

Migrating, Installing, and Configuring ADOBE® CONNECT™ 9

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Chapter 1: About this document

What this document contains

This document explains how to install, configure, and deploy Adobe® Connect™ 9.3 and the associated components. The document also covers the pre-install requirements and post-install tasks, such as verification, manual settings, system security, and administration tasks.

To refer to install, configure, and deploy instructions of the other versions of Adobe Connect, see the catalog of all documents at http://www.adobe.com/go/learn_Connect_doclisting_en.

Who should read this document

This document is intended for users who are installing, configuring, administering, or deploying Adobe Connect and the associated components. These users include Adobe Connect evaluators, administrators, developers, and Adobe partners.

Conventions used in this document

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

| Name | Default value | Description |
|--------------------|---------------|--|
| [root_install_dir] | C:\Connect | The default installation directory where Adobe Connect 9.3 gets installed is C:\Connect\9.3.1\ . However, the content and the logs are placed in C:\Connect\ folder. |
| [extract_dir] | NA | The location on your hard disk where you extract the files from the Adobe Connect ESD file. |

Useful resources

Following resources can help you learn more about and troubleshoot Adobe Connect.

| For information about | See |
|---|--|
| Help and support for Adobe Connect | Adobe Connect Help |
| Adobe Connect forums, tutorials, whitepapers, partner showcase, events, and latest news | Adobe Connect User Community |
| Using Adobe Connect guide | Using Adobe Connect guide |
| A list of Adobe Connect resources | Adobe Connect resources |
| Adobe Connect videos on Adobe TV | Adobe Connect on Adobe TV |

| For information about | See |
|---|--|
| Adobe Connect downloads and updates like, meeting add-ins, patches for on-site deployments, extensions, and so on | Adobe Connect downloads and updates |
| Get the latest Adobe Connect add-in | Latest add-in for Windows Latest add-in for Mac |
| SDKs and learning materials to help developers extend the functionality of Adobe Connect for end users | Adobe Connect Development Center |
| Adobe Connect news, announcements, best practices, and how-to instructions | Adobe Connect official blog |
| Troubleshooting the installation, deployment, and configuration issues | Adobe Connect Support blog |

Chapter 2: Preparing for migration, installation, and configuration

Installation requirements

The techniques you use to install Adobe® Connect™ depend on the type of installation you are performing.

- If you are installing Adobe Connect for the first time, review the installation requirements, supported configurations, and technical overview. Then see “[Installing or Upgrading to Adobe Connect 9](#)” on page 22.
- If you are migrating from a previous version of Adobe Connect, review the information that explains what’s new in this version. Then see “[Preparing to migrate](#)” on page 6.

Hardware, software, and user requirements

For Adobe Connect and Adobe Connect Edge Server requirements, see www.adobe.com/go/adobeconnect_techspecs.

Port requirements

The following table describes ports on which users must be able to establish TCP connections.

| Number | Bind Address | Access | Protocol |
|--------|---------------|--------|--------------|
| 80 | */Any Adaptor | Public | HTTP, RTMP |
| 443 | */Any Adaptor | Public | HTTPS, RTMPS |
| 1935 | */Any Adaptor | Public | RTMP |

Note: RTMP (Real Time Messaging Protocol) is an Adobe protocol.

The following table describes the ports open inside a cluster. Each Adobe Connect server in a cluster must be able to establish TCP connections to all other servers in the cluster on these ports.

Note: These ports should not be open to the public, even if you are not using a cluster.

| Number | Source Port | Bind Address | Access | Protocol |
|--------|-------------|---------------|---------|----------|
| 8506 | Any | */Any Adaptor | Private | RTMP |
| 8507 | Any | */Any Adaptor | Private | HTTP |

Each Adobe Connect server in a cluster must be able to establish a TCP connection to the database server on the following port:

| Number | Source Port | Access | Protocol |
|--------|-------------|---------|----------|
| 1433 | Any | Private | TSQL |

The following table describes server ports that Adobe Connect uses to communicate internally. These ports must not be in use by any other process or program on a server hosting Adobe Connect, or Adobe Connect may fail to start.

| Number | Bind Address | Access | Protocol |
|--------|---------------|----------|----------|
| 1111 | 127.0.0.1 | Internal | RTMP |
| 2909 | 127.0.0.1 | Internal | RMI |
| 4111 | */Any Adaptor | Internal | JMX |
| 8510 | 127.0.0.1 | Internal | HTTP |

If you are installing an integrated or custom telephony adaptor, each Adobe Connect server in a cluster must have the following port available:

| Number | Bind Address | Access | Protocol |
|--------------|---------------|--|----------|
| 9080 or 9443 | */Any Adaptor | Public if using InterCall or Arkadin telephony adaptor; internal otherwise | HTTP |

Some integrated telephony adaptors require access to specific ports in addition to the ports listed in the tables above. These ports are listed in the information for each adaptor; see [“Preparing to install integrated telephony adaptors”](#) on page 16.

For information about Flash Media Gateway ports, see [“Flash Media Gateway ports and protocols”](#) on page 47.

Ports in the range 8088-8093 are used by Adobe® CQ for clustering. For more information, see [CRX Clustering](#). Default ports for CQ Author and Publish servers are 4502 and 4503, respectively. On the system(s) where CQ is installed, free the ports in this range.

Supported configurations

Supported Adobe Connect-Adobe CQ configurations

Adobe Connect uses Adobe® CQ technology to create and manage event and email templates, and event catalog. Adobe CQ Author and Publish servers support authoring and publishing, respectively. CQ Author and CQ Publish servers can be installed with Adobe Connect either on a single machine or on separate machines. Also, a cluster of CQ Author server, CQ Publish server, or both, can exist with a server or a cluster of Adobe Connect.

Supported server-database configurations

Adobe Connect uses a database to store information about users and content. The Adobe Connect 9.3 installer includes Microsoft® SQL Server® 2008 Express Edition and supports Microsoft SQL Server 2008 Enterprise Edition and Microsoft SQL Server 2012 Enterprise Edition.

The following are the supported Adobe Connect and database configurations:

Single server with embedded database engine Install Adobe Connect on a single computer and install the embedded database engine (included on the Adobe Connect installer) on the same computer. The embedded database engine is Microsoft SQL Server 2008 Express Edition.

Note: This configuration should be used only in testing environments, not in production environments.

Single server with SQL Server Install Adobe Connect on a single computer and install MicrosoftSQL Server on the same computer.

Single server with an external SQL Server database Install Adobe Connect on a single computer and install SQL Server on another computer.

Single server with multiple external SQL Server databases Install Adobe Connect on a single computer and install SQL Server on multiple computers (also called a cluster) external to Adobe Connect. Adobe Connect supports mirroring and clustering of the SQL Server databases.

Multiple servers with an external SQL Server database Install Adobe Connect on multiple servers (also called a cluster) and install SQL Server on another computer.

Multiple servers with multiple external SQL Server databases Install Adobe Connect on multiple servers (also called a cluster) and install SQL Server in a separate cluster. Adobe Connect supports mirroring and clustering of the SQL Server databases.

