Adobe

Preparing to Upgrade to LiveCycle® ES 8.2 from 8.0.x

Adobe® LiveCycle® ES

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Update 1 (8.2)

Adobe® LiveCycle® ES Update 1 (8.2) Preparing to Upgrade to LiveCycle® ES 8.2 from 8.0.x for Microsoft® Windows®, Linux®, and UNIX®
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Contents

About This Document

This document provides the information that is required to prepare your server environment for upgrading to Adobe® LiveCycle® ES (Enterprise Suite) Update 1 (8.2) from LiveCycle ES 8.0.x on JBoss® Application Server, IBM® WebSphere® Application Server, or BEA WebLogic Server®.

What's in this document?

This document contains the following types of information:

- Information about the changes in LiveCycle ES that may affect your upgrade planning and an overview of how the upgrade process works, including an outline of the tasks involved
- All the tasks that must be performed to ensure that the upgrade runs correctly with minimal server downtime (including backing up the existing LiveCycle ES server and patching the application server as required)
- All hardware and software requirements and configurations that *must* be already in place to ensure a successful LiveCycle ES upgrade process

Note: If you are planning to perform an upgrade by using the turnkey method, you do not need to perform many of the steps in this document. However, all preparatory information for turnkey upgrades, including system requirements, is included in *Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x*.

After you complete the tasks in this document, proceed to the *Upgrading to LiveCycle ES* document for your application server.

Who should read this document?

This document also provides general information about the upgrading process that helps users estimate the resources that are required to upgrade to LiveCycle ES 8.2. Readers who are interested in high-level information about the upgrade process can read the sections "Understanding the Changes in LiveCycle ES" on page 12 and "System Requirements for Upgrading LiveCycle ES" on page 27.

This document provides information for administrators or developers who are responsible for preparing the application and database servers for development, staging, and production environments prior to installing, configuring, upgrading, administering, and deploying LiveCycle ES. The information provided is based on the assumption that anyone reading this document is familiar with application servers, Red Hat® Linux®, SUSE™ Linux, Microsoft® Windows®, IBM AIX®, or Sun™ Solaris™ operating systems, MySQL, Oracle®, IBM 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.

Name	Description	Default value
[LiveCycleES root]	The installation directory used for all LiveCycle ES solution components. The directory contains subdirectories for Adobe LiveCycle Configuration Manager, LiveCycle ES SDK, and each LiveCycle ES solution component installed (along with the product documentation). This directory also includes directories that relate to third-party technologies.	Windows: C:\Adobe\LiveCycle8.2\ Linux and UNIX: /opt/adobe/livecycle8.2/
[appserver root]	The home directory of the application server that runs the LiveCycle ES services.	JBoss on Windows: C:\jboss JBoss on Linux: /opt/jboss WebSphere on Windows: C:\Program Files\IBM\WebSphere\AppServer WebSphere on Linux and UNIX: /opt/IBM/WebSphere/AppServer WebSphere on AIX: /usr/IBM/WebSphere/AppServer **or** /opt/IBM/WebSphere/AppServer WebLogic on Windows: C:\bea\weblogic92\ C:\bea\wlserver_10.0 WebLogic on Linux and UNIX: /opt/bea/weblogic92 /opt/bea/wlserver_10.0
BEA_HOME	The installation directory for WebLogic as specified for the `BEA_HOME` environment variable.	WebLogic on Windows C:\bea WebLogic on Linux and UNIX: /opt/bea
[appserverdomain]	The domain that you configured on WebLogic. The default domain is called *base_domain*.	WebLogic on Windows: C:\bea\user_projects\domains\base_domain WebLogic on Linux and UNIX: /opt/bea/user_projects/domains/base_domain

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

Additional information

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

For information about	See
Performing the upgrade from LiveCycle 7.x to LiveCycle ES using the turnkey method	*Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x*
Upgrading custom applications to LiveCycle ES	*Upgrading Applications to LiveCycle ES Using APIs*
General information about LiveCycle ES and the solution components	*LiveCycle ES Overview*
What's new in this LiveCycle ES (Enterprise Suite) release	*What's New for LiveCycle ES*
LiveCycle ES terminology	*LiveCycle ES Glossary*
Other services and products that integrate with LiveCycle ES	Adobe Developer Center
LiveCycle ES solution components	*obe LiveCycle ES*
All documentation that is available for LiveCycle ES	Adobe LiveCycle ES documentation
LiveCycle ES release information and last-minute changes that occur to the product	LiveCycle ES Release Notes
Patch updates, technical notes, and additional information about this product version	LiveCycle Support Center

1 Introduction to Upgrading LiveCycle ES

This section provides information about the documentation that is available to help you understand the upgrade process. It also provides a high-level outline of the tasks that are involved in upgrading LiveCycle ES 8.0.x to LiveCycle ES 8.2.

About the upgrade documentation

Several documents are available to help you upgrade to LiveCycle ES version 8.2:

- *Preparing for Upgrading to LiveCycle ES from 8.0.x*
- *Upgrading to LiveCycle ES from 8.0.x for JBoss*
- *Upgrading to LiveCycle ES from 8.0.x for WebSphere*
- *Upgrading to LiveCycle ES from 8.0.x for WebLogic*
- *Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x*
- *LiveCycle Configuration Manager Help* (available by pressing F1 when using LiveCycle Configuration Manager)
- *Upgrading Applications to LiveCycle ES Using APIs*

Preparing to Upgrade to LiveCycle ES (this document)

This document contains all the information you need about the following topics to prepare your system for upgrading from LiveCycle ES 8.0.x.

Understanding what occurs during the upgrade process

Upgrading LiveCycle ES 8.0.x to LiveCycle ES 8.2 requires a series of tasks, most of which are automated by LiveCycle Configuration Manager. To gain an understanding of the automated and manual tasks involved in upgrading and how your system is affected, see "Overview of the upgrade process" on page 13.

Preparing your environment for upgrade

Before you actually install LiveCycle ES Update 1 (8.2) and migrate LiveCycle ES 8.0 data and configuration to it, you must complete several tasks to prepare the LiveCycle ES environment. These tasks are covered in the following sections:

"Understanding the Changes in LiveCycle ES" on page 12

"Upgrading your infrastructure" on page 17

"Backing up the existing LiveCycle ES environment" on page 17

"Providing the LiveCycle 7.x EAR files" on page 23

Hardware and software prerequisites

Before upgrading, you must ensure that your hardware and software meets the requirements of LiveCycle ES. Although LiveCycle ES 8.2 is supported on the same platform combinations as LiveCycle ES 8.0.x, you may need to patch your application server to the most current version. You should also determine whether any updates are required in order to ensure optimal performance for LiveCycle ES. (See "System Requirements for Upgrading LiveCycle ES" on page 27.)

Gathering the required information

During the upgrade process, you will be prompted to provide information about your LiveCycle ES server and database, and the target LiveCycle ES environment. For a checklist of the information you need during the upgrade process, such as directory paths, file names, and passwords, see "Gathering required information before you start" on page 24.

When you understand all the relevant changes between LiveCycle ES 8.0.x and LiveCycle ES 8.2, and you have completed all the tasks that are described in this document, you can use one of the documents mentioned in the next two sections to perform the actual upgrade.

Upgrading to LiveCycle ES from 8.0.x for JBoss, WebSphere, or WebLogic

The documents *Upgrading to LiveCycle ES from 8.0.x for JBoss*, *Upgrading to LiveCycle ES from 8.0.x for WebSphere*, and *Upgrading to LiveCycle ES from 8.0.x for WebLogic* provide the information that you need to perform the actual installation and migration steps that make up the upgrade process. Each guide is specific to the application server you are using.

Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x

The *Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x* document includes all the steps that are required to upgrade to LiveCycle ES 8.2 for JBoss and MySQL from LiveCycle ES 8.0.x by using the turnkey method. The turnkey method automatically installs, configures, and upgrades the product.

You can upgrade by using the turnkey method if you installed LiveCycle ES 8.0.x by using turnkey and if the solution components are deployed to the JBoss instance that was included as part of the turnkey installation.

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

Note: To perform an upgrade by using the turnkey method, you do not need to perform many of the steps in this document (*Preparing for Upgrading to LiveCycle ES from 8.0.x*). It is recommended that you review the section  nderstanding the Changes in LiveCycle ES" on page 15. However, all preparatory information for turnkey upgrades, including system requirements, are included in *Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x*.

LiveCycle Configuration Manager Help

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

For more information about LiveCycle Configuration Manager, see the *Upgrading to LiveCycle ES* document for your application server, mentioned earlier in this section.

Upgrading task outline

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

To upgrade from LiveCycle 8.0.x to LiveCycle ES 8.2, you must complete the following tasks.

Task	**See**
Understand the upgrade process (high-level section).	"Understanding the Changes in LiveCycle ES" on page 12
Understand the upgrade implications for data, processes, and APIs.	"About data, process, and API compatibility" on page 13
Patch the application server to ensure that you have the most up-to-date version.	"System requirements" on page 31
Ensure that you have all the information about passwords, directory locations, and credentials that you need.	"Gathering required information before you start" on page 24
Back up all LiveCycle ES data, resources, directories.	"Backing up the existing LiveCycle ES environment" on page 17
Install LiveCycle ES 8.2.	*Upgrading to LiveCycle ES from 8.0.x* for your application server
Run LiveCycle Configuration Manager to configure LiveCycle ES 8.2 and upgrade from LiveCycle ES 8.0.x.	• *Upgrading to LiveCycle ES from 8.0.x* for your application server • *LiveCycle Configuration Manager Help*

2 Understanding the Changes in LiveCycle ES

To successfully upgrade to LiveCycle ES 8.2 from LiveCycle ES 8.0.x, you must first understand which parts of your IT organization are involved. This section provides the high-level information that is required to plan for your upgrade.

How the LiveCycle ES upgrade protects your IT investment

The upgrade to LiveCycle ES 8.2 is designed to provide an automated experience with minimal manual tasks. It continues to protect your investment in the forms, processes, and applications that you have built around LiveCycle. By protecting that investment, an IT administrator can upgrade to LiveCycle ES without help from the form authors who created your forms, the process authors who created your processes, and the Java™ developers who created custom applications for LiveCycle 7.x or LiveCycle ES.

The LiveCycle upgrade limits the changes so that they affect only the middle tier of your enterprise infrastructure. If you are using Adobe Reader® with LiveCycle, your organization can continue to use the existing version of Adobe Reader that you deployed across your clients. If you are using an Oracle or DB2 database in your data tier, you can continue to use it without changing the version. Keeping the LiveCycle upgrade restricted to your middle tier minimizes the disruption to the remainder of your enterprise infrastructure.

Adobe Reader compatibility

One of the key features of the upgrade is that the version of Adobe Reader on the client is independent of the version of LiveCycle on the server. When LiveCycle ES renders a form, it renders it in the version of PDF that you specify. You can create forms that work best in Adobe Reader 7.x, or you can use new features that work best with Adobe Reader 8.0. Form authors are warned if they choose to use a feature that is not appropriate for the particular version of Adobe Reader.

