Configuring LiveCycle® ES2 Application Server Clusters Using JBoss®
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About This Document

This document is one of several resources available to help you learn about Adobe® LiveCycle® ES2 (Enterprise Suite) Update 1. LiveCycle ES2 is a flexible, extensible platform that helps automate and accelerate the flow of business-critical information to and from customers, partners, constituents, and employees.

This document provides information about how to install and configure the following modules in a clustered environment on Microsoft® Windows® and Linux® and how to deploy the modules to JBoss® Application Server:

- Adobe LiveCycle ES2 Connector for EMC Documentum
- Adobe LiveCycle ES2 Connector for IBM FileNet
- Adobe LiveCycle ES2 Connector for IBM Content Manager
- Adobe LiveCycle Content Services ES2
- Adobe LiveCycle Digital Signatures ES2
- Adobe LiveCycle Forms ES2
- Adobe LiveCycle Foundation
- Adobe LiveCycle Output ES2
- Adobe LiveCycle PDF Generator ES2
- Adobe LiveCycle PDF Generator 3D ES2
- Adobe LiveCycle Process Management ES2
- Adobe LiveCycle Reader Extensions ES2
- Adobe LiveCycle Rights Management ES2

Who should read this document?

This document provides information for administrators or developers who are responsible for installing, configuring, administering, or deploying LiveCycle ES2 components in a clustered environment. The information provided assumes that readers are familiar with Java™ 2 Platform, Enterprise Edition (J2EE) application servers; Linux and Windows operating systems; Oracle®, DB2®, or SQL Server database servers; and web environments.
Conventions used in this document

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Default value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[LiveCycleES2 root]</td>
<td>Windows: C:\Adobe\Adobe LiveCycle ES2\</td>
<td>The installation directory that is used for all LiveCycle ES2 modules. The installation directory contains subdirectories for LiveCycle Configuration Manager and the LiveCycle ES2 SDK.</td>
</tr>
<tr>
<td></td>
<td>Linux: /opt/adobe/adobe livecycle es2/</td>
<td></td>
</tr>
<tr>
<td>[appserver root]</td>
<td>JBoss Application Server on Windows: C:\jboss\</td>
<td>The home directory of the application server that runs the LiveCycle ES2 services.</td>
</tr>
<tr>
<td></td>
<td>JBoss Application Server on Linux: /opt/jboss/</td>
<td></td>
</tr>
<tr>
<td>[dbserver root]</td>
<td>The location where the LiveCycle ES2 database server is installed.</td>
<td>Depends on the database type and your specification during installation.</td>
</tr>
</tbody>
</table>

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

Additional information

The resources in this table can help you learn more about LiveCycle ES2.

<table>
<thead>
<tr>
<th>For information about</th>
<th>See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparing to install LiveCycle ES2 on a server cluster</td>
<td>Preparing to Install LiveCycle ES2 (Server Cluster)</td>
</tr>
<tr>
<td>Performing administrative tasks for LiveCycle ES2</td>
<td>LiveCycle Administration Console Help</td>
</tr>
<tr>
<td>Installing LiveCycle Workbench ES2</td>
<td>Installing Your Development Environment</td>
</tr>
<tr>
<td>Other services and products that integrate with</td>
<td><a href="http://www.adobe.com">www.adobe.com</a></td>
</tr>
<tr>
<td>LiveCycle ES2</td>
<td></td>
</tr>
<tr>
<td>Patch updates, technical notes, and additional information</td>
<td>LiveCycle Technical Support</td>
</tr>
<tr>
<td>on this product version</td>
<td></td>
</tr>
</tbody>
</table>
Introduction

This chapter provides information to help you understand how to prepare your cluster to install LiveCycle ES2, the type of installation and deployment you should perform for LiveCycle ES2, and information that will help you understand the LiveCycle ES2 installation, configuration, and deployment process:

- "Preparing your server cluster to install LiveCycle ES2" on page 8
- "Installation, configuration, and deployment process" on page 8
- "Installation and deployment list" on page 9

For information about preparing your system to create your server cluster and install LiveCycle ES2, including system requirements, preparing the database, and configuring LiveCycle Reader Extensions ES2 credentials, see Preparing to Install LiveCycle ES2 (Server Cluster).

1.1 Preparing your server cluster to install LiveCycle ES2

You must create and configure your server cluster before you install, configure, and deploy LiveCycle ES2. (See "Configuring JBoss in a Cluster" on page 11.)

1.2 Installation, configuration, and deployment process

Installing, configuring, and deploying LiveCycle ES2 involves the following processes:

**Installing:** Install LiveCycle ES2 by running the installation program. Installing LiveCycle ES2 places all of the required files onto your computer, within one installation directory structure. The default installation directory is C:\Adobe\Adobe LiveCycle ES2 (Windows) or /opt/adobe_livecycle_es2 (Linux and Solaris); however, you can install the files to a different directory. In this document, the default installation directory is referred to as [LiveCycleES2 root]. (See “Installing the LiveCycle ES2 Modules” on page 31.)

**Configuring and assembling:** Configuring LiveCycle ES2 modifies various settings that determine how LiveCycle ES2 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 LiveCycle Configuration Manager. (See “Configuring LiveCycle ES2 for Deployment” on page 39.) You can configure and assemble multiple LiveCycle ES2 modules at the same time.

**Deploying:** Deploying the product involves deploying the assembled EAR files and supporting files to the JBoss Application Server cluster on which you plan to run your LiveCycle ES2 solution. If you have configured and assembled multiple modules, the deployable components are packaged within the deployable EAR files. Components and LiveCycle ES2 archive (LCA) files are packaged as JAR files.

**Initializing the LiveCycle ES2 database:** Initializing the database to be used with LiveCycle ES2 creates tables for use with User Management and other components. Deploying any module that connects to the LiveCycle ES2 database requires you to initialize the LiveCycle ES2 database after the deployment process.
1.3 Selecting tasks for configuring and deploying

After you perform an installation, you can run LiveCycle Configuration Manager to perform various tasks:

- Configure LiveCycle ES2 modules in an EAR file for deploying to the application server cluster
- Initialize LiveCycle ES2 database
- Deploy LiveCycle ES2 components
- Validate LiveCycle ES2 component deployment
- Import LiveCycle ES2 Samples into LiveCycle ES2 (optional)

**Note:** In addition to the LiveCycle ES2 samples that you can import, you can access more samples from Adobe web site.

- Configure LiveCycle ES2 components

If you install Reader Extensions ES2, you can also specify and import the Reader Extensions ES2 Rights credential that is required for applying usage rights to PDF documents.

If you want to install Business Activity Monitoring, see the “Configuring LiveCycle Business Activity Monitoring ES2” section in the single server install guide for JBoss after you install all other LiveCycle ES2 components.

1.4 Upgrading to LiveCycle ES2

If you are upgrading from LiveCycle 7.x, review the *Upgrading from LiveCycle 7.x to LiveCycle ES2* guide.

If you are upgrading to LiveCycle ES2 from LiveCycle 8.x and later, ensure that you completed the tasks that are described in *Preparing to Upgrade to LiveCycle ES2* and refer to the *Upgrading to LiveCycle ES2 from LiveCycle ES* guide for your application server.

1.5 Installation and deployment list

The following list includes the steps that are required for installing LiveCycle ES2 by using the manual method. Your application server cluster must be installed and configured before you perform the installation.

- Ensure that you have the required software installed and configured in the target environment. (See *Preparing to Install LiveCycle ES2 (Server Cluster)*.)
- Ensure that you created and configured the application server cluster in the target environment. (See “Configuring JBoss in a Cluster” on page 11.)
- Run the installation program. (See “Installing the LiveCycle ES2 Modules” on page 31.)
- Run LiveCycle Configuration Manager and select the Configure LiveCycle ES2 EARs task. This task configures and assembles LiveCycle ES2. (See “Configuring LiveCycle ES2 for Deployment” on page 39.)
- Deploy the EAR files to the application server. You must do this manually. (See “Configuring LiveCycle ES2 for Deployment” on page 39.)
- Run LiveCycle Configuration Manager to deploy LiveCycle ES2 component files, initialize the LiveCycle ES2 database, and (optionally) deploy product samples. (See “Configuring LiveCycle ES2 for Deployment” on page 39.)
[36x748]Adobe LiveCycle ES2
Configuring LiveCycle ES2 Application Server Clusters Using JBoss
Installation and deployment list

- Access LiveCycle Administration Console and User Management. (See “Accessing LiveCycle Administration Console” on page 50.)
- (Optional) Configure LDAP access. (See “Configuring LiveCycle ES2 to access LDAP” on page 64.)
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” on page 11.)
- Install JBoss Application Server software. (See “Installing JBoss Application Server software” on page 12.)
- Modify the JBoss configuration files. (See “Modifying JBoss configuration files” on page 13.)
- (Vertical cluster) Configure collocated instances of JBoss Application Server. (See “Configuring vertically clustered JBoss Application Servers” on page 15.)
- Modify the JBoss run file. (See “Modifying the JBoss run file” on page 18.)
- Configure LiveCycle ES2 database connectivity. (See “Configuring LiveCycle ES2 database connectivity” on page 20.)
- Test your JBoss cluster configuration. (See “Testing the JBoss Application Server cluster” on page 29.)

2.1 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 LiveCycle ES2 (Server Cluster)*.)

**Account privileges:** (Only for PDF Generator ES2 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 LiveCycle ES2 (Server Cluster)*.)

**J2SE SDK version:** You must have J2SE SDK version 1.5.0_11 (or a later update) on each node of the cluster. (See *Preparing to Install LiveCycle ES2 (Server Cluster)*.)

### 2.2 Installing JBoss Application Server software

Install and configure JBoss Application Server on each computer of the cluster. You can install multiple instances on any computer where you plan to implement vertical clustering. The *Preparing to Install LiveCycle ES2 (Server Cluster)* document describes the versions of JBoss Application Server that are supported for LiveCycle ES2.

Install the Adobe-preconfigured JBoss Application Server that is provided on the LiveCycle ES2 installation medium under the *third_party* directory. When you extract the *third_party/jboss.zip* file, the following sub-directories are created under the *server* directory:

- (Single server) `lc_oracle`
- (Single server) `lc_sqlserver`
- (Single server) `lc_mysql`
- (Cluster) `lc_sqlserver_cl`
- (Cluster) `lc_oracle_cl`

You can safely remove the directories that are not relevant to your configuration. For example, if you plan to use Oracle for Adobe-preconfigured JBoss in a clustering configuration, retain `lc_oracle_cl` and delete the other directories.

**Note:** Only JBoss 4.2.1 is shipped as Adobe-preconfigured JBoss.

**Note:** The `appserver root/server/all` directory is relevant only for manually-configured JBoss. For Adobe-preconfigured JBoss, you can use a relevant database-specific directory mentioned above instead of the `all` directory.

**Caution:** 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 LiveCycle ES2 (Single server)*; they apply to a stand-alone configuration and are not appropriate for a clustered configuration.

### 2.2.1 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. This installation is fully configured for a horizontal cluster.
2.2.2 Installing JBoss Application Server for a vertical cluster

If you intend to vertically cluster two or more JBoss Application Servers on a single computer, copy the directory and contents to a separate location for each JBoss Application Server instance that you intend to cluster on each computer. After you complete this installation, you must complete additional configuration steps for a vertical cluster.

2.2.3 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 - Configuring JBoss as a Windows Service” on page 108 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 run.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 run.log. You can inspect the file to discover any errors that occur during service shutdown.

2.3 Modifying JBoss configuration files

Modify the following JBoss configuration files to enable clustering:

- cluster-service.xml

   Note: You must modify the JBoss configuration files for each member of the cluster.

➢ To modify the cluster-service.xml file:

1. On a member of the cluster, open the cluster-service.xml file located in [appserver root]/server/all/deploy, in a text editor.

   Note: The [appserver root]/server/all directory is relevant only for manually-configured JBoss. For Adobe-preconfigured JBoss, you can use a relevant database-specific directory instead of the /all directory.

2. In the Cluster Partition section of the file, change the following UDP attributes of the config element, using one of the formats below as appropriate for your configuration:
● (JBoss Application Server 4.2.0 only)

\[
mcast\_port="{\text{jboss.hapartition.mcast\_port:<port number>}}"
\]
\[
ip\_ttl="{\text{jgroups.udp.ip\_ttl:2}}"
\]

**Note:** The `<port number>` value for the `mcast_port` attribute must uniquely distinguish this cluster from any other JBoss clusters on the same subnet. You can use any value from 1 to 65535 that meets this criterion for this cluster. The `ip_ttl` attribute can be any other appropriate value for the number of hops between nodes.

● (IPv6 only) Set the following configuration:

\[
mcast\_addr="{\text{jboss.partition.udpGroup:<mcast address>}}"
\]

**Note:** The `<mcast address>` is a host name mapped to an IPv6 multicast address in the host file of the system. An example of the entry in the Cluster Partition section is as below:

\[
mcast\_addr="{\text{jboss.partition.udpGroup:mcast1}}"
\]

Further, `ff05::1 mcast1` is the host entry in the host file that corresponds to this example.

3. In the HA JNDI section of the file, set the `DiscoveryDisabled` attribute as follows:

\[
<\text{attribute name}="\text{DiscoveryDisabled">false</attribute>}
\]

4. (IPv6 only) In the HA JNDI section of the file, set the `AutoDiscoveryAddress` attribute as follows:

\[
<\text{attribute name}="\text{AutoDiscoveryAddress">${\text{jboss.partition.udpGroup:<mcast address>}}</attribute>}
\]

**Note:** The `<mcast address>` is a host name mapped to an IPv6 multicast address in the host file of the system. An example of the entry in the Cluster Partition section is as below:

\[
<\text{attribute name} = "\text{AutoDiscoveryAddress">${\text{jboss.partition.udpGroup:mcast2}}</attribute>}
\]

Further, `ff05::2 mcast2` is the host entry in the host file that corresponds to this example.

5. Save the edited file, and then copy the edited `cluster-service.xml` file to the `[appserver root]/server/all/deploy` directory on each other node of the cluster.

6. (Vertically clustered) On a vertically clustered JBoss Application Server instance, open the `cluster-service.xml` file in a text editor and, in the HA JNDI section of the file, change the default values of the following attributes:

● (JBoss Application Server 4.2.0)

\[
<\text{attribute name}="\text{Port">1100</attribute>}
\]
\[
<\text{attribute name}="\text{RmiPort">1101</attribute>}
\]
\[
<\text{attribute name}="\text{RMIOBJECTPort}>4447</attribute>}
\]
\[
<\text{attribute name}="\text{ServerBindPort}>4448</attribute>}
\]

**Note:** You can set the port numbers for these attributes to any unused port.

The attributes edited in this step may not be located adjacent to each other in the file. You may need to search within the HA JNDI section of the file to find each attribute you must edit.

7. (Vertically clustered) Save the edited file.

8. (Vertically clustered) Repeat steps 6 to 7 on all JBoss Application Server instances except one. The attributes edited in these steps must have a different set of values for each vertically clustered JBoss Application Server instance. One instance can use the initial set of values; however, you must edit the
cluster-service.xml file of all other vertically clustered instances to use a different set of non-conflicting port numbers.

➤ To modify the jboss-service.xml file:

1. On a member of the cluster, open the jboss-service.xml file located in [appserver root]/server/all/deploy/jboss-web-cluster.sar/META-INF, in a text editor.

   **Note:** The [appserver root]/server/all directory is relevant only for manually-configured JBoss. For Adobe-preconfigured JBoss, you can use a relevant database-specific directory instead of the /all directory.

2. In the TreeCache configuration section of the file, change the following UDP attributes of the config element:

   ```
   ip_ttl="${jgroups.udp.ip_ttl:2}"
   ip_mcast="true"
   mcast_port="${jboss.webpartition.mcast_port:<port number>}"
   ```

   **Note:** The <port number> value for the mcast_port attribute must uniquely distinguish this cluster from any other JBoss Application Server (stand-alone or clustered) on the same subnet. You can use any value from 1 to 65535 that meets this criterion for this cluster. You must use the same <port number> value for each JBoss Application Server in this cluster. The ip_ttl attribute can be any other appropriate value for the number of hops between nodes.

3. (IPv6 only) In the TreeCache configuration section of the file, change the following UDP attributes of the config element:

   ```
   mcast_addr="${jboss.partition.udpGroup:<mcast address>}"
   ```

   **Note:** The <mcast address> is a host name mapped to an IPv6 multicast address in the host file of the system. An example of the entry in the TreeCache section is as below:

   ```
   mcast_addr="${jboss.partition.udpGroup:mcast1}"
   ```

   Further, ff05::1 mcast1 is the host entry in the host file that corresponds to this example.

4. Save the edited file, and then copy the edited jboss-service.xml file to the [appserver root]/server/all/deploy/jboss-web-cluster.sar/META-INF directory on each other node of the cluster.

2.4 Configuring vertically clustered JBoss Application Servers

If you are configuring a vertical cluster (that is, you have multiple JBoss Application Server instances collocated on a single computer), you can employ either of two alternative configurations to resolve address conflicts between the collocated instances:

- Assign different ports to each collocated instance. (See "Configuring collocated JBoss Application Server ports" on page 16.)

- Assign different IP addresses (multihoming) to each collocated instance. (See "Configuring collocated JBoss Application Servers by multihoming" on page 17.)
2.4.1 Configuring collocated JBoss Application Server ports

If you choose to resolve address conflicts by using different ports, you must reconfigure certain ports on each instance.

**Note:** Standard utilities such as TCPView for Windows or Netstat can assist you in investigating the availability of alternative ports on a computer.

**To configure collocated JBoss Application Server ports:**

1. On one of the JBoss instances, open the server.xml file in a text editor. The file is in the following location:
   - `{appserver root}\server\all\deploy\jboss-web.deployer`

2. Change the following ports:
   - **HTTP/1.1 Connector:** From 8080 to, for example, 8888
   - **AJP 1.3 Connector port:** From 8009 to, for example, 8099
   - **SSL/TLS Connector:** From 8443 to, for example, 8493
     (JBoss Application Server 4.2.0 only)
   - **AJP 1.3 Connector redirectPort:** From 8443 to, for example, 8493

   **Note:** On JBoss Application Server 4.2.0, you must set the AJP 1.3 Connector redirectPort and the SSL/TLS Connector to the same value.

3. Repeat steps 1 to 2 for each additional JBoss instance, except the one on a single computer, changing each port to a different available port. The ports that are changed in these steps must have a different set of values for each vertically clustered JBoss Application Server instance. One instance can use the initial set of values; however, you must edit the server.xml file of all other vertically clustered instances on a single computer to use a different set of non-conflicting port numbers.

4. On one of the JBoss instances, open the jboss-service.xml file located in `{appserver root}\server\all\conf` in a text editor and change the following ports:
   - **WebService:** From 8083 to, for example, 8899
   - **NamingService:** From 1099 to, for example, 9999
   - **RMIport:** From 1098 to, for example, 9998
   - **RMIOBJECTPORT:** From 4444 to, for example, 9444
   - **PooledInvoker ServerBindPort:** From 4445 to, for example, 9445
     (JBoss Application Server 4.2.0 only)
   - **ServerBindPort:** From 4446 to, for example, 9446.

