

Modify domain.xml file (Windows and Unix)

- 1) Open the [JBoss_root]/domain/configuration/domain_<DBType>.xml file for editing.
- 2) Add the following system properties as a child of the `<property name="java.net.preferIPv4Stack" value="true"/>` node:

```
<property name="com.arjuna.ats.arjuna.allowMultipleLastResources"
value="true"/>
<property name="org.apache.catalina.connector.URI_ENCODING"
value="UTF-8"/>
```

- 3) The domain.xml file contains four profiles such as default, ha, full, and full-ha. AEM Forms on JEE configured on a Cluster for JBoss application server required only full profile. Search and delete the following nodes:

- `<profile name="default">`
- `<profile name="ha">`
- `<profile name="full-ha">`

4) To add and update logging properties:

- a) In the node `<subsystem xmlns="urn:jboss:domain:logging:1.3">`, set the value of the child node `<append value="true"/>` to false.
- b) Add the following code after the `</periodic-rotating-file-handler>` node.

```
<logger category="com.adobe">
    <level name="INFO"/>
</logger>
<logger category="org.springframework">
    <level name="WARN"/>
</logger>
<logger category="org.mc4j.ems">
```

```

        <level name="WARN"/>
    </logger>

```

- c) Add the following code as the child of the `<subsystem xmlns="urn:jboss:domain:ee:1.1">` node

```

    <global-modules>
        <module name="org.jgroups" slot="main"/>
        <module name="org.jacorb" slot="main"/>
    </global-modules>

```

- 5) Locate the following text and add/change the value that appears in bold to 100:

```

<strict-max-pool name="slsb-strict-max-pool" max-pool-size="20"
instance-acquisition-timeout="5"
instance-acquisition-timeout-unit="MINUTES"/>

```

- 6) locate the `<subsystem xmlns="urn:jboss:domain:jacorb:1.3">` node, replace the child node `<initializers transactions="spec" security="identity"/>` with `<initializers security="identity" transactions="spec"/>`

- 7) Locate the node

```

<orb socket-binding="jacorb" ssl-socket-binding="jacorb-ssl">
    <initializers security="identity" transactions="spec"/>
</orb>

```

and add the following lines after it.

```

<properties>
<property name="jacorb.connection.client.pending_reply_timeout"
value="360000"/>
</properties>

```

- 8) Locate the following text and remove the text that appears in bold:

```

<!--<remoting-connector use-management-endpoint="false"/>-->

```

- 9) In the `<subsystem xmlns="urn:jboss:domain:messaging:1.4">` node, locate the child node `<address-settings>`. In the child node, after the line

`<address-full-policy>PAGE</address-full-policy>`, add the following text:

```

<page-size-bytes>2097152</page-size-bytes>

```

- 10) In the `<subsystem xmlns="urn:jboss:domain:remoting:1.1">` node, remove the value that appears in bold:

```

<connector name="remoting-connector" socket-binding="remoting"
security-realm="ApplicationRealm"/>

```

- 11) Add the following lines as a child of the `<interfaces>` node:

```

<interface name="any">
    <any-ipv4-address/> <!-- 0.0.0.0 -->
</interface>

```

- 12) Locate and delete all the child nodes of all the `<socket-binding-group>` nodes for all the profiles.

- 13) Locate and replace the child nodes of the `<socket-binding-groups>` nodes for all the profiles to

```

    <socket-binding-group name="full-sockets" default-interface="public">
        <!-- Needed for server groups using the 'default' profile -->
        <socket-binding name="http" interface="any" port="8080"/>
        <socket-binding name="https" interface="any" port="8443"/>
    <socket-binding name="jacorb" interface="public" port="3528"/>
        <socket-binding name="remoting" interface="any" port="4447"/>
    </socket-binding-group>

```

- 14) Locate and delete all the child nodes of the `<socket-binding-group name="ha-sockets" default-interface="public">` node for all the profiles.
- 15) Locate and delete all the child nodes of the `<socket-binding-group name="full-ha-sockets" default-interface="public">` node for all the profiles.
- 16) Delete the following childs of the `<server-groups>` node:

```

<server-group name="other-server-group" profile="full-ha">
    <jvm name="default">
        <heap size="1303m" max-size="1303m"/>
        <permgen max-size="256m"/>
    </jvm>
    <socket-binding-group ref="full-ha-sockets"/>
</server-group>

```

- 17) Change the heap size from `<heap size="1303m" max-size="1303m"/>` to `<heap size="1024m" max-size="4096m"/>`.
- 18) Change the prem size from `<permgen max-size="256m"/>` to `<permgen max-size="1024m"/>`.
- 19) Save and close the file.