Supported Flash Media Gateway deployments

Deploy Flash Media Gateway to enable Universal Voice. The following are supported deployments:

Single computer Install Adobe Connect, Flash Media Gateway, and SQL Server on the same computer.

Two computers Install Adobe Connect and Flash Media Gateway on the same computer and SQL Server on a separate computer.

A cluster of computers Install each Adobe Connect server and each Flash Media Gateway on its own computer. If you are installing Adobe Connect and FMG on separate machines, install Adobe Connect before installing FMG.

More Help topics

[“Adobe Connect audio and video conferencing options”](#) on page 16

[“Deploying Universal Voice”](#) on page 46

Supported LDAP directory servers

You can configure user authentication against your organization's LDAP directory server and import directory information into Adobe Connect from your organization's LDAP directory server. For a list of the supported LDAP directory servers, see www.adobe.com/go/learn_cnn_sysreqs_en.

***Note:** Any LDAP v.3 directory server may integrate with Adobe Connect. However, only directory servers that have been tested by Adobe are supported.*

More Help topics

[“Integrating with a directory service”](#) on page 40

Supported content storage devices

You can configure your Adobe Connect system to store content on Network Attached Storage (NAS) and Storage Area Network (SAN) devices. For a list of supported NAS and SAN devices, see www.adobe.com/go/learn_cnn_sysreqs_en.

More Help topics

[“Configuring shared storage”](#) on page 57

Preparing to migrate

Migration paths

Run Adobe Connect installer to upgrade from the previous versions of Adobe Connect. The Adobe Connect installer guides you through the upgrade. The upgrade paths are mentioned below.

Adobe Connect 9.3 installer supports upgrading from the following versions of Adobe Connect:

- Adobe Connect 9.0
- Adobe Connect 9.1
- Adobe Connect 9.2

For more information about upgrading, contact Adobe Support: www.adobe.com/support/programs/connect.

Workflow for migrating to Adobe Connect 9.3

Follow this workflow to migrate to Adobe Connect 9.3 from one of the supported older versions.

1. Test the migration in a non-production environment.

It's a good idea to take a snapshot of your current production environment and test the migration in a non-production environment before you migrate your production environment. Once you've successfully migrated in a test environment, proceed to step 2.

2. Inform users about the migration.

See “[Informing users about the migration](#)” on page 7.

3. (Optional) Back up content and configuration files.

See “[Back up files](#)” on page 7.

4. Back up the database.

See “[Back up the database](#)” on page 87.

5. Run the Adobe Connect installer.

See “[Installing or Upgrading to Adobe Connect 9](#)” on page 22. The installer stops the Adobe Connect services and backs up existing files, including the custom.ini file.

(Optional) Gather information required to install one or more integrated telephony adapters.

See “[Preparing to install integrated telephony adapters](#)” on page 16.

Verify your installation.

See “[Verify your installation](#)” on page 28.

Informing users about the migration

As with any software upgrade—especially one that affects a workgroup—communication and planning are important. Before you begin migrating or adding modules to Adobe Connect, Adobe suggests that you do the following:

- Allocate enough time to ensure a successful migration. The upgrade should fit into your normal maintenance period.
- Let users know in advance that they won't be able to use Adobe Connect during the migration.
- Let users know what types of changes they can expect (such as new features or improved performance) after the migration. For information about what's new, see www.adobe.com/products/connect.

Back up files

The installer creates backup copies of the appserv and comserv directories and the custom.ini file and installs new versions. The installer does not erase or overwrite the content directory. Customizations done in `ConnectProSvc.conf` or `TelephonyService.conf` files, on a 64-bit OS, are not retained after a migration to Adobe Connect 9.x.

You can optionally choose to create backup copies of these directories and files.

Migrating the existing database to a new machine

Follow this workflow to migrate from using the embedded database to using SQL Server 2008 on a different computer.

***Note:** You may perform this migration when you migrate to Adobe Connect. You may also perform this migration at any time after installing Adobe Connect.*

1. Install SQL Server on a different computer than the computer hosting Adobe Connect.

Follow the instructions provided by Microsoft to install SQL Server.

2. Back up the embedded database (SQL Server 2008 Express Edition).

See “[Back up the database](#)” on page 87.

3. Copy the BAK file from the computer hosting Adobe Connect to the computer hosting SQL Server.

When you back up SQL Server Express Edition, a file is created called *breeze.bak* (where *breeze* is the name of the database).

4. Restore the database on the computer hosting SQL Server.

For more information about restoring SQL Server, see [How to Restore a Database Backup](#).

5. Enter the SQL Server database information in the Application Management Console on the server hosting Adobe Connect.

Choose Start > Programs > Adobe Connect Server > Configure Adobe Connect Server.

Preparing to install Adobe Connect

Adobe Connect technical overview

An Adobe Connect installation consists of several components: Adobe Connect Central Application Server, Adobe® CQ, Adobe® Flash® Media Server, Adobe Connect, Flash Media Gateway (Universal Voice), a database, the Adobe Connect Telephony service, and telephony adaptors for audio conferencing.

The Adobe Connect Central Application Server is built as a J2EE web application running on the Tomcat servlet engine. Called the *application server*, it manages users, groups, on-demand content, and client sessions. Some of the application server's duties include access control, security, quotas, licensing, and auditing and management functions such as clustering, failover, and replication. It also transcodes media, including converting Microsoft® PowerPoint and audio to Adobe® Flash®. The application server handles meeting requests and content transfer requests (slides, HTTP pages, SWF files, and files in the File Share pod) over an HTTP or HTTPS connection.

Certain components of Flash Media Server (FMS), also called the *meeting server*, are installed with Adobe Connect to handle real-time audio and video streaming, data synchronization, and rich-media content delivery, including Adobe Connect meeting interactions. Some Flash Media Server tasks include meeting recording and playback, timing the synchronization of audio and video, and transcoding—converting and packaging data for real-time screen sharing and interaction. Flash Media Server also reduces server load and latency by caching frequently accessed web pages, streams, and shared data. Flash Media Server streams audio, video, and accompanying meeting data over Adobe's high-performance Real Time Messaging Protocol (RTMP or RTMPS).