   Repeat this step for each additional JBoss instance, except one on a single computer, changing each port to a different available port. The ports that are changed in this step must have a different set of values for each vertically clustered JBoss Application Server instance. One instance can use the initial set of values; however, you must edit the jboss-service.xml file of all other vertically clustered instances on a single computer to use a different set of non-conflicting port numbers.
5. On one of the JBoss instances, open the jacob.properties file located in \[appserver root\]/server/all/conf in a text editor and change the following ports:
   
   **OAPort:** From 3528 to, for example, 9528
   **OASSLPort:** From 3529 to, for example, 9529

   Repeat this step for each additional JBoss instance, except one on a single computer, changing each port to a different available port. The ports that are changed in this step must have a different set of values for each vertically clustered JBoss Application Server instance. One instance can use the initial set of values; however, you must edit the jacob.properties file of all other vertically clustered instances on a single computer to use a different set of non-conflicting port numbers.

6. On one of the JBoss instances, open the jboss-service.xml file located in \[appserver root\]/server/all/deploy\snmp-adaptor.sar\META-INF in a text editor and change the following ports:

   **org.jboss.jmx.adaptor.snmp.trapd.TrapdService:** From 1162 to, for example, 1182
   **org.jboss.jmx.adaptor.snmp.agent.SnmpAgentService:** From 1161 to, for example, 1181

   Repeat this step for each additional JBoss instance, except one on a single computer, changing each port to a different available port. The ports that are changed in this step must have a different set of values for each vertically clustered JBoss Application Server instance. One instance can use the initial set of values; however, you must edit the jboss-service.xml file of all other vertically clustered instances on a single computer to use a different set of non-conflicting port numbers.

7. On one of the JBoss instances, open the managers.xml file located in \[appserver root\]/server/all/deploy\snmp-adaptor.sar, in a text editor and change the port from 1162 to match the org.jboss.jmx.adaptor.snmp.trapd.TrapdService value configured in step 6.

   Repeat this step for each additional JBoss instance, except one on a single computer, changing each port to a different available port. The port changed in this step must have a different value for each vertically clustered JBoss Application Server instance. One instance can use the initial value; however, you must edit the managers.xml file of all other vertically clustered instances on a single computer to use a different non-conflicting port number.

8. (JBoss Application Server 4.2.0 only) On one of the JBoss instances, open the jboss-service.xml file located in \[appserver root\]/server/all/deploy\ejb3.deployer\META-INF in a text editor and change DefaultEjb3Connector serverBindPort from 3873 to (for example, 3879). Change the port value to the same new value in the two places in the file where the serverBindPort appears.

   Repeat this step for each additional JBoss instance, except one on a single computer, changing both occurrences of the port to a different available port. The ports that are changed in this step must have a different value for each vertically clustered JBoss Application Server instance. One instance can use the initial value; however, you must edit the jboss-service.xml file of all other vertically clustered instances on a single computer to use a different non-conflicting port number.

2.4.2 Configuring collocated JBoss Application Servers by multihoming

   If you choose to resolve JBoss port conflicts by assigning multiple IP addresses to one computer, known as **multihoming**, specify a different IP address for each JBoss instance on the computer.

   ➤ To configure collocated JBoss Application Server IP addresses:

   1. On a member of the cluster, open the \[appserver root\]/server/all/deploy/cluster-service.xml file in a text editor.
Note: The \{appserver root\}/server/all directory is relevant only for manually-configured JBoss. For Adobe-preconfigured JBoss, you can use a relevant database-specific directory instead of the /all directory.

2. In the Cluster Partition section, add the UDP bind_addr attribute to the UDP element with the IP address for that member, as in this example:

   bind_addr="10.20.30.5"

3. Save the edited file.

4. Repeat steps 1 to 3 for each other instance on the same computer, but configure the UDP bind_addr attribute of the config element with a unique IP address on the same computer, as in this example:

   bind_addr="10.20.30.6"

Note: When you start JBoss Application Server instances that are vertically clustered and employ multihoming, use the -b option in your start command. (See "Testing the JBoss Application Server cluster" on page 29.)

2.5 Modifying the JBoss run file

Modify the JBoss run file of each JBoss Application Server instance in the LiveCycle ES2 cluster to add LiveCycle ES2 options.

Before you start this procedure, you must know whether your cluster uses a 32-bit or 64-bit JVM:

- If your cluster uses a 64-bit JVM, change the heap size settings in the Adobe-preconfigured JBoss Application Server. (See "To modify the JBoss run file:" on page 18.)
- If your cluster uses a 32-bit JVM, the Adobe-preconfigured JBoss Application Server has set the appropriate values.

See Preparing to Install LiveCycle ES2 (Server Cluster) to determine the JVM that is required for your cluster configuration.

Before you start this procedure, determine how your LiveCycle ES2 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 "Configuring the caching locators (caching using TCP only)" on page 35.)

- You can use UDP only if your cluster is based on IPv4.

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 run file:

1. Open the following file in a text editor:

   - (Windows) \{appserver root\}/bin/run.bat
   - (UNIX) \{appserver root\}/bin/run.sh
2. In the JAVA_OPTS line, add or change the following argument:
   -Djboss.partition.name=<clusternamex>

Note: The value for <clusternamex> can be any value that is unique to your LiveCycle ES2 cluster.
Configure the same <clusternamex> value on every node of the LiveCycle ES2 cluster, as in this example:
   -Djboss.partition.name=lc9_cluster

3. In the JAVA_OPTS line, add or change the following argument:
   -Dadobeidp.serverName=<servernamex>

Note: The value for <servernamex> can be any value; however, you must configure a unique <servernamex> value for each node of the LiveCycle ES2 cluster, as in this example:
   -Dadobeidp.serverName=server1
   -Dadobeidp.serverName=server2

You can configure additional nodes for the LiveCycle ES2 cluster in a similar manner but with unique <servernamex> values.

4. In the JAVA_OPTS line, set the following argument for IPv4:
   -Djava.net.preferIPv4Stack=true

For IPv6, set the following arguments:
   -Djava.net.preferIPv6Stack=true
   -Djava.net.preferIPv6Addresses=true

5. Depending on the configured cluster caching mechanism (UDP or TCP), add the following caching arguments. In the JAVA_OPTS line, add or change one of the following arguments:
   - (Caching using UDP only) 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 1 and 65535. The multicast port must be unique to the LiveCycle ES2 cluster (that is, the port must not be used by any other cluster on the same network). It is recommended that you configure the same <port number> on all nodes in the LiveCycle ES2 cluster, as in this example:
   -Dadobe.cache.multicast-port=33456

   - (Caching using UDP discovery) Configure the multicast address argument in the following format if your system has multiple network interfaces (NICs):
     -Dadobe.cache.multicast-address=<ip address>

Note: 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.

Note: The multicast address must be unique to the LiveCycle ES2 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 LiveCycle ES2 cluster. For example:
   -Dadobe.cache.multicast-address=239.192.81.1

   - (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 1 and 65535. It is recommended that you configure the
same <port number> on all nodes in the LiveCycle ES2 cluster, as in this example:
-Dadobe.cache.cluster-locators=10.20.30.5[22345],10.20.30.6[22345]

6. In the JAVA_OPTS line, add or change the following arguments:
   - (64-bit JVM only) -XX:MaxPermSize=512m -Xms256m -Xmx1792m
   - (32-bit JVM only) -XX:MaxPermSize=256m -Xms1024m -Xmx1024m

7. Save the edited file.

8. Repeat steps 1 to 7 for each node in the cluster.

9. If your LiveCycle ES2 installation uses Content Services ES2 and you haven’t configured your
   application server through LiveCycle Configuration Manager, you must perform additional manual
   configuration of the application server before deployment. See "Setup for Content Services ES2" on
   page 64.

### 2.6 Configuring LiveCycle ES2 database connectivity

You must enable database connectivity from each JBoss Application Server in the cluster to the
LiveCycle ES2 database by performing the following tasks:

- Ensure that the correct JDBC driver exists on each instance of JBoss Application Server in the cluster.
- Create a data source file and deploy it to each instance of JBoss Application Server in the cluster. The
  adobe-ds.xml file configures the data source that is used by LiveCycle ES2, including parameters such
  as the host name of the computer where the database resides, the database name, port number, and
  the user name and password for the database.

You can simplify this task by following these steps:

1. Copy the necessary files from your LiveCycle ES2 installation medium to any computer.
2. Edit the files as described in the following subsections.
3. Save the edited files to each node of the cluster.

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

- "Configuring Oracle for Adobe-preconfigured JBoss" on page 21
- "Configuring Oracle for manually-installed JBoss" on page 22
- "Configuring SQL Server for Adobe-preconfigured JBoss" on page 24
- "Configuring SQL Server for manually-installed JBoss" on page 26
2.6.1 Configuring Oracle for Adobe-preconfigured JBoss

To enable JBoss to connect to the Oracle database that stores LiveCycle ES2 data, you need the following files supplied with Adobe-preconfigured JBoss:

- Oracle JDBC driver file at \[appserver_root\]/server/lc_oracle_cl/lib
- Adobe data source file at \[appserver_root\]/server/lc_oracle_cl/deploy
- Oracle data source file at \[appserver_root\]/server/lc_oracle_cl/deploy

2.6.1.1 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 LiveCycle ES2 (Server Cluster).)

➤ To modify the Adobe data source file:

1. Open the \[appserver root\]/server/lc_oracle_cl/deploy/adobe-ds.xml file in a text editor and locate this line:

   ```
   <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 name of the database that stores the LiveCycle ES2 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 step 2 for the `IDP_DS`, `EDC_DS` and `com.celequest.metadata.metaDatasource` elements.

   **Note:** The `com.celequest.metadata.metaDatasource` element is required only if you are using LiveCycle ES2 Business Activity Monitoring.

5. Save the file.

➤ To modify the Oracle data source file:

1. Open the \[appserver root\]/server/lc_oracle_cl/deploy/oracle-ds.xml file in a text editor and locate these 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 name of the database that stores the LiveCycle ES2 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. Save the file.

### 2.6.1.2 Editing the login-config.xml file

1. Open the `[appserver root]/server/lc_oracle_cl/conf/login-config.xml` file in a text editor and modify the following code within the `<policy>` element:

```xml
<application-policy name="OracleDbRealm">
  <authentication>
    <login-module
      code="org.jboss.resource.security.ConfiguredIdentityLoginModule" flag = "required">
      <module-option name="principal">adobe</module-option>
      <module-option name="userName">adobe</module-option>
      <module-option name="password">adobe</module-option>
      <module-option
        name="managedConnectionFactoryName">jboss.jca:service=LocalTxCM,
        name=Default DS </module-option>
    </login-module>
  </authentication>
</application-policy>
```

2. Replace the **bold text** with values that are specific to your database so that the application server can access your database.

3. Save and close the file.

4. Restart JBoss.

### 2.6.2 Configuring Oracle for manually-installed JBoss

To enable JBoss to connect to the Oracle database that stores LiveCycle ES2 data, complete the following tasks if you are manually deploying LiveCycle ES2:

- Obtain and copy the Oracle JDBC driver to the instance of JBoss where you will deploy LiveCycle ES2.
- Create an Adobe data source file and deploy it to the instance of JBoss where you will deploy LiveCycle ES2.
- Create an Oracle data source file and deploy it to the instance of JBoss where you will deploy LiveCycle ES2.

#### 2.6.2.1 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 LiveCycle ES2 (Server Cluster)*.)
To install the Oracle 10g/Oracle 11g database driver:

1. Copy the ojdbc5.jar for JDK 1.5 or ojdbc6.jar for JDK 1.6 driver file from the [DVD_root]/third_party/db/oracle directory to the [appserver root]/server/lib directory.

   Note: You can also download these drivers from the Oracle Technology Network.

To create the Adobe data source file:

1. Copy the adobe-ds.xml file from the [DVD_root]/third_party/datasources/lc_oracle/deploy directory to the [appserver root]/server/all/deploy directory.

2. Open the adobe-ds.xml file in a text editor and locate this line:
   
   ```
   <connection-url>jdbc:oracle:thin:@//localhost:1521:adobe</connection-url>
   <user-name>adobe</user-name>
   <password>adobe</password>
   ```

3. 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 name of the database that stores the LiveCycle ES2 data. You will need to update the default value adobe with your database name.

4. 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.


   Note: The com.celequest.metadata.metaDatasource element is required only if you are using LiveCycle ES2 Business Activity Monitoring.

6. Save the file.

To create the Oracle data source file:

1. Copy the oracle-ds.xml file from the [appserver root]/docs/examples/jca directory to the [appserver root]/server/all/deploy directory.

2. Open the oracle-ds.xml file in a text editor and locate this line:
   
   ```
   <jndi-name>OracleDS</jndi-name>
   <connection-url>jdbc:oracle:thin:@youroraclehost:1521:yoursid</connection-url>
   <user-name>x</user-name>
   <password>y</password>
   ```

3. Replace the following text with values that are specific to your database:
   - OracleDS: Change to DefaultDS.
   - youroraclehost: 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.

● **yoursid**: The name of the database that stores the LiveCycle ES2 data. You will need to update the default value `adobe` with your database name.

4. 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.

5. Save the file.

### 2.6.2.2 Editing the login-config.xml file

1. Open the `[appserver root]/server/all/conf/login-config.xml` file in a text editor and add the following code within the `<policy>` element:

   ```xml
   <application-policy name="OracleDbRealm">
   <authentication>
   <login-module code="org.jboss.resource.security.ConfiguredIdentityLoginModule" flag = "required">
   <module-option name="principal">adobe</module-option>
   <module-option name="userName">adobe</module-option>
   <module-option name="password">adobe</module-option>
   <module-option name="managedConnectionFactoryName">jboss.jca:service=LocalTxCM, name=Default DS</module-option>
   </login-module>
   </authentication>
   </application-policy>
   ```

2. Replace the **bold text** with values that are specific to your database so that the application server can access your database.

3. Save and close the file.

4. Restart JBoss.

### 2.6.3 Configuring SQL Server for Adobe-preconfigured JBoss

To enable JBoss to connect to the SQL Server database that stores LiveCycle ES2 data, you need the following files supplied with Adobe-preconfigured JBoss:

- SQL Server JDBC driver file at `[appserver_root]/server/lc_sqlserver_cl/lib`
- Adobe data source file at `[appserver_root]/server/lc_sqlserver_cl/deploy`
- SQL Server data source file at `[appserver_root]/server/lc_sqlserver_cl/deploy`

#### 2.6.3.1 Configuring the data source files

Before you configure the SQL Server data source, you must have already created the LiveCycle ES2 database on SQL Server. (See *Preparing to Install LiveCycle ES2 (Server Cluster)*.)
To modify the Adobe data source file:

1. Open the `[appserver root]/server/lc_sqlserver_cl/deploy/adobe-ds.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 used to access the database. The default port is `1433`.
   - `adobe`: The name of the database that stores the LiveCycle ES2 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.


   **Note:** The `com.celequest.metadata.metaDatasource` element is required only if you are using LiveCycle ES2 Business Activity Monitoring.

5. Save the file.

To modify the SQL Server data source file:

1. Open the `[appserver root]/server/lc_sqlserver_cl/deploy/mssql-ds.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 used to access the database. The default port is `1433`.
   - `adobe`: The name of the database that stores the LiveCycle ES2 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. Save the file.

This next procedure provides instructions on how to use integrated security to make a trusted connection with SQL Server.
To configure Integrated Security on Windows:

1. Modify the adobe-ds.xml file, located in [appserver root]\server\all\deploy, 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 1.2 driver installation (default is <InstallDir>/sqljdbc_1.2/enu/auth/x86).

3. Open the properties for the JBoss for Adobe LiveCycle 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.

2.6.3.2 Editing the login-config.xml file

1. Open the [appserver root]/server/lc_sqlserver_cl/conf/login-config.xml file in a text editor and add the following code within the <policy> element:
   
   `<application-policy name="MSSQLDbRealm">
   <authentication>
   <login-module code="org.jboss.resource.security.ConfiguredIdentityLoginModule" flag = "required">
   <module-option name="principal">adobe</module-option>
   <module-option name="userName">adobe</module-option>
   <module-option name="password">adobe</module-option>
   <module-option name="managedConnectionFactoryName">jboss.jca:service=LocalTxCM, name=Default DS</module-option>
   </login-module>
   </authentication>
   </application-policy>

   2. Replace the bold text with values that are specific to your database so that the application server can access your database.

   3. Save and close the file.

   4. Restart JBoss.

2.6.4 Configuring SQL Server for manually-installed JBoss

To enable JBoss to connect to the SQL Server database that stores LiveCycle ES2 data, complete the following tasks:

- Obtain and copy the SQL Server JDBC driver files to the [appserver root]/server/all/lib directory.
- Create an Adobe data source file and deploy it to the instance of JBoss where you will deploy LiveCycle ES2 (for example, [appserver_root]/server/all/deploy).
● Create a SQL Server data source file and deploy it to the instance of JBoss where you will deploy LiveCycle ES2 (for example, [appserver_root]/server/all/deploy).

2.6.4.1 Configuring the data source files

Before you configure the SQL Server data source, you must have already created the LiveCycle ES2 database on SQL Server. (See Preparing to Install LiveCycle ES2 (Server Cluster).)

➤ To install the SQL database driver:

Copy the sqljdbc.jar file from [DVD_root]/third_party/db/mssql directory to the [appserver root]/server/all/lib directory.

Note: You can also obtain the SQL Server JDBC 1.2 database driver for your operating system from the Microsoft website and copy it to the [appserver root]/server/all/lib directory. Use SQL Server JDBC Driver 1.2 for both Microsoft SQL Server 2005 SP2 and Microsoft SQL Server 2008.

➤ To create the Adobe data source file:

1. Copy the adobe-ds.xml file from the [DVD_root]/third_party/datasources/lc_sqlserver/deploy directory to the [appserver root]/server/all/deploy directory.

2. Open the adobe-ds.xml file in a text editor and locate this line:

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

3. Change the <driver-class> as follows:

   <driver-class>com.microsoft.sqlserver.jdbc.SQLServerDriver</driver-class>

4. 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 LiveCycle ES2 data. You will need to update the default value adobe with your database name.

5. 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.


    Note: The com.celequest.metadata.metaDatasource element is required only if you are using LiveCycle ES2 Business Activity Monitoring.

7. Save the file.
To create the SQL Server data source file:

1. Copy the mssql-ds.xml file from the [appserver root]/docs/examples/jca directory to the [appserver root]/server/all/deploy directory.

2. Open the adobe-ds.xml file in a text editor and locate this line:
   `<jndi-name>MSSQLDS</jndi-name>`
   `<connection-url>jdbc:microsoft:sqlserver://localhost:1433;DatabaseName=MyDatabase</connection-url>`
   `<user-name>x</user-name>`
   `<password>y</password>`

3. Change the `<driver-class>` as follows:
   `<driver-class>com.microsoft.sqlserver.jdbc.SQLServerDriver</driver-class>`

4. Replace the following text with values that are specific to your database:
   - **MSSQLDS**: Change to DefaultDS.
   - **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 used to access the database. The default port is 1433.
   - **MyDatabase**: The name of the database that stores the LiveCycle ES2 data. You will need to update the default value adobe with your database name.

5. 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.

6. Save the file.

To configure Integrated Security on Windows:

1. Modify the adobe-ds.xml file, located in [appserver root]/server/all/deploy, 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 1.2 driver installation (default is <InstallDir>/sqljdbc_1.2/enu/auth/x86).

3. Open the properties for the JBoss for Adobe LiveCycle 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.
2.6.4.2 Editing the login-config.xml file

1. Open the [appserver root]/server/all/conf/login-config.xml file in a text editor and modify the following code within the <policy> element:

   ```xml
   <application-policy name="MSSQLDbRealm">
   <authentication>
   <login-module code="org.jboss.resource.security.ConfiguredIdentityLoginModule" flag = "required">
   <module-option name="principal">adobe</module-option>
   <module-option name="userName">adobe</module-option>
   <module-option name="password">adobe</module-option>
   <module-option name="managedConnectionFactoryName">jboss.jca:service=LocalTxCM,
   name=Default DS</module-option>
   </login-module>
   </authentication>
   </application-policy>
   
   2. Replace the bold text with values that are specific to your database so that the application server can access your database.