All forms render in LiveCycle ES 8.2 in the same way that they rendered in previous versions of LiveCycle ES. All the scripts that you added to your forms will work in LiveCycle ES 8.2. In addition to the LiveCycle ES features that support multiple versions of Adobe Reader, Adobe Reader itself also works with multiple versions of LiveCycle. You can roll out Adobe Reader 9.0 to your clients without upgrading your server.

Compatibility between LiveCycle ES 8.0.x and LiveCycle ES 8.2

When you upgrade your LiveCycle software, you maintain compatibility on a number of levels:

- Data, processes, and configuration settings are compatible.
- Most APIs are compatible, without requiring developers to recompile their applications.
- Electronic forms and form clients are compatible.

About data, process, and API compatibility

On the server, all data is migrated automatically so that it is available in LiveCycle ES 8.2. For example, all historical process data continues to be available so that users can run queries that span the upgrade. The configuration information that LiveCycle ES 8.2 requires is migrated from the earlier version of LiveCycle ES.

Processes that are developed in or updated to LiveCycle ES 8.0.x runs natively in LiveCycle ES 8.2. Long-running processes will continue after the upgrade. For example, if you created a process that helps your business conform to a government regulation, the process will work in LiveCycle ES as you originally designed it. For these and all other processes that come from the previous LiveCycle ES system, end users can continue to log in to LiveCycle Workspace ES and see all the processes in the state that they left them. Many of the services that processes use are automatically updated to the new versions to ensure that your environment is up-to-date with bug fixes and functionality enhancements.

If you originally upgraded to LiveCycle ES 8.0.x from LiveCycle 7.x and you are still running some LiveCycle 7.x processes or applications, they will continue to run in LiveCycle ES 8.2.

Changes to database schemas in LiveCycle ES are kept to a minimum. Any changes in schemas are automatically handled during the upgrade, and data is automatically migrated.

Most APIs that are used with LiveCycle ES 8.0.x are compatible with LiveCycle ES 8.2. For details about the APIs that are deprecated or updated, see *Upgrading Applications to LiveCycle ES Using APIs*.

Form and client compatibility

Adobe has placed top priority on separating the LiveCycle server from the Adobe Reader client. This separation now gives your IT organization the flexibility to decide when to upgrade your client, independent of the server. As a result, forms that were developed for use with Adobe Reader 7.0 are still compatible with LiveCycle ES.

In addition, forms that you developed for LiveCycle ES 8.0.x work as designed with Adobe Reader 8.0 and LiveCycle ES 8.2. When users open LiveCycle ES 8.0.x forms in Adobe Reader 8.0, the PDF version will not be incremented unless the form uses new features that are specific to Adobe Reader 8.0. Forms that have a flowable layout will render the same way in Adobe Reader 8.0 as they did in Adobe Reader 7.0.

Overview of the upgrade process

Upgrading from LiveCycle ES 8.0.x to LiveCycle ES version 8.2 updates the existing LiveCycle ES 8.0.x server. Configuration settings, user data, and job information is updated or patched to the LiveCycle ES 8.2.

Most of the tasks in the upgrade process are automated and performed (with some user input) by LiveCycle Configuration Manager. *LiveCycle Configuration Manager* is a wizard-like tool used to configure, deploy, and validate LiveCycle ES components for deployment to the application server. When run in upgrade mode, LiveCycle Configuration Manager also performs upgrade tasks such as updating configuration settings and data. LiveCycle Configuration Manager can also apply a compatibility layer to ensure backward-compatibility with existing custom applications that were developed in LiveCycle 7.x, if applicable.

Some upgrade tasks are manual; they need to be performed by an administrator. These tasks include the environment preparation tasks that are described in this document, such as backing up the existing server environment and related files, and patching application servers if necessary. If you previously upgraded

from LiveCycle 7.x, you must also ensure that you have access to the LiveCycle EAR files from the LiveCycle 7.x deployment; these are required during the upgrade process. The EAR files are required for configuration settings that are related to the compatibility layer. All other configurations are maintained because they were added to the database when LiveCycle 7.x was originally upgraded. If you do not have access to the EAR files from LiveCycle 7.x, default configuration settings that are related to the compatibility layer are used during the upgrade process.

The running LiveCycle ES system (application server and database) must be accessible to LiveCycle Configuration Manager during the upgrade. If you need to import the LiveCycle 7.x EAR files, they must be available to LiveCycle Configuration Manager during the upgrade process.

Upgrading to LiveCycle ES 8.2 using LiveCycle Configuration Manager

Upgrading to LiveCycle ES solution components from LiveCycle ES 8.0.x involves these tasks:

1. Installing LiveCycle ES 8.2 product files.
2. Running LiveCycle Configuration Manager to initiate the configuration, upgrading, and deployment process. The remaining steps (below) are included in this process.
3. Extracting configuration settings and data from LiveCycle 7.x EAR files and applying them to the LiveCycle ES EAR files and database.

   Note: This task is required only if the LiveCycle ES 8.0.x server was upgraded from LiveCycle 7.x. It is not applicable to LiveCycle Rights Management ES and LiveCycle Policy Server upgrades.
4. Applying a compatibility layer to the LiveCycle ES EAR files. The compatibility layer comprises a set of deprecated Enterprise JavaBeans™ (EJBs), classes, servlets, and CORBA APIs that support custom applications developed with LiveCycle 7.x. The compatibility layer enables these legacy applications to continue to work with LiveCycle ES. Application of the compatibility layer is optional when installing or updating from LiveCycle ES without having done a previous upgrade from LiveCycle 7.x.
5. Updating and redeploying LiveCycle ES EAR files to the application server.
6. Patching LiveCycle ES components that are already deployed to the server.
7. Starting LiveCycle ES on the application server so that it is available to accept user requests.
8. Migrating essential data to the LiveCycle ES database.
9. Migrating remaining data, such as audit records that are submitted or historical data that are associated with LiveCycle Process Management ES.

Upgrading a system previously upgraded from LiveCycle 7.x

If you are upgrading from a LiveCycle ES installation that was previously upgraded from LiveCycle 7.x, and you are still using applications based on the LiveCycle 7.x processes and APIs, special considerations are required for upgrading to LiveCycle ES 8.2.

- LiveCycle 7.x EAR files must be available to provide data to the LiveCycle ES 8.2 server.
- LiveCycle 7.x compatibility layer is included with LiveCycle ES 8.2 so that you can continue to work with applications that were developed using LiveCycle 7.x.

- Processes based on LiveCycle 7.x QPACs remain compatible in LiveCycle ES 8.2, but they should be upgraded using the Process Upgrade Tool that is available in LiveCycle Workbench ES.

For information about the files required, see "Providing the LiveCycle 7.x EAR files" on page 23.

Installing the LiveCycle 7.x compatibility layer

The compatibility layer consists of the Enterprise JavaBeans (EJBs), classes, servlets, and CORBA APIs that are deprecated in LiveCycle ES but are used by custom applications that were developed for LiveCycle 7.x. When present in the LiveCycle ES deployment, the compatibility layer ensures that custom applications that were developed for LiveCycle 7.x continue to work with LiveCycle ES.

Note: The contents of the compatibility layer are deprecated and included for backward compatibility only. It is required only if you did not upgrade LiveCycle 7.x-based processes and applications to run natively in LiveCycle ES.

The APIs that are exposed in LiveCycle 7.x remain compatible in LiveCycle ES. During the upgrade process, a compatibility layer is inserted into LiveCycle ES so that you can use your existing code with LiveCycle ES. The Java methods that you used in LiveCycle 7.x are maintained, the web service calls are present at the same URL, and all other programmatic methods of access that exist in LiveCycle 7.x persist. The compatibility layer ensures that your organization do not need developers to upgrade your LiveCycle 7.x system to LiveCycle ES.

For information about how upgrading to LiveCycle ES affects existing applications at the API level, see *Upgrading Applications to LiveCycle ES Using APIs*.

Upgrading LiveCycle 7.x QPACs

If you previously upgraded from LiveCycle 7.x and are using processes based on QPACs, you can upgrade LiveCycle QPACs. The Process Upgrade tool is available within LiveCycle Workbench ES to automate the QPAC upgrade. LiveCycle 7.x QPACs can run in LiveCycle ES without modifications so that you can run the QPAC upgrade tool when you are ready. (LiveCycle 7.x processes remain compatible until LiveCycle ES version 10.) You must also perform some manual configuration updates on the processes that were upgraded by using the Process Upgrade Tool. (See "Upgrading QPACs" in *LiveCycle Workbench ES Help*.)

Updating client libraries

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

Note: This task is required even if you are not changing the version of JBoss you have installed.

The JBoss client libraries are located in the //third_party/*[jboss_version]*/client directory on the LiveCycle ES 8.2 installation media (DVD or ESD).

Updating server libraries

To ensure successful deployment of the upgraded EAR files to JBoss Application Server, you must update certain JAR files (server-libs) within the JBoss installation.

Note: This task is required even if you are not changing the version of JBoss you have installed.

The JBoss server libraries are located in the //third_party/*[jboss_version]*/patches directory on the LiveCycle ES 8.2 installation media (DVD or ESD) and must be copied to *[jboss_home]*/server/all/lib.

Review the README.txt file located in the //third_party/*[jboss_version]*/patches directory to ensure that you update the JBoss server library files as required.

Upgrading the LiveCycle ES Connectors for ECM

Upgrading the LiveCycle ES Connector for EMC Documentum or LiveCycle ES Connector for IBM FileNet is supported only when the enterprise content management (ECM) system itself is not upgraded. That is, if LiveCycle ES 8.0.x Connector for IBM FileNet was running on IBM FileNet P8 Content Engine 3.5.x, Connector for IBM FileNet must still be running on FileNet P8 Content Engine 3.5.x when it is upgraded to LiveCycle ES 8.2.

If the ECM content server is upgraded before Connector for IBM FileNet or if Connector for EMC Documentum is upgraded to LiveCycle ES 8.2, run-time configuration information for LiveCycle ES 8.0.x, such as shared locks on the resources, will not be available and migrated to LiveCycle ES 8.2.

3 Preparing Your Environment for Upgrading

Before you begin the upgrade process, you must perform several tasks to prepare your environment for upgrading:

- Upgrade your infrastructure by applying the latest patches to your application server.
- Back up the existing LiveCycle ES environment.
- Provide the LiveCycle 7.x EAR files, if applicable (if you originally upgraded from LiveCycle 7.x and are still running LiveCycle 7.x components on the server).
- Remove the LiveCycle ES 8.0.1 samples.

Upgrading your infrastructure

Platforms that are supported in LiveCycle ES version 8.0 continue to be supported in LiveCycle ES version 8.2. However, because LiveCycle ES supports the latest versions of application servers, you may need to apply the latest patch to your application server.

Note: It is recommended that you apply application server patches and continue to run the updated application server for a period of time before you upgrade LiveCycle ES. This approach helps ensure that the application server is running correctly when you are ready to upgrade.

For details about supported platforms, see "System Requirements for Upgrading LiveCycle ES" on page 27.

Backing up the existing LiveCycle ES environment

Before you start the upgrade process, you must back up all the files and directories that are associated with the LiveCycle ES 8.0.x deployment, including the Java SDK, installation files, watched folder contents, and temporary directory. Do not delete any of these items.