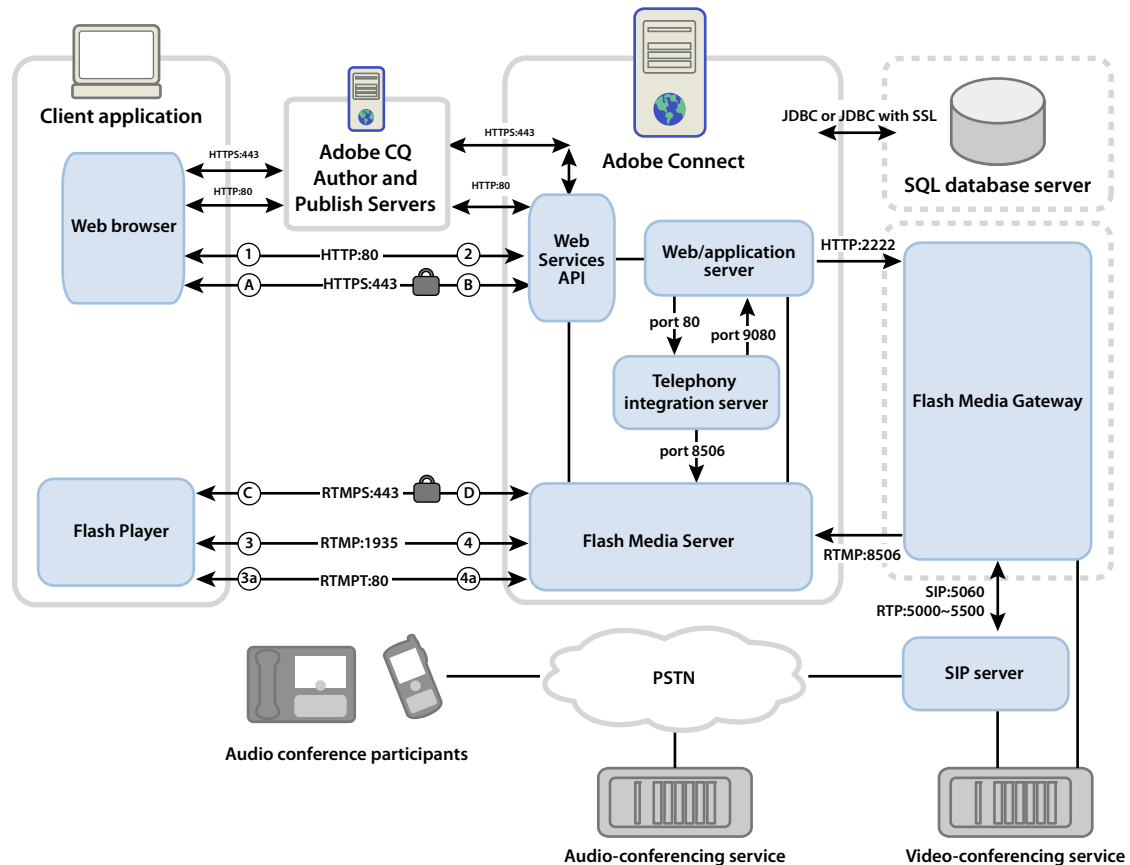
Flash Media Gateway integrates Adobe Connect with your SIP/RTP infrastructure. Flash Media Gateway receives audio from a SIP server and sends it into Adobe Connect meeting rooms. Flash Media Gateway also streams video and audio from Video Conference devices to the Video Telephony pod. This solution is called Universal Voice.

Adobe Connect requires a database for persistent storage of transactional and application metadata, including user, group, content, and reporting information. You can use the embedded database engine (SQL Server 2008 Express Edition) included in the Adobe Connect installer, or you can purchase and install Microsoft SQL Server 2008 Enterprise Edition or Microsoft SQL Server 2012 Enterprise Edition.

Adobe Connect supports several telephony adaptors to enable audio conferencing. You can choose to install one or more adaptors during the installation process.

Data flow

The following diagram illustrates how data flows between a client application and Adobe Connect.



The data can flow over an unencrypted connection or an encrypted connection.

Unencrypted connection

Unencrypted connections are made over HTTP and RTMP and follow the paths described in the table. The numbers in the table correspond to the numbers in the data flow diagram.

| Number | Description |
|--------|--|
| 1 | The client web browser requests a meeting or content URL over HTTP:80. |
| 2 | The web server responds and transfers the content or provides the client with information to connect to the meeting. |
| 3 | The client Flash Player requests a connection to the meeting over RTMP:1935. |
| 3a | The client Flash Player requests a connection to the meeting but can only connect over RTMP:80. |
| 4 | Flash Media Server responds and opens a persistent connection for Adobe Connect streaming traffic. |
| 4a | Flash Media Server responds and opens a tunneled connection for Adobe Connect streaming traffic. |

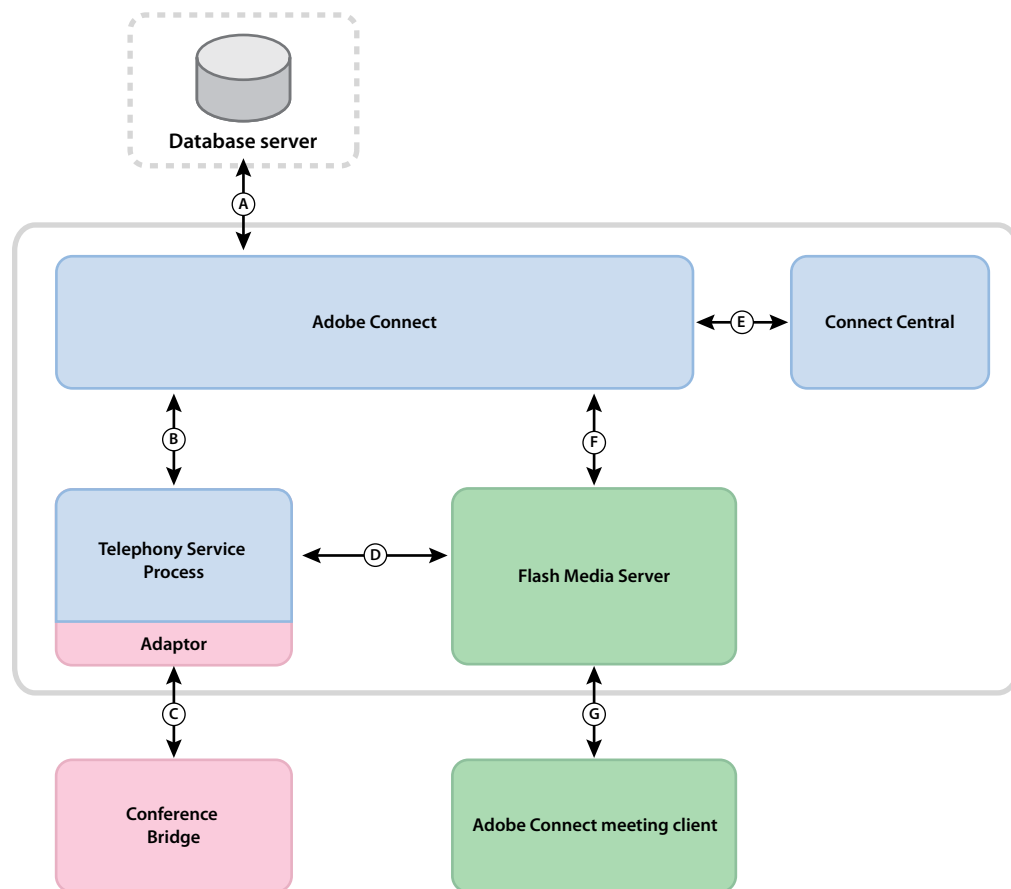
Encrypted connection

Encrypted connections are made over HTTPS and RTMPS and follow the paths described in the table. The letters in the table correspond to the letters in the data flow diagram.

| Letter | Description |
|--------|--|
| A | The client web browser requests a meeting or content URL over a secure connection on HTTPS:443. |
| B | The web server responds and transfers the content over a secure connection or provides the client with information to connect to the meeting securely. |
| C | The client Flash Player requests a secure connection to Flash Media Server over RTMPS:443. |
| D | Flash Media Server responds and opens a secure, persistent connection for Adobe Connect streaming traffic. |

Telephony data flow

The following diagram illustrates how data flows between telephony services and Adobe Connect.