   3. Save and close the file.

   4. Restart JBoss.

2.7 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 LiveCycle ES2.

➤ To test the JBoss Application Server cluster:

1. Start all JBoss Application Server instances of the cluster by entering the appropriate command:

   - (Oracle for Adobe preconfigured JBoss Application Server on Windows) run.bat -c lc_oracle_cl -b <IPaddressORhostname>
   - (Oracle for manually-configured JBoss Application Server on UNIX) run.sh -c lc_oracle_cl -b <IPaddressORhostname>
   - (SQL Server for Adobe preconfigured JBoss Application Server on Windows) run.bat -c lc_sqlserver_cl -b <IPaddressORhostname>
   - (SQL Server for manually-configured JBoss Application Server on UNIX) run.sh -c lc_sqlserver_cl -b <IPaddressORhostname>
   - (Manually-configured JBoss Application Server on Windows) run.bat -c all -b <IPaddressORhostname>
   - (Manually-configured JBoss Application Server on UNIX) run.sh -c all -b <IPaddressORhostname>

   **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 4.2.0 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]/server/all/log` or `[appserver root]/server/[database-specific directory]/log`. Messages such as this one confirm the active members of the cluster:

```
INFO [org.jboss.ha.framework.interfaces.HAPartition.DefaultPartition] Number of cluster members: 2
  ( [<IPAddress1>:<Port1>], [<IPAddress2>:<Port2>])
```
This section describes the first phase of setting up a LiveCycle ES2 system that is running the LiveCycle ES2 installation program on Windows, Linux, and Solaris. A subsequent phase will include running LiveCycle Configuration Manager to configure and deploy LiveCycle ES2.

Before you install the modules, ensure that your environment includes the software and hardware that is required to run LiveCycle ES2. You should also understand the installation options and have the environment prepared as required. (See Preparing to Install LiveCycle ES2 (Server Cluster).)

LiveCycle ES2 also provides a command line interface (CLI) for the installation program. See “Appendix - Install Command Line Interface” on page 92 for instructions on using the CLI. There is also a CLI for LiveCycle Configuration Manager. See “Appendix - LCM Command Line Interface” on page 96. These CLIs are intended to be used by advanced users of LiveCycle ES2 or in server environments that do not support the use of the graphical user interface of the installation program or of LiveCycle Configuration Manager.

This chapter covers the following topics:

- “Checking the installer” on page 31
- “ Installing the product files” on page 32
- “Viewing the error log” on page 35
- “Configuring the caching locators (caching using TCP only)” on page 35
- “Configuring the font directories” on page 38

### 3.1 Checking the installer

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

➤ **Check the DVD installation media:**

Ensure that the installation media that you received is not damaged. If you copy the installer media contents to the hard disk of your computer where you are installing LiveCycle ES2, ensure that you copy the entire DVD contents on to the hard disk. To avoid installation errors, do not copy the DVD install image to a directory path that exceeds the Windows maximum path length limit. Also, do not use special characters such as the number sign character (#) in the local path. If you use special characters in the local path, the appropriate license information may not be displayed during installation.

➤ **Check the downloaded files:**

If you downloaded the installer from the Adobe web site, 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 download web page:

- **Linux:** Use the `md5sum` command.
- **Solaris:** Use the `digest` command in Solaris.
- **Windows:** Use a tool such as WinMD5.
Expanding the downloaded archive files:

If you downloaded the ESD from the Adobe web site, extract the entire `<appserver>_DVD.zip` (Windows) or `<appserver>_DVD_unix.tar.gz` (Linux or Solaris) archive file to your computer. For Solaris, use gunzip to extract the .gz file.

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

### 3.2 Installing the product files

To successfully install, you need read and write permissions for the installation directory. The following installation directories are the defaults; however, you can specify a different directory as required:

- (Windows) C:\Adobe\Adobe LiveCycle ES2\n- (Linux or Solaris) /opt/adobe/adobe_livecycle_es2/

If the LiveCycle ES2 installation path contains international characters and the UTF-8 locale is not set on the system, LiveCycle ES2 does not recognize the fonts installation directory within the internationalized `[LiveCycleES2 root]`. To avoid this issue, create a new fonts directory with the UTF-8 locale set and then run the LiveCycle Configuration Manager with UTF-8 locale, by adding the `-Dfile.encoding=utf8` argument in the ConfigurationManager.bat or ConfigurationManager.sh script.

**Caution:** When installing LiveCycle ES2, do not use double byte or extended latin characters (such as àâçéèêëîïôùûÄÖßÜ€) in the installation path.

**Caution:** *(Windows only)* The LiveCycle ES2 installation directory path must not contain any non-ASCII characters (for example, international characters such as é or ñ), otherwise the JBoss Service for Adobe LiveCycle ES2 will fail to start.

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 text 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.

**Caution:** Ensure that the temporary directory for your operating system meets the minimum requirements as outlined in *Preparing to Install LiveCycle ES2 (Server Cluster)*. The temporary directory is one of the following locations:

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

When you are installing the modules on UNIX-like systems, you must be logged in as the root user to successfully install the modules to the default location, which is `/opt/adobe/adobe_livecycle_es2`. If you are logged in as a non-root user, change the installation directory to one that you have permissions (read-write-execute privileges) for. For example, you can change the directory to `/home//username/adobe_livecycle_es2`.

On Windows, you must have administrator privileges to install LiveCycle ES2.

Temporary files are generated in the system default temp directory or in the directory that you specified. In certain instances, the generated temporary files may remain after the installer is closed. You can remove these files manually.
On Windows, improve the speed of installation by disabling any on-access virus scanning software during installation.

3.2.1 Installing on a Windows staging platform for Linux or UNIX

LiveCycle ES2 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. For example, a locked-down environment does not have a graphical user interface installed.

When you run the installation program on Windows, you can choose a Linux or UNIX operating system as the target platform for deploying LiveCycle ES2. The installation program installs binaries for Linux, or Solaris that are also used by LiveCycle Configuration Manager when you 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 that you are targeting must be consistent with what you choose during installation and configuration, regardless of the operating system.

3.2.2 Configuring the JAVA_HOME environment variable

The JAVA_HOME environment variable must point to the Java SDK for your application server as outlined in the Supported Software table in Preparing to Install LiveCycle ES2 (Server Cluster).

3.2.3 Installing LiveCycle ES2

This section covers the initial installation of LiveCycle ES2 product files. For information about configuration and deployment, see "Configuring LiveCycle ES2 for Deployment" on page 39.

Note: To avoid permission issues during deployment, ensure that you run the LiveCycle ES2 installer and LiveCycle Configuration Manager as the same user who will run the application server.

➤ Install LiveCycle ES2:

1. Ensure that the JAVA_HOME environment variable points to the directory that contains a compatible JDK.

2. Start the installation program:
   - (Windows) Do one of the following:
     - Navigate to the livecycle_server directory on the installation media or the folder in your hard disk, and launch the run_windows_installer.bat file. This batch file launches the appropriate installer (32-bit or 64-bit), depending on the Windows version.
     - Navigate to the appropriate directory on the installation media or folder on your hard disk where you copied the installer, and double-click the install.exe file.
       - (Windows 32-bit) \livecycle_server\9.0\Disk1\InstData\Windows\VM
       - (Windows 64-bit) \livecycle_server\9.0\Disk1\InstData\Windows_64bit\VM
   - (Linux, Solaris) Navigate to the appropriate directory, and from a command prompt, type ./install.bin.
     - (Linux) /livecycle_server/9.0/Disk1/InstData/Linux/NoVM
     - (Solaris) /livecycle_server/9.0/Disk1/InstData/Solaris/NoVM
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Note: If you are installing on Solaris or Linux and you are not installing directly from a release DVD, set executable permissions on the installation file.

3. When prompted, select the language for the installation to use and click OK.


5. If you have a previous version of LiveCycle ES (8.x) installed on the computer where you are running the installer, the Preparation for Upgrade screen appears. You can choose to prepare for an upgrade to LiveCycle ES2 or perform a new installation of LiveCycle ES2. Select Next to continue installing LiveCycle ES2.

   - **Prepare to upgrade existing installation to LiveCycle ES2 v9.0:** Installation program prepares the data from your existing LiveCycle ES (8.x) installation for an upgrade to LiveCycle ES2. If you select this option, update your module license in LiveCycle Administration Console after the installation.

6. **Install LiveCycle ES2 v9.0:** Installation program installs LiveCycle ES2. On the Choose Installation Folder screen, accept the default directory as listed or click Choose and navigate to the directory where you intend to install LiveCycle ES2, and then click Next.

   If you type the name of a directory that does not exist, it is created for you.

   Caution: If you are installing on Linux or UNIX, the directory you specify should not contain any spaces; otherwise, the installation program does not install the module.

7. On the Choose Installation Type screen, select Custom > Manual, and click Next.

   Note: If you are installing LiveCycle ES2 using JBoss Turnkey, see Installing and Deploying LiveCycle ES2 Using JBoss Turnkey.

8. *(Windows only and when Manual installation is selected)* 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 LiveCycle ES2 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" on page 33.)

   Note: adobe-livecycle-weblogic.ear and adobe-contentservices.ear files fail to deploy on a remote machine if secured datasources are used with WebLogic. For more information, see TechNote

9. Read the LiveCycle ES2 Server 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.

10. On the Pre-Installation Summary screen, review the details and click Install. The installation program displays the progress of the installation.

11. Review the Release Notes information and click Next.

12. Review the details of the Installation Complete screen.

13. The **Start LiveCycle Configuration Manager** checkbox is selected by default. Click Done to run the LiveCycle Configuration Manager.
Note: To run LiveCycle Configuration Manager later, deselect the **Start LiveCycle Configuration Manager** option before you click **Done**. You can start LiveCycle Configuration Manager later using the appropriate script in the `[LiveCycleES2 root]/configurationManager/bin` directory. See “Configuring LiveCycle ES2 for Deployment” on page 39.

Note: *(PDF Generator ES2 or PDF Generator 3D ES2 for Windows only)* If Acrobat 9.2 is not installed on all nodes in the cluster, install it now. Then complete the steps in “Configuring Acrobat Professional” on page 55.

### 3.3 Viewing the error log

If errors occur during the installation, the installation program creates the `Adobe_LiveCycle_ES2_InstallLog.log` file, which contains the error messages. This log file is created in the `[LiveCycleES2_root]/log` directory.

### 3.4 Configuring the caching locators (caching using TCP only)

If you implement caching for your LiveCycle ES2 cluster by using TCP, configure the TCP locators to find other members of the LiveCycle ES2 cluster.

**Note:** This section does not apply if you implement caching for your LiveCycle ES2 cluster by using UDP. (See “Modifying the JBoss run file” on page 18 to configure caching for your LiveCycle ES2 cluster using UDP.)

Do the following to enable LiveCycle ES2 cluster caching using TCP:

- Ensure that the TCP locators are installed and configured. TCP locators are installed in the `[LiveCycle ES2 root]/lib/caching` directory, with a default configuration, when you install LiveCycle ES2. You can change the default configuration. (See “Modifying the TCP locators” on page 35.)

- Configure each node in the LiveCycle ES2 cluster to use the locators. (See “Modifying the JBoss run file” on page 18)

- Ensure that the TCP locators are running. (See “Starting the TCP locators” on page 37.)

#### 3.4.1 Modifying the TCP locators

The LiveCycle ES2 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 LiveCycle ES2 cluster. You can also create additional failover locators to support high availability in your cluster.

You can also modify the TCP locators to use a port other than the default port (22345).

➢ **To install the TCP locators:**

1. Log on to the computer where you installed LiveCycle ES2 and navigate to the `[LiveCycle ES2 root]/lib/caching` directory.

2. Copy the caching directory and its contents to the computer on which you want to run the locators.
To 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 LiveCycle ES2, in the [LiveCycle ES2 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 1 and 65535.

   **Caution:** 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 LiveCycle ES2 cluster. (See “Modifying the JBoss run file” on page 18.)

3. (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 LiveCycle ES2 cluster.

   See “Modifying the JBoss run file” on page 18.

   **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.

4. Save the edited file.

5. Repeat steps 1 to 4 on any additional locators for your LiveCycle ES2 cluster.

To 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 LiveCycle ES2, in the [LiveCycle ES2 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 1 and 65535.

   **Caution:** 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 LiveCycle ES2 cluster.

   See “Modifying the JBoss run file” on page 18.

3. (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 LiveCycle ES2 cluster.

See “Modifying the JBoss run file” on page 18.

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

4. Save the edited file.

5. Repeat steps 1 to 4 on any additional locators for your LiveCycle ES2 cluster.

3.4.2 Starting the TCP locators

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 LiveCycle ES2 cluster, caching will not function.

➤ To start the 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 LiveCycle ES2, in the [LiveCycle ES2 root]/lib/caching directory.

2. *(IPv6 only)* Modify startlocator.bat (Windows) or startlocator.sh (UNIX) and add the following JVM arguments:
   
   -Djava.net.preferIPv6Stack=true
   -Djava.net.preferIPv6Addresses=true

3. Run the appropriate file:
   
   - (Windows) startlocator.bat
   - (UNIX) startlocator.sh

4. Repeat steps 1 to 3 on any additional locators for your LiveCycle ES2 cluster.

➤ To stop the 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 LiveCycle ES2, in the [LiveCycle ES2 root]/lib/caching directory.

2. Run the appropriate file:
   
   - (Windows) stoplocator.bat
   - (UNIX) stoplocator.sh

3. Repeat steps 1 to 3 on any additional locators for your LiveCycle ES2 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.
3.5 Configuring the font directories

You must configure the font directories for each node in the cluster, including the LiveCycle ES2 fonts that are installed in the 
\([LiveCycleES2 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 the \([LiveCycle ES2 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 LiveCycle ES2 using LiveCycle Configuration Manager.

**Caution:** The font directories must be distinct from the GDS directory. However, they may be distinct sibling subdirectories of a single shared parent directory.

3.6 Next steps

*New for 9.5*

You must now configure LiveCycle ES2 for deployment. (See "Conﬁguring LiveCycle ES2 for Deployment" on page 39.) You may choose to configure LiveCycle ES2 later if you plan to install LiveCycle ES2.5 Solution Accelerators. In that case, you are required to first apply LiveCycle ES2 service pack 2 or later and install LiveCycle ES2.5 Solution Accelerators.

For more information about installing Solution Accelerators, see *Installing and Deploying LiveCycle ES2.5 Solution Accelerators.*
This chapter describes how to perform the following tasks:

- Configure LiveCycle ES2 modules in EAR files for deploying to the application server
- Initialize the LiveCycle ES2 database
- Deploy LiveCycle ES2 components
- Configure LiveCycle ES2 components
- (Optional) Configure the LiveCycle ES2 Connectors for ECM, Reader Extensions ES2, PDF Generator ES2, and PDF Generator 3D ES2 modules

**Note:** (Optional) LiveCycle Configuration Manager does not support configuration, deployment and database initialization for LiveCycle Business Activity Monitoring ES2 on manual installation option. See “Configuring LiveCycle Business Activity Monitoring ES2” in the single server install guide for your application server if you want to install BAM.

- (Optional) Import the LiveCycle ES2 samples into LiveCycle ES2

## 4.1 About LiveCycle Configuration Manager

LiveCycle Configuration Manager is a wizard-like tool used to configure, deploy, and validate LiveCycle ES2 components for deployment to the application server. LiveCycle Configuration Manager is installed with the module files when you run the LiveCycle ES2 installation program. When you run LiveCycle Configuration Manager, you specify the LiveCycle ES2 modules you are configuring, and the tasks that you want LiveCycle Configuration Manager to perform.

### 4.2.1 CLI versus GUI versions of LiveCycle Configuration Manager

This section describes the GUI version of LiveCycle Configuration Manager. For instructions about using the command line interface (CLI) version of LiveCycle Configuration Manager, see “Appendix - LCM Command Line Interface” on page 96.

You can configure LiveCycle using LCM in GUI, CLI, and manual modes. The following table summarizes the configuration steps and their corresponding valid modes (GUI, CLI, or manual).

<table>
<thead>
<tr>
<th>LiveCycle ES2 configuration task</th>
<th>LCM GUI</th>
<th>LCM CLI</th>
<th>Manual (Non-LCM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure LiveCycle ES2</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Configure application server</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Validate application server configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deploy LiveCycle ES2 EARs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initialize LiveCycle ES2 database</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Initialize Business Activity Monitoring ES2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
When you run LiveCycle Configuration Manager, you can select the tasks that you want the program to perform automatically.

**Tip:** LiveCycle Configuration Manager verifies the values that are specified on each screen when you click Next. If it cannot validate a value, a warning message appears, the property on the screen becomes red, and you cannot proceed until you enter a valid value.

**Tip:** If you are running LiveCycle Configuration Manager again after an earlier run, parameters that are already configured are shown as non-editable. Click Edit configurations to make these fields editable and make changes.

After LiveCycle Configuration Manager configures the LiveCycle ES2 EAR files, it places the following files in the [LiveCycleES2 root]/configurationManager/export directory:

- adobe-livecycle-native-jboss-[OS].ear
- adobe-livecycle-jboss.ear
- adobe-workspace-client.ear (if you installed LiveCycle Process Management ES2)
- and adobe-contentservices.ear (if you installed LiveCycle Content Services ES2)

When you manually deploy the LiveCycle ES2 EAR files, you can access the files in this directory and deploy them to the application server.