NOTE: The memory arguments specified in the `domain_db.xml` file are used for server process fork on each node under `other-server-group` unless some specific configuration parameters is not set in `host.xml`

Modify the host.xml file

- 1) Open the `[JBoss_root]/domain/configuration/hosts.xml` file for editing.
- 2) Locate the `<jvms>` node and change the values in bold:

```

<jvms>
    <jvm name="default">
        <heap size="1024m" max-size="2048m"/>
        <permgen size="256m" max-size="768m"/>
        <jvm-options>
            <option value="-server"/>
        </jvm-options>
    </jvm> </jvms>

```

- 3) Locate the `<server>` node and delete the following child nodes:

```

<server name="server-two" group="main-server-group" auto-start="true">
    <!-- server-two avoids port conflicts by incrementing the ports
in
        the default socket-group declared in the server-group -->
        <socket-bindings port-offset="150"/>
</server>

```



```

        <server name="server-three" group="other-server-group"
auto-start="false">
        <!-- server-three avoids port conflicts by incrementing the
ports in
            the default socket-group declared in the server-group -->
        <socket-bindings port-offset="250"/>
    </server>

```

- 4) Save and close the file.

NOTE: The memory arguments specified in the host.xml have more precedence over the memory arguments specified in the domain_db.xml file.

Modify the modules.xml file

- 1) Open the module.xml file from the \Program Files\EAP-6.4.0\jboss-eap-6.4\modules\system\layers\base\sun\jdk\main directory for editing.
- 2) Add the following tags to the file in the <paths> tag:

```

<path name="com/sun/org/apache/xerces/internal/jaxp"/>
<path name="sun/net/util"/>

```
- 3) Save and Close.

12.5. About JVM Arguments

The memory arguments defined in the domain.conf.bat file are applicable to the processes of domain controller and process controller. Ensure that you set these memory arguments on each node of the cluster.

In a managed domain, the JVM settings are declared in the host.xml and the domain.xml configuration files. Domain controller components responsible for starting and stopping server processes use these settings. In a standalone server instance, the server startup processes can pass command line settings at startup. These settings can be declared from the command line or from the System Properties screen in the Management Console.

Managed Domain

An important feature of the managed domain is the ability to define JVM settings at multiple levels. You can configure custom JVM settings at the host level, by server group, or by server instance. The more specialized child elements override the parent configuration, allowing for the declaration of specific server configurations without requiring exclusions at the group or host level. This also allows the parent configuration to be inherited by the other levels until settings are either declared in the configuration files or passed at runtime.

JVM settings in the domain configuration file

The following example shows a JVM declaration for a server group in the domain_db.xml configuration file.

```
<server-groups>
<server-group name="main-server-group" profile="default">
<jvm name="default">
<heap size="64m " max-size="512m "/>
</jvm >
<socket-binding-group ref="standard-sockets"/>
</server-group>
</server-groups>
```

In this instance a server group called main-server-group declares a heap size of 64 megabytes, and a maximum heap size of 512 megabytes. Any server that belongs to this group inherits these settings. You can change these settings for the group as a whole, by the host, or the individual server.

The following example shows a JVM declaration for a server group in the host.xml configuration file.

```
<servers>
<server name="server-one" group="main-server-group" auto-start="true">
<jvm name="default">
<heap size="64m " max-size="256m "/>
</jvm >
</server>
</servers>
```

In this instance, a server named server-one belongs to the server group named main-servergroup, inheriting the JVM settings from the default JVM group. In the previous example, the main heap size for main-server-group was set at 512 megabytes. By declaring the lower maximum heap size of 256 megabytes, server-one can override the domain.xml settings to fine-tune performance to the required levels.