Back up (or export) the LiveCycle ES 8.0.1 Samples that you modified and want to keep because you will delete the samples before you runn the upgrade. (See "Removing the LiveCycle ES 8.0.1 Samples" on page 24.)

The LiveCycle ES database, global document storage (GDS) directory, and application servers must be part of this backup.

You must determine the best backup strategy for your LiveCycle ES implementation. This strategy depends on how LiveCycle ES is used, whether custom applications access files in the GDS directory, and how many and how often the GDS files are updated. After you identify how LiveCycle ES is used, you can determine which files need to be backed up, how often, and the backup window that is available.

This section provides backup and recovery procedures for implementations that require both the LiveCycle ES database and the GDS directory. Most of the application data resides in files in the GDS directory and in the database. To prevent data loss, the GDS directory and database must be backed up and recovered synchronously because a reference to each document that is stored in the GDS directory exists in the database. The backup strategy for this implementation would require a hot backup of the database to be done concurrently with a cold backup of the GDS directory (LiveCycle ES must be shut down to back up the GDS files).

To determine whether your implementation is a candidate for synchronous LiveCycle ES database and GDS directory backup and recovery, consider the following examples:

- If your LiveCycle ES custom application renders forms by using only the Forms service and does not use the security and process infrastructure, you must back up the database. Therefore, this implementation is not a candidate for the procedures covered in this section, although you should review the database section.
- If your LiveCycle ES custom application files are used by long-lived and non-transient processes, asynchronous jobs, the Task Manager, and the service containers, you must back up the LiveCycle ES database and the GDS directory synchronously.

Files to be backed up and recovered

For the purposes of backup and recovery, the LiveCycle ES application data can be divided into two different types of files:

"Global document storage directory" on page 18

"LiveCycle ES database" on page 19

Global document storage directory

G*lobal document storage* is a directory used to store long-lived files such as PDF files that used within a process or service container deployment archives. Long-lived files are a critical part of the overall state of the LiveCycle ES environment. If some or all long-lived documents are lost or corrupted, the LiveCycle ES server may become unstable. Input documents for asynchronous job invocation are also stored in the global document storage directory and must be available in order to process requests.

The long-lived files may contain sensitive user information (that is, the information that may require special credentials when accessed by using the LiveCycle ES APIs or user interfaces). It is important that the GDS directory is properly secured through the operating system and that only the administrator account that is used to run the application server has read/write access to this directory.

The default location of the GDS directory is determined during the LiveCycle ES installation process or later by using the LiveCycle Administration Console.

Global document storage directory location

If you leave the location setting blank during installation, the location defaults to a directory under the application server installation. You must back up the following directory for your application server:

- (JBoss) *[appserver root]*/server/<server>/svcnative/DocumentStorage
- (WebLogic) *[appserverdomain]*/<server>/adobe/LiveCycleServer/DocumentStorage
- (WebSphere) *[appserver root]*/installedApps/adobe/<server>/DocumentStorage

If you changed the GDS directory location after installation, you can determine it by logging in to the LiveCycle Administration Console, clicking Settings > Core System Settings > Configurations, and recording the location that is specified in the Global Document Storage Directory box on the Core Configuration page.

Note: In a clustered environment, the GDS directory typically points to a directory that is shared on the network and is read/write-accessible for every cluster node.

Backup and recovery of the global document storage directory location

Because the GDS directory location is a file system directory, use any operating system or third-party backup and recovery utilities that are available.

The time at which you back up the GDS directory location depends on how LiveCycle ES is used and whether the backup window is available. The backup window can be affected by long-lived processes because they can run for days at a time.

LiveCycle ES database

The LiveCycle ES database stores content such as form artifacts, service configurations, process state, and database references to files in the GDS directory. The database administrator can back up the database in hot mode, which means that the database does not have to be shut down and users still have access to it.

To back up the database in this mode, the database must be configured to run in archive log mode. When running in archive log mode, database data files can be backed up while the database is open and available for use. Also, the database preserves its rollback and transaction logs when it is running in this mode.

Backup and recovery of the database

After LiveCycle ES is installed and deployed to production areas, the database administrator should perform a full backup of the database. The database must be shut down for this backup.

To recover the database, you must first run a database restore operation by using the database backup files. You must then apply the transaction redo logs to the recovered database.

Note: If the database is running in archive log mode, as described in the previous section, the database logs also need to be backed up frequently so that they can be used to restore the database in case of media failure.

The following sections provide a brief overview of the relational database management system (RDBMS) that LiveCycle ES supports and how to configure archive logging for the specified database.

DB2

Caution: Hot backup is not supported for upgraded LiveCycle ES 8.2 environments using a DB2 database.

This section describes how to configure your IBM DB2 database to run in archive log mode. First, you need to understand these two different types of logging modes that are available in DB2:

Circular logging: Log files are overwritten after a certain amount of time. For this reason, you cannot roll forward a database after a restore operation when using circular logging. This mode also restricts the backup capabilities to cold backup only. Circular logging is the default logging mode for DB2 databases.

Archive logging: This mode does not overwrite existing log files. Instead, it creates new log files as needed. When using archive logging, you can repeat transactions to a database after a restore operation. This widely enhances the restore capabilities of DB2 databases and ensures that no, or only very little, data is loss when you need to restore a database.

To configure your DB2 database to run in archive logging mode, run the following command, where ***database_name*** is the name of your LiveCycle ES database:

```
db2 update database configuration for database_name using LOGRETAIN ON
```

Archive logging mode increases storage requirements over time because many log files are created. To move the log files to a different storage location, you must ensure that the log files do not contain any non-committed or non-externalized transactions. You can use the DB2 user exit to determine whether a log file contains these types of transactions.

For more information about DB2 database backup and recovery, see *Developing a backup and recovery strategy for DB2.*

IBM has a suite of tools and help systems to help database administrators manage their backup and recovery tasks:

- IBM DB2 Archive Log Accelerator (see *Archive Log User's Guide and Reference*).
- IBM DB2 Data Archiving Expert (see *Archive Expert User's Guide and Reference*).

DB2 has built-in capabilities to back up a database to Tivoli Storage Manager. By using Tivoli Storage Manager, DB2 backups can be stored to other media and local hard drive.

Oracle

You must configure your Oracle database to run in archive logging mode. (See *An Introduction to Oracle Backup*.)

For more information about backing up and recovering your Oracle database, see *Oracle Backup and Recovery* and *Backup and Recovery Strategies*.

SQL Server

SQL Server does not support archive logging mode but does support transaction log backup.

SQL Server provides two backup and recovery tools:

- SQL Server Management Studio (GUI)
- T-SQL (command line)

For more information about SQL Server database backup and recovery tools, see *Backup Strategies* and *Backup and Restore*.

MySQL

MySQL provides the mysqldump utility to backup the database. A hot backup tool for MySQL is also available from InnoBase software. (See *Innobase Hot Backup*.)

For more information about MySQL database backup and recovery, see *Backup Strategies*.

Backing up the database and GDS directory

This section contains the tasks that are required to perform a single node and cluster backup.

To ensure a successful backup and recovery, a system image backup must be available at all times. Then, if a loss occurs, you can recover your entire environment to a consistent state.

You can choose to perform a hot backup or cold backup of your database and GDS directory. If you are running long-lived processes, ensure that you perform the hot backup tasks.

To perform a hot backup of the database and GDS directory, complete these tasks:

1. Verify the system version and record patches or updates that were applied since a complete system image backup was performed.
2. Ensure that your database is configured with archive log mode or hot backup mode. (See "LiveCycle ES database" on page 19.)
3. Back up the LiveCycle ES database transaction and rollback log. (See "LiveCycle ES database" on page 19.)
4. Back up the global document storage directory. (See "Global document storage directory location" on page 18.)

To perform a cold backup of the database and GDS directory, complete these tasks:

1. Verify the system version and record patches or updates that were applied since a complete system image backup was performed.
2. Stop the LiveCycle ES services. (See "Starting and stopping the services" on page 22.)
3. Stop the application server. For cluster backups, stop the application server on each cluster node.
4. Back up the global document storage directory. (See "Global document storage directory location" on page 18.)
5. Back up the LiveCycle ES database. (See "LiveCycle ES database" on page 19.)
6. Start LiveCycle ES (see "Starting and stopping the services" on page 22) and the application servers.

Recovery procedures

This section contains the tasks that are required to recover from non-cluster, single node, and full cluster losses.

When restoring from backup to a new system, the following configurations may be different. This should not affect a successful recovery of the LiveCycle ES application:

- IP address
- Physical system configuration (CPUs, disk, memory)
- Hard disk layout (drive letters and UNIX partition scheme)

If a single node of a multinode cluster failed and the remaining nodes of the cluster are operating normally, perform the cluster single-node recovery tasks.

To recover a database and global document storage directory:

1. (Optional) Stop the LiveCycle ES services and application server and, for cluster recovery, stop the application server on each cluster node.

   Note: If you are running long-lived processes, do not stop LiveCycle ES services and application server.

2. Re-create the physical system from a system image.

3. Apply patches or updates to LiveCycle ES that were applied since the image was made. This information was recorded in step 1 of the backup tasks you performed. LiveCycle ES must be recovered to the same patch level as it was when the system was backed up.

4. Recover the GDS directory. (See "Global document storage directory location" on page 18.)

5. Recover the LiveCycle ES database. (See "LiveCycle ES database" on page 19.)

6. Start LiveCycle ES (see "Starting and stopping the services" on page 22) and the application server(s).

To recover a single node in a cluster:

1. Re-create the physical system from a system image.

2. Apply patches or updates to LiveCycle ES that were applied since the image was made. This information was recorded in step 1 of the backup tasks you performed. LiveCycle ES must be recovered to the same patch level as it was when the system was backed up.

3. Join the node to the functioning nodes of the LiveCycle ES cluster.

To recover a full cluster:

1. Re-create the physical system from a system image.

2. Apply patches or updates to LiveCycle ES that were applied since the image was made. This information was recorded in step 1of the backup tasks you performed. LiveCycle ES must be recovered to the same patch level as it was when the system was backed up.

3. Recover the GDS on each cluster node. (See "Global document storage directory location" on page 18.)

4. Recover the LiveCycle ES database. (See "LiveCycle ES database" on page 19.)

5. Start LiveCycle ES (see "Starting and stopping the services" on page 22) and the application server(s).

Starting and stopping the services

This section describes how to start and stop the various services that LiveCycle ES uses. Prior to a backup or recovery, these services must be stopped. After a backup or recovery, these services must be started.

If you installed LiveCycle ES on JBoss Application Server by using the turnkey method, the following services will be available on your system:

- JBoss for Adobe LiveCycle ES v8.0
- MySQL for Adobe LiveCycle ES v8.0

These services are accessible by selecting Start > Control Panel > Administrative Tools > Services. Start or stop these services by selecting them from the list and then clicking the appropriate action button on the panel.