After LiveCycle Configuration Manager configures the LiveCycle ES2 EAR files, you may rename the EAR files to a custom file name (for example, to specify in the file name a version identifier, or any other information required by standard practices in the local JDK environment).

**Tip:** You can override the font while selecting or browsing to a directory or file name on a LiveCycle Configuration Manager screen. Add the following JVM argument to ConfigurationManager.bat (Windows) or ConfigurationManager.sh (Linux, UNIX):

```
-Dlcm.font.override=<FONT_FAMILY _NAME>
```

For example, -Dlcm.font.override=SansSerif.
Configure using LiveCycle Configuration Manager:

**Tip:** You can press F1 in LiveCycle Configuration Manager to view Help information for the screen you are viewing. This Help contains details that may not be included in this document and are specific to the context of each screen in LiveCycle Configuration Manager.

**Tip:** If you are running LiveCycle Configuration Manager again after an earlier run, parameters that are already configured are shown as non-editable. Click Edit configurations to make these fields editable and make changes.

**Note:** You cannot configure settings for IPv6-based clusters using LiveCycle Configuration Manager.

1. If you did not start LiveCycle Configuration Manager automatically from the installation program, navigate to the [LiveCycleES2 root]/configurationManager/bin directory and enter the appropriate command:
   - (Windows) ConfigurationManager.bat
   - (Non-Windows)/ConfigurationManager.sh

2. If prompted, select a language and click OK.

3. On the Welcome screen, click Next.

4. On the Upgrade task selection screen, ensure that no options are selected, then click Next to continue.

**Caution:** If you want to upgrade an existing LiveCycle ES installation, do not continue this procedure. For upgrade information and procedures, see the Preparing to Upgrade to LiveCycle ES2 from 8.x guide applicable to your current version of LiveCycle ES2 and the Upgrading to LiveCycle ES2 guide applicable to your application server.

5. On the Module Selection screen, select the LiveCycle ES2 modules and then click Next.

**Caution:** Do not select Adobe Business Activity Monitoring ES2 if you are installing LiveCycle ES2 on a 32-bit computer. Business Activity Monitoring ES2 is supported only on 64-bit computers, operating systems, and application servers.

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

   The Configure Application Server, Validate Application Server Configuration, and Deploy LiveCycle ES2 EARs tasks are not available for JBoss. You must configure your JBoss Application Server cluster and deploy the LiveCycle ES2 EARs manually (see “Configuring JBoss in a Cluster” on page 11 and the Preparing to Install LiveCycle ES2 (Server Cluster) guide).

7. On the Configure LiveCycle ES2 (1 of 5) screen, click Configure. Click Next when done.

8. On the Configure LiveCycle ES2 (2 of 5) screen, click Next to accept the default directory locations, or customize the directories that LiveCycle ES2 will use to access fonts, and then click Next.
   - (Optional) To change the default location of the Adobe server fonts directory, type the path or browse to the directory.
   - (Optional) Specify a directory for the Customer fonts directory. The directory contains any additional fonts that you have licensed and installed.

**Note:** It is recommended that you have local server fonts and customer fonts directories at the same path on each node in the cluster. Having shared fonts directories instead of local fonts directories may cause performance issues.
● (Optional) To change the default location of the System fonts directory, type the path or browse to the directory.

● (Optional) To enable FIPS, ensure that Enable FIPS is selected. Select this option only if you require the Federal Information Processing Standards (FIPS) to be enforced.

9. Click Browse on the Configure LiveCycle ES2 (3 of 5) screen to specify the Location of the temporary directory.

(UNIX only) If a non-root user is running the application server, the user must have full permissions on the specified temporary directory.

Note: If you do not create the temporary directory, the default system-configured location is used.

For more information about creating a temporary directory in cluster environment, see Preparing to Install LiveCycle ES2 (Server Cluster).

Caution: Future upgrades might fail if you specify a shared network directory as the temporary directory.

10. On the Configure LiveCycle ES2 (4 of 5) screen, add the location of the GDS directory path by typing the specific location of the GDS directory or clicking Browse to navigate to the location of the GDS directory.

For clusters, specify a shared GDS directory path accessible to all nodes in the cluster. You can map a shared network location to a Windows drive. You can then use the mapped drive as a root directory for GDS.

If you leave the GDS directory field empty, LiveCycle ES2 will create the directory in a default location in the application server directory tree. The location will be viewable after configuration by clicking LiveCycle Administration Console > Core settings.

Note: You must specify the location of the global document storage directory you established previously (see the Preparing to Install to LiveCycle ES2 (Server Cluster) guide).

Caution: Component deployment will fail on Windows if the GDS directory is at the drive root (for example, D:\). For GDS, you must make sure that the directory is not located at the root of the drive but is located in a subdirectory. For example, the directory should be D:GDS and not simply D:.

11. On the Configure Persistent Document Storage (5 of 5) screen, select the option for persistent document storage in addition to the GDS directory. Select one of the following:

● 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 LiveCycle ES2 database for storing the persistent documents and long-lived artifacts. However, the file-system based GDS is also required for storing short-lived artifacts.

Note: When choosing the database option, no sensitive data is persisted to the file-system based GDS, therefore eliminating the need for back-up if LiveCycle is moved to another server. Using the database simplifies backup and restore procedures.

12. Click Configure to configure the LiveCycle ES2 EARs with this directory information and, after the configuration is complete, click Next.

13. (Content Services ES2 only) On the LiveCycle Content Services ES2 Configuration screen, set the following parameters that Content Services ES2 will use, and click Next.
● **Deploy Type:** Select **Single Server** or **Cluster**.

● **Index Root Directory:** Specify the indexes directory that is used by Content Services ES2. This directory is unique for each cluster node and must have the same name and location on all nodes.

● **Content storage root directory:** Specify the root directory that is used by Content Services ES2. The content storage root directory should be a location shared by all instances in the cluster.

**Note:** Run LiveCycle Configuration Manager with the UTF-8 locale if you want to specify a content storage root directory having international characters.

● **(Optional) Enable CIFS:** Select this option to allow Windows-based clients to access files from the server that runs LiveCycle ES2 using the Common Internet File System (CIFS) protocol. Click **Next** to specify the following details:

  ● **CIFS Server Name:** Specify the name through which the Content Services ES2 Repository will be accessible. By default, LiveCycle Configuration Manager populates the server name of the LiveCycle ES2 server with 'a' attached to it. For example, if the LiveCycle ES2 server name is lcserver, the CIFS Server name will be populated as lcservera. You must ensure that the CIFS server name that you specify is unique within the network.

  ● **Choose the CIFS Server Implementation:** Select the type of CIFS implementation supported on the server as one of the following:

    **JAVA (Socket Based):** Specify the alternate IP address assigned to the CIFS Server, and how the server name will be resolved in the local domain. For example, if the primary IP is 10.40.68.142, assign 10.40.68.143 as the alternate IP. Ensure that this IP is not allocated to any other machine on the network.

    **Windows Native (DLL Based):** Click **Browse** to select the path (usually, C:\Windows\system32) to where LiveCycle Configuration Manager will copy the DLL files. This step should be performed manually for the cluster nodes on which you do not plan to run LiveCycle Configuration Manager.

    The path where DLL files will be copied must be specified in the system PATH environment variable. For example, for Windows Server 2003 and 2008, the system PATH must include C:\Windows\system32.

  ● **Use WINS Server or Broadcast to resolve Local Domain:** Select the method used to resolve the local domain:

    **Broadcast:** Specify the broadcast address (subnet mask) of the network segment in the local domain. For example, 10.40.91.255. In Broadcast mode, the CIFS server and clients must be in the same subnet.

    **WINS Server:** Specify the IP addresses of the primary and secondary WINS servers. For example, 10.40.4.248. If WINS server is selected, the clients can reside in any subnet in the local domain.

**Windows only**

CIFS is not supported on Windows when the application server is running in pure IPv6 mode. You may have to update your DNS entries with CIFS server name and the virtual IP address assigned so that Windows clients can access the CIFS server by name.

**UNIX only**

For UNIX machines, only Java implementation is supported. For UNIX machines, you must create a virtual interface and assign a virtual IP address that can be used as the alternate IP address for CIFS
implementation. This ensures that the UNIX machines can run Samba and CIFS on the same machine, but on two different IP addresses, because both these services use the same ports.

To enable CIFS on an IPv6 implementation of LiveCycle ES2, you must edit the contentservices.war file after the configuration of the EAR files is completed. Update the EAR file and then proceed to the next step in LiveCycle Configuration Manager. See “Enabling CIFS in IPv6 mode” on page 77.

In addition to these steps in LiveCycle Configuration Manager, you must complete other manual configuration steps for Windows Server 2003 and Windows Server 2008. See “Server configuration for enabling CIFS” in the Preparing to Install LiveCycle ES2 (Server Cluster) guide

14. **(Content Services ES2 only)** On the LiveCycle Content Services ES2 Module Configuration screen, do the following tasks, and then click **Configure** to configure the LiveCycle ES2 EAR files with the Content Services ES2 settings. After the configuration is complete, click **Next**. See Alfresco documentation for more information.

   - Select the Alfresco Module Packages (AMP) that you want to include in Content Services ES2. By default, all AMPs that are dependent on the selected LiveCycle ES2 modules are included.

   - (Optional) To include your own AMPs, select the **Do you want to package your own AMPs** in Content Services box, and click **Browse** to select the directory where the custom AMPs are available. All AMPs in the selected directory are packaged.

   **Note:** If you want to enable SharePoint clients to migrate to Alfresco CMS, you must add the SharePoint AMP:

   ```
   [LiveCycleES2 root]\LiveCycle_ES_SDK\misc\ContentServices\adobe-vti-module.amp
   ```

   After you add this file, follow the steps detailed in “Configuring SharePoint client access” on page 76.

15. **(Windows only)** On the Configure Acrobat for LiveCycle PDF Generator screen, click **Configure** to run the script that will configure Adobe Acrobat and required environment settings. Click **Next** when complete.

   This screen appears only when LiveCycle Configuration Manager is running locally on a server computer. You must have Adobe Acrobat already installed or this step will fail.

   **Note:** To use OpenOffice.org on Linux or Solaris, set the Openoffice_PATH environment variable. Refer to “Setting environment variables” on page 54.

16. On the Configure LiveCycle ES2 Summary screen, click **Next**. Configured archives are placed in the `[LiveCycleES2 root]/configurationManager/export` directory. Stop each JBoss Application Server instance in the cluster.

   **Note:** The paths for pop3.jar and the JDK must be same on all nodes in the cluster.

17. Without exiting LiveCycle Configuration Manager, manually deploy the LiveCycle ES2 EAR files to JBoss by copying the following files from the `[LiveCycleES2 root]/configurationManager/export` directory to the following directory: (Manually-configured JBoss) `[appserver root]/server/all/deploy` or (Adobe-preconfigured JBoss) `[appserver root]/server/lc_<db-name>_cl/deploy` on each JBoss Application Server instance of the cluster:

   - adobe-livecycle-native-jboss-[OS].ear
   - adobe-livecycle-jboss.ear
   - adobe-workspace-client.ear (Process Management ES2 only)
   - adobe-contentservices.ear (Content Services ES2 only)

   You can optionally deploy the LiveCycle ES2 Forms, Output, and Assembler IVS EARs as well.
Caution: Deploying the IVS EAR files to a production environment is not recommended. If you are deploying Content Services ES2, refer to “Setup for Content Services ES2” on page 64 to configure the required JVM arguments in the run.bat/run.sh file for each JBoss Application Server instance prior to EAR deployment.

18. Start JBoss to ensure the LiveCycle ES2 applications start successfully.


20. On the LiveCycle ES2 Database Initialization screen, verify that the host and port information and then 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 has completed successfully, click Next.

Note: You need to initialize the database against only one server of the cluster. Subsequent steps need to be performed on only this server as well.

21. On the LiveCycle ES2 Server Information screen, in the Password box, type password. (This password is the default administrator password; it is recommended that you change the password later.)

22. Click Verify Server Connection, and when complete, click Next.

Note: The server information that appears on this screen represents default values for the deployment. Verifying the server connection helps narrow troubleshooting in case failures occur in the deployment or validation. If the connection test passes but deployment or validation fails in the next few steps, connectivity issues can be eliminated from the troubleshooting process.

23. On the Central Migration Bridge Service Deployment Configuration screen, if applicable, select the Include Central Migration Bridge Service in deployment option and then click Next.

24. On the LiveCycle Component Deployment screen, click Deploy. The components that are deployed at this time are Java archive files that plug into the LiveCycle ES2 service container for purposes of deploying, orchestrating, and executing services. Click View Progress Log to view the deployment progress and, when the deployment has completed successfully, click Next.

25. On the LiveCycle Component Deployment Validation screen, click Validate. LiveCycle Configuration Manager validates that the LiveCycle components (Java archive files) are deployed to and running on the LiveCycle ES2 server. Click View Progress Log to view the validation progress and, when the validation has completed successfully, click Next.

26. On the Configure LiveCycle Components screen, select the tasks to run with LiveCycle Configuration Manager, and click Next. Press F1 for more information.

27. (If EMC Documentum, IBM FileNet or IBM Content Manager is selected for configuration) On the LiveCycle Server JNDI Information screen, enter the host name and port number for the JNDI server. Press F1 for more information.

28. (Optional - EMC Documentum only) On the Specify Client for EMC Documentum screen, select Configure Connector for EMC Documentum Content Server, and specify the following settings. Enter the details, 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.
29. **(Optional - EMC Documentum only)** On the Specify EMC Documentum Content Server Settings screen, enter the EMC Documentum Server details, and then click Next. Press F1 for information about the details you need to enter.


31. **(Optional - IBM Content Manager only)** On the Specify Client for IBM Content Manager screen, select Configure Client for IBM Content Manager, and enter a value for the IBM Content Manager Client Installation Directory Path. Click Verify and when complete, click Next to continue.

32. **(Optional - IBM Content Manager only)** On the Specify IBM Content Manager Server Settings screen, enter the details of the IBM Content Manager Server, and click Next. Press F1 for more information.

33. **(Optional - IBM Content Manager only)** On the Configure Adobe LiveCycle ES2 Connector for IBM Content Manager screen, click Configure IBM Content Manager Connector. When complete, click Next.

34. **(Optional - IBM FileNet only)** On the Specify Client for IBM FileNet screen, select Configure Client for IBM FileNet Content Manager, and specify the following settings. Enter the details, click Verify, and when complete, click Next to continue.
   - **Choose IBM FileNet Client Version:** Select the client version that you want to use with the EMC Documentum Content Server.
   - **IBM FileNet Client Installation Directory Path:** Click Browse to select the directory path.

35. **(Optional - IBM FileNet only)** On the Specify IBM FileNet Content Server Settings screen, enter the required details, and click Next. Press F1 for more information.

36. **(Optional - IBM FileNet only)** On the Specify Client for IBM FileNet Process Engine screen, enter the required details, and click Verify. When complete, click Next. Press F1 for more information.


39. **(Optional – LiveCycle ES2 Connector for Microsoft SharePoint only)** On the Adobe LiveCycle ES2 Connector for Microsoft SharePoint screen, enter the following details and click Configure. When complete, click Next.

   **Note:** You can skip this step if you want to configure the SharePoint Connector later using LiveCycle Administration Console.
   - **User Name and Password:** Enter the user account details that will be used to connect to the SharePoint server.
   - **Host Name:** Enter the host name of the SharePoint server in the format `<hostname>:<port>`. The port number must be of the web application on the SharePoint server.
   - **Domain Name:** Enter the domain in which the SharePoint server is present.

40. **(PDF Generator ES2 only)** On the Administrator user credentials for LiveCycle server machine screen, enter the user name and password of a user with administrative privileges on the server computer, and then click Add.
**Note:** You must add at least one administrative user for Windows 2008 Server. On Windows 2008 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 deselect Use User Account Control (UAC) to help protect your computer, then click OK. Restart the computer to apply these changes.

For Windows Server 2003, Linux, and Solaris, adding a user is not mandatory. Users added on Linux and Solaris platforms must have sudo privileges.

For more information, press F1 on this screen to access the LiveCycle Configuration Manager Help.

41. **(Only for PDF Generator ES2 when LiveCycle Configuration Manager is running locally on a server machine)** On the LiveCycle PDFGenerator System Readiness Test screen, click Start to validate if the system has been appropriately configured for PDF Generator ES2.

42. **(PDF Generator ES2 only)** Review the System Readiness Tool Report and click Next.

43. **(Reader Extensions ES2 only)** On the LiveCycle Reader Extensions ES2 Credential Configuration screen, specify the details that are associated with the Reader Extensions ES2 credential that activates the module services:
   - **Credential file:** The path and file name of the Reader Extensions ES2 credential (.pfx or .p12 file type).
   - **Credential Password:** The password that is associated with the credential. This password was provided with the credential file.
   - **User defined name for this credential:** The name (or alias) that you specified for this credential when it is configured.

   This name appears in the Reader Extensions ES2 web interface, and the alias that is used to reference the credential through SDK calls. You can create any unique name for the Reader Extensions ES2 credential.

   **Note:** You can skip this step at this time by selecting Configure later using LiveCycle Administration Console. You can configure the Reader Extensions ES2 credential by using LiveCycle Administration Console after you complete the deployment. (After logging in to LiveCycle Administration Console, click Home > Settings > Trust Store Management > Local Credentials.)

   Click Configure and then click Next.

44. **(Optional)** On the LiveCycle ES2 Samples Import screen, click Import. When the import has completed successfully, click Next or click Skip LiveCycle Samples Import and then click Next to import the samples at a later time.

   **Caution:** Do not import the LiveCycle ES2 Samples in a production employment. These samples create users with default passwords, which may be a security concern for your production environment.

45. On the Summary page, review the tasks performed, and click Next.

46. The Next steps screen displays the URL and login information. Click Finish to exit LiveCycle Configuration Manager.

   **Note:** After you configure LiveCycle ES2, complete the post-configuration activities that apply to your solution implementation.
47. Restart each application server instance in your cluster

48.