12.6. Copying jar files

- 1) Copy the following JAR files from [DVD root]\third_party\jboss.zip\[JBoss_root]\modules\system\layers\base\com\adobe\lifecycle\main to the [JBoss_root]\modules\system\layers\base\com\adobe\lifecycle\main directory of your downloaded JBoss.
 - certjFIPS.jar
 - cglib.jar
 - jsafeFIPS.jar
 - jsafeJCEFIPS.jar
 - module.xml

NOTE: The module.xml contains path entry for all the jar files.

- 2) On your server, create a folder structure [JBoss_root]\modules\system\layers\base\com\microsoft\main.

Copy the following JAR files from [DVD root]\third_party\jboss.zip\[JBoss_root]\modules\system\layers\base\com\microsoft\main to the [JBoss_root]\modules\system\layers\base\com\microsoft\main directory of your downloaded JBoss.

- sqljdbc4.jar
- module.xml

NOTE: The module.xml contains path entry for all the jar files.

- 3) On your server, create a folder structure [JBoss_root]\modules\system\layers\base\com\mysql\main..

Copy the following JAR files from [DVD root]\third_party\jboss.zip\[JBoss_root]\modules\system\layers\base\com\mysql\main to the [JBoss_root]\modules\system\layers\base\com\mysql\main directory of your downloaded JBoss.

- mysql-connector-java-bin.jar
- module.xml

NOTE: The module.xml contains path entry for all the jar files.

- 4) On your server, create a folder structure [JBoss_root]\modules\system\layers\base\com\oracle\main.

Copy the following JAR files from [DVD root]\third_party\jboss.zip\[JBoss_root]\modules\system\layers\base\com\oracle\main to the [JBoss_root]\modules\system\layers\base\com\oracle\main directory of your downloaded JBoss.

- ojdbc6.jar
- module.xml

NOTE: The module.xml contains path entry for all the jar files.

- 5) On your server, create a folder structure [JBoss_root]\modules\system\layers\base\org\apache\commons.

Copy the following JAR files from [DVD root]\third_party\jboss.zip\[JBoss_root]\modules\system\layers\base\org\apache\commons\validator\main to the [JBoss_root]\modules\system\layers\base\org\apache\commons directory of your downloaded JBoss.

- commons-validator.jar
- commons-validator.jar.index
- module.xml

NOTE: The module.xml contains path entry for all the jar files.

- 6) On your server, create a folder structure [JBoss_root]\modules\system\layers\base\org\hibernate\3.

Copy the following JAR files from [DVD root]\third_party\jboss.zip\[JBoss_root]\modules\system\layers\base\org\hibernate\3 to the [JBoss_root]\modules\system\layers\base\org\hibernate\3 directory of your downloaded JBoss.

- hibernate-annotations.jar
- hibernate-entitymanager.jar
- module.xml

NOTE: The module.xml contains path entry for all the jar files.

12.7. AEM Forms database connectivity for manually installed JBoss

To configure the AEM Forms database connectivity, you must complete the following tasks:

- Configure the AEM Forms data source.
- Configure JBoss to use your database as the default data source.

You must install database drivers to the installation directories of the application server. Drivers are required to enable Configuration Manager and the application server to connect to the AEM Forms database. Install the drivers for the type of database that you use for the database.

You must configure the data source to connect to the database. For JBoss, you can configure an MySQL, Oracle, or SQL Server data source.

NOTE: Before proceeding with the following tasks, ensure that JBoss is not running.

Configuring MySQL for manually installed JBoss

To enable JBoss to connect to the MySQL database that stores AEM Forms data, you must complete these tasks.