A. Persistence. **B.** Service management and failover, service connection and session brokering, and user data provisioning and access. **C.** Native commands and events using proprietary vendor APIs for conference control. **D.** Commands and events using RPC calls. **E.** Provisioning. **F.** Telephony service request. **G.** Telephony commands and state.

Installation workflow

The following steps help you design, install, and configure an Adobe Connect system. Some steps require you to make a decision, and other steps require you to complete a task. Each step refers you to background information about the decision or task.

1. Choose which database to use.

For more information, see [“Choosing a database”](#) on page 13.

2. If you chose SQL Server in step 1, install it.

For more information, see the SQL Server documentation.

Note: If you are installing the embedded database, you don't have to perform this step.

3. (Optional) Choose and gather information needed for installing telephony adaptors.

If you are installing one or more of the integrated telephony adaptors, collect the information that the installer requires. For more information, see [“Choosing to install integrated telephony adaptors”](#) on page 14.

4. Install Adobe Connect and the selected components.

During the installation of Adobe Connect, you can also install Adobe CQ Author and Publish servers, embedded database engine, one or more telephony adaptors, and Flash Media Gateway (Universal Voice). See [“Installing or Upgrading to Adobe Connect 9”](#) on page 22.

5. Verify that Adobe Connect and the selected components are installed correctly.

For more information, see [“Verify your installation”](#) on page 28.

6. Deploy Adobe Connect.

For more information, see [“Deploying Adobe Connect”](#) on page 33.

7. (Optional) Integrate Adobe Connect with your infrastructure.

There are many possibilities for integrating Adobe Connect into your organization's existing infrastructure. It's a good idea to verify that Adobe Connect is functional after configuring each of these features.

Integrate with Adobe Omniture Adobe Connect 9 uses the Adobe Omniture technology to provide detailed event analytics reports. Adobe SiteCatalyst integration involves providing the credentials to Adobe's Omniture website in Adobe Connect configuration. For more information, contact Omniture support at <http://www.omniture.com/en/contact/support>.

Integrate with a SIP provider Integrate Adobe Connect with your organization's SIP server or a third-party SIP provider (also called a *VoIP provider*) to provide seamless audio conferencing. See [“Deploying Universal Voice”](#) on page 46.

Integrate with an LDAP Directory Integrate Adobe Connect with your organization's LDAP directory server so you don't need to manage multiple user directories. See [“Integrating with a directory service”](#) on page 40.

Configure a secure sockets layer Conduct all Adobe Connect communication securely. See [“SSL \(secure sockets layer\)”](#) on page 71.

Store content on NAS/SAN devices Use network devices to share content storage duties. See [“Configuring shared storage”](#) on page 57.

Host Adobe Connect Add-in Users can download the Adobe Connect Add-in easily from Adobe servers. However, if your organization's security policy doesn't allow external downloads, host the add-in on your own server and still retain a great user experience. See [“Hosting Adobe Connect Add-in”](#) on page 69.

8. (Optional) Choose whether to install Adobe Connect in a cluster.

For more information, see [“Choosing to deploy Adobe Connect in a cluster”](#) on page 12.

9. (Optional) Choose whether to install edge servers.

For more information, see [“Choosing to deploy Adobe Connect Edge Server”](#) on page 14.

Choosing to deploy Adobe Connect in a cluster

It is possible to install all Adobe Connect components, including the database, on a single server, but this system design is best used for testing, not production.

A group of connected servers, each doing an identical job, is usually called a *cluster*. In an Adobe Connect cluster, you install an identical copy of Adobe Connect on each server in the cluster.

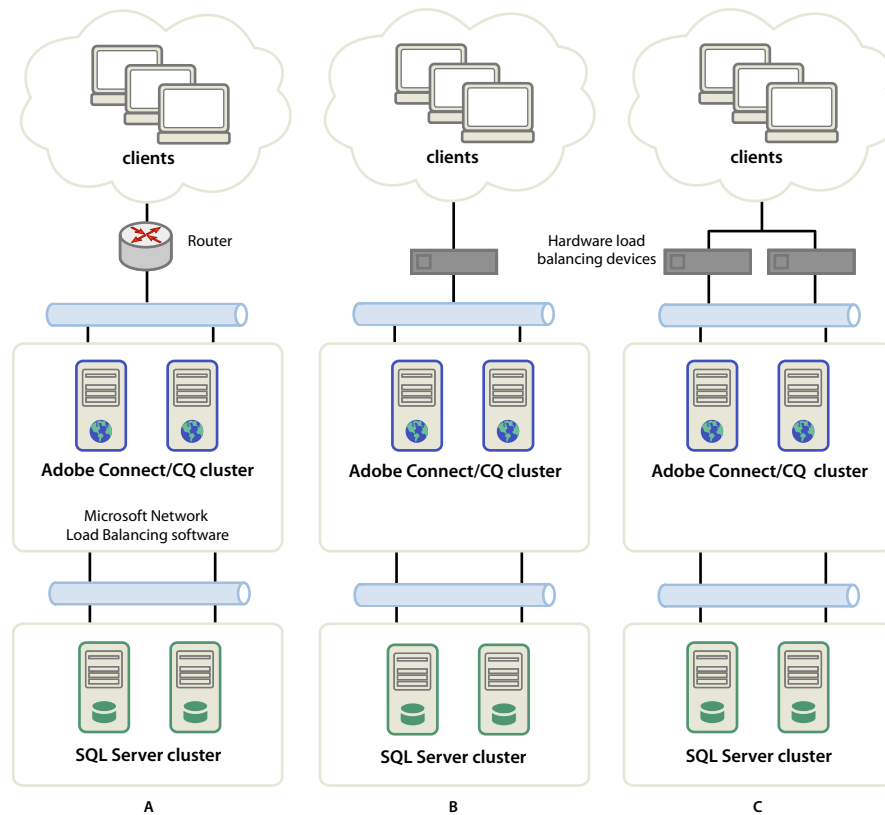
Note: *When you install Adobe Connect in a cluster, use a supported SQL server and install it on a separate computer.*

If one host in the cluster fails, another host in the cluster can take over and host the same meeting. You must use third-party hardware or software to provide load balancing for the cluster. Often, load balancing hardware can also function as an SSL accelerator.