4.4 Next steps

Now that you have configured and deployed LiveCycle ES2, you can do the following tasks:

- Verify the deployment. (See “Verifying the deployment” on page 50.)
- Access LiveCycle Administration Console. (See “Accessing LiveCycle Administration Console” on page 50.)
- Configure PDF Generator ES2 or PDF Generator 3D ES2. (See “Configuring LiveCycle PDF Generator ES2 or 3D ES2” on page 54.)
- Perform the final setup for Rights Management ES2. (See “Setting watched folder performance parameters” on page 63.)
- Configure LiveCycle ES2 modules to access LDAP. (See “Configuring LiveCycle ES2 to access LDAP” on page 64.)
- Perform watched folder performance-tuning for PDF Generator ES2. (See “Setting watched folder performance parameters” on page 63.)
- Enable FIPS mode. (See “Enabling FIPS mode” on page 66.)
- Enable HTML digital signatures. (See “Configuring HTML digital signature” on page 66.)
- Configuring Connector for EMC Documentum, Connector for IBM Content Manager, or Connector for IBM FileNet. (See “Configuring the Connector for EMC Documentum service” on page 67, “Configuring the Connector for IBM FileNet service” on page 71, or “Configuring the Connector for IBM Content Manager” on page 78.)
- Set environment variables for PDF Generator ES2. (See “Setting environment variables” on page 54.)
- Install and deploy LiveCycle Business Activity Monitoring ES2. See the Installing and Deploying LiveCycle ES2 guide for your application server.
- Uninstall LiveCycle ES2. (See “Uninstalling LiveCycle ES2” on page 82.)
This chapter describes how to verify the deployment by accessing the LiveCycle Administration Console and checking the application server log files. It also describes how to get started using LiveCycle ES2 modules and services after they are installed, configured, and deployed to your application server:

- “Configuring a Windows service for JBoss Application Server” on page 49
- “Restart the application server” on page 50
- “Set the date, time, and time zone” on page 50
- “Verifying the deployment” on page 50
- “Installing LiveCycle ES2.5 Solution Accelerators” on page 51 (optional)
- “Accessing module web applications” on page 51
- “Accessing User Management” on page 53
- “Configuring LiveCycle PDF Generator ES2 or 3D ES2” on page 54
- “Setup for Content Services ES2” on page 64
- “Configuring LiveCycle ES2 to access LDAP” on page 64
- “Enabling FIPS mode” on page 66
- “Configuring HTML digital signature” on page 66
- “Configuring the Document Management service” on page 67
- “Configuring the Connector for EMC Documentum service” on page 67
- “Configuring the Connector for IBM FileNet service” on page 71
- “Configuring the Connector for IBM Content Manager” on page 78
- “Perform a system image backup” on page 81
- “Isloating JBoss Clusters” on page 81
- “Uninstalling LiveCycle ES2” on page 82

After you configure the settings in this chapter, for additional information about configuring your LiveCycle ES2 environment for development and production, see LiveCycle ES2 Administration Help.

### 5.1 Configuring a Windows service for JBoss Application Server

If your JBoss Application Server runs on a Windows operating system, you may optionally install a Windows service 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. See “Appendix - Configuring JBoss as a Windows Service” on page 108 for information about using the JBoss Web Native Connector to configure JBoss as a Windows service.
5.2 Restart the application server

When you first deploy LiveCycle ES2, 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 a typical production state. You must restart the application server to get the server back into a clean state.

5.3 Set the date, time, and time zone

Setting the date, time, and time zone on all servers connected to your LiveCycle ES2 environment will ensure that time-dependent modules, such as LiveCycle Digital Signatures ES2 and LiveCycle Reader Extensions ES2, 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.

5.4 Verifying the deployment

You can verify the deployment by logging in to LiveCycle Administration Console. If you log in successfully, then LiveCycle ES2 is running on the application server and the default user is created in the database.

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.

5.4.1 Accessing LiveCycle Administration Console

LiveCycle Administration Console is the web-based portal for accessing a variety of configuration pages where you can set run-time properties that control the way LiveCycle ES2 operates. When you log in to LiveCycle Administration Console, you can access User Management, Watched Folder, and Email client configuration, and administrative configuration options for other services. LiveCycle Administration Console also provides access to Applications and Services, which administrators use for managing archives and deploying services to a production environment.

The default user name and password for logging in is administrator and password. After you log in the first time, access User Management and change the password. If you have upgraded, the user name and password remain the same as when they were set by the administrator when LiveCycle ES (8.x) was configured.

Before you access LiveCycle Administration Console, LiveCycle ES2 must be deployed and running on your application server.

For information about using LiveCycle Administration Console, see LiveCycle ES2 Administration Help.

➤ To access LiveCycle Administration Console:

1. Type the following URL in a web browser:
   http://[host name]:[port]/adminui
   The default port number for JBoss is 8080.

2. In the User Name box, type administrator and, in the Password box, type 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.

### 5.4.2 Change default password

LiveCycle ES2 creates one or more default users during the installation. The password for these users is in the product documentation and is publicly available. You must change this default password, depending on your security requirements.

The LiveCycle ES2 administrator user password is set to “password” by default. You must change it in LiveCycle Administration Console > Settings > User Management.

### 5.4.3 Viewing the log files

You can view the log files to verify that the LiveCycle ES2 cluster functions properly. 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 help you find the problem. You can open the log files by using any text editor.

**➤ To verify the LiveCycle ES2 cluster:**

1. Ensure that all application server instances of the cluster are started.

2. View the Gemfire.log file, located in the directory `[LiveCycle ES2 temp]/[server name]/caching`. 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.

### 5.5 Installing LiveCycle ES2.5 Solution Accelerators

*New for 9.5*

If you are planning to install LiveCycle ES2.5 Solution Accelerators, you are required to first apply LiveCycle ES2 service pack 2 or later and install LiveCycle ES2.5 Solution Accelerators. However, note that you need to rerun LiveCycle Configuration Manager after installing LiveCycle ES2.5 Solution Accelerators.

For more information about installing Solution Accelerators, see [Installing and Deploying LiveCycle ES2.5 Solution Accelerators](#).

### 5.6 Accessing module web applications

After LiveCycle ES2 is deployed, you can access the web applications that are associated with the following modules:
After accessing the web applications by using the default administrator permissions to ensure that they are accessible, you can create additional users and roles so that others can log in and use the applications. (See LiveCycle ES2 Administration Help.)

➤ To access the Reader Extensions ES2 web application:

Note: You must apply a Reader Extensions ES2 credential and apply the user roles for a new user. (See “Configuring credentials for use with Reader Extensions ES2” in LiveCycle ES2 Administration Help.)

1. Open a web browser and enter this URL if you are using a local deployment:
   http://localhost:{port}/ReaderExtensions
   For JBoss, the port is 8080

2. Log in using the default user name and password:
   User name: administrator
   Password: password

Note: You must have administrator or superuser privileges to log in using the default user name and password. To allow other users to access the Reader Extensions ES2 web application, you must create the users in User Management and grant them the Reader Extensions Web Application role.

➤ To access Workspace ES2:

1. Open a web browser and enter this URL if you are using a local deployment:
   http://localhost:{port}/workspace
   For JBoss, the port is 8080

2. Log in using the default user name and password:
   User name: administrator
   Password: password

➤ To access the Content Services ES2 web application:

Note: You must apply the LiveCycle Contentspace Administrator or LiveCycle Contentspace User roles for a new user to login to this web application. To do this, you must create the users in User Management and grant them the appropriate role.

1. Open a web browser and enter this URL if you are using a local deployment:
   http://localhost:{port}/contentspace
   For JBoss, the port is 8080
2. Log in using the default user name and password:
   
   **User name:** administrator  
   **Password:** password

### 5.7 Accessing Rights Management ES2

You must create a user with the LiveCycle Rights Management End User role in User Management and log in to the Rights Management ES2 administrator or end-user applications by using the login information that is associated with that user.

**Note:** The default administrator user cannot access the Rights Management ES2 end-user web application but you can add the appropriate role to its profile. You can create a new user or modify an existing user through LiveCycle Administration Console.

➤ To access the Rights Management ES2 end-user web application:

1. Open a web browser and enter this URL:
   
   http://[server]:[port]/edc/Login.do

➤ To access the Rights Management ES2 administration web application:

1. Open a web browser and enter this URL:
   
   http://[server]:[port]/adminui

2. Click Services > LiveCycle Rights Management ES2. For information about setting up users and roles for Rights Management ES2, see LiveCycle ES2 Administration Help.

➤ To assign the LiveCycle Rights Management End User role:

1. Log in to LiveCycle Administration Console. (See “Accessing LiveCycle Administration Console” on page 50.)

2. Click Settings > User Management > Users and Groups.

3. In the Find box, type all and, in the In list, select Groups.

4. Click Find and, for the required domains, click All Principals in the list that appears.

5. Click the Role Assignments tab and click Find Roles.

6. In the list of roles, select the check box next to LiveCycle Rights Management End User.

7. Click OK and then click Save.

### 5.8 Accessing User Management

By using User Management, administrators can maintain a database of all users and groups, synchronized with one or more third-party user directories. User Management provides authentication, authorization, and user management for LiveCycle ES2 modules, including Reader Extensions ES2, Workspace ES2, Rights Management ES2, Process Management ES2, Forms ES2, PDF Generator ES2, PDF Generator 3D ES2, and Content Services ES2.
To access User Management:

1. Log in to LiveCycle Administration Console.
2. On the home page, click **Settings > User Management**.

**Note:** For information about configuring users with User Management, click *User Management Help* in the upper-right corner of the User Management page.

### 5.9 Configuring LiveCycle PDF Generator ES2 or 3D ES2

If you installed LiveCycle PDF Generator ES2 or LiveCycle PDF Generator 3D ES2 as part of your LiveCycle ES2 solution, complete the following tasks:

- “Setting environment variables” on page 54
- “Setting the Adobe PDF Printer as the default printer” on page 55
- “Configuring Acrobat Professional” on page 55
- “Configuring user accounts for multi-threaded file conversions” on page 57
- “Installing East Asian characters in Windows Server 2003” on page 58
- “Adding fonts to PDF Generator ES2 or PDF Generator 3D ES2” on page 58
- “Installing the Network Printer Client” on page 62
- “Setting watched folder performance parameters” on page 63

#### 5.9.1 Setting environment variables

If you installed the PDF Generator ES2 or PDF Generator 3D ES2 module and configured it to convert files to PDF, for some file formats, you must manually set an environment variable that contains the absolute path of the executable that is used to start the corresponding application. The table below lists the native applications that PDF Generator ES2 or PDF Generator 3D ES2 requires you to set up environment variables for. For a cluster configuration, ensure that the required applications are installed on all nodes in the cluster.

<table>
<thead>
<tr>
<th>Application</th>
<th>Environment variable</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrobat</td>
<td>Acrobat_PATH</td>
<td>C:\Program Files\Adobe\Acrobat 9.0\Acrobat\Acrobat.exe</td>
</tr>
<tr>
<td>Adobe FrameMaker*</td>
<td>FrameMaker_PATH</td>
<td>C:\Program Files\Adobe\FrameMaker7.1\FrameMaker.exe</td>
</tr>
<tr>
<td>Notepad</td>
<td>Notepad_PATH</td>
<td>C:\WINDOWS\Notepad.exe</td>
</tr>
<tr>
<td>OpenOffice</td>
<td>OpenOffice_PATH</td>
<td>C:\Program Files\OpenOffice.org 3</td>
</tr>
</tbody>
</table>

**Note:** The environment variable *Acrobat_PATH* is case-sensitive.

**Note:** You can leave the *Notepad_PATH* variable blank.
Adobe LiveCycle ES2
Configuring LiveCycle ES2 Application Server Clusters Using JBoss

Setting the Adobe PDF Printer as the default printer

5.9.2 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 ES2 cannot convert files successfully.

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

➢ To 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.

5.9.3 Configuring Acrobat Professional

This procedure is required only if you upgraded to or installed Acrobat after you completed the LiveCycle ES2 installation. Upgrading Acrobat can be completed after you run LiveCycle Configuration.
Manager and deploy LiveCycle ES2 to the application server. Acrobat Professional root directory is designated as [Acrobat root]. Typically, the root directory is C:\Program Files\Adobe\Acrobat 9.0\Acrobat.

➤ To 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. Do one of the following:
   ● If you are using the media, insert the Acrobat CD.
   ● If you are using the ESD downloads, download Acrobat from your ESD location.
3. Install Acrobat by running the AutoPlay.exe file.
4. Navigate to the additional\scripts folder on the LiveCycle ES2 installation media.
5. Run the following batch file on the cluster node where LiveCycle ES2 is installed:
   Acrobat_for_PDFG_Configuration.bat [LiveCycleES2 root]/pdfg_config
6. On all cluster nodes on which you do not plan to run LiveCycle 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 [LiveCycle ES2 root]/plugins/x86_win32 directory on the node where LiveCycle ES2 is installed to the [Acrobat root]/plug_ins directory on the node being currently configured.
   ● Copy PDFG_PDPE-1(sRGB).kfp, PDFG_PDFA-1a(sRGB).kfp, and PDFG_PDFA-1b(sRGB).kfp files from the [LiveCycle ES2 root]/plugins/x86_win32 directory on the node where LiveCycle ES2 is installed to the [Acrobat root]/plug-ins/Preflight directory on the node being currently configured.
7. If you are also installing PDF Generator 3D ES2, follow these additional steps on nodes where you do not plan to run LiveCycle Configuration Manager:
   ● Set the value of the environment variable A3DREVIEWER_MULTI to 1.
   ● Copy PDFG3dAddin.dll from [LiveCycle ES2 root]/plugins/x86_win32 on the node where LiveCycle ES2 is installed to any directory on the node being currently configured.
   ● Change to the directory to which you just copied PDFG3dAddin.dll.
   ● Register PDFG3dAddin.dll using the following command:
     regsvr32 PDFG3dAddin.dll
   Note: You do not need to follow steps 6 and 7 on a node where LiveCycle ES2 is installed. Simply run the batch file specified in step 5.
8. Open Acrobat and select Help > Check for updates > Preferences.

➤ To 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 the Acrobat dialog boxes that are displayed after the Acrobat installation is completed and disable the automatic updates for Acrobat.

Set the **Acrobat_PATH** environment variable to point to Acrobat.exe (For example, `C:\Program Files\Adobe\Acrobat 9.0\Acrobat\Acrobat.exe`).

➤ **To configure native application support:**

1. Install and validate Acrobat as described in the previous procedure.

2. Set Adobe PDF printer as the default printer.

3. *(PDF Generator 3D ES2)* Register the DLL file located at `[LiveCycleES2 root]\plugins\x86_win32\PDFG3dAddin.dll`.

### 5.9.4 Configuring user accounts for multi-threaded file conversions

By default, PDF Generator ES2 can convert only one OpenOffice, Microsoft Word, or PowerPoint document at a time. If you enable multi-threaded conversions, PDF Generator ES2 can convert more than one of the documents concurrently by launching multiple instances of OpenOffice or PDFMaker (which is used to perform the Word and PowerPoint conversions).

**Note:** Only Microsoft Word 2007 and Microsoft PowerPoint 2007 are supported with multi-threaded file conversions. Microsoft Excel 2003 or 2007 versions are not supported.

If you need to enable multi-threaded file conversion, you must first perform the tasks outlined in the “Enabling multi-threaded file conversions” section of the *Preparing to Install LiveCycle ES2 (Single Server)* guide.

For Linux and Solaris users, you must create your users and make these additional configurations to remove the password prompts.

➤ **Add a user account:**

1. In LiveCycle Administration Console, click **Services > LiveCycle PDF Generator ES2 > User Accounts**.

2. Click **Add** and enter the user name and password of a user who has administrative privileges on the LiveCycle ES2 server. If you are configuring users for OpenOffice, dismiss the initial OpenOffice activation dialogs.

   **Note:** If you are configuring users for OpenOffice, the number of instances of OpenOffice cannot be greater than number of user accounts specified in this step.

3. Restart the LiveCycle ES2 server.

➤ **Additional configuration required for OpenOffice on Linux or Solaris**

1. Add user accounts as described above.

2. Add entries for additional users (other than the administrator who runs the LiveCycle ES2 server in the `/etc/sudoers` file. For example, if you are running LiveCycle ES2 as a user named `lcadm` and a server
named myhost, and you want to impersonate user1 and user2, add the following entries to /etc/sudoers:

```bash
lcadm myhost=(user1) NOPASSWD: ALL
lcadm myhost=(user2) NOPASSWD: ALL
```

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

3. Allow all the users that you added via Add a user account to make connections to the LiveCycle ES2 server. For example, to allow a local user named user1 the permission of making the connection to the LiveCycle ES2 server, use the following command:

```bash
xhost +local:user1@
```

For more details, refer to xhost command documentation.

4. Restart the server.

### 5.9.5 Installing East Asian characters in Windows Server 2003

When HTML files are converted to PDF by using PDF Generator ES2 or PDF Generator 3D ES2, some East Asian languages, such as Japanese, Korean, and Chinese, and also right-to-left languages, such as Arabic, Armenian, Georgian, Hebrew, Indic, Thai, and Vietnamese, may not be displayed in the PDF file.

To ensure that these languages are displayed in Windows Server 2003, appropriate fonts must be present on the client and server.

➤ To install East Asian characters in Windows Server 2003:

1. Select Start > Control Panel and open Regional and Language Options.
2. Click the Languages tab and select Install Files for East Asian Languages.
3. Click the Advanced tab and select all the options under Code Page Conversion Tables.

If converted PDF files are still missing fonts, verify that the Arial Unicode MS (TrueType) font (ARIALUNI.TTF) is present in the C:\WINDOWS\Fonts directory.

### 5.9.6 Adding fonts to PDF Generator ES2 or PDF Generator 3D ES2

LiveCycle ES2 provides a central repository of fonts named Adobe LiveCycle ES2 Fonts Management, which is accessible to all LiveCycle ES2 modules. Make the extra fonts available to non-LiveCycle ES2 applications on the server so that PDF Generator can use these fonts to create PDF documents that are created with these applications.

#### 5.9.6.1 Non-LiveCycle applications

The following list contains non-LiveCycle ES2 applications that PDF Generator ES2 or PDF Generator 3D ES2 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 Visio
● Microsoft Office Publisher
● AutoDesk AutoCAD
● Corel WordPerfect
● Adobe Photoshop CS
● Adobe FrameMaker
● Adobe PageMaker
● Adobe Acrobat Professional Extended

**Multiplatform 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.

### 5.9.6.2 Adding new fonts to Windows applications only

All the Windows-only applications that are mentioned above can access all the fonts that are 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 LiveCycle ES2 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.

### 5.9.6.3 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](http://wiki.services.openoffice.org).

In addition, OpenOffice Suite has these resources about the fonts-related behavior:

● *OpenOffice Fonts Troubleshooting Guide* at [http://www.openoffice.org/FAQs/fontguide.html](http://www.openoffice.org/FAQs/fontguide.html). Some of the text in this guide is applicable only to OpenOffice 1.x and therefore may be obsolete for OpenOffice 3.x and above.
• Importing Fonts into OpenOffice 2.1 at http://openoffice.blogs.com/openoffice/2007/02/font_import_wiz.html. Even though this blog mentions OpenOffice 2.1, the instructions that are mentioned should be applicable to OpenOffice 2.2 and later.

5.9.6.4 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.

5.9.7 Configuring HTML to PDF conversions

The HTML-to-PDF conversion process is designed to use the settings from Acrobat 9 that override the settings from LiveCycle PDF Generator ES2.

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

➤ To configure the HTML-to-PDF conversion:

1. Install and validate Acrobat as described in “Configuring Acrobat Professional” on page 55.

2. Locate the pdfgen.api file in the [LiveCycleES2 root]\plugins\x86_win32 directory and copy it to [Acrobat root]\Acrobat\plug_ins directory.