- Obtain and copy the MySQL JDBC driver to the instance of JBoss where you will deploy AEM Forms.
- Create a data source file and deploy it to the instance of JBoss where you will deploy AEM Forms.
- Encrypt the password in the lc_<db-name>.xml file. Use the following command to encrypt the password:

```
java -cp
%JBOSS_HOME%\modules\system\layers\base\.overlays\layer-base-jboss-ea
p-6.4.5.CP\org\picketbox\main picketbox-4.1.2.Final-redhat-1.jar
org.picketbox.datasource.security.SecureIdentityLoginModule
<password>
```

NOTE: If you do not have the picketbox-4.1.2.Final-redhat-1.jar file, which is used to encrypt data-source passwords for JBoss, then download it from [Index of /techpreview/all/org/picketbox/picketbox/4.1.2.Final-redhat-1](http://techpreview.all.org/picketbox/picketbox/4.1.2.Final-redhat-1). Do not use the JAR file available at <http://wiki.jboss.org>.

Configuring the MySQL data source

Before you configure the MySQL data source, you must have the database created on MySQL. (See Creating a MySQL database.)

Set MySQL as the data source

- 1) Copy the database profiles from [DVD root]\third_party\jboss.zip\ [JBoss_root]\stand-alone\configuration to the [AppServer_root]\standalone\configuration directory.
- 2) Open the [JBoss_root]/domain/configuration/domain_oracle.xml file for editing.
- 3) Locate the <datasources> tag and delete all the child nodes.

```

<datasources>
    <datasource jta="true"
jndi-name="java:/IDP_DS" pool-name="IDP_DS" enabled="true"
use-java-context="true">
<connection-url>jdbc:mysql://localhost:3306/adobe</connection-url>
<driver>mysql</driver>
<transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>
    <pool>
<min-pool-size>1</min-pool-size>
<max-pool-size>30</max-pool-size>
    </pool>
<security>
    <user-name>adobe</user-name>
<password>password</password>
    </security>
<validation>
    <valid-connection-checker
class-name="org.jboss.jca.adapters.jdbc.extensions.novendor.JDBC4ValidCo
nnectionChecker"/>
<check-valid-connection-sql>SELECT count(*) from
DUAL</check-valid-connection-sql>
<!--exception-sorter
class-name="com.mysql.jdbc.integration.jboss.ExtendedMysqlExceptionSorte
r"/-->
    <exception-sorter
class-name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLExceptionS
orter"/>
    </validation>
    <timeout>
<blocking-timeout-millis>20000</blocking-timeout-millis>
<idle-timeout-minutes>2</idle-timeout-minutes>
    </timeout>
    <statement>
<prepared-statement-cache-size>20</prepared-statement-cache-size>
    </statement>
    </datasource>

```

- 4) Replace the bold values with values that are specific to your database:
 - **MySQLDS** : Change to DefaultDS.
 - **mysql-hostname, 3306, jbossdb, x, and y**: The database values that the application server uses to access the database.
- 5) Save and close the file.

Edit the standardjbosscomp-jdbc.xml file

- 1) Open the `[appserver root]\server\<profile_name>\conf\<profile_name>jbosscomp-jdbc.xml` file and change the following elements (not necessarily contiguous):

```

<!-- optional since 4.0 <datasource-mapping>Hypersonic SQL
</datasource-mapping> -->
<fk-constraint>>false</fk-constraint>

```

- Remove the text *<!-- optional since 4.0* and the trailing *-->* comment tag from the `<datasource-mapping>` tag to uncomment it.
- Replace Hypersonic SQL with `mySQL` in the `<datasource-mapping>` element.

The final <datasource-mapping> tag will look like the following line:

```

<datasource-mapping>mySQL</datasource-mapping>

```

- Replace `false` with `true` in the `<fk-constraint>` element.

- 2) Save and close the file.

Configuring Oracle for manually installed JBoss

Install the Oracle 12c database driver

Copy the ojdbc6.jar for JDK 1.8 driver file from the [aem-forms root]/lib/db/oracle directory to the [appserver root]/modules/system/layers/base/com/oracle/main directory. You can also download the Oracle 11g driver from the JDBC Driver Downloads site, see [Supported PlatformCombinations](#) for supported versions of Oracle 12c driver.

Set Oracle as the data source

To use Oracle pluggable database, see .

If you are running LiveCycle with Oracle database, you must create three datasources IDP_DS, EDC_DS, and DefaultDS.