A complete implementation of LiveCycle ES will include the application server and database services to be installed:

- *[application server]* for Adobe LiveCycle ES 8.0
- *[database]* for Adobe LiveCycle ES 8.0

In Microsoft Windows, these services are accessible through Administrative Tools > Services. On UNIX or Linux, enter the following text from a command line, where `<service name>` is the name of the service you are verifying:

```
ps -A | grep <service name>
```

Providing the LiveCycle 7.x EAR files

If you are upgrading from a LiveCycle ES installation that was previously upgraded from LiveCycle 7.x, you must reimport the LiveCycle 7.x EAR files that you used when you upgraded from LiveCycle 7.x to LiveCycle ES 8.0.x. Some configuration information stored in these EAR files was not saved in the LiveCycle ES 8.0.x database and is required by the LiveCycle ES 8.2 server.

Note: This procedure is not required if you upgraded from LiveCycle Policy Server only.

The following list includes all the possible archive files that must be imported during the upgrade process, depending on the products and versions you are upgrading. However, any of the following archives that were included in your original deployment must be imported if you are upgrading those products.

LiveCycle.ear or Data Manager Module: Can be one of these files:

- DataManagerService.war (if you upgraded from an earlier version of LiveCycle 7.x, such as LiveCycle Document Security 7.0 or LiveCycle Reader Extensions)
- DataManagerService.bar (if you upgraded from an earlier version of LiveCycle 7.x, such as LiveCycle Document Security 7.0 or LiveCycle Reader Extensions)
- AdobeServices.sar (if you upgraded from an earlier version of LiveCycle 7.x, such as LiveCycle Document Security 7.0 or LiveCycle Reader Extensions)
- LiveCycle.ear (if you upgraded from an earlier version of LiveCycle 7.0 products other than those listed previously, or later versions such as LiveCycle 7.1 or 7.2)

LiveCycle Document Security or Trust Manager Module: Can be one of these files:

- LiveCycle-security.ear (if you are upgrading from LiveCycle 7.2.x)
- TrustManager.war (if you upgraded from a version that is earlier than LiveCycle 7.2)
- TrustManager.bar (if you upgraded from LiveCycle 7.0 for JBoss)

LiveCycle PDF Generator: Can be one of these files:

- pdfg-ps-all.ear (if you upgraded from LiveCycle PDF Generator for PostScript®)
- pdfg-all.ear (if you upgraded from LiveCycle PDF Generator Professional or Elements)

Font Manager Module: Can be one of these files:

- adobe-FontManager.ear (if you upgraded from LiveCycle 7.2.x)
- adobe-FontManager.war (if you upgraded from a version that is earlier than LiveCycle 7.2)
- adobe-FontManager.bar (if you upgraded from LiveCycle 7.0 for JBoss)

LiveCycle Assembler: Acceptable file is adobe-Assembler7.ear.

Note: File names may not exactly match the file names in the list because they may have been modified by administrators or by the application server during export.

Gathering required information before you start

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

Determining the JNDI port

Provide JNDI port information for your application server (JBoss, WebLogic, or WebSphere) and for your database.

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

➤ **To determine the JNDI port for JBoss 4.x:**

1. Navigate to the *[jboss_root]*/server/all/conf directory and open the jboss-service.xml file.
2. Find the `<mbean code="org.jboss.naming.NamingService">` element. The JNDI server port is the value of the `<attribute name="Port">` element.

➤ **To determine the JNDI port for WebSphere 6.0.x:**

1. Log in to the WebSphere Administrative Console.
2. In the navigation tree, click **Servers** > **Application Servers** > *[server_name]* **> Ports**, and find the value of bootstrap_address.

Note: For WebLogic, the JNDI server port is usually the same as for the server that is created to host LiveCycle ES. If a Managed Server is configured for deployment of LiveCycle ES, the JNDI port should be the port used by the Managed Server.

Server names

If you are installing the LiveCycle ES product files and running LiveCycle Configuration Manager from a different computer than the target LiveCycle ES server, you must know the server name of the system that LiveCycle ES will be deployed on.

Removing the LiveCycle ES 8.0.1 Samples

The LiveCycle ES 8.0.1 Samples can be removed manually through the LiveCycle Administration Console.

➤ **To remove the LiveCycle ES Samples manually:**

1. Log in to LiveCycle Administration Console and click **Home** > **Services** > **Applications and Services** > **Archive Management**.
2. Delete all the samples in the “Samples to delete” list below.

Caution: Do not delete the following samples

- Samples - Forms - Render Form Guide
- Samples - Forms - Render HTML Form
- Samples - Forms - Render PDF Form
- Samples - Forms - Submit Form Guide
- Samples - Forms - Submit HTML Form
- Samples - Forms - Submit PDF form

Samples to delete

- Samples - Data Services - CreateMortgageApplication
- Samples - Reader Extensions - CreateBarCodedForm
- Samples - Reader Extensions - ReviewAndCommenting
- Samples - Reader Extensions - DynamicallyApplyRights
- Samples - Barcoded Forms - RouteOnDataEntry
- Samples - Barcoded Forms - RouteOnFormType
- Samples - Digital Signatures - Verify Digital Signatures
- Samples Forms - DataExtractionAndApplyXSLT
- Samples Forms - DataExtractionAndUpdateDB
- Samples Forms - DataLookup
- Samples Forms - PrePopulateLDAPQuery
- CreateCustomerAndBankAccount-03-07-2007-1702
- SendEmail-03-07-2007-1701
- Samples - Events - EventCorrelation
- Samples - Events - EventCorrelationStartPoint
- Samples - Events - EventGenerationandReceipt
- Samples - Events - Timeout
- Samples - Foundation - JDBC
- Samples - Foundation - E-mail
- Samples - Foundation - FileSystem
- Samples - Foundation - File Transfer Protocol (FTP)
- Samples - Foundation - JMS
- Samples - Foundation - LDAP
- Samples - Foundation - Variable Logger
- Samples - Foundation - Web Service
- Samples - Foundation - XSLT
- Samples - RightsManagement - ApplyPolicy
- Samples - RightsManagement - RegisterApplyPolicy
- Samples - RightsManagement - RevokeOnPrint

- Sample - PDF Generator - ConvertAllFileTypesToPDF
- Sample - PDF Generator - ConvertTiffToPDF
- Sample - PDF Generator - FilterLogFileInPSToPDFConversion
- Samples Output - FaxDetailsInMetaData
- Samples Output - LetterWithAttachment
- Samples Output - RenderTemplateInMultipleFormats
- Samples - ConnectorforEMCDocumentum - ArchiveSubmittedData-Documentum
- Samples - ConnectorforEMCDocumentum - AssemblePDFAndArchiveToECM-Documentum
- Samples - ConnectorforEMCDocumentum - RenderFormsFromSubmittedData-Documentum
- Samples - ConnectorforEMCDocumentum - RenderReaderEnabledFormsWithData-Documentum
- Samples - ConnectorforEMCDocumentum - MortgageLoan-Documentum
- Samples - ConnectorforIBMFileNet - ArchiveSubmittedData-Filenet
- Samples - ConnectorforIBMFileNet - AssemblePDFAndArchiveToECM-Filenet
- Samples - ConnectorforIBMFileNet - RenderFormsFromSubmittedData-Filenet
- Samples - ConnectorforIBMFileNet - RenderReaderEnabledFormsWithData-Filenet
- Samples - ConnectorforIBMFileNet - MortgageLoan-Filenet
- Samples - LiveCycle ES - AcceptanceConfirmation
- Samples - LiveCycle ES - Dynamic Document Generation
- Samples - LiveCycle ES - End-To-EndMortgageApplication
- Samples - LiveCycle ES - End-To-EndMortgageApplicationGenerateCreditCheck
- Samples - LiveCycle ES - End-To-EndMortgageApplicationReceiveAgreement
- Samples - LiveCycle ES - MortgageLoan - Prebuilt
- Samples - LiveCycle ES - SecureFormCreation
- Samples - LiveCycle ES - SimpleMortgageLoan - Flex
- Samples - LiveCycle ES - SimpleMortgageLoan-FormGuide
- Samples - LiveCycle ES - SimpleMortgageLoan-HTML
- Samples - LiveCycle ES - SimpleMortgageLoan-PDF

4 System Requirements for Upgrading LiveCycle ES

This section is included as a reference. Upgrading from LiveCycle ES 8.0.x to LiveCycle ES 8.2 is done in place, and the same hardware and software platform on which LiveCycle ES 8.0.x is running is supported. However, you must update application servers with the applicable patches, which are listed in this section.

When you are ready to upgrade to LiveCycle ES 8.2, refer to the following document for instructions on performing the upgrade:

- *Upgrading to LiveCycle ES from 8.0.x for JBoss*
- *Upgrading to LiveCycle ES from 8.0.x for WebSphere*
- *Upgrading to LiveCycle ES from 8.0.x for WebLogic*
- *Upgrading to LiveCycle ES for JBoss Turnkey from 8.0.x*

LiveCycle ES patch updates

Before you install LiveCycle ES 8.2, ensure that you download any required patch updates, which are located at LiveCycle Technical Support.

Third-party infrastructure support

This section summarizes the referenced platform and database combinations for JBoss® Application Server 4.0.3 SP1 and 4.2.0, BEA WebLogic Server® 9.2 and 10.1, and IBM WebSphere® Application Server 6.1.0.7. To facilitate the use of WebLogic for joint Adobe and BEA customers, BEA has provided the BEA Download site from which you can download the exact version of WebLogic that LiveCycle ES requires.

Microsoft Windows Server

LiveCycle ES supports the following Microsoft Windows operating system:

- Windows Server 2003 Standard and Enterprise Edition SP2 and later (32-bit and 64-bit)
- Windows Server 2003 R2 Standard SP2 and later (32-bit and 64-bit)
- Windows Server 2003 Enterprise Edition R2 SP2 and later running on 32-bit, 64-bit, and VMWare ESX/GSX architectures

Note: Microsoft Windows XP is supported for nonproduction environments.

This table lists the supported application server, Java™ Development Kit (JDK), and database configurations for this operating system.

Application server	JDK	OS/JVM architecture	Database
Red Hat JBoss Application Server 4.0.3 SP1	Sun JDK 5.0 Update 11 or later updates to 5.0	32-bit OS and 32-bit JVM™	• MySQL 5.0 • IBM DB2 8.2, 9.1 • Oracle 9i, 10g • Microsoft SQL Server 2005 SP2
Red Hat JBoss Application Server 4.2.0	Sun JDK 5.0 Update 11 or later updates to 5.0	64-bit OS and 64-bit JVM	• MySQL 5.0 • IBM DB2 8.2, 9.1 • Oracle 9i, 10g • Microsoft SQL Server 2005 SP2
BEA WebLogic 9.2 (Advantage & Premium)	BEA JRockit® JDK supplied with application server	32-bit OS and 32-bit JVM	• IBM DB2 8.2, 8.1 FixPack 7a • Oracle 9i, 10g • Microsoft SQL Server 2005 SP2
BEA WebLogic 10.1 MP1 (Advantage & Premium)	BEA JRockit JDK	32-bit OS and 32-bit JVM	• MySQL 5.0
BEA WebLogic 10.1 MP1 (Advantage & Premium)	BEA JRockit JDK	64-bit OS and 64-bit JVM all others.	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g • Microsoft SQL Server 2005 SP2
IBM WebSphere 6.1.0.5 (Base & Network Deployment Edition) for in-place upgrade IBM WebSphere 6.1.0.7 (Base & Network Deployment Edition) **Note:** It is recommended that WebSphere installations use the latest Fixpack and SR.	JDK 1.5 SR4 available for download from IBM	32-bit OS and 32-bit JVM or 64-bit OS and 64-bit JVM	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g • Microsoft SQL Server 2005 SP2

Note: When using PDF Generator ES with a 64-bit application server, an additional 32-Bit JVM must be installed. For a detailed list of the supported database editions, see "Supported software" on page 35.