5.9.7.1 Enabling support for Unicode fonts in HTML to PDF conversions

Caution: The HTML-to-PDF conversion fails if a 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/X/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/cfqauser/Library/Fonts
  /System/Library/Fonts
  /Library/Fonts
  /Users/ + System.getProperty(<user name>, root) + /Library/Fonts
  System.getProperty(JAVA_HOME) + /lib/fonts
  /usr/X11R6/lib/X11/fonts/TTF

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

2. Modify the font-name mapping in the cffont.properties file located in the [LiveCycleES2 root]/adobe-generatepdf-dsc.jar file:
   • Extract this archive, 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.
     
     ```text
     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`).

### 5.9.8 Modifying Microsoft Visio 2007 default macro settings

When a Microsoft Visio 2007 file containing macros is submitted for conversion, the resultant Microsoft Office Visio Security Notice dialog causes the conversion to time out. To successfully convert files that contain macros, the default macro settings in Visio must be changed.
➤ Change the default Visio 2007 macro settings:

- In Visio 2007, click Tools > Trust Center > Macro Settings and select either of the following options and then click OK:
  - Disable all macros without notification
  - Enable all macros

5.9.9 Installing the Network Printer Client

PDF Generator ES2 includes an executable file to install the PDF Generator ES2 network printer on a client computer. After the installation is complete, a PDF Generator ES2 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 PDF Generator ES2 Network Printer Client (wizard) is supported on 32-bit Windows platforms only.

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 “To configure PDFG Network Printer on Windows using the native Add Printer wizard:” on page 62.

➤ To install the PDF Generator ES2 Network Printer Client:

1. Ensure that you successfully installed PDF Generator ES2 on your server.

2. From a Windows client computer, enter the following URL in your web browser, where \[server\] is the name of the server where you installed PDF Generator ES2 and \[port\] is the application server port used:

   \[http://[server]:[port]/pdfg-ipp/install\]

3. On the Configure Internet Port screen, select Use the specified user account and provide the credentials of a LiveCycle 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.

Upon successful installation, a dialog box appears, indicating that “The Printer Adobe LiveCycle PDF Generator ES2 has been successfully installed.”

4. Click OK. You will now have a printer named Adobe LiveCycle PDF Generator ES2 in your list of available printers.

➤ To 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 \[server\] is the server name and \[port\] is the port number where the server is running:

   \[http://[server]:[port]/pdfg-ipp/printer\]

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.

   ➤ **To install and configure the PDF Generator ES2 Network Printer Client using Proxy server port forwarding**

   1. Configure port forwarding on the CC Proxy server on a particular port to the LiveCycle ES2 server, and disable the authentication at proxy server level (since LiveCycle ES2 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 LiveCycle ES2 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 LiveCycle ES2 server.

5.9.10 **Setting 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 LiveCycle Administration Console.

   ➤ **To set performance parameters for PDF Generator:**

   1. Log in to LiveCycle 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.

5.10 **Final setup for LiveCycle Rights Management ES2**

Rights Management ES2 requires the application server to be configured to use SSL. (See *LiveCycle ES2 Administration Help*.)
If your LiveCycle ES2 installation uses Content Services ES2 and you haven’t configured your application server through LiveCycle Configuration Manager, you must perform additional manual configuration of the application server before deployment. Complete the following procedure on your application server.

**Note:** You must configure and deploy LiveCycle ES2 before you perform this procedure (see “Configuring and deploying LiveCycle ES2” on page 40). This procedure configures directories that are created only when you deploy LiveCycle ES2.

➤ **To configure setup for Content Services ES2:**

1. Open the application server run file in a text editor. The run file is located here:
   - (Windows) `[appserver root]/bin/run.bat`
   - (Unix) `[appserver root]/bin/run.sh`
2. In the JAVA_OPTS section, add the following code:
   ```
   -Dalfresco.tcp.initial_hosts=<host name>[<port value>],[<host name>[<port value>]
   -Dalfresco.cluster.name=lc9_cluster
   -Dalfresco.tcp.start_port=<port value>
   -Dalfresco.tcp.port_range=3
   -Dfile.encoding=utf8
   ```
   **Note:** Replace `<host name>` with the name of a node in the cluster other than the node you are working on. Replace `<port value>` with the port number (any value between 7800 and 8000) for that node.

   **Note:** For IPv6-based clusters, the `<host name>` should be mapped to an IPv6 address.

   **Caution:** You must include all JBoss Application Servers in the cluster, except for the server being configured. Use commas to separate the names of the servers in the argument list after the `tcp.initial_hosts=<host name>[<port value>].`
3. Save the edited file.
4. Repeat steps 1 to 3 for each JBoss Application Server of the cluster.

**Note:** Vertical clustering is not supported for Content Services ES2.

### 5.12 Configuring LiveCycle ES2 to access LDAP

If you configured LDAP for LiveCycle 7.x products, those settings are migrated during the upgrade process, and you do not need to perform the steps in this section. If you did not previously configure LDAP, you can use the following procedure as a guideline when configuring User Management to support authentication using LDAP.

➤ **To configure User Management with LDAP (Enterprise Domain):**

1. Open a web browser, navigate to `http://[host]:[port]/adminui` and log in. (See “Accessing LiveCycle Administration Console” on page 50.)
2. Click **Settings > User Management > Domain Management**, and then click **New Enterprise Domain**.

3. In the **ID** box, type a unique identifier for the domain and, in the **Name** box, type a descriptive name for the domain.

4. Click **Add Authentication** and, in the **Authentication Provider** list, select **LDAP**.

5. Click **OK**.

6. Click **Add Directory** and, in the **Profile Name** box, type a name for your LDAP profile.

7. Click **Next**.

8. Specify values in the **Server**, **Port**, **SSL**, and **Binding** boxes, and in the **Populate Page with** box, select a directory settings option such as **Default Sun ONE values**. Also, specify values in the **Name** and **Password** box that would be used to connect to the LDAP database when anonymous access is not enabled. (See “Directory settings” in *LiveCycle ES2 Administration Help*.)

9. (Optional) Test your configuration:
   - Click **Test**. The screen displays a message indicating either a successful server test or any configuration errors that exist.

10. Click **Next** and configure the **User Settings** as required. (See “Directory settings” in *LiveCycle ES2 Administration Help*.)

11. (Optional) Test your configuration:
   - Click **Test**.
   - In the Search Filter box, verify the search filter or specify a new search filter, and then click **Submit**. The screen displays a list of entries that match the search criteria.
   - Click **Close** to return to the User Settings screen.

12. Click **Next** configure the **Group Settings** as required. (See “Directory settings” in *LiveCycle ES2 Administration Help*.)

13. (Optional) Test your configuration:
   - Click **Test**.
   - In the Search Filter box, verify the search filter or specify a new search filter, and then click **Submit**. The screen displays a list of entries that match the search criteria.
   - Click **Close** to return to the Group Settings screen.

14. Click **Finish** to exit the New Directory page and then click **OK** to exit.

➤ **To configure User Management (Local Domain):**

1. Open a web browser, navigate to `http://[host]:[port]/adminui`, and log in. (See “Accessing LiveCycle Administration Console” on page 50.)

2. Click **Settings > User Management > Domain Management**, and then click **New Local Domain**.

3. In the appropriate boxes, enter the domain ID and name. (See “Adding local domains” in *LiveCycle ES2 Administration Help*. )
4. (Optional) Disable account locking by deselecting the **Enable Account Locking** option.

5. Click **OK**.

### 5.13 Enabling FIPS mode

LiveCycle ES2 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 LiveCycle Configuration Manager during LiveCycle ES2 configuration or if you enable it but want to turn it off, you can change this setting through LiveCycle 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.

**To turn FIPS mode on or off:**

1. Log in to LiveCycle Administration Console.

2. Click **Settings > Core System Settings > Configurations**.

3. Select **Enable FIPS** to enable FIPS mode or deselect it to disable FIPS mode.

4. Click **OK** and restart the application server.

**Note:** LiveCycle ES2 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).

### 5.14 Configuring HTML digital signature

To use the HTML digital signature feature of Forms ES2, complete the following procedure.

**To enable HTML digital signature:**

1. Manually deploy the `[LivecycleES2 root]/deploy/adobe-forms-ds.ear` file to your application server.

2. Log in to LiveCycle Administration Console and click **Services > LiveCycle Forms ES2**.

3. Select **HTML Digital Signature Enabled** and then click **Save**.
5.15 Configuring the Document Management service

If you installed Content Services ES2 and your application server is running on a non-default port, modify the port that the Document Management service uses.

➤ To modify the port:

1. Log in to LiveCycle Administration Console and click Services > Applications and Services > Service Management.
2. In the list, select DocumentManagementService.
3. On the Configuration tab, in the HTTP Port box, specify the port numbers you are using on each member of the cluster (as a comma-separated list, and then click Save. For example, specify the following:
   ● JBoss Cluster: 8080, 8081, 8082

5.16 Configuring the Connector for EMC Documentum service

Note: LiveCycle ES2 supports EMC Documentum, versions 6.0, 6.5 and 6.7 SP1 only. Make sure your ECM is upgraded accordingly.

If you installed the Connector for EMC Documentum service as part of your LiveCycle ES2 solution, configure the service to connect to the Documentum repository.

➤ To configure Connector for EMC Documentum:

1. Locate the adobe-component-ext.properties file in the [appserverdomain] 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
   ● (For Connector for EMC Documentum 6.5 only)
     ● configservice-impl.jar,
     ● configservice-api.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:

Note: If you copy and paste this text, you must remove the formatting characters.

● Connector for EMC Documentum 6.0 only:
com.adobe.livecycle.ConnectorforEMCDocumentum.ext=
C:/Program Files/Documentum/Shared/dfc.jar,
C:/Program Files/Documentum/Shared/aspectjrt.jar

● Connector for EMC Documentum 6.5 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

● Connector for EMC Documentum 6.7 SP1 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

3. Repeat steps 1 and 2 on each JBoss Application Server instance of the cluster.

4. Open a web browser and enter this URL:
   http://localhost:8080/adminui (local deployment using the default port)

5. Log in using the default user name and password:
   **User name:** administrator
   **Password:** password

6. Navigate to Services > LiveCycle ES2 Connector for EMC Documentum > Configuration Settings and perform these tasks:
   ● Type 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**.

7. (Optional) Navigate to Services > LiveCycle ES2 Connector for EMC Documentum > Repository Credentials Settings, click **Add**, specify the Docbase information, and then click **Save**.

8. If JBoss 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://localhost:8080/adminui (local deployment using the default port)

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 the following services:
   - EMCDocumentumAuthProviderService
   - EMCDocumentumContentRepositoryConnector
   - EMCDocumentumRepositoryProvider

12. Click **Start**. If any of the services do not start correctly, check the settings entered in step 6.

13. Do one of the following tasks:
   - To use the Documentum Authentication service (EMCDocumentumAuthProviderService) to display content from a Documentum repository in the Resources view of Workbench ES2, continue with this procedure. Using the Documentum Authentication service overrides the default LiveCycle ES2 authentication and must be configured to log in to Workbench ES2 using Documentum credentials.
   - To use the LiveCycle ES2 repository, log in to Workbench ES2 by using the LiveCycle ES2 super administrator credentials (by default, **Administrator** and **password**).

You have now completed the required steps for this procedure. Use the credentials provided in step 6 for accessing the default repository in this case and use the default LiveCycle ES2 authentication service.

14. Restart the application server.

15. Log in to LiveCycle 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.

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 LiveCycle ES2 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 ES2 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 ES2. If you do not log in using the username@repository_name, Workbench ES2 attempts to log in to the default repository specified in step 6.

25. (Optional) To install the LiveCycle ES2 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 LiveCycle ES2 Administration Help for information about configuring Workbench ES2 with your Documentum repository.

5.17 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.

➤ To 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.

➤ To configure the Connector for EMC Documentum service to use a Documentum Administrator:

1. Open a web browser and enter this URL:
   http://localhost:[port]/adminui (local deployment using the default port)

2. Log in using the default user name and password:
   - User name: administrator
   - Password: password

3. Click Services > LiveCycle ES2 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 to 6 for all repositories where users will store XDP files.

5.18 Configuring the Connector for IBM FileNet service

LiveCycle ES2 supports IBM FileNet, versions 4.0, 4.5 and 5.0 only. Make sure your ECM is upgraded accordingly.

If you installed the Connector for IBM FileNet service as part of your LiveCycle ES2 solution, you must configure the service to connect to the FileNet object store.

Complete the following procedure to configure the Connector for IBM FileNet service.

➤ To configure the connector using FileNet 4.x or FileNet 5.0 and CEWS transport:

1. Open the application server run file in a text editor. The run file is as follows:
   - (Windows) [appserver root]/bin/run.bat
   - (UNIX) [appserver root]/bin/run.sh

2. Add the location of the FileNet Configuration files as a Java option to the application server start command, and then save the file.

   Note: If JBoss is running as a service, add the Java option in the registry where other JVM arguments are defined.
For example, using a default FileNet Application Engine installation on a Windows operating system, add this Java option:

```
-Dwasp.location=C:/Program Files/FileNet/AE/CE_API/wsi
```

3. If your deployment uses the Process Engine Connector service, copy the file

```
[appserver root]/client/logkit.jar
```

to the following directory:

- (Manually-configured JBoss)
  
  ```
  [appserver root]/server/all/lib
  ```

- (Adobe-preconfigured JBoss)
  
  ```
  [appserver root]/server/lc_<db-name>/lib
  ```

4. Locate the adobe-component-ext.properties file in the

```
[appserver root]/bin
```

directory (if the file does not exist, create it).

5. Add a new system property that provides the location of these FileNet Application Engine JAR files:

- javaapi.jar
- soap.jar
- wasp.jar
- builtin_serialization.jar (FileNet 4.0 only)
- wsdl_api.jar
- jaxm.jar
- jaxrpc.jar
- saaj.jar
- jetty.jar
- runner.jar
- p8cjar.jar
- Jace.jar
- (optional) pe.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:

```
com.adobe.livecycle.ConnectorforIBMFileNet.ext=
C:/Program Files/FileNet/AE/CE_API/lib2/javaapi.jar,
C:/Program Files/FileNet/AE/Workplace/WEB-INF/lib/soap.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/wasp.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/builtin_serialization.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/wsdl_api.jar,
```
C:/Program Files/FileNet/AE/CE_API/wsi/lib/jaxm.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/jaxrpc.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/saaj.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/jetty.jar,
C:/Program Files/FileNet/AE/CE_API/wsi/lib/runner.jar,
C:/Program Files/FileNet/AE/CE_API/lib2/p8cjares.jar,
C:/Program Files/FileNet/AE/CE_API/lib/Jace.jar,
C:/Program Files/FileNet/AE/CE_API/lib/WEB-INF/lib/pe.jar

**Note:** Add C:/Program Files/FileNet/AE/Workplace/WEB-INF/lib/pe.jar only if your deployment uses the IBMFileNetProcessEngineConnector service.

**Note:** For FileNet 4.5, remove the line C:/Program
Files/FileNet/AE/CE_API/wsi/lib/builtin_serialization.jar,

**Note:** For FileNet 5.0, add following .jar files
C:/Program Files/FileNet/AE/CE_API/lib/Jace.jar,
C:/Program Files/FileNet/AE/CE_API/lib2/javaapi.jar,
C:/Program Files/FileNet/AE/CE_API/lib2/log4j.jar,
C:/Program Files/FileNet/AE/Router/lib/mailapi.jar,
C:/Program Files/FileNet/AE/Workplace/WEB-INF/lib/pe.jar
C:/Program Files/FileNet/AE/CE_API/lib/stax-api.jar,
C:/Program Files/FileNet/AE/CE_API/lib/xlxpScanner.jar
C:/Program Files/FileNet/AE/CE_API/lib/xlxpScannerUtils.jar
C:/Program Files/FileNet/AE/Router/java/jre/lib/xml.jar

6. (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:
  
  RemoteServerUrl = cemp:http://[contentserver_IP]:[contentengine_port]/wsi/FNCEWS40DIME/

- 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.

7. Locate the login-config.xml file in the following folder and add the following application policy as a child of the <policy> node:

- **(Manually-configured JBoss)** [appserver root]/server/all/conf

- **(Adobe-preconfigured JBoss)** [appserver root]/server/lc_<db-name>/conf

```xml
<application-policy name = "FileNetP8WSI">
<authentication>
  <login-module code = "com.filenet.api.util.WSILoginModule" flag = "required" />
</authentication>
</application-policy>
```
8. (FileNet Process Engine Connector only) If your deployment uses the process engine, add the following node to the login-config file:

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

9. If the application server is not currently running, start the server. Otherwise, stop and then restart the server.

10. If JBoss runs as a service, start (or restart) the JBoss for Adobe LiveCycle ES2 service.

11. Repeat steps 1 to 9 on each JBoss Application Server instance of the cluster.

12. Open a web browser and enter this URL:

   http://[host]:[port]/adminui

13. Log in using the default user name and password:

   **User name:** administrator
   **Password:** password

14. Click **Services > LiveCycle ES2 Connector for IBM FileNet.**

15. Provide all of 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.

16. Click **Save** and navigate to **Services > Applications and Services > Service Management.**

17. Select the check box next to each of these services and then click **Start:**
   - IBMFileNetAuthProviderService
   - IBMFileNetContentRepositoryConnector
   - IBMFileNetRepositoryProvider
   - IBMFileNetProcessEngineConnector (if configured)

   If any of the services do not start correctly, verify the settings entered in step 15.

18. 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 ES2, continue with this procedure. Using the FileNet Authorization service overrides the default LiveCycle ES2 authorization and must be configured to log in to Workbench ES2 by using FileNet credentials.
To use the LiveCycle ES2 repository, log in to Workbench ES2 by using the LiveCycle ES2 super administrator credentials (by default, Administrator and password). The credentials provided in step 15 use the default LiveCycle ES2 authorization service for accessing the default repository in this case.

19. Restart your application server.

20. Log in to LiveCycle Administration Console and click Settings > User Management > Domain Management.

21. 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.

22. Add a custom authentication provider:
   - Click Add Authentication.
   - In the Authentication Provider list, select Custom.
   - Select IBMFileNetAuthProviderService and then click OK.

23. Add an LDAP authentication provider:
   - Click Add Authentication.
   - In the Authentication Provider list, select LDAP and then click OK.

24. 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.

25. Click OK to exit the Add Directory page, and then click OK again.

26. 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.

27. Navigate to Settings > User Management > Users and Groups.

28. 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 LiveCycle ES2 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.
29. Start Workbench ES2 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 ES2. If you do not log in using the `username@repository_name`, Workbench ES2 attempts to log in to the default repository specified in step 15.

30. (Optional) If you intend to install the LiveCycle ES2 Samples for Connector for IBM FileNet, create a FileNet object store named `Samples` and install the samples in that object store.

   After you configure your Connector for IBM FileNet service, it is recommended that you see LiveCycle ES2 Administration Help for information about configuring Workbench ES2 functions properly with your FileNet repository.