Note: *In the Application Management Console you can configure shared storage so that content is stored on external devices and cached on the Adobe Connect server. For a fresh installation, you can also configure NAS.*

Reliable networked systems are designed with redundant components; if one component fails, another identical (*redundant*) component can take over the same job. When a component fails and its counterpart takes over, *failover* has occurred.

Ideally, every component in a system should be redundant, not just Adobe Connect. For example, you could use multiple hardware load balancing devices (such as BIG-IP by F5 Networks), a cluster of servers hosting Adobe Connect, and SQL Server databases on multiple external computers. Build your system with as many redundancies as possible and add to your system over time.



Three clustering options

A. A cluster with Network Load Balancing software and two external databases B. BIG-IP hardware load balancing devices, cluster, and two external databases C. Two BIG-IP load balancing devices, cluster, and two external databases

More Help topics

[“Configuring shared storage”](#) on page 57

Choosing a database

Adobe Connect uses a database to store information about users, content, courses, meetings, and reports. You can use the embedded database engine (included with the installer), or you can install a supported SQL server (which must be purchased separately).

Note: The embedded database engine in Adobe Connect 9.3 is Microsoft SQL Server 2008 Express Edition.

Embedded database

The embedded database engine is recommended for testing and development. It uses the same data structures as SQL Server 2008 Enterprise Edition, but it isn’t as robust.

The embedded database engine has the following limitations:

- Because of licensing restrictions, you must install the embedded database engine on the same computer as Adobe Connect. The computer must be a single-processor computer.
- 2 GB is the maximum size of the database.
- The embedded database engine has a command-line interface, rather than a graphical user interface.

External database

Adobe Connect installer contains and installs the Microsoft SQL Server 2008 Express Edition. However, for production environments, Adobe recommends using Microsoft SQL Server 2008 Enterprise Edition or Microsoft SQL Server 2012 Enterprise Edition as it is a more scalable database management system (DBMS) designed to support a large number of concurrent users. SQL Server 2008 Standard Edition also provides graphical user interfaces for managing and querying the database.

You can install SQL Server 2008 Standard Edition on the same computer as Adobe Connect or on a different computer. If you install them on different computers, synchronize the computers to the same time source. For more information, see the following TechNote: www.adobe.com/go/2e86ea67.

Install SQL Server in mixed login mode so that you can use SQL authentication. Set the database to case insensitive.

You must use SQL Server in the following deployment scenarios:

- To install the database on a computer that doesn't have Adobe Connect installed.
- Adobe Connect is deployed in a cluster.
- Adobe Connect is installed on multiprocessor computers with Hyper-Threading.

More Help topics

[“Supported server-database configurations”](#) on page 4

Choosing to install integrated telephony adapters

During the Adobe Connect installation process, you have the option to install one or more telephony adapters.

Each adapter requires you to supply specific pieces of information. If you have the information, you can configure the adapter during the initial installation of Adobe Connect. If you prefer, you can install the adapter without configuring it. When you are ready to configure the adapter, run the installer again. For more information, see [“Preparing to install integrated telephony adapters”](#) on page 16.

Choosing to deploy Adobe Connect Edge Server

When you deploy Adobe Connect Edge Server on your network, clients connect to the edge server and the edge server connects to Adobe Connect (also called the *origin server*). This connection occurs transparently—to users, it appears that they are connected directly to the origin server hosting the meeting.

Edge servers provide the following benefits:

Decreased network latency Edge servers cache on-demand content (such as recorded meetings and presentations) and split live streams, resulting in less traffic to the origin. Edge servers place resources closer to clients.

Security Edge servers are an additional layer between the client Internet connection and the origin.

If your license permits it, you can install and configure a cluster of edge servers. Deploying edge servers in a cluster has the following benefits:

Failover When an edge server fails, clients are routed to another edge server.

Support for large events If you require more than 500 simultaneous connections to the same meeting, a single edge server will run out of sockets. A cluster allows more connections to the same meeting.

Load balancing If you require more than 100 simultaneous meetings, a single edge server may run out of memory. Edge servers can be clustered behind a load balancer.

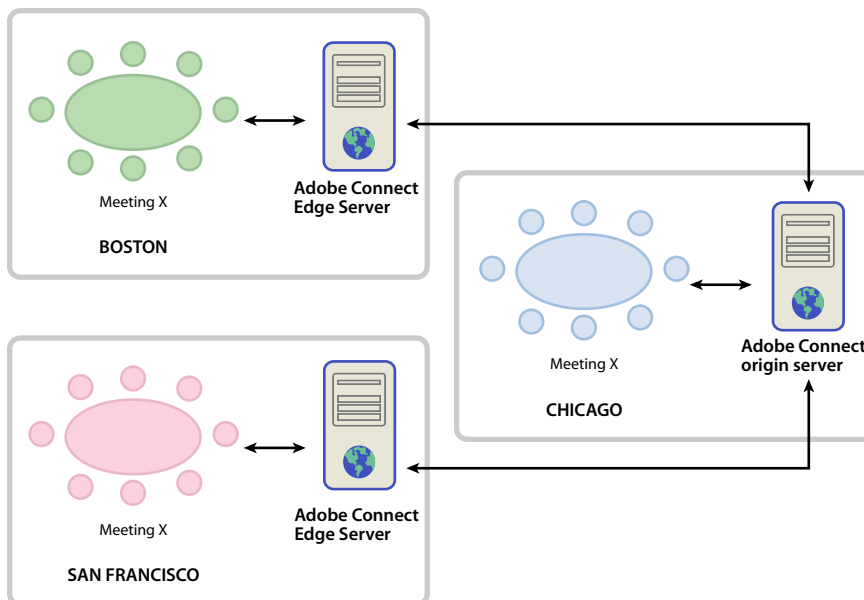
How edge servers work

Edge servers authenticate users and authorize their requests for web services such as Adobe Connect Meeting rather than forwarding every request to the origin server and consuming its resources for these tasks. If the requested data is found in the edge server's cache, it returns the data to the requesting client without calling Adobe Connect.

If the requested data is not found in the edge server's cache, the edge server forwards the client's request to the origin server, where the user is authenticated and the request for services is authorized. The origin server returns the results to the requesting edge server, and the edge server delivers the results to the requesting client. The edge server also stores this information in its cache, where other authenticated users can access it.

Sample edge server deployment

Consider the following sample edge server deployment:



Clients on-site in Chicago use the origin located in a data center in Chicago. The edge servers in Boston and San Francisco aggregate local client requests and forward them to the origin. The edge servers receive the responses from the origin in Chicago and transmit them to clients in their zones.

More Help topics

[“Install Adobe Connect Edge Server”](#) on page 31

[“Deploying Adobe Connect Edge Server”](#) on page 37

Building and optimizing a VMWare environment

Installing Adobe Connect on VMWare is no different than installing it on a physical computer. For information about hardware, software, and configuration requirements, see the [white paper](#) about running Adobe Connect in a virtual environment.