Red Hat Enterprise Linux and SUSE Linux

LiveCycle ES supports the following Red Hat Enterprise Linux and SUSE Linux operating systems:

- Red Hat Enterprise Linux AS or ES 4.0 (x86/EDT/AMD64 32-bit architectures)
- Red Hat Enterprise Linux AS or ES 5.0 (EDT/AMD64 64-bit architectures)
- SUSE Linux Enterprise Server 9.0 (x86/EDT/AMD64 32-bit architectures)
- SUSE Linux Enterprise Server 10.0 (EDT/AMD64 64-bit architectures)

This table lists the supported application server, JDK, and database configurations for the Red Hat Enterprise Linux AS or ES 4.0 and SUSE Linux Enterprise Server 9.0 operating systems.

Application server	JDK	OS/JVM architecture	Database
Red Hat JBoss Application Server 4.0.3 SP1	(Red Hat Linux) Sun JDK 5.0 Update 11 or later updates to 5.0.	32-bit OS and 32-bit JVM	• MySQL 5.0 • IBM DB2 8.2, 9.1 • Oracle 9i, 10g
BEA WebLogic 9.2 (Advantage & Premium)	BEA JRockit JDK	32-bit OS and 32-bit JVM	• Oracle 9i, 10g
IBM WebSphere 6.1.0.7 (Base & Network Deployment Edition 6) **Note:** It is recommended that WebSphere installations use the latest Fixpack and SR.	JDK 1.5 SR4 available for download from IBM	32-bit OS and 32-bit JVM	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g

Note: When using PDF Generator ES with a 64-bit application server, an additional 32-Bit JVM must be installed. For a detailed list of the supported database editions, see "Supported software" on page 35.

This table lists the supported application server, JDK, and database configurations for the Red Hat Enterprise Linux AS or ES 5.0 and SUSE Linux Enterprise Server 10.0 operating systems.

Application server	JDK	OS/JVM architecture	Database
Red Hat JBoss Application Server 4.2.0	Sun JDK 5.0 Update 11 or later updates to 5.0.	64-bit OS and 64-bit JVM	• MySQL 5.0 • IBM DB2 8.2, 9.1 (Red Hat only) • Oracle 9i, 10g
BEA WebLogic 10.1 MP1 (Advantage & Premium)	BEA JRockit JDK	64 bit OS and 64-bit JVM	• Oracle 9i, 10g
IBM WebSphere 6.1.0.7 (Base & Network Deployment Edition) **Note:** It is recommended that WebSphere installations use the latest Fixpack and SR.	JDK 1.5 SR4 available for download from IBM	64-bit OS and 64-bit JVM	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g

IBM AIX

LiveCycle ES supports the following IBM AIX operating system:

- AIX 5L 5.3 (64-bit and 32-bit architectures)

Note: It is recommended using the 64-bit architecture for AIX even when using the 32 bit JDK.

This table lists the supported application server, JDK, and database configurations for this operating system.

Application server	JDK	OS/JVM architecture	Database
IBM WebSphere 6.1.0.7 (Base & Network Deployment Edition)	JDK 1.5 SR4 available for download from IBM	64-bit OS and 64-bit JVM	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g
IBM WebSphere 6.1.0.7 (Base & Network Deployment Edition) **Note:** It is recommended that WebSphere installations use the latest Fixpack and SR.	JDK 1.5 SR4 available for download from IBM	64-bit OS and 32-bit JVM	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g

Note: For a detailed list of the supported database editions, see "Supported software" on page 35.

Sun Solaris

LiveCycle ES supports the Sun Solaris 9, 10 (SPARC® architectures) operating systems.

Caution: Do not use the Solaris tar command to extract files or errors (such as missing files) will occur. Download the GNU tar tool and use it to extract all files on a Solaris environment.

This table lists the supported application server, JDK, and database configurations for these operating systems.

Application server	JDK	OS/JVM architecture	Database
(Solaris 10 only) Red Hat JBoss Application Server 4.2.0	Sun JDK 5.0 Update 11 or later updates to 5.0.	64-bit OS and 64-bit JVM	• Oracle 9i, 10g
BEA WebLogic 9.2 (Advantage & Premium)	Sun JDK 5.0 Update 11 or later updates to 5.0.	64-bit OS and 32-bit JVM	• Oracle 9i, 10g
(Solaris 10 only) BEA WebLogic 10.1 MP1 (Advantage & Premium)	Sun JDK supplied with application server.	64-bit OS and 64-bit JVM	• Oracle 9i, 10g
IBM WebSphere 6.1.0.7 (Base & Network Deployment Edition) **Note:** It is recommended that WebSphere installations use the latest Fixpack and SR.	JDK 1.5 SR4 available for download from IBM.	64-bit OS and 64-bit JVM only on Solaris 10 64-bit OS and 32-bit JVM on Solaris 9 and 10	• IBM DB2 8.2, 9.1 • Oracle 9i, 10g

Note: For a detailed list of the supported database editions, see "Supported software" on page 35.

System requirements

This section provides the minimum and recommended hardware requirement for LiveCycle ES.

Minimum hardware requirements

This table provides the minimum hardware requirements that LiveCycle ES supports.

Operating system	Minimum hardware requirement
Microsoft Windows Server® 2003 Enterprise Edition or Standard Edition SP2 and R2 (32-bit and 64-bit architectures)	Intel® Pentium® 4, 2.8 GHz processor VMWare ESX 3.0 and 3.5 or VMWare Server 1.0 (formerly GSX) RAM: • 2 GB (32-bit OS) • 3 GB (64-bit OS) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES
Sun Solaris 9 and 10	UltraSPARC® IIe, 650 MHz processor RAM: • 3GB (64-bit OS with 64 bit JVM) • 2GB (64-bit OS with 32 bit JVM) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES
IBM AIX 5L 5.3	P4 pSeries 615 (Model 6C3) 7029-6C3, 1.2 GHz processor RAM: • 3GB (64-bit OS with 64 bit JVM) • 2GB (64-bit OS with 32 bit JVM) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES
SUSE Linux Enterprise Server 9.0 (32-bit edition only)	Pentium 4 or x86 equivalent, 1 GHz processor RAM: • 2 GB (32-bit OS) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES

Operating system	Minimum hardware requirement
SUSE Linux Enterprise Server 10.0 (64-bit edition only)	Pentium 4 or x86 equivalent, 1 GHz processor VMWare ESX 3.0 and 3.5 or VMWare Server 1.0 (formerly GSX) RAM: • 3GB (64-bit OS with 64 bit JVM) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES
Red Hat Enterprise Linux AS or ES 4.0 (32-bit edition only)	Pentium 4 or x86 equivalent, 1 GHz processor VMWare ESX 3.0 and 3.5 or VMWare Server 1.0 (formerly GSX) RAM: • 2 GB (32-bit OS) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES
Red Hat Enterprise Linux AS or ES 5.0 (64-bit edition only)	Pentium 4 or x86 equivalent, 1 GHz processor VMWare ESX 3.0 and 3.5 or VMWare Server 1.0 (formerly GSX) RAM: • 3GB (64-bit OS with 64 bit JVM) Free disk space: 5.4 GB of temporary space plus 3.4 GB for LiveCycle ES

Intel x86 compatibility

On supported Windows and Linux environments, LiveCycle ES supports Intel EDT64 and AMD64 compatible chipsets running either 32-bit or 64-bit supported operating systems.

Recommended hardware requirements

In addition to the minimum hardware requirements listed previously, here are the recommended hardware requirements for a small production environment:

Intel environments: Pentium 4, 2.8 GHz or greater. Using a dual core processor will further enhance performance.

Sun SPARC environments: UltraSPARC V or later.

IBM AIX environments: Power4 or later

Memory requirements: 4 GB of RAM.

Additional hardware requirement for LiveCycle Content Services ES

If you are installing LiveCycle Content Services ES for use with a DB2 database, you must have a minimum of 2 GB of RAM on the LiveCycle ES database computer.

Recommended hardware requirements for client-side machines

The following minimum RAM requirements are recommended for client-side computers that are used either for development or for end-user interactions. These computers will need adequate resources for running applications (such as LiveCycle Workbench ES, LiveCycle Workspace ES, Adobe Flash Player, Adobe Reader) according to the tasks they will perform.

Development environment hardware requirements:

- Workbench ES: 1 GB of RAM
- Adobe Flex® Builder 2.0.1 Hot Fix 2 or later, or Flex SDK 2.0.1 Hot Fix 2 or later: 1 GB of RAM (2 GB recommended)
- Adobe Flash Player 9 or later: 512 MB of RAM (1 GB recommended)
- Adobe Acrobat® Professional and Acrobat Pro Extended, versions 7.0 to 9.0: 1 GB of RAM

Note: For more information, see *Installing Your Development Environment*.

End-user hardware requirements:

- LiveCycle Workspace ES: 1 GB of RAM (includes requirements for Adobe Flash and Adobe Reader)
- Adobe Flash Player 9 or later: 512 MB of RAM (1 GB recommended)
- Adobe Reader 7.0.9: 128 MB of RAM (256 MB recommended)

Note: For web browser requirements, see "End-user user interface" on page 40.

Supported software

This table provides a summary of the application servers, web browsers, databases, database drivers, JDK versions, and LDAP servers that LiveCycle ES supports.

Required software	Supported version

Operating system	• Microsoft Windows
	  • Standard Server 2003 SP2 and later
	  • Enterprise Edition SP2 and later
	  • Standard Server R2 SP2 and later
	  • Enterprise Edition R2 SP2 and later running on 32-bit, 64-bit, and VMWare ESX/GSX architectures
	• (Workbench ES) Microsoft Windows
	  • Windows Vista 32 bit and 64 bit
	  • XP Professional SP2 and above Platform 32 bit
	  • XP Tablet PC SP2 and above 32 bit
	  • 2003 Server SP1 and above 32 bit and 64 bit
	• Sun Solaris 9 and 10
	• IBM AIX 5L 5.3
	• SUSE Linux Enterprise Server 9.0 (32-bit edition only)
	• Red Hat Enterprise Linux AS or ES 4.0 (32-bit edition only) or ES 5.0 (64-bit edition only)

Application server	• JBoss 4.0.3 SP1 • JBoss 4.2.0 • IBM WebSphere 6.1.0.7 (Base and Network Deployment editions) • BEA WebLogic 9.2 (Advantage and Premium editions) • BEA WebLogic 10.1 MP1 (Advantage and Premium editions) **Note:** To facilitate the use of WebLogic for joint Adobe and BEA customers, BEA provides the BEA Download site from which you can download the exact version of WebLogic that LiveCycle ES requires. **Note:** It is recommended that WebSphere installations use the latest FixPack and SR.
Web browser	For a list of web browsers, see "Web browser support" on page 40.