- 1) Copy the database profiles from [DVD root]\third_party\jboss.zip\ [JBoss_root]\stand-alone\configuration to the [AppServer_root]\standalone\configuration directory.
- 2) Open the [JBoss_root]/domain/configuration/domain_oracle.xml file for editing.
- 3) Locate the <datasources> tag and delete all the child nodes.
- 4) To create the IDP_DS datasource, in the <datasources> node, add the following lines:

```
<datasource jta="true" jndi-name="java:/IDP_DS" pool-name="IDP_DS"
enabled="true" use-java-context="true">
```

```
<connection-url>jdbc:oracle:thin:@localhost:1521:ORACLE_SID</connection-
url>
<driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
<driver>oracle</driver>
```

```
<transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>
```

```
<pool>
  <min-pool-size>1</min-pool-size>
  <max-pool-size>30</max-pool-size>
</pool>
<security>
  <user-name>DB_NAME</user-name>
  <password>DB_PASSWORD</password>
</security>
```

```
<validation>
<exception-sorter
class-name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleExceptio
nSorter"/>
</validation>
```

```
<timeout>
```

```

<blocking-timeout-millis>20000</blocking-timeout-millis>
    <idle-timeout-minutes>2</idle-timeout-minutes>
  </timeout>
  <statement>

<prepared-statement-cache-size>20</prepared-statement-cache-size>
  </statement>
</datasource>

```

- 5) To create the EDC_DS datasource, after the IDP_DS datasource nodes, in the <datasources> node, add the following lines:

```

<datasource jndi-name="java:/EDC_DS" pool-name="EDC_DS" enabled="true"
use-java-context="true">

<connection-url>jdbc:oracle:thin:@localhost:1521:ORACLE_SID</connection-
url>
<driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
<driver>oracle</driver>

<transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>
    <pool>
      <min-pool-size>1</min-pool-size>
      <max-pool-size>30</max-pool-size>
    </pool>
    <security>
      <user-name>DB_NAME</user-name>
      <password>DB_PASSWORD</password>
    </security>

<validation>
<exception-sorter
class-name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleExceptio
nSorter"/>
</validation>

    <timeout>

<blocking-timeout-millis>20000</blocking-timeout-millis>
    <idle-timeout-minutes>2</idle-timeout-minutes>
  </timeout>
  <statement>

<prepared-statement-cache-size>20</prepared-statement-cache-size>
  </statement>
</datasource>

```

- 6) To create the DefaultDS datasource, after the EDC_DS datasource nodes, in the <datasources> node, add the following lines:

```

<datasource jndi-name="java:/DefaultDS" pool-name="DefaultDS"
enabled="true" use-java-context="true">

<connection-url>jdbc:oracle:thin:@localhost:1521:ORACLE_SID</connection-
url>
<driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
<driver>oracle</driver>

<transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>

        <pool>
            <min-pool-size>1</min-pool-size>
            <max-pool-size>30</max-pool-size>
        </pool>
        <security>
            <user-name>DB_NAME</user-name>
            <password>DB_PASSWORD</password>
        </security>

<validation>
<exception-sorter
class-name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleExceptio
nSorter"/>
</validation>

        <timeout>

<blocking-timeout-millis>20000</blocking-timeout-millis>
        <idle-timeout-minutes>2</idle-timeout-minutes>
        </timeout>
        <statement>

<prepared-statement-cache-size>20</prepared-statement-cache-size>
        </statement>
</datasource>

```

- 7) Set the following database specific values for datasources IDP_DS, EDC_DS, and DefaultDS:
- Localhost:** The name, IP address, or fully-qualified path of the computer that hosts the database. The default is localhost
 - 1521:** If Oracle does not use the default port, provide the appropriate port number.
 - ORACLE_SID:** Replace the ORACLE_SID with your Oracle System Identifier.?
 - DB_USER, DB_PASSWORD:** Provide the credentials that the application server uses to access your database.
 - Modify the minimum and maximum values for the data source connections:
NOTE: If you are using a pluggable database, replace the colon (:) after <port> with a forward slash (/).
 - IDP_DS:


```

<min-pool-size>1</min-pool-size>
<max-pool-size>30</max-pool-size>

```


- EDC_DS:


```
<min-pool-size>1</min-pool-size>
<max-pool-size>30</max-pool-size>
```

NOTE: If your forms server handles heavy load, increase the number of maximum JDBC connections to ensure that all jobs are processed. In such cases, increase <max-pool-size> to 50 or more for both IDP_DS and EDC_DS.