Adobe Connect audio and video conferencing options

Adobe Connect supports two ways to connect to audio conferencing providers: Universal Voice and integrated telephony adaptors. Each solution has different benefits. You can configure one solution or both solutions for a single audio conferencing provider. You can configure any number of audio conferencing providers for an Adobe Connect account.

Universal Voice enables Adobe Connect to send and receive audio from any audio conferencing provider. You can record the audio along with your web conference and stream the audio to VoIP-only attendees.

Use Universal Voice to integrate video telephony devices that support SIP/H.264. Adobe Connect officially supports the Tandberg 990MXP and Edge 95 video conferencing devices, though other Tandberg H.264 devices should work as well. For more information, see the [Tandberg website](#).

The Universal Voice solution uses a component called Flash Media Gateway that installs with Adobe Connect. Flash Media Gateway receives audio from a SIP server and sends it to Adobe Connect over RTMP. To use Universal Voice you need to host your own SIP server or have an account with a SIP provider. For information about configuring Flash Media Gateway, see “[Deploying Universal Voice](#)” on page 46.

After you have deployed Universal Voice, account administrators can use Adobe Connect Central to configure audio conference information. For more information, see [Configure audio providers for universal voice](#).

Integrated telephony adaptors are Java extensions that provide communication between Adobe Connect and specific audio conferencing providers. Integrated telephony adaptors provide enhanced call control. You can install one or more telephony adaptors when you install Adobe Connect. For more information, see “[Choosing to install integrated telephony adaptors](#)” on page 14.

You can also use the [Adobe Connect Telephony Java API](#) to develop an integrated telephony adaptor for any audio conferencing provider.

The following table describes the features of both solutions:

| | Universal Voice Audio Provider | Integrated Telephony Adaptor |
|---|--------------------------------|---|
| Broadcast audio to VoIP-only attendees | Yes | No (unless adaptor is configured for Universal Voice) |
| Enhanced call control. For example, mute, hold, and so on. | No | Yes |
| Record audio with Adobe Connect meeting | Yes | Yes |
| Requires Flash Media Gateway (bundled in the Adobe Connect installer) | Yes | No (unless adaptor is configured for Universal Voice) |

Preparing to install integrated telephony adaptors

Integrated telephony adaptors provide communication between Adobe Connect and specific audio conferencing providers. Integrated adaptors have advanced call capabilities, allowing hosts and presenters to control the audio conference from the meeting.

To install integrated telephony adaptors, run the Adobe Connect installer.

Each adaptor requires you to supply specific pieces of information during when you install it. For more information, see:

- “[Avaya telephony adaptor](#)” on page 17
- “[Cisco Unified MeetingPlace telephony adaptor](#)” on page 18

- “InterCall telephony adaptor” on page 18
- “MeetingOne telephony adaptor” on page 19
- “PGi (formerly Premiere Global) NA or EMEA telephony adaptor” on page 20
- “Arkadin telephony adapter” on page 21

Note: You can enable multiple audio bridges for Adobe Connect Server. Meeting hosts choose which audio bridge to use when they create a meeting in Adobe Connect Central. Each meeting can have only one audio bridge.

Avaya telephony adaptor

The Avaya Meeting Exchange™ telephony adaptor allows meeting hosts, presenters, and participants to control audio conference features from Adobe Connect meeting rooms. Complete the following workflow to enable the telephony adaptor.

Working with Avaya customer support

It’s a good idea to involve Avaya customer support early in the planning process. Make certain that you have the contact information for the Avaya account representative and Avaya customer support available. Contact Avaya support to inform them that you are installing and using the adaptor and gather information about the bridge.

Note: A current maintenance contract with Avaya covering the audio bridge is required.

1 Contact Avaya Customer Support.

2 Request the following information:

- The IP address of the bridge

Communication between Adobe Connect and the telephony adaptor takes place through the Avaya bridge.

- An administration login

Use the administration login to configure and restart the bridge, change the number of operators, add new users, and view statistics.

Note: Avaya uses an additional login for root access. Avaya does not usually supply that login to customers. For operations that require root access, contact Avaya Customer Support.

- A file access login

Use the file access login to connect to the recording files directory.

- A Bridge Talk user name and password

Bridge Talk is an application to manage conferences and callers on the Avaya Meeting Exchange Audio Conference Bridge. Use Bridge Talk to determine if there is a problem with the bridge or the adaptor. You can also use this program to dial phone numbers; create, schedule, and manage new conferences; view running conferences; and monitor bridge activity. For more information, including a User Guide, see www.avaya.com.

3 Verify that you have FTP access to the recording files directory by entering the following from an FTP prompt:

```
ftp://bridgeIPAddress  
ftp>dcbguest:abc123@machineNameOrIPAddress  
ftp>cd /usr3/confnp  
ftp>bye
```

Information needed when installing

Items marked with an asterisk (*) are required.

Enable Dial Out Select this option to enable system-wide dial out. If you don't select this option, any selections you make for the following four entries are ignored. If you do select this option, use the following four entries to specify how dial out is implemented.

Enable Dial Out for Host Select this option to permit the meeting host to dial out.

Enable Dial Out for Presenter Select this option to permit the presenter to dial out.

Enable Dial Out for Participant Select this option to permit participants to dial out.

Enable "Call Me" Dialog If dial out is enabled, select this option to display the "Call Me" dialog box to participants when they join a meeting.

Meeting Exchange Host Name* The hostname or address of the Avaya Meeting Exchange server.

Phone Operator ID* The ID of the operator channel used to associate with the Meeting Exchange server.

Login ID* The Login ID used to establish a connection with the Meeting Exchange Server.

Password* The password used with the Login ID to connect to the Avaya Meeting Exchange server.

FTP Directory* The FTP directory for audio files on the Avaya Bridge.

FTP Login* User name for FTP login.

FTP Password* Password for FTP login.

Meeting Exchange Dial In Number* A valid phone number dialed by Adobe Connect to reach the Meeting Exchange server.

Cisco Unified MeetingPlace telephony adaptor

The MeetingPlace telephony adaptor allows meeting hosts, presenters, and participants to control audio conference features from Adobe Connect meeting rooms.

Information needed while installing

Items marked with an asterisk (*) are required.

CISCO Unified MeetingPlace Server* URL for the MeetingPlace server

CISCO Unified MeetingPlace Administrator* The ID you use to connect to MeetingPlace server as an administrator.

CISCO Unified MeetingPlace Password* Password for the MeetingPlace administrator account.

Confirm Password retype the password for the MeetingPlace administrator account.

InterCall telephony adaptor

The InterCall telephony adaptor allows meeting hosts, presenters, and participants to control audio conference features from Adobe Connect meeting rooms. This adaptor requires a VoIP or SIP provider and Flash Media Gateway (Universal Voice) for recording meetings. Complete the following workflow to enable the telephony adaptor.

Note: InterCall recommends using API instead of CCAPI.