Required software	Supported version
JDK	• JBoss on all platforms: Sun JDK 1.5.0_11 (or later version of the 1.5.0 release) available at Sun Developer Network. • WebLogic on all platforms except Solaris: BEA JRockit SDK 1.5.0_06 or later updates of 1.5.0 • WebLogic on Solaris: Sun JDK 1.5.0_04. Requires the Daylight Savings Time (TZ) update, available at Sun Updater Tool, to be run in North America. • WebSphere on all platforms except Solaris: IBM JDK 1.5.0 SR4 (available for download from IBM). • WebSphere on Solaris: Sun JDK 1.5.0_09 For more information about JDKs, see "LDAP configuration" on page 49. To use AES 256 encryption, obtain and install the Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy files from the Java SE Downloads. **Note:** These requirements are optional and required only if you need to use Advanced Encryption Standard (AES) 256.
32-bit JDK (required for 64-bit Java application server only)	• Sun JDK 1.5.0_11 (or later version of the 1.5.0 release) available at Sun Developer Network. •
Database	• IBM DB2 8.2 or IBM DB2 9.1 **Caution:** Hot backup is not supported for DB2 on upgraded LiveCycle ES 8.2 environments. **Note:** If you are using WebLogic 10.1 MP1 with DB2 9.1 you need to contact BEA to obtain a custom patch that fixes a DB2 9.1 driver issue; otherwise, the JDBC connection does not function properly. • Microsoft SQL Server 2005 SP2 (Standard and Enterprise Edition) • MySQL 5.0.18 (InnoDB Engine) • Oracle 9i or 10g (Standard and Enterprise Editions) **Note:** LiveCycle ES is compliant with the database vendors' compatibility statements. (See the vendors' websites.)
Database driver	• IBM DB2 9.1 driver is required for all supported versions of DB2: db2jcc.jar and db2jcc_license_cu.jar • SQL Server 2005 JDBC 1.1: sqljdbc.jar • MySQL: mysql-connector-java-3.1.12-bin.jar (3.1.12) • Oracle 9i and 10g: ojdbc14.jar, Release 2 (10.2.0.2 Thin or later update of 10.2) **Note:** All LiveCycle ES Business Activity Monitoring metadata databases use the drivers listed above.

Required software	Supported version
LDAP server	• Sun ONE 5.1 • Sun ONE 5.2 • Microsoft Active Directory 2000 • Microsoft Active Directory 2003 • Novell® eDirectory 8.7.3 • IBM Tivoli Directory Server 6.0 • IBM Domino Enterprise Server 8.0 and later updates of 8.0
Email servers	• Microsoft Exchange 2000 • Microsoft Exchange 2003 • Microsoft Exchange 2007 • Lotus Notes/Domino 6/7 • SendMail (included with Red Hat 4/5 and SUSE 9) • Novel GroupWise 6/7

LiveCycle Data Services ES	• Adobe Flex® Builder™ 2.0.1 Hot Fix 2 or later
	or
	• Flex SDK 2.0.1 Hot Fix 2 or later
	• Flex is required for these tasks:
	  • Using LiveCycle Data Services ES
	  • Customizing form guides in LiveCycle Designer ES
	  • Customizing LiveCycle Workspace ES
	  • Creating Flex applications for LiveCycle Workspace ES
	  • Calling LiveCycle ES APIs using Flex

Required software	Supported version
LiveCycle ES connector	**Connector for EMC® Documentum®:** • EMC Documentum Content Server 5.3 (and later service packs) • EMC Documentum Content Server 6.0 (and later service packs) In addition, on your LiveCycle ES server, install the version of EMC Documentum Foundation Classes (DFC) that corresponds to your version of Content Server. (See *Documentum Foundation Classes Installation Guide* available from EMC Documentum.) **Connector for IBM FileNet:** • IBM FileNet P8 Content Engine 3.5.x • IBM FileNet P8 Content Engine 4.0.x • IBM FileNet P8 Process Engine 3.5.x • IBM FileNet P8 Process Engine 4.0.x **Note:** The version of Process Engine should correspond to the version of your Content Engine (for example, Process Engine 3.5.x for Content Engine 3.5.x). In addition, on your LiveCycle ES server, install the version of IBM FileNet P8 Content Java API that corresponds to your version of Content Engine (for example, 3.5.x Content Java API or 4.0.x Content Engine Java API). For a list of the required JAR files, see *Content Java API Developer's Guide* available from IBM FileNet. **Connector for IBM Content Manager:** • IBM Content Manager 8.3 (and later fix packs) In addition, on your LiveCycle ES server, install the version of IBM software that corresponds to your version of IBM Content Manager: • DB2 Universal Database Client (not required if IBM Content Manager is on same server as the LiveCycle ES server) • Information Integrator for Content (II4C) available from IBM **Note:** IBM Content Manager running on Oracle database is not supported.

Required software	Supported version

PDF client	• Adobe Acrobat® Professional and Acrobat Pro Extended, versions 7.0 to 9.0 (for securing documents with policies and opening policy-protected documents)
	• Adobe Reader, versions 7.0 to 9.0 (for opening policy-protected documents)
	• Acrobat Reader 6.0: The following limitations apply:
	  • LiveCycle Reader Extensions ES supports only UB3, which works down to Adobe Reader 7.0. Adobe Reader 6.0 supports UB2; LiveCycle ES does not generate files from UB2.
	  • Files from previous versions of Reader Extensions ES work for submitting forms online or by email.
	  • Designer ES, version 8.2, can create PDF forms that support Adobe Reader 6.0.2 and later.
	  • Workspace ES requires Adobe Reader 7.0.5 (and later), 8.0 (and later), 8.1 (and later), and 9.0 (and later).
	• Apple® QuickTime 7 Player or Pro (for converting embedded video to PDF multimedia)

Minimum database user permissions

This section outlines the minimum database permissions required by the user performing the LiveCycle ES database initialization and by runtime users.

Database	Initialization permissions	Runtime permissions
Oracle	CREATE SESSION	CREATE SESSION
	CREATE CLUSTER	CREATE CLUSTER
	CREATE TABLE	UNLIMITED TABLE SPACE
	CREATE VIEW	
	CREATE SEQUENCE	
	UNLIMITED TABLE SPACE	
MySQL	CREATE	SELECT
	DROP	INSERT
	REFERENCES	UPDATE
	ALTER	DELETE
	INDEX	
	CREATE_NEW	
	SELECT	
	INSERT	
	UPDATE	
	DELETE	

Database	Initialization permissions	Runtime permissions
SQL Server - DB level	Create Table Create View Connect	Connect
SQL Server - Schema level	Alter Insert References Select Update Delete	Insert Select Update Delete
DB2	Refer to "DB2 user account" on page 52 for a complete description.	Refer to "DB2 user account" on page 52 for a complete description.

Web browser support

This section outlines the supported web browsers for the LiveCycle ES user interfaces.

End-user user interface

End-user components include these solution components:

- LiveCycle Workspace ES (Flash Player required)
  - Adobe Flash Player 9.0.115.0 or later is required for Workspace ES or for using form guides in Workspace ES.
- LiveCycle Reader Extensions ES (Flash Player required)
- LiveCycle Rights Management ES (browser only)
- LiveCycle PDF Generator ES and LiveCycle PDF Generator 3D ES (browser only)

Operating system	Flash Player	Supported browser
Microsoft Windows Vista™	Flash Player 9*	Microsoft Internet Explorer 7 or later(1) Firefox 2.0.0.1 or later(1)
Windows 2000	Flash Player 9*	Internet Explorer 6 or later(1) Firefox 2.0.0.1 or later(1)
Windows XP	Flash Player 9*	Internet Explorer 6 or later(1) Firefox 2.0.0.1 or later(1)
Windows Server 2003	Flash Player 9*	Internet Explorer 6 or later(1) Firefox 2.0.0.1 or later(1)

Operating system	Flash Player	Supported browser
OS X v 10.4.x (PowerPC)	Flash Player 9*	Safari 2.x or later (Workspace ES requires version 3.0.3 or later)(2)
OS X v 10.4.x (Intel)	Flash Player 9*	Safari 2.x or later (Workspace ES requires version 3.0.3 or later)(2)

(1)"or later" includes maintenance revisions. For example, LiveCycle ES supports Microsoft Internet Explorer 7 and Firefox 2.0.0.1 and maintenance versions of these releases.

(2)Workspace ES supports Internet Explorer and Firefox on Windows but only Safari 3.0.3 or later on the Mac platform.

Administrator user interface

This table outlines the supported web browsers for the LiveCycle Administration Console user interface.

Operating system	Flash Player	Supported browser
Microsoft Windows Vista	N/A	Internet Explorer 7 or later(1) Firefox 2.0.0.1 or later(1)
Windows 2000	N/A	Internet Explorer 6 or later(1) Firefox 2.0.0.1 or later(1)
Windows XP	N/A	Internet Explorer 6 or later(1) Firefox 2.0.0.1 or later(1)
Windows Server 2003	N/A	Internet Explorer 6 or later(1) Firefox 2.0.0.1 or later(1)
OS X v 10.4.x (Intel)	N/A	Safari 2.x or later(1)

(1)"or later" includes major revisions. For example, Microsoft Internet Explorer 6.0 or later also covers Microsoft Internet Explorer 7.0

Additional requirements for Linux or UNIX operating systems

The installer for LiveCycle ES requires the bc tool to be available on the Linux or UNIX system. Usually, the bc tool (an arbitrary precision calculator language) is present by default. Ensure that this tool is installed on the system before you run the installer. If the tool is not present, error messages occur that warn about the lack of disk space because the bc tool is used to compute whether or not enough disk space is available before starting the installation. Your operating system vendor may provide the bc tool, or you can get the GNU bc tool at ww.gnu.org.

Note: To verify that the tool is available, execute `which bc` from the shell. If the tool is available, the path to the program is displayed.

Additional requirements for PDF Generator ES and PDF Generator 3D ES

This section applies only if your LiveCycle ES installation includes LiveCycle PDF Generator ES or LiveCycle PDF Generator 3D ES. If you are not installing PDF Generator ES, proceed to "Additional requirements for Connector for IBM Content Manager" on page 45.

User account on Windows

You must use the same user account for the following tasks:

- Installing Microsoft Office
- Installing PDF Generator ES or PDF Generator 3D ES
- Installing Acrobat 9.0 Professional Extended for PDF Generator ES or PDF Generator 3D ES
- Running the application server process

Using 64-bit application servers with PDF Generator ES and PDF Generator 3D ES

If you are using a 64-bit application server on a Windows or UNIX system with PDF Generator ES or PDF Generator 3D ES, you must ensure that a supported 32-bit Java 5 JDK is installed in addition to the 64-bit one the application server uses. You must set the following environment variable.

```
JAVA_HOME_32
```

Note: PDF Generator 3D ES is supported on Windows environments only.

➤ **To set the Windows JAVA_HOME_32 variable:**

1. Select **Start** > **Control Panel** > **System**.
2. Click the **Advanced** tab**.**
3. Click **Environment Variables** and, under System Variables, click **New.**
4. Enter the environment variable `JAVA_HOME_32`. This directory is the directory that contains the JDK. For example, type the following code:

   ```
   D:\Program Files\Java\jdk1.5.0_14
   ```

➤ **To set the JAVA_HOME_32 environment (UNIX and Linux):**

Set the JAVA_HOME_32 variable for the supported Java SDK for Borne and Bash shells as shown in this example:

```
JAVA_HOME_32=/opt/jdk1.5.0_11
export JAVA_HOME_32
```

Note: The specific path varies based on the installation directory you specified and the operating system you are installing on.