- f) Add the following lines as child of the <datasource> tag:

```
<drivers>
<driver name="oracle" module="com.oracle">
<xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-da
tasource-class>
</driver>
</drivers>
```

- 8) Save and close the file.

Edit the lc_turnkey.xml file

- 1) Open the *[appserver root]/standalone/configuration/lc_turnkey.xml* file in a text editor and add the following text within the <authentication> element:

```
<security-domain name="EncryptDBPassword">
  <authentication>
    <login-module
code="org.picketbox.datasource.security.SecureIdentityLoginModule"
flag="required">
      <module-option name="userName" value="adobe"/>
      <module-option name="password"
value="-3bfaa32dfe43f65b207a6df87216de44"/>
      <module-option name="managedConnectionFactoryName"
value="jboss.jca:name=DefaultDS,service=LocalTxCM"/>
    </login-module>
  </authentication>
</security-domain>
<security-domain name="EncryptDBPassword_IDP_DS">
  <authentication>
    <login-module
code="org.picketbox.datasource.security.SecureIdentityLoginModule"
flag="required">
      <module-option name="userName" value="adobe"/>
      <module-option name="password"
value="-3bfaa32dfe43f65b207a6df87216de44"/>
      <module-option name="managedConnectionFactoryName"
value="jboss.jca:name=IDP_DS,service=LocalTxCM"/>
    </login-module>
  </authentication>
</security-domain>
<security-domain name="EncryptDBPassword_EDC_DS">
  <authentication>
```

```

        <login-module
code="org.picketbox.datasource.security.SecureIdentityLoginModule"
flag="required">
            <module-option name="userName" value="adobe"/>
            <module-option name="password"
value="-3bfaa32dfe43f65b207a6df87216de44"/>
            <module-option name="managedConnectionFactoryName"
value="jboss.jca:name=EDC_DS,service=LocalTxCM"/>
        </login-module>
    </authentication>
</security-domain>

```

- 2) In the file, specify the values that are specific to your database.
- 3) Save and close the file.
- 4) Start JBoss.

Configuring SQL Server for manually installed JBoss

Configuring the SQL Server database connectivity

Before you configure the SQL Server data source, you must have the AEM Forms database created on SQL Server. (See Creating a SQL Server database.)

Set MSSQL as the data source

If you are running AEM Forms with MSSQL database, you must create three datasources `IDP_DS`, `EDC_DS`, and `DefaultDS`.

- 1) Copy the database profiles from `[DVD root]\third_party\jboss.zip\ [JBoss_root]\stand-alone\configuration` to the `[AppServer_root]\standalone\configuration` directory.
- 2) Open the `[JBoss_root]/domain/configuration/domain_mssql.xml` file for editing.
- 3) Locate the `<datasources>` tag and delete all the child nodes.
- 4) To create the `IDP_DS` datasource, in the `<datasources>` node, add the following lines:

```

<datasources>
    <datasource jta="true" jndi-name="java:/IDP_DS"
pool-name="IDP_DS" enabled="true" use-java-context="true">

    <connection-url>jdbc:sqlserver://localhost:1433;DatabaseName=adobe</conn
ection-url>

    <driver-class>com.microsoft.sqlserver.jdbc.SQLServerDriver</driver-class
>
        <driver>sqlserver</driver>

    <transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>

```

```

        <pool>
            <min-pool-size>1</min-pool-size>
            <max-pool-size>30</max-pool-size>
        </pool>
        <security>
            <user-name>DB_USER</user-name>
            <password>DB_PASSWORD</password>
        </security>
        <timeout>

<blocking-timeout-millis>20000</blocking-timeout-millis>
        <idle-timeout-minutes>2</idle-timeout-minutes>
    </timeout>
    <statement>

<prepared-statement-cache-size>20</prepared-statement-cache-size>
    </statement>
</datasource>