Planning for deployment

To deploy the InterCall adaptor, certain ports must be available, as shown in the following table:

| Port | Description |
|------|---|
| 80 | InterCall uses port 80 to communicate with Adobe Connect over HTTP. This port must be open for incoming communication, to be able to receive callbacks from InterCall to Adobe Connect. |
| 443 | InterCall uses port 443 to communicate with Adobe Connect over HTTPS (SSL). This port must be open for incoming communication, to be able to receive callbacks from InterCall to Adobe Connect. |
| 8443 | Adobe Connect uses port 8443 to communicate with InterCall over HTTPS (SSL). Adobe Connect uses this port for CCAPI/API and authorization services. This port must be open so that outgoing messages can be sent from Adobe Connect to InterCall. |
| 9080 | As mentioned earlier, this port is required for telephony in general. For InterCall, however, it must additionally be opened on the firewall for each node in a cluster. |

Information needed when installing

Items marked with an asterisk (*) are required.

Enable Dial Out Select this option to enable system-wide dial out. If you don't select this option, any selections you make for the following four entries are ignored. If you do select this option, use the following four entries to specify how dial out is implemented.

Enable Dial Out for Host Select this option to permit the meeting host to dial out.

Enable Dial Out for Presenter Select this option to permit the presenter to dial out.

Enable Dial Out for Participant Select this option to permit participants to dial out.

Enable "Call Me" Dialog If dial out is enabled, select this option to display the "Call Me" dialog box to participants when they join a meeting.

CCAPI Host* URL for the InterCall CCAPI service

CCAPI Auth Host* URL for the InterCall CCAPI authorization service.

Client Callback URL* Callback URL used the InterCall service to call back to Adobe Connect. This URL must be publicly accessible.

Application Token* Value used to identify your connection with the InterCall audio service.

Country Codes* List of country codes for which Adobe Connect displays available conference service numbers.

Toll Free Number Country Code The country code whose conference number is toll-free; for example, US.

MeetingOne telephony adaptor

The MeetingOne telephony adaptor allows meeting hosts, presenters, and participants to control audio conference features from Adobe Connect meeting rooms.

Information needed when installing

Items marked with an asterisk (*) are required.

Enable Dial Out Select this option to enable system-wide dial out. If you don't select this option, any selections you make for the following four entries are ignored. If you do select this option, use the following four entries to specify how dial out is implemented.

Enable Dial Out for Host Select this option to permit the meeting host to dial out.

Enable Dial Out for Presenter Select this option to permit the presenter to dial out.

Enable Dial Out for Participant Select this option to permit participants to dial out.

Enable “Call Me” Dialog If dial out is enabled, select this option to display the "Call Me" dialog box to participants when they join a meeting.

MeetingOne API URL* URL for the MeetingOne audio conference API service.

SSH Specifies whether SSH downloading of recordings is enabled.

Telephony API Server Login* The ID you use to for the MeetingOne audio conference API service.

Telephony API Server Password* Password for the administrator account.

Confirm Password retype the password for the MeetingPlace administrator account.

PGi (formerly Premiere Global) NA or EMEA telephony adaptor

The PGi telephony adaptor allows meeting hosts, presenters, and participants to control audio conference features from Adobe Connect meeting rooms. The information in this section applies to both the PGi NA and the PGi EMEA adaptors.

Information needed when installing

Items marked with an asterisk (*) are required.

Enable Dial Out Select this option to enable system-wide dial out. If you don't select this option, any selections you make for the following four entries are ignored. If you do select this option, use the following four entries to specify how dial out is implemented.

Enable Dial Out for Host Select this option to permit the meeting host to dial out.

Enable Dial Out for Presenter Select this option to permit the presenter to dial out.

Enable Dial Out for Participant Select this option to permit participants to dial out.

Enable “Call Me” Dialog If dial out is enabled, select this option to display the "Call Me" dialog box to participants when they join a meeting.

Note: The next four values are supplied to you by PGi.

PGi Hostname* The host name or IP address of the PGi audio conference service. For PGi NA, this value is usually csaxis.premconf.com. For PGi EMEA, this value is usually euaxis.premconf.com.

PGi Port Number* The port number that Adobe Connect uses to connect to the PGi audio conference service. This value is usually 443.

PGi Web ID* The ID you use when you connect to the PGi audio conference service.

PGi Password* The password you use when you connect to the PGi audio conference service.

Recording Download Login* The login used to download audio recordings from the PGi audio conference service.

Download Password* The password used with the Recording Download Login to retrieve recordings from the PGi audio conference service.

Download URL The URL that Adobe Connect uses to download recordings from the PGi audio conference service. The default value is for PGi NA is <https://ww5.premconf.com/audio/>. The default value for PGi EMEA is <http://eurecordings.premierglobal.ie/audio/>.

Country Code for Universal Line Number* The corresponding country code for a Universal line number.

Arkadin telephony adapter

The Arkadin telephony adaptor allows meeting hosts, presenters, and participants to control audio conference features from Adobe Connect meeting rooms. This adaptor requires a VoIP or SIP provider and Flash Media Gateway (Universal Voice) for recording meetings. Complete the following workflow to enable the telephony adaptor.

Planning for deployment

For Arkadin telephony adapter to work, you must get the host IP address of your Adobe Connect Server running telephony services, whitelisted on the firewall of Arkadin. Since the IP address is allowed on Arkadin's firewall, the Adobe Connect Server hosting Arkadin services, must have a public IP address.

For more information, see <http://www.arkadin.com/>.

Information needed when installing

Enable Dial Out Select this option to enable system-wide dial out. If you don't select this option, any selections you make for the following four entries are ignored. If you select this option, use the following four entries to specify how dial out is implemented.

Enable Dial Out for Host Select this option to permit the meeting host to dial out.

Enable Dial Out for Presenter Select this option to permit the presenter to dial out.

Enable Dial Out for Participant Select this option to permit participants to dial out.

Arkadin client application identifier* Arkadin client application identifier (provided by Arkadin, no default value).

Arkadin server URL* Arkadin server URL (provided by Arkadin, no default value).

Adobe Connect external hostname* Adobe Connect external hostname ([https://\[external-hostname\]/servlet/bamboo/](https://[external-hostname]/servlet/bamboo/) is the default value).

Arkadin Access Number server URL* Arkadin access number server URL (provided by Arkadin, no default value).

Arkadin authentication server URL* Arkadin authentication server URL (provided by Arkadin, no default value).

Chapter 3: Installing or Upgrading to Adobe Connect 9

Installing Adobe Connect and associated products

After reviewing and gathering required information (see “[Preparing for migration, installation, and configuration](#)” on page 3), you are ready to install Adobe® Connect™.