### 5.19 Configuring SharePoint client access

You can configure Microsoft SharePoint clients to access content services from LiveCycle ES2. For this, you should add the SharePoint Alfresco Module Package using LiveCycle Configuration Manager. The SharePoint AMP file (`adobe-vti-module.amp`) is available in `[LiveCycleES2 root]\LiveCycle_ES_SDK\misc\ContentServices` folder.

After you add the SharePoint AMP, perform the following steps:

#### 5.19.1 Obtain and edit the share.war file

Alfresco CMS uses the file `share.war` to connect with Content Services ES2. You should modify the share.war file to enable SharePoint clients to access Content Services ES2.

1. Obtain the `share.war` from the Alfresco installation. See your Alfresco documentation for more details.
2. Copy the file `share.war` to a directory in your file system.
3. Use a file archive utility such as WinRar to open the `share.war` file.
4. From the file archive utility window, extract the file `WEB-INF/classes/alfresco/webscript-framework-config.xml` and open it using a text editor.
6. Save and close the file.

#### 5.19.2 Deploy the share.war file

1. Open the archive file `adobe-contentservices.ear` using an archive utility such as WinRar from the location appropriate to your application server.
   - (Adobe-preconfigured JBoss): `[appserver root]\server\lc_<db-name>_cl\deploy`.
   - (Manually-configured JBoss): `[appserver root]\server\all\deploy`
2. Add the updated share.war file to the adobe-contentservices.ear archive that is opened in the archive utility window.

3. From the file archive utility window, extract the file application.xml to a folder in the local file system, and open it using a text editor. This file is in the adobe-contentservices.ear\META-INF directory.

4. Add the following lines under the <application> tag:
   <module id="Share">
     <web>
       <web-uri>share.war</web-uri>
       <context-root>/share</context-root>
     </web>
   </module>

5. Copy the updated application.xml file back to the adobe-contentservices.ear archive.

6. Save and close the archive.

7. Deploy the updated EAR file.

   **Note:** For JBoss cluster, you can copy the updated EAR file to the [appserver root]\jboss\server\lc_<db-name>_cl\deploy\ directory for Adobe-preconfigured JBoss and [appserver root]\server\all\deploy for manually-configured JBoss.

5.20 Enabling CIFS in IPv6 mode

If you want to enable CIFS for Content Services ES2 on an IPv6 implementation, you must explicitly add an additional IPv6 address to the machine that hosts LiveCycle ES2. This IPv6 address should be a static IP address that resides in the same subnet as the clients. You need to do the following tasks after you configure LiveCycle ES2 using LiveCycle Configuration Manager. Typically, you should pause the LiveCycle Configuration Manager after the EAR file configuration and then edit the EAR file. After you have edited the EAR file, you can go back to the LiveCycle Configuration Manager to deploy the updated EAR file along with other selected EAR files.

5.20.1 Edit the contentservices.war file

1. Navigate to [LiveCycleES2 root]\configurationManager\export directory.

2. Use a file archive utility such as WinRar to open the contentservices.war file.

3. From the file archive utility window, extract the file contentservices.war\WEB-INF\classes\alfresco\file-services-custom.xml and open it using a text editor.

4. Locate the following line and change it by adding ipv6="enabled":
   
   <tcpipSMB platforms="linux,solaris,macosx,windows,AIX"/>
   
   to
   
   <tcpipSMB platforms="linux,solaris,macosx,windows,AIX" ipv6="enabled"/>

5. Save and close the file
6. From the file archive utility window, extract the file contentservices.war\WEB-INF\classes\alfresco\extension\file-servers-properties into a folder in the local file system, and open it using a text editor.

7. Locate the line cifs.ipv6=disabled and replace it with cifs.ipv6=enabled.

8. Save and close the file.

9. Copy the updated file-servers-custom.xml file into the archive under contentservices.war\WEB-INF\classes\alfresco\extension\.

10. Save the contentservices.war file.

**Note:** After you update the EAR files, you should use the LiveCycle Configuration Manager to deploy the updated EAR file.

### 5.21 Configuring the Connector for IBM Content Manager

**Note:** LiveCycle ES2 supports IBM Content Manager, version 8.4 only. Make sure your ECM is upgraded accordingly.

If you installed the Connector for IBM Content Manager service as part of your LiveCycle ES2 solution, complete the following procedure to configure the service to connect to the IBM Content Manager data store.

➢ **To 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 II4C JAR files, Config folder that contains the IBM II4C property files, and a ZIP file from DB2 Universal Database Client installation:
   - 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
The new system property look like this structure:

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

For example, using a default DB2 Universal Database Client and II4C 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/ibmjgssprovider2.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/jcache.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 data store 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 data store from IBMCMConnectorService Property Sheets by using the Use Credentials From Process Context as the login mode, complete the following procedure.

➤ To 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 default user name and password:
   - **User name:** administrator
   - **Password:** password

3. Click Services > LiveCycle ES2 Connector for IBM Content Manager > Configuration Settings.

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 (IBMCMAuthProviderService) to use content from an IBM Content Manager data store, in the Processes view of Workbench ES2, continue with this procedure. Using the IBM Content Manager Authorization service overrides the default LiveCycle ES2 authorization and must be configured to log in to Workbench ES2 by using IBM Content Manager credentials.
   - To use the System Credentials provided in step 4 to use content from an IBM Content Manager data store, in the Processes view of Workbench ES2, log in to Workbench ES2 by using the LiveCycle ES2 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 LiveCycle ES2 authorization service for accessing the default repository in this case.

6. Log in to the LiveCycle 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.

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.
5.22 Perform a system image backup

After LiveCycle ES2 is installed and deployed into production areas and before the system is live, it is recommended that you perform a system image backup on servers to which LiveCycle ES2 is implemented. The LiveCycle ES2 database, GDS directory, and application servers must be part of this backup. This is a complete system backup that you can use to restore the contents of your computer if your hard drive or entire computer stops working. See the “LiveCycle ES2 Backup and Recovery” topic in LiveCycle ES2 Administration Help.

5.23 Isloiating JBoss Clusters

There are a lot of JBoss services that create multiple JGroup channels services. These channels should only communicate with specific channels.
To isolate JGroups clusters from other clusters on the network, ensure that

- The channels in the various clusters use different group names. Use `./run.sh -g QAPartition -b <ipaddress> -c all` to create unique groups.

- The channels in the various clusters use different multicast addresses. Use `/run.sh -u <UDP group Ip address> -g QAPartition -b <ipaddress> -c all` to control the multicast address.

- The channels in each cluster use different multicast ports. Use `/run.sh -u <UDP group Ip address> -g QAPartition -b <ipaddress> -c all -Djboss.jgroups.udp.mcast_port=12345 -Djboss.messaging.datachanneludpport=23456` to control the multicast sockets.

See, Isolating JGroups Channels in jbossclustering guide at [http://docs.jboss.org/](http://docs.jboss.org/) for detailed information to isolate JBoss Clusters.

### 5.24 Uninstalling LiveCycle ES2

The uninstaller located in the `[LiveCycleES2 root]` directory removes the files and applications that were created by the LiveCycle ES2 installer. However, the uninstaller does not remove any custom, non-LiveCycle application folders or files deployed on the application server. If some folders are not removed during uninstallation, restart the system and delete those folders manually.

**Note:** If you installed LiveCycle ES2 using the command line interface (CLI), you must uninstall LiveCycle ES2 using the CLI itself. See “Appendix - Install Command Line Interface” on page 92.

**Caution:** By running the uninstaller, all the contents within the product installation directory are subject to removal without further warning. Before you proceed, back up any data you do not want to lose.

► **To remove the files from your computer:**

1. Invoke the uninstall program:

   - (Windows) Do one of the following:
     
     - Use **Add or Remove Programs** in the Windows Control Panel and remove *Adobe LiveCycle ES2*.

     - Manually uninstall:
       
       - Navigate to the directory that contains the uninstaller: `[LiveCycleES2 root]\Uninstall_Adobe LiveCycle ES2`
       
       - Double-click the *Uninstall Adobe LiveCycle ES2.exe* file.

   - (UNIX) Do the following:

     - From a terminal, navigate to the directory that contains the uninstall script: `cd /opt/adobe/adobe_livecycle_es2/Uninstall_Adobe LiveCycle ES2`

     - Type `./Uninstall Adobe LiveCycle ES2` (you may need to make this binary an executable file by typing a command, such as `chmod 777`).

**Note:** (UNIX) Navigate to the directory (Uninstall_Adobe LiveCycle ES2) which contains the uninstall script to run it. Because the directory name contains spaces, you should include the entire directory path as part of the command to uninstall the product.
2. Follow the on-screen instructions in the uninstall program, and then click **Finish**.

3. If you are planning to reinstall LiveCycle ES2, remove all residual directories and files existing under the `[LiveCycleES2 root]` directory.
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. Use the Apache web server and the mod_jk plug-in to implement load balancing for the cluster.

To configure load balancing:

1. Obtain the Apache web server software that is applicable to your operating system:
   - (Windows) Download the Apache web server from the Apache TTP Server Project site.
   - (Solaris 64 bit) Download the Apache web server (apache-2.0.59-sol10-sparc-local.gz) from the Sunfreeware for Solaris site.
   - (Linux) The Apache web server is preinstalled on a Linux system.

2. Go to the Apache Tomcat Connector site, select your operating system, and then download the mod_jk 1.2.15 plug-in file indicated by the Apache website.
   
   Note: Ensure that the downloaded mod_jk plug-in file is supported by the Apache version you downloaded.

3. Rename the downloaded file to mod_jk.so and save it in the APACHE_HOME/modules/ directory.

4. 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

5. Using a text editor, create a new file with this content and save it as APACHE_HOME/conf/mod-jk.conf:

   # 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 +ForwardURICompact -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>

6. Using a text editor, create a file with content similar to the following text and save the file to conf/workers.properties.

```properties
Define list of workers that will be used
# 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
```

7. In the file, define these items:
   - Each node of the cluster (in this example, two nodes named node1 and node2)
   - The `worker.loadbalancer.balance_workers` entry to include all nodes defined in the file.

8. For each node in the cluster, open the server.xml file in a text editor from this location:
   - `[appserver root]/server/all/deploy/jboss-web.deployer`

9. 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"/>
```

10. Save the edited server.xml file.
11. For each Tomcat instance in the JBoss cluster, open the jboss-service.xml file in a text editor from this location:
   - [appserver root]/server/all/deploy/jboss-web.deployer/META-INF

12. Search the jboss-service.xml file for the element UseJK and change the element to read as follows:

   <attribute name="UseJK">true</attribute>

Advanced Production Configuration

This section describes advanced tuning for LiveCycle Output ES2, LiveCycle Forms ES2, and LiveCycle PDF Generator ES2. This section should be completed only on a production system by an advanced application server administrator.

7.1 Configuring pool size for Output ES2 and Forms ES2

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 CPUs 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.

➤ To 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

7.2 LiveCycle PDF Generator ES2

LiveCycle PDF Generator ES2 is capable of doing multiple PDF conversions simultaneously for some types of input files. This is enforced through the use of stateless session beans.

7.2.1 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, Photoshop®, 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 ES2.

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 LiveCycle ES2 application EARs are deployed on the application server:

● adobe-livecycle-jboss.ear
● adobe-livecycle-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

To configure the pool size for PS2PDF and Image2PDF:

Refer to Distiller service settings and Generate PDF service settings under “Managing services” in the LiveCycle ES2 Administration Help.

7.3 LiveCycle Content Services ES2

Content Services ES2 uses Alfresco as the content repository. In a JBoss 4.2.x deployment, you must modify the hibernate bytecode provider value in the persistence.properties file. The cglib code generation library is more optimized than javassist and is available as part of the JBoss installation in the [appserver root]/server/all/lib directory. Detailed information about this requirement is documented on the Alfresco Developers wiki.

Modify the hibernate bytecode provider:

1. Locate the persistence.properties file in the following location and open it in an editor:
   [appserver root]/server/all/deploy/ejb3.deployer/META-INF

2. Locate the line hibernate.bytecode.provider and change the value to cglib.

3. Save and close the file.
7.4 Enabling CIFS on Windows

You will need to manually configure the Windows Server 2003 and 2008 machines that host LiveCycle ES2. When you enable CIFS support in Alfresco, users can access the Content Services ES2 repository as a network folder and perform various file operations as on their local file system. In LiveCycle Content Services ES2, CIFS is supported for enterprise domain users with ActiveDirectory as their directory provider.

**Note:** Ensure that the server has a static IP address.

On Windows machines, you need to do the following:

- "Enable NetBIOS over TCP/IP" on page 89
- "Add additional IP addresses" on page 89
- "Disable SMB over NetBIOS registry (Windows 2003 only)" on page 89
- "Disable File and Printer Sharing (Windows 2008 only)" on page 90

### 7.4.1 Enable NetBIOS over TCP/IP

You need to enable NetBIOS over TCP/IP so that clients connecting to the LiveCycle ES2 server can have their requests revolved 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.

### 7.4.2 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.

### 7.4.3 Disable SMB over NetBIOS registry (Windows 2003 only)

You must disable SMB over NetBIOS by editing the Windows registry.

1. In the Windows Registry Editor, navigate to **HKEY_LOCAL_MACHINE > SYSTEM > CurrentControlSet > Services > NetBT > Parameters**.
2. Set the DWORD SMBDeviceEnabled to 0. If it is not present, add a new DWORD value with name SMBDeviceEnabled and set it to 0.
7.4.4 Disable File and Printer Sharing (Windows 2008 only)

- Go to **Network Settings**, deselect **File and Printer Sharing for Microsoft Clients**, and click **Apply**.
For information about troubleshooting your LiveCycle ES2 installation and configuration, see the Troubleshooting LiveCycle ES2 guide.
Appendix - Install Command Line Interface

LiveCycle ES2 provides a command line interface (CLI) for the installation program. The CLI is intended to be used by advanced users of LiveCycle ES2 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.

Before you install the modules using the CLI install option, ensure the following:

- Your environment includes the software and hardware required to run LiveCycle ES2.
- You have prepared the environment as required. (See Preparing to Install LiveCycle ES2 (Server Cluster).)
- You have reviewed the first page of “Installing the product files” on page 32 and the “Installing the LiveCycle ES2 Modules” on page 31 section.

Note: MySQL is not supported for server clusters. Do not choose a MySQL option when you respond to prompts displayed by the LiveCycle ES2 CLI installation program.

This appendix covers the following topics:

- “Installing LiveCycle ES2” on page 92
- “Error logs” on page 94
- “Uninstalling LiveCycle ES2 in console mode” on page 94
- “Next steps” on page 95

A.1 Installing LiveCycle ES2

This section covers the initial installation of LiveCycle ES2. For information about configuration and deployment, see “Configuring LiveCycle ES2 for Deployment” on page 39 or “Appendix - LCM Command Line Interface” on page 96.

Note: To avoid permission issues during the deployment, ensure that you are logged in as the user who will run the application server process when you run the LiveCycle ES2 install CLI and LiveCycle Configuration Manager.

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. 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.

To install LiveCycle ES2:

1. Open a command prompt and navigate to the folder in the installation media or your hard disk that contains the installer executable:
   - (Windows) livecycle_server\9.0\Disk1\InstData\Windows\VM
   - (Windows 64-bit) livecycle_server\9.0\Disk1\InstData\Windows_64bit\VM
   - (Linux) livecycle_server/9.0/Disk1/InstData/Linux/NoVM
   - (Solaris) livecycle_server/9.0/Disk1/InstData/Solaris/NoVM
2. Open a command prompt and run the following command:
   - (Windows) `install.exe -i console`
   - (Linux, Solaris) `./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:

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose Locale</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>The options are Deutsch, English, and Français. English is the default language.</td>
</tr>
<tr>
<td>Choose Install Folder</td>
<td>On the Destination screen, press Enter to accept the default directory or type the new installation directory location.</td>
</tr>
<tr>
<td></td>
<td>Default install folders are:</td>
</tr>
<tr>
<td></td>
<td>(Windows): C:\Adobe\Adobe LiveCycle ES2</td>
</tr>
<tr>
<td></td>
<td>(Linux, Solaris): /opt/adobe/adobe_livecycle_es2</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Do not use accented characters in the directory name. If you do, the CLI will ignore the accents and create a directory after modifying the accented characters.</td>
</tr>
<tr>
<td>LiveCycle ES2 Server License</td>
<td>Press Enter to read through the pages of the license agreement. If you agree to the agreement, type <code>Y</code> and press Enter.</td>
</tr>
<tr>
<td>Agreement</td>
<td>Pre-Installation Summary                                                                  Review the installation choices you have made and 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.</td>
</tr>
<tr>
<td>Ready To Install</td>
<td>Installer displays the installation directory. Press Enter to start the installation process. During the installation process, the progress bar advances to indicate the progress of installation. Type back if you want to change the settings, or quit to close the installation.</td>
</tr>
<tr>
<td>Installing</td>
<td>The progress of the installation process is indicated.</td>
</tr>
</tbody>
</table>
A.2 Error logs

If an error occurs, you can review the Adobe_LiveCycle_ES2_InstallLog.log in the log directory of your installation:

- (Windows) C:\Adobe\Adobe LiveCycle ES2\log
- (Linux, Solaris) /opt/adobe/adobe_livecycle_es2/log

For information about errors that may occur during the installation, see the appropriate troubleshooting guide.

A.3 Uninstalling LiveCycle ES2 in console mode

If you had installed LiveCycle using the command line option, you can uninstall Adobe LiveCycle ES2 only by running the uninstaller from the command line. If you want a silent uninstallation, omit the “-i console” flag.

Do the following:

1. Open a command prompt, and navigate to the directory which contains the uninstall script:

   **Note:** On UNIX systems, you should manually navigate to the directory that contains the uninstall script because the directory name contains spaces.

   - (Windows) cd C:\Adobe\Adobe LiveCycle ES2\Uninstall_Adobe LiveCycle ES2
   - (Linux, Solaris) cd /opt/adobe/adobe_livecycle_es2/Uninstall_Adobe LiveCycle ES2

2. Type the following command at the prompt and press Enter:

   - (Windows) Uninstall Adobe LiveCycle ES2.exe -i console
   - (Linux, Solaris) ./Uninstall Adobe LiveCycle ES2 -i console
Note: If you typed the uninstall command without the `-i console` option, uninstallation is completed silently.

3. Follow the on-screen instructions.

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninstall Adobe LiveCycle ES2</td>
<td>Press Enter to continue uninstallation. Enter quit to close the uninstall program. After you start the uninstall program, type back to go back to the previous step and make any changes.</td>
</tr>
<tr>
<td>Uninstalling...</td>
<td>After the uninstallation starts, the rest of the uninstallation process is completed and the cursor returns to the prompt. Note that some items may not be removed. Also, any folder created after installing LiveCycle ES2 are not removed. You must remove these files and folders manually.</td>
</tr>
</tbody>
</table>

A.4 Next steps

You must now configure LiveCycle ES2 for deployment. (See “Configuring LiveCycle ES2 for Deployment” on page 39 or “Appendix - LCM Command Line Interface” on page 96.)
LiveCycle ES2 provides a Command Line Interface (CLI) for the LiveCycle Configuration Manager. The CLI is intended to be used by advanced users of LiveCycle ES2, for example in server environments which do not support the use of the Graphical User Interface (GUI) of the LiveCycle Configuration Manager. This chapter describes how to use the CLI to configure LiveCycle ES2.

- “Order of operations” on page 96
- “Command Line Interface property file” on page 97
- “Examples Usage” on page 106
- “Error Logs” on page 106

B.1 Order of operations

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

2. Validate application server topology.
3. Validate the database connectivity.
4. Validate the application server configurations.
8. Validate the LiveCycle ES2 server.
10. Deploy the 7.x compatibility layer with the LiveCycle ES2 modules.
11. Validate the LiveCycle ES2 module deployment.
12. Check system readiness for PDF Generator ES2.
13. Add administrator user for PDF Generator ES2.
15. Configure LiveCycle ES2 Connector for IBM FileNet.
17. Test all LiveCycle ES2 Connectors for ECM configurations.
18. Configure Content Services ES2.

**Caution:** You must restart each JBoss Application Server of your cluster after you complete your LiveCycle Configuration Manager CLI operations.

### B.2 Command Line Interface property file

The LiveCycle Configuration Manager CLI requires a property file containing the defined properties for your LiveCycle environment. The template for the properties file, cli_propertyFile_template.txt, is located in the 