➤ **To set the PATH environment variable (UNIX and Linux):**

Set the PATH variable for Borne and Bash shells as shown in this example:

```
PATH=$JAVA_HOME/bin:$PATH
export PATH
```

Native file conversion software installation

Before you install PDF Generator ES or PDF Generator 3D ES, install the software that supports the file formats for which PDF conversion support is required and manually activate the licenses for the software. You must activate one license on your LiveCycle ES server for each native application that PDF Generator ES or PDF Generator 3D ES supports. Refer to the individual licensing agreement for each native application that your LiveCycle ES deployment will support, and ensure that your LiveCycle ES deployment meets the licensing requirements specified. Typically, each LiveCycle ES user who will use native application support must also have an activated license on their own computer for the native application.

PDF Generator ES or PDF Generator 3D ES can be extended to convert these additional file types to PDF files by using the following applications:

- Microsoft Office 2000, XP, or 2003 (DOC, XLS, PPT, RTF, TXT)
- Microsoft Office 2007 (DOC, XLS, PPT, RTF, TXT, Microsoft Office open XML Formats)
- Microsoft Office Visio 2003, 2007 (VSD)
- Microsoft Publisher 2003, 2007 (PUB)
- Microsoft Project 2003, 2007 (MPP)
- AutoCAD 2005, 2006, 2007, 2008 (DWG, DXF, DWF)
- Corel WordPerfect 12 (WPD)
- Adobe Photoshop® CS2
- Adobe FrameMaker® 7.2, 8 (FM)
- Adobe PageMaker® 7.0 (PMD, PM6, P65, PM)
- OpenOffice 2.4 and 3.x (ODT, ODP, ODS, ODG, ODF, SXW, SXI, SXC, SXD)

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

- Print files (PS, PRN, EPS)
- Web files (HTML)
- Image files (JPEG, GIF, BMP, TIFF, PNG)

Acrobat

PDF Generator ES or PDF Generator 3D ES requires that Acrobat 9 Pro Extended is installed. You must install Acrobat before you run the LiveCycle ES installer. Acrobat Pro Extended is provided with the LiveCycle ES media or as an option for ESD downloads.

However, if LiveCycle ES is installed (or upgraded from a previous version) and Acrobat Pro Extended is not installed, you need to install Acrobat Pro Extended and then run the Acrobat_for_PDFG_Configuration.bat script, located in *[LiveCycle ES media]*\JBoss_EFGJ_DVD\additional\scripts. Otherwise, PDF conversions may fail.

You also need to update the `Acrobat_PATH` environment variable and restart the application server.

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

To use AES 256 encryption, you must obtain and install the Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy files from Java SE Downloads.

Note: These requirements are optional and required only if you need to use Advanced Encryption Standard (AES) 256 with Acrobat 9 Pro Extended.

QuickTime 7

PDF Generator ES or PDF Generator 3D ES requires that QuickTime 7 (Player or Pro) is installed if you want to convert video embedded in files, such as PowerPoint presentations to PDF multimedia files. This application is available from the Apple Downloads site.

Setting Windows environment variables

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

The names of these environment variables are listed here:

- `FrameMaker_PATH`
- `Notepad_PATH`
- `OpenOffice_PATH`
- `PageMaker_PATH`
- `Photoshop_PATH`
- `WordPerfect_PATH`

These environment variables are optional and need to be set only if you plan to use the corresponding application to convert PDF files through PDF Generator ES or PDF Generator 3D ES. The value of the environment variable should contain the absolute path of the executable that is used to start the corresponding application.

For example, the variable `Photoshop_PATH` may contain the value `D:\Program Files\Adobe\Adobe Photoshop CS3\Photoshop.exe`. However, `OpenOffice_PATH` is different from others. This variable must be set to the OpenOffice installation folder (instead of the path to the executable). A typical value of `OpenOffice_PATH` on Windows would be `C:\Program Files\OpenOffice.org 2.0\`.

Paths for Microsoft Office applications such as Word, PowerPoint, Excel, Visio, and Project or for AutoCAD are not required. The Generate PDF service starts these applications automatically if they are installed on the server.

➤ **To set the Windows environment variables:**

1. Select **Start** > **Control Panel** > **System**.
2. Click the **Advanced** tab**.**
3. Click **Environment Variables** and, under System Variables, click **New.**
4. Enter the environment variable name you need to set (for example**,** `Photoshop_PATH`). This directory is the directory that contains the executable file. For example, type the following code:

```
D:\Program Files\Adobe\Adobe Photoshop CS3\Photoshop.exe
```

IPP Client installation

PDF Generator ES includes an Internet Printing Protocol (IPP) client installer for installation of the PDF Generator ES Internet printer. After the installation is completed, a PDF Generator ES printer is added to the list of existing printers on the clients computer. This printer can then be used to send documents for conversion to PDF. For more information about installing the IPP client, see *Installing and Deploying LiveCycle ES* document for your application server.

Note: The PDF Generator ES IPP Client is only supported on the following 32-bit Windows platforms: Windows XP, Windows 2000, Windows Server 2003, Windows Vista.

Service Control Manager command line tool

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

Headless mode configuration

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

Additional requirements for Connector for IBM Content Manager

These requirements are optional and required only if you are installing LiveCycle ES Connector for IBM Content Manager.

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

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

The following sections describe how to configure these applications. Specific application server configurations are described in the "Post-Deployment Activities" chapter in the *Installing and Deploying LiveCycle ES* document for your application server.

➤ **To configure the connection for a single IBM Content Manager datastore:**

1. Start the DB2 Configuration Assistant.
2. Click **Selected** > **Add Database Using Wizard**.
3. Select **Manually Configure a Connection to a Database** and click **Next**.
4. Select **TCP/IP** and click **Next**.
5. Specify the following TCP/IP communication options and then click **Next**:

- In the **Host Name** box, type the host name of the server hosting DB2 Content Manager.
- Leave the Service Name box empty.
- In the **Port Number** box, type the port number. The default DB2 Content Manager port number is 50000.

6. In the **Database Name** box, type the IBM Content Manager datastore name and, in the **Database Alias** box, type the alias name for the datastore and then click **Next**.
7. Click **Next** to accept the default data source settings.
8. In the **Operating System** list, select the operating system you are using and then click **Next**.
9. Specify the following system options and then click **Next**:
   - In the **System Name** box, type the server name hosting DB2. If you click Discover, DB2 Content Manager searches for the system name you specified and, if the system is not found, all of the DB2 instances are listed.
   - In the **Host Name** box, type the name of the host, or click View Details to show the domain and IP address of the system you named in the previous step.
   - In the **Operating System** list, select the operating system (Windows, Linux, or AIX) on which you deployed DB2 Content Manager.
10. (Optional) To specify Security options, select **Use Authentication Value in Server's DBM Configuration** and click **Finish**.
11. In the Test Connection dialog box, test the connection as required.

➤ **To configure connections for multiple IBM Content Manager datastores:**

1. Configure the initial connection by following the steps in "To configure the connection for a single IBM Content Manager datastore:" on page 45.
2. Add additional database connections by modifying the cmbicmsrvs.ini file (the file that stores the datastore information) as follows:
   - From a command prompt window, change the directory to *[II4C home]*/bin (for example, C:\program files\db2cmv8\ on Windows **or** /opt/IBM/db2cmv8 on Linux or UNIX).
   - Run the cmbenv81.bat (Windows) or cmbenv81.sh (UNIX/Linux) file to set the environment and the classpath for the Java Utilities of II4C.
   - Change the directory to *[II4C working directory]*/cmgmt/connectors where *[II4C working directory]* is one of the following paths:

     (Windows) C:/Program Files/db2cmv8

     (Linux, AIX) /home/ibmcmadm

     (Solaris) /export/home/ibmcmadm
   - Run the command `java com.ibm.mm.sdk.util.cmbsrvsicm -a add -s <library server database name> -sm <database schema name>`, where `<library server database name>` is the same as `Database Alias` configured in step 6 above.

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

➤ **To configure a multiuser connection to the IBM Content Manager datastore:**

1. From a command prompt window, change the directory to *[II4C home]*/bin (for example, C:\program files\db2cmv8\ on Windows **or** /opt/IBM/db2cmv8 on Linux or UNIX).
2. Run the cmbenv81.bat (Windows) or cmbenv81.sh (UNIX/Linux) file to set the environment and the classpath for the Java Utilities of II4C.
3. Change the directory to *[II4C working directory]*/cmgmt/connectors, where *[II4C working directory]* is one of the following paths:

   (Windows) C:/Program Files/db2cmv8

   (Linux, AIX) /home/ibmcmadm

   (Solaris) /export/home/ibmcmadm
4. Run the command `java com.ibm.mm.sdk.util.cmbenvicm -a add -s <library server database name> -u <database user ID> -p <database password>`, where `<library server database name>` is the same as `Database alias` configured in step 6 above.

Additional upgrade requirements for Content Services ES

If your LiveCycle ES 8.0.x environment includes a DB2 database and you are installing Content Services ES with your 8.2 upgrade, you must create and run the following script before you perform your installation.

➤ **To prepare for installing Content Services ES with your 8.2 upgrade:**

1. In a text editor, copy the following script:

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

```
connect to [dbname];

CREATE BUFFERPOOL BP32K1 SIZE 50 PAGESIZE 32768 NOT EXTENDED STORAGE;

CREATE TEMPORARY TABLESPACE [dbname]_TEMP_32K IN DATABASE PARTITION
GROUP IBMTEMPGROUP PAGESIZE 32768 MANAGED BY SYSTEM USING
('DB2_root\[dbname]k_TEMP') EXTENTSIZE 32 PREFETCHSIZE 16 BUFFERPOOL
BP32K1;

CREATE REGULAR TABLESPACE [dbname]_DATA_32K IN DATABASE PARTITION GROUP
IBMDEFAULTGROUP PAGESIZE 32768 MANAGED BY DATABASE USING
(FILE'DB2_root\[dbname]k_DATA'9000) EXTENTSIZE 16

PREFETCHSIZE 16 BUFFERPOOL BP32K1;

commit work;

deactivate database [dbname];

activate database [dbname];
```

2. Make the following changes to the script:
   - Replace the instances of *dbname* and *DBNAME* with the name of your LiveCycle ES 8.0.x database.
   - Replace *DB2_root* with the path to the root directory where DB2 is installed.
   - Ensure that no commands include line breaks and each command is terminated by a semicolon (;).
   - Change `9000` in the following line based on your database size:

```
(FILE'DB2_root\DBNAME_DATA'9000)
```

This number specifies the minimum number of pages that is required to initialize the database. You can also change this number by using the DB2 administration tools after you initialize the database.

3. Save the text file in a location that DB2 Command Line Processor can access.
4. Open a DB2 command prompt and type the following command to run the script:

```
db2 -tf <path_to_script_file>/<script_file_name>
```

LDAP configuration

This configuration is optional and required only if you are using an LDAP directory to authenticate users. When you upgrade LiveCycle Policy Server 7.x or Rights Management ES 8.0, LDAP configuration settings are automatically migrated.