```

- 5) To create the EDC_DS datasource, after the IDP_DS datasource nodes, in the <datasources> node, add the following lines:

```

<datasource jndi-name="java:/EDC_DS" pool-name="EDC_DS" enabled="true"
use-java-context="true">

<connection-url>jdbc:sqlserver://localhost:1433;DatabaseName=adobe</conn
ection-url>

<driver-class>com.microsoft.sqlserver.jdbc.SQLServerDriver</driver-class
>

        <driver>sqlserver</driver>

<transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>

        <pool>
            <min-pool-size>1</min-pool-size>
            <max-pool-size>30</max-pool-size>
        </pool>
        <security>
            <user-name>DB_USER</user-name>
            <password>DB_PASSWORD</password>
        </security>
        <timeout>

<blocking-timeout-millis>20000</blocking-timeout-millis>
        <idle-timeout-minutes>2</idle-timeout-minutes>
    </timeout>
    <statement>

<prepared-statement-cache-size>20</prepared-statement-cache-size>

```

```

        </statement>
    </datasource>

```

- 6) To create the DefaultDS datasource, after the EDC_DS datasource nodes, in the <datasources> node, add the following lines:

```

<datasource jndi-name="java:/DefaultDS" pool-name="DefaultDS"
enabled="true" use-java-context="true">

<connection-url>jdbc:sqlserver://localhost:1433;DatabaseName=adobe</conn
ection-url>

<driver-class>com.microsoft.sqlserver.jdbc.SQLServerDriver</driver-class
>

        <driver>sqlserver</driver>

<transaction-isolation>TRANSACTION_READ_COMMITTED</transaction-isolation
>

        <pool>
            <min-pool-size>1</min-pool-size>
            <max-pool-size>30</max-pool-size>
        </pool>
        <security>
            <user-name>DB_USER</user-name>
            <password>DB_PASSWORD</password>
        </security>
        <timeout>

<blocking-timeout-millis>20000</blocking-timeout-millis>
        <idle-timeout-minutes>2</idle-timeout-minutes>
    </timeout>
    <statement>

<prepared-statement-cache-size>20</prepared-statement-cache-size>
        </statement>
    </datasource>

```

- 7) Set the following database specific values for datasources IDP_DS, EDC_DS, and DefaultDS:
- Localhost:** The name, IP address, or fully-qualified path of the computer that hosts the database. The default is localhost
 - 1433:** If MSSQL does not use the default port, provide the appropriate port number.
 - DB_USER, DB_PASSWORD:** Provide the credentials that the application server uses to access your database.
 - Modify the minimum and maximum values for the data source connections:
 - IDP_DS:**

```

<min-pool-size>1</min-pool-size>
<max-pool-size>30</max-pool-size>

```
 - EDC_DS:**

```
<min-pool-size>1</min-pool-size>  
<max-pool-size>30</max-pool-size>
```

NOTE: If your forms server handles heavy load, increase the number of maximum JDBC connections to ensure that all jobs are processed. In such cases, increase `<max-pool-size>` to 50 or more for both IDP_DS and EDC_DS.

- 8) Save and close the file.

Configure Integrated Security on Windows

- 1) Add the `sqljdbc_auth.dll` file to the Windows systems path (`C:\Windows`) on the computer that is running JBoss. The `sqljdbc_auth.dll` file is located within the Microsoft SQL JDBC 4.0 driver installation. The default location is `[SQL_root]/sqljdbc_3.0/enu/auth/x86` for 32-bit operating systems and `[SQL_root]/sqljdbc_3.0/enu/auth/x64` for 64-bit operating systems.
- 2) Open the properties for the JBoss for Adobe Experience Manager Forms 6.3 service or the JBoss service that you configured, and click the **Log On** tab.
- 3) Select **This Account** and type the value of a valid user account. This change is not required if you are running JBoss from the command line.
- 4) Change SQL Server Security from Mixed mode to Windows Authentication only.

12.8. Next steps

Configure AEM Forms on JBoss Cluster by following the instructions provided in [Configuring AEM forms Application Server Clusters Using JBoss](#)