```
[LiveCycleES2 root]/configurationManager/bin
```

folder. You must create and edit the values. You can customize this file based on the LiveCycle Configuration Manager operations you intend to use. The following section describes the properties and values required.

You should create the property file according to your installation. Use one of the following methods.

- Create a property file and populate the values according to your installation and configuration scenarios.
- Copy the property file cli_propertyFile_template.txt and edit the values based on the LiveCycle Configuration Manager operations you intend to use.
- Use the GUI of the LiveCycle Configuration Manager and then use the property file created by the GUI version as the CLI version property file. When you run the

```
[LiveCycleES2 root]/configurationManager/bin/configurationManager.bat
```

file, the userValuesForCLI.properties file is created in the 

```
[LiveCycleES2 root]/configurationManager/config
```

directory. You can use this file as input for the LiveCycle Configuration Manager CLI.

**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 LiveCycle Configuration Manager CLI script, you should enter it as C:\\Windows\\Fonts.

#### B.2.1 Common properties

The common properties are as follows:

**LiveCycle Server specific properties:** Required for the Initialize LiveCycle and Deploy LiveCycle Components operations.

These properties are required for the following operations:

- Initialize LiveCycle ES2
- Deploy LiveCycle ES2 components.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LiveCycle Server specific properties</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCHost</td>
<td>String</td>
<td>The hostname of the server where LiveCycle ES2 will be deployed.</td>
</tr>
<tr>
<td>LCPort</td>
<td>Integer</td>
<td>The web port number where LiveCycle ES2 will be deployed.</td>
</tr>
</tbody>
</table>
B.2.2 Configure LiveCycle properties

These properties only apply to the configure LiveCycle operation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdobeFontsDir</td>
<td>String</td>
<td>Location of the Adobe server fonts directory. This path must be accessible from the server being deployed to.</td>
</tr>
<tr>
<td>customerFontsDir</td>
<td>String</td>
<td>Location of the customer fonts directory. This path must be accessible from the server being deployed to.</td>
</tr>
<tr>
<td>systemFontsDir</td>
<td>String</td>
<td>Location of the system fonts directory. Multiple System fonts locations can be entered using a semicolon as separator. These paths must be accessible from the server being deployed to.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LCTempDir</td>
<td>String</td>
<td>Location of the temporary directory. This path must be accessible from the server being deployed to.</td>
</tr>
<tr>
<td>LCGlobalDocStorageDir</td>
<td>String</td>
<td>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. Specify this property only when deploying LiveCycle ES2 components in a clustered environment. This path must be accessible from the server being deployed to.</td>
</tr>
<tr>
<td>EnableDocumentDBStorage</td>
<td>true or false</td>
<td>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.</td>
</tr>
<tr>
<td>enableFIPS</td>
<td>true or false</td>
<td>Enabling the Federal Information Processing Standards (FIPS) option restricts data protection to FIPS 140-2 approved algorithms using the RSA BSAFE Crypto-J 3.5.2 encryption module with FIPS 140-2 validation certificate #590. Set this value to true only if you require FIPS to be enforced.</td>
</tr>
</tbody>
</table>

**Content Services ES2 only**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>contentServices.rootDir</td>
<td>String</td>
<td>[Adobe LiveCycle Content Services ES2 only] Specify the root directory used by Content Services ES2. If the Livecycle is in clustered environment, this directory must be a location shared by all nodes in a cluster with the same path across all nodes.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>contentServices.indexesDir</td>
<td>String</td>
<td>Specify the indexes directory used by Content Services ES2. This directory is unique for each cluster node and must have the same name and location on all nodes. For example, <code>contentServices.indexesDir=C:\:\\Adobe\\LiveCycle 9\\lccs_indexes</code>.</td>
</tr>
<tr>
<td>contentServices.topology</td>
<td>String</td>
<td>Specify either SERVER or CLUSTER. Default: SERVER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Adobe LiveCycle Content Services ES2 only] SERVER for single node, CLUSTER for a cluster configuration.</td>
</tr>
<tr>
<td>contentServices.cifs.enable</td>
<td>true or false</td>
<td>Enables or disables CIFS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Adobe LiveCycle Content Services ES2 only]</td>
</tr>
<tr>
<td>contentServices.cifs.servername</td>
<td>String</td>
<td>Server name of the CIFS server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Adobe LiveCycle Content Services ES2 only]</td>
</tr>
<tr>
<td>contentServices.cifs.implementation</td>
<td>String</td>
<td>Specify one of the following: NetBIOS, PureJava. Specifies how Content Services ES2 connects to the CIFS server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Adobe LiveCycle Content Services ES2 only]</td>
</tr>
<tr>
<td>contentServices.cifs.dllpath</td>
<td>String</td>
<td>Specify the path from where the NetBIOS DLL will be copied. Required if &quot;contentServices.cifs.implementation=NetBIOS&quot;. This path must be present in the environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Adobe LiveCycle Content Services ES2 only] Path where NetBios DLL will be copied. Required if &quot;contentServices.cifs.implementation=NetBIOS&quot;. This path must be present in the environment.</td>
</tr>
<tr>
<td>contentServices.cifs.alternateIP</td>
<td>Numeric</td>
<td>Alternate IP Address of the CIFS Server. It should be static IP and it is required field if &quot;contentServices.cifs.implementation=PureJava&quot;.</td>
</tr>
<tr>
<td>Property</td>
<td>Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| contentServices.cifs.WinsOrBrdcast | String. Specify one of the following:  
  ● winsServer  
  ● broadcast | [Adobe LiveCycle Content Services ES2 only] DNS discovery method. It can be “winsServer” or “broadcast” and it is required field if “contentServices.cifs.implementation=PureJava”. |
| contentServices.cifs.winsPrmIP    | Numeric                     | [Adobe LiveCycle Content Services ES2 only] Primary WINS Server IP address. It can obtained from `ipconfig /all` command. It is required field if “contentServices.cifs.implementation=PureJava” and “contentServices.cifs.WinsOrBrdcast=winsServer”. |
| contentServices.cifs.winsSecIP    | Numeric                     | [Adobe LiveCycle Content Services ES2 only] Secondary WINS Server IP address. It can obtained from `ipconfig /all` command. It is required field if “contentServices.cifs.implementation=PureJava” and “contentServices.cifs.WinsOrBrdcast=winsServer”. |
| contentServices.cifs.brdCastIP    | Numeric                     | [Adobe LiveCycle Content Services ES2 only] Broadcast IP address. It is required field if “contentServices.cifs.implementation=PureJava” and “contentServices.cifs.WinsOrBrdcast=broadcast”. |
| contentServices.dbType            | String                      | [Adobe LiveCycle Content Services ES2 only] Content Services database type. |

**B.2.3 Configure Application Server properties**

If you are installing LiveCycle ES2 with a JBoss application server, you must manually configure JBoss, use the Adobe preconfigured JBoss provided on the LiveCycle ES2 DVD, or use the JBoss turnkey option.
<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>jvm.initialHeapSize</td>
<td>Default: 512</td>
<td>The initial heap size, in MB, for the JVM.</td>
</tr>
<tr>
<td>jvm.maxHeapSize</td>
<td>Default: 1792</td>
<td>The maximum heap size, in MB, for the JVM.</td>
</tr>
<tr>
<td>contentServices.cluster.cacheListenerArgs</td>
<td>Comma-separated string myhostA:7800,myhostB:7800</td>
<td>(Cluster only) [Adobe LiveCycle Content Services ES2 only] The hostname or IP address of the Content Services ES2 cache listener in the cluster with port.</td>
</tr>
<tr>
<td>contentServices.cluster.startPort</td>
<td>Integer</td>
<td>(Cluster only) [Adobe LiveCycle Content Services ES2 only] The port the Content Services ES2 cache listener at this node uses to listen to requests.</td>
</tr>
<tr>
<td>contentServices.cluster.portRange</td>
<td>Integer. Default is 3.</td>
<td>(Cluster only) [Adobe LiveCycle Content Services ES2 only] Content Services ES2 cache range.</td>
</tr>
</tbody>
</table>

**Datasource configuration**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>datasource.dbType</td>
<td>Choose: ● oracle ● sqlserver</td>
<td>The type of database configured to use with LiveCycle ES2.</td>
</tr>
<tr>
<td>datasource.dbName</td>
<td>String</td>
<td>The name of the database.</td>
</tr>
<tr>
<td>datasource.dbHost</td>
<td>String</td>
<td>The host name or IP address of the server where the database is located.</td>
</tr>
<tr>
<td>datasource.dbPort</td>
<td>Integer</td>
<td>The database port LiveCycle ES2 will use when communicating with the database.</td>
</tr>
<tr>
<td>datasource.dbUser</td>
<td>String</td>
<td>The user ID LiveCycle ES2 will use when accessing the database.</td>
</tr>
<tr>
<td>datasource.dbPassword</td>
<td>String</td>
<td>The password associated with the database user ID.</td>
</tr>
<tr>
<td>datasource.target.driverPath</td>
<td>String</td>
<td>JDBC driver in the application server lib directory. This path must be valid and accessible from the server being configured.</td>
</tr>
</tbody>
</table>
B.2.4 Deploy LiveCycle properties

These properties only apply to the deploy LiveCycle ES2 operation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>datasource.local.driverPath</td>
<td>String</td>
<td>Local JDBC driver. This value is used for testing direct database connection.</td>
</tr>
</tbody>
</table>

You must configure the LiveCycle Server Information section. For more information, see “Common properties” on page 97.

B.2.5 Initialize LiveCycle properties

These properties only apply to the initialize LiveCycle ES2 operation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAMHost</td>
<td>String</td>
<td>The hostname of the server where BAM is deployed and running.</td>
</tr>
<tr>
<td>BAMPort</td>
<td>Integer</td>
<td>The port number the BAM server is using to listen for requests.</td>
</tr>
<tr>
<td>BAMAdminUserID</td>
<td>String</td>
<td>The BAM administrator user ID to use when connecting to the BAM server.</td>
</tr>
<tr>
<td>BAMAdminPassword</td>
<td>String</td>
<td>The BAM administrator password to use when connecting to the BAM server.</td>
</tr>
</tbody>
</table>

You must configure the LiveCycle Server Information section. For more information, see “Common properties” on page 97.

B.2.6 Initialize BAM properties

These properties only apply to the initialize BAM operation.

Note: Business Activity Monitoring ES2 is an optional component with LiveCycle ES2.
B.2.7 Deploy LiveCycle Components properties

These properties apply to the following operations:
- Deploy LiveCycle Components
- Validate LiveCycle Component Deployment
- Validate LiveCycle Server.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>databaseType</td>
<td>Choose:</td>
<td>The type of database LiveCycle is using to capture BAM data.</td>
</tr>
<tr>
<td></td>
<td>- oracle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- mysql</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- db2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- sqlserver</td>
<td></td>
</tr>
</tbody>
</table>

You must configure the LiveCycle Server Information section. For more information, see “Common properties” on page 97.

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCAdminUserID</td>
<td>String</td>
<td>The user ID to assign to the LiveCycle Administrator user. This User ID is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>used to login to the LiveCycle Administrator Console.</td>
</tr>
<tr>
<td>LCAdminPassword</td>
<td>String</td>
<td>The password to assign to the LiveCycle Administrator user. This password</td>
</tr>
<tr>
<td></td>
<td></td>
<td>is used to login to the LiveCycle Administrator Console.</td>
</tr>
</tbody>
</table>

B.2.8 Command Line Interface Usage

Once you have configured your property file, you must navigate to the (/LiveCycleES2 root)/configurationManager/bin folder.

To view a complete description of the LiveCycle Configuration Manager CLI commands, type: ConfigurationManagerCLI help <command name>.

B.2.8.1 Configure LiveCycle CLI Usage

The Configure LiveCycle operation requires the following syntax:

```
configureLiveCycle -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” on page 97.
B.2.8.2 Deploy LiveCycle CLI Usage

The Deploy LiveCycle operation requires the following syntax:

deployLiveCycle -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” on page 97.

B.2.8.3 Initialize LiveCycle CLI Usage

The initialize LiveCycle operation requires the following syntax:

initializeLiveCycle -f <propertyFile>

Where:

- **-f <propertyFile>:** A property file containing the required arguments. For instructions on creating a property file, see “Command Line Interface property file” on page 97.

B.2.8.4 Initialize Business Activity Monitoring CLI Usage

The initialize Business Activity Monitoring operation requires the following syntax:

initializeBAM -f <propertyFile>

Where:

- **-f <propertyFile>:** A property file containing the required arguments. For instructions on creating a property file, see “Command Line Interface property file” on page 97.

B.2.8.5 Deploy LiveCycle Components CLI Usage

The Deploy LiveCycle Components operation requires the following syntax:

deployLiveCycleComponents -f <propertyFile> -targetServer_AdminPassword <password>

Where:

- **-f <propertyFile>:** A property file containing the required arguments. For instructions on creating a property file, see “Command Line Interface property file” on page 97.

- **-targetServer_AdminPassword <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.

B.2.8.6 Validate database connectivity CLI Usage

The validate Database Connectivity operation is optional and requires the following syntax:

validateDBConnectivity -f <propertyFile> -datasource_dbPasssword <password>

Where:
● -f <propertyFile>: A property file containing the required arguments. For instructions on creating a property file, see “Command Line Interface property file” on page 97.

● -datasource_dbPassword <password>: Allows you to set the database user password on the command line. If this argument is present, it will override the datasource.dbPassword property in the property file.

B.2.8.7 Validate LiveCycle Server CLI Usage

The Validate LiveCycle Server operation is optional and requires the following syntax:

validateLiveCycleServer -f <propertyFile> -targetServer_AdminPassword <password>

Where:

● -f <propertyFile>: A property file containing the required arguments. For instructions on creating a property file, see “Command Line Interface property file” on page 97.

● -targetServer_AdminPassword <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.

B.2.8.8 Validate LiveCycle Component Deployment CLI Usage

The Validate LiveCycle Component Deployment operation is optional and requires the following syntax:

validateLiveCycleComponentDeployment -f <propertyFile> -targetServer_AdminPassword <password>

Where:

● -f <propertyFile>: A property file containing the required arguments. For instructions on creating a property file, see “Command Line Interface property file” on page 97.

● -targetServer_AdminPassword <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.

B.3 Examples Usage

From the C:\Adobe\Adobe LiveCycle ES2\configurationManager\bin, type:

ConfigurationManagerCLI configureLiveCycle -f cli_propertyFile.txt

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

B.4 Error Logs

If an error occurs, you can review the CLI Error logs located here in the [LiveCycleES2 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.
B.5 Next steps

If you used LiveCycle Configuration Manager CLI to configure and deploy LiveCycle ES2, you can now do the following tasks:

- Verify the deployment. (See “Setting watched folder performance parameters” on page 63.)
- Access LiveCycle Administration Console. (See “Accessing LiveCycle Administration Console” on page 50.)
- Configure LiveCycle modules to access LDAP. (See “Configuring LiveCycle ES2 to access LDAP” on page 64.)
- Uninstall LiveCycle ES2. (See “Uninstalling LiveCycle ES2” on page 82.)
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 2003 or 2008, both 32- and 64-bit versions.

C.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): http://labs.jboss.com/file-access/default/members/jbossweb/freezone/dist/2.0.8.GA/jboss-native-2.0.8-windows-x64-ssl.zip
   - (32-bit): http://labs.jboss.com/file-access/default/members/jbossweb/freezone/dist/2.0.8.GA/jboss-native-2.0.8-windows-x86-ssl.zip

2. Extract the ZIP file and copy all contents of the \bin folder (except the \native folder) to the \bin 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 (SVCNAME), Service Display (SVCDISP) and Service Description (SVCDESC) with values that reflect your JBoss environment. For example, if your JBoss version is 4.2.1, enter the following:
   ```
   set SVCNAME=JBAS42SVC
   set SVCDISP=JBossAS 4.2 for Adobe LiveCycle ES2
   set SVCDESC=JBoss Application Server Community Edition 4.2.1 GA/Platform: Windows x64
   ```

4. In the :cmdStart section, locate and edit the call run.bat line to add the configuration name (all in this example) and bind IP address (0.0.0.0 for binding to all IP addresses of the server) such as follows:
   ```
   call run.bat -c all -b 0.0.0.0 < .r.lock >> run.log 2>&1
   ```

5. Repeat the edits in step 4 for the :cmdRestart section:
   ```
   call run.bat -c all -b 0.0.0.0 < .r.lock >> run.log 2>&1
   ```

6. Save and close the file.

C.2 Install the Windows service

1. From the \bin folder of JBoss, create the Windows service using the following command:
   ```
   service.bat install
   ```
   If the command is successful, you will get a response such as:
   ```
   Service JBossAS 4.2 for Adobe LiveCycle ES2 installed
   ```
2. Check the Services applet in Windows Control Panel for a new service listed as *JBossAS 4.2 for Adobe LiveCycle ES2* which is the value of the SVCDISP 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.

### C.3 Verify the installation

1. Start the service from the Services applet in Windows Control Panel.
2. Watch (tail) the *server.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.

### C.4 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 JBAS42SVC depend= MSSQL$MYSERVER
```

Update the *MSSQL$MYSERVER* variable with service name of the Microsoft SQL Server 2005 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
```

### C.5 Start and stop JBoss Application Server as a Windows service

➤ **To 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 *run.log*. You can inspect the file to discover any errors that occur during service startup.
➤ **To 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 `run.log`. You can inspect the file to discover any errors that occur during service shutdown.