Install and configure your LDAP server and database according to the vendor's documentation. For a list of supported LDAP servers, see "Supported software" on page 35. Make note of the LDAP administrator name and password to use during the LiveCycle ES configuration process. Configure LiveCycle ES to connect with the LDAP database after you install and deploy your LiveCycle ES services. This configuration is done by using the User Manager service. See the *Installing and Deploying LiveCycle ES* document for your application server.

Global document storage directory

The global document storage (GDS) directory is used to store long-lived files that are used within a process as well as critical LiveCycle ES product components. The lifetime of long-lived files is intended to span multiple restarts of a LiveCycle ES system, and can span for days and even years. These files may include PDF files, policies, or form templates. Long-lived files are a critical part of the overall state of many LiveCycle ES deployments. If some or all long-lived documents are lost or corrupted, the LiveCycle ES server may become unstable. Input documents for asynchronous job invocation are also stored in the GDS directory and must be available in order to process requests. Therefore, it is important that you consider the reliability of the file system that hosts the GDS directory.

Planning and creating the global document storage directory

You should plan the location, size, and security aspects of your GDS directory in advance (see "Location of the global document storage directory" on page 49, "Sizing factors for the global document storage directory" on page 50, and "Securing the global document storage directory" on page 50). You should also plan the backup strategy and practices that you will implement (see "Backing up the global document storage directory" on page 50).

You must create the GDS directory before you initialize the LiveCycle ES database.

Location of the global document storage directory

You can reconfigure the location of your GDS directory with LiveCycle Configuration Manager after you upgrade LiveCycle ES. The GDS directory you specify should be highly available and should have low access time to enhance performance.

If you leave the location setting empty during installation, the location defaults to a directory under the application server installation:

- (JBoss) *[appserver root]*/server/<server>/all/svcnative/DocumentStorage
- (WebLogic) *[appserverdomain]*/<domain>/adobe/<server>/DocumentStorage
- (WebSphere) *[appserver root]*/installedApps/adobe/<server>/DocumentStorage

You can change the GDS directory location after completing the upgrade (see *Administering LiveCycle ES*), but this is not a trivial procedure. Plan an appropriate location for the GDS directory that will be long-lived.

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:\.

Sizing factors for the global document storage directory

The size of the shared directory depends on expected LiveCycle ES usage factors for the deployment. You should allocate a minimum of 10 GB of disk space for the GDS directory, but the following factors also affect the sizing:

- The typical volume of documents that LiveCycle ES processes. Processing high volumes of documents requires a larger GDS directory.
- The typical size of documents that LiveCycle ES processes. Processing large documents requires a larger shared GDS directory.
- The complexity of documents that LiveCycle ES processes. Processing complex documents (that is, documents that are processed by multiple LiveCycle ES services) requires a larger GDS directory.

Securing the global document storage directory

Access to the GDS directory must be secure. The long-lived documents in this directory may contain sensitive user information, such as information that requires special credentials when accessed by using the LiveCycle ES SDK or user interfaces.

Use a security method that is appropriate to your operating system. It is recommended that only the operating system account that is used to run the application server has read and write access to this directory.

Note: Incorrectly deleting files or directories from the GDS directory can render the LiveCycle ES installation inoperative.

Backing up the global document storage directory

The GDS directory should be backed up to allow administrators to restore LiveCycle ES in case of failure. (See *Administering LiveCycle ES*.)

If the GDS directory becomes unavailable or is lost due to failure, LiveCycle ES will not run until the GDS directory and database are restored by a consistent back up or LiveCycle ES is reinitialized with a new installation.

LiveCycle ES Business Activity Monitoring requirements

The following recommendations are required only if you are installing the LiveCycle ES Business Activity Monitoring solution component.

Basic requirements

This section describes the basic requirements for installing, deploying, and running Business Activity Monitoring. It covers the following requirements:

- Dedicated JVM
- Client memory
- Web browser
- Mail server

Dedicated JVM

Business Activity Monitoring requires a dedicated JVM. If you are deploying LiveCycle ES and Business Activity Monitoring on the same computer, be aware that Business Activity Monitoring must run on a dedicated JVM. This requires that Business Activity Monitoring is deployed separately from LiveCycle ES as follows:

- If deployed on JBoss, the two applications must be deployed on two completely separate JBoss implementations.
- If deployed on WebLogic or WebSphere, the two applications must be deployed on completely separate server definitions.

Client memory

The client computer that accesses Business Activity Monitoring should have a minimum of 512 MB RAM (1.0 GB is recommended).

Web browser

Business Activity Monitoring is tested for Microsoft Internet Explorer 6.0 (with patch 828750) or later browser for accessing BAM Workbench.

Note: You must also install Adobe Flash, version 8.0 or later.

Note: If your implementation of Business Activity Monitoring is running in an Asian language, you must configure the browser for the appropriate language support. See the documentation for Internet Explorer or Windows.

Mail Server

Business Activity Monitoring requires a running Simple Mail Transfer Protocol (SMTP) email server for delivering email notifications. The server is external to Business Activity Monitoring and is managed by your email system administrator. Contact that administrator to set up an account specifically for Business Activity Monitoring. You need an account and password for sending mail, an address to use in the From address field, and the name of the email server host.

Creating the Business Activity Monitoring metadata database

You must create a Business Activity Monitoring metadata database to store the definitions of the process metrics that BAM Server monitors, as well as the details of any alerts and object run-time data that need to be persisted to disk.

Because Business Activity Monitoring metadata can grow quite large, you must allocate at least 50 MB for the BAM Server metadata database. For production deployments, allocate at least 200 MB.

BAM Server can require specific settings for some aspects of the BAM Server metadata database configuration. The settings depend on the type of application server that is hosting BAM Server and the type of database server that is used to store the BAM Server metadata.

The following three tables provide information about which databases are supported for BAM Server metadata databases for JBoss, Weblogic, and WebSphere.

You need to create a user account that BAM Server can use to connect to the BAM Server metadata database. For database permissions, see "Minimum database user permissions" on page 39.

JBoss requirements

The following tables describe the database and system requirements for installing and deploying Business Activity Monitoring on JBoss Application Server.

Disk space: 115 MB

Metadata database:

Database	JDBC driver
DB2 8.2	• db2jcc.jar • db2jcc_license_cu.jar
Oracle 9.2 or later	• Oracle thin driver (ojdbc14.jar) • Oracle thick driver (OCI) **Note:** Use the Oracle 10G JDBC driver for both configurations.
MS SQL Server 2000	• sqljdbc.jar OR • mssqlserver.jar • msbase.jar • /msutil.jar **Note:** The sqljdbc.jar driver is backward-compatible to version 2000.

Database	JDBC driver
MS SQL Server 2005	• sqljdbc.jar **Note:** Ensure that the version 2000 drivers are not in the classpath.
MySQL 5.0 or later	• mysql-connector-java-[version]-bin.jar

Note: A Microsoft issue exists with the sqljdbc.jar driver, which is addressed in the Microsoft Knowledge Base Article 917054.

Note: The sqljdbc.jar driver is backward-compatible to version 2000. However, if you use the 2005 driver (sqljdbc.jar), ensure that the version 2000 drivers are not in the classpath.

WebLogic requirements

The following table describes the database and system requirements for installing and deploying Business Activity Monitoring on WebLogic Server.

Disk space: 750 MB

Metadata database:

Database	JDBC driver
IBM DB2	db2jcc.jar db2jcc_license_cu.jar
SQL Server 2000 plus SP3 or later	Embedded BEA drivers for MS SQL Server
SQL Server 2005	Embedded BEA drivers for MS SQL Server
MySQL 5.0 or later	mysql-connector-java-[version]-bin.jar
Oracle 9.2 or later	Embedded BEA drivers for Oracle thin or thick drivers

WebSphere requirements

The following table describes the database and system requirements for installing and deploying Business Activity Monitoring on WebSphere Application Server.

Metadata database:

Database	JDBC driver
IBM DB2	• db2jcc.jar • db2jcc_license_cu.jar
MS SQL Server 2000	• mssqlserver.jar • msbase.jar • msutil.jar
MS SQLServer 2005 (WebSphere 6.1.x only)	Use the native WebSphere drivers.
MySQL 5.0 or later	mysql-connector-java-[version]-bin.jar
Oracle	ojdbc14.jar (from version 10g) **Note:** You can use either the OCI (thick) or thin driver. Use of the thick driver requires installation of the Oracle Client.

Installation considerations

This section includes considerations for administrators when installing LiveCycle ES.

Installing from network drives

It is recommended that you install LiveCycle ES only from the installation media or a local disk drive. Attempting to install the software over a network results in considerable delays in starting and installing. It is also likely that installing from a network drive will add to the length of the directory path, which will cause the LiveCycle ES installer to prevent the installation from proceeding.

Using LiveCycle ES with a Luna HSM cluster

When using a SafeNet Luna ethernet-attached Hardware Security Module (HSM) cluster, you must ensure HAOnly mode is enabled on the device.

➤ **To enable HAOnly mode on the Luna device**

1. Use the vtl tool shipped with the Luna client to determine if HAOnly mode is enabled. Type:

   ```
   vtl haAdmin –HAOnly -show
   ```

2. 1) If HAOnly mode is not enabled, type:

```
vtl haAdmin –HAOnly -enable
```

Manual use of Acrobat restricted

If you installed the PDF Generator ES or PDF Generator 3D ES for native document conversion, use of the bundled Acrobat installation is restricted to the Generate PDF and Generate 3D PDF services and is not licensed for any other use.

Restricted use of unlicensed Process Management ES functionality

When you install LiveCycle ES in a production environment without licensing Process Management ES, some core Process Management ES functionality is available but not the following notable exceptions:

- Run a long-lived process
- Use a "User Task" in a process
- Access Workspace ES

If you require any of these features, you must purchase the appropriate license.

LiveCycle ES IPv6 support

LiveCycle ES 8.2 introduces IPv6 support. The default configurations defined in the installation documentation for LiveCycle ES set IPv4 as the default IP protocol because this protocol has the most compatibility with third-party infrastructure. It is recommended that IPv6 is not enabled unless there is a specific requirement for it in your deployment. The number of supported platform configurations is reduced when enabling IPv6 support with LiveCycle ES. It is recommended that you verify that all third-party software, hardware, and networks that you plan to use have IPv6 support before you attempt to enable IPv6.

Caution: When installing on a pure IPv6 WebSphere Application Server environment (that is, no IPv4 addresses at all), you must configure and deploy the LiveCycle ES EAR files manually. The tasks required are as follows:

- Run LiveCycle Configuration Manager to configure LiveCycle ES
- Manually configure WebSphere
- Manually deploy the LiveCycle ES EAR files

Once these tasks are done, run the following tasks on LiveCycle Configuration Manager:

- Initialize the LiveCycle ES database
- Deploy the LiveCycle ES components
- Validate the LiveCycle ES component deployment

Processes with document form variables and digital signatures

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

Here are possible solutions for avoiding this problem; choose the method that is most appropriate for your LiveCycle ES environment:

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

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

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

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