- 1 Verify that the computer is connected to the Internet.
- 2 Log on to the computer as an Administrator. By default, Adobe Connect installer requires a different local administrator account, than the one you are logged in with. Keep the credentials of an administrator account handy, using which you want to install Adobe Connect.
- 3 Close all applications.
- 4 Extract the files from the Adobe Connect ESD file to a location on your hard disk. *[extract-dir]* denotes this location.
- 5 Double-click the install.exe file. Adobe Connect 9.3 installation file is available at *[extract_dir]\Connect\9.3.1\Disk1\InstData\VM\install.exe*. In case of DVD, double-click the install.exe file at *[DVD Drive]\Connect\9.3.1\Disk1\InstData\VM*
- 6 Select a language and click OK to continue.
- 7 On the Introduction screen, click Next to continue.
- 8 On the License Agreement screen read the agreement, select I accept the terms of the License Agreement, and click Next.
- 9 On the Deployment Options screen, select Deploy Adobe Connect to install Adobe Connect. Provide the credentials of a local administrator account, than the one logged in, to install Adobe Connect.

Note: If you choose to use a different local administrator account, ensure the account has the rights to install services. For more information, see [Add the Log on as a service Right to an Account](#).

- 10 Select Perform pre-deployment tasks in the background without affecting the live server. If you select this option, the installer starts to install Adobe Connect and other selected components without deploying them. To deploy them, re-run the installer later and select Deploy Adobe Connect. You can run the installer with both the options selected, if necessary.
- 11 Do one of the following to select the Adobe Connect installation location:

- Click Next to accept the default Adobe Connect installation location (C:\Connect), or click Choose to select a different location.

Note: Subsequent installations of Adobe Connect on the same machine share content and logs location. However files for different versions of Adobe Connect are in their own version folder in C:\Connect. If you are migrating from an earlier version, all the files except content and log files are backed up.

- If you’ve chosen a different location and decide to use the default location instead, click Restore Default.
- If Adobe Connect is already installed on this computer, the Update Existing Install screen appears. Select the check box to confirm you’ve backed up your database and the Adobe Connect root directory.

- 12 Enter your serial number and click Next.

13 Click the link to download your license file from Adobe. Click Choose and browse to the downloaded license file. Click Next.

14 Choose the products you wish to install and click Next to continue. Adobe CQ-related options can be selected only if your license has Events enabled. Otherwise the CQ options are grayed out

- Adobe Connect Server
- Flash Media Gateway (Universal Voice)

Note: To install only FMG on a machine, select this option and ignore the other options. To install FMG on a machine where Adobe Connect Server 9.x is already installed, rerun the installer and select the appropriate options.

Important: If you are installing Adobe Connect and FMG on separate machines, install Adobe Connect before installing FMG.

Note: Flash Media Gateway requires an upstream SIP/VoIP provider. For more information, see “[Adobe Connect audio and video conferencing options](#)” on page 16.

- CQ Author Server

Note: To install only CQ Author server on a machine, select this option and ignore the other options. If you want to install CQ Author server on a machine where Adobe Connect Server 9.x is already installed, rerun the installer with appropriate options selected. Provide the FQDN of the CQ Author server, along with the port. If CQ Author server is clustered, provide the load balancer URL along with the port. Use the proceeding `http://` in the URL.

- CQ Publish Server

Note: To install only CQ Publish server on a machine, select this option and ignore the other options. To install CQ Publish server on a machine where Adobe Connect Server 9.x is already installed, rerun the installer with appropriate options selected. Provide the FQDN of the CQ Publish server, along with the port. If CQ Publish server is clustered, provide the load balancer URL along with the port. Use the proceeding `http://` in the URL.

- PGi (NA) Telephony Adaptor
- PGi (EMEA) Telephony Adaptor
- Cisco Unified MeetingPlace
- Avaya Telephony Adaptor
- InterCall Telephony Adaptor

Note: Install Adobe Flash Media Gateway (FMG), to use the InterCall adaptor.

- Arkadin Telephony Adaptor
- MeetingOne Telephony Adaptor

Note: When you click Next, the installer verified the system hardware and proceeds with the installation if the machine meets the minimum system requirements. For a complete list of system requirements, refer to the Adobe Connect tech specs [here](#).

15 On the Embedded Database Engine screen, do one of the following:

- If you plan to install a database on a different computer, select Do not install the embedded database engine.
- To install the embedded database, select Install the embedded database engine. To install to the default location, click Next. To select a different location, click Choose.

Note: If the Adobe Connect 9.3 installer detects that Microsoft SQL Server 2008 Enterprise Edition or Microsoft SQL Server 2012 Enterprise Edition is already installed on this computer, the installer does not install the database. If you're migrating and are already using the embedded database, Adobe Connect uses the existing database. When the installer detects an embedded Microsoft SQL Server 2005 Express Edition, the installer prompts to upgrade the database. When the installer detects an external database, it prompts the user to upgrade the database.

16 If you installed the embedded database engine, enter a strong password and confirm it, and then click Next.

17 Set values for the Database Connection settings listed below, then click Next. Items marked with an asterisk (*) are required.

- **Host*** The host name of the computer on which the database is installed. If you installed the embedded database, the value is `localhost`.
- **Port*** The port the database uses to communicate with Adobe Connect. The default value is 1433.
- **Database Name*** The name of the database. The default value is `breeze`.
- **User*** The name of the database user. If you installed the embedded database, the default value is `sa`.
- **Password*** The password for the database user. If you installed the embedded database, you set the password in the previous step.

18 Set values for the network settings listed below, then click Next. Items marked with an asterisk (*) are required.

- **Account Name*** A name that identifies the Adobe Connect account, such as “Adobe Connect account”.
- **Adobe Connect Host*** A Fully Qualified Domain Name (FQDN) clients use to connect to Adobe Connect. For example, if the URL of the account is `http://connect.example.com`, the Adobe Connect Host value would be `connect.example.com` (without the leading `http://`).
- **Installation Type** Select the type of installation as Single or Cluster.

19 Set values for the mail settings listed below, then click Next. Items marked with an asterisk (*) are required.

- **SMTP Host** The host name of the computer hosting the SMTP mail server.
- **SMTP Username** The user name used to authenticate against the SMTP host. If this field is left blank, Adobe Connect tries to send emails without authenticating with the SMTP server.
- **SMTP Password** The password for the SMTP user name.
- **System E-mail*** The email address to which administrative messages are addressed.
- **Support E-mail*** The email address to which Adobe Connect user support requests are sent.
- **BCC E-mail** A blind-copy email address to which all user notifications are also sent. This variable allows administrative tracking of email messages sent through Adobe Connect without exposing an internal email address.

20 Enter the values in the Support Settings screen to provide the contact information used by Adobe Connect when users need support or help.

- **Administrators name** Provide the name of the Adobe Connect Account Administrator.
- **Support email address** Provide the email address to which users can direct their queries and support requests.
- **Support phone number** Provide the contact number that users can call to seek support.
- **Support comments** Provide any other comments.

21 Enter values for the shared storage settings listed below, then click Next.

- **Shared Storage** A volume and directory on an external server where content is stored, for example, `\\volume\directory`. If you want to store content on multiple volumes, separate them with semicolons (;). Before configuring this feature, see “[Configuring shared storage](#)” on page 57.
- **Content Cache Size** An integer from 1 through 100 specifying the percent of free disk space to use to store content on Adobe Connect. The cache can grow beyond the percent you specify, so it’s a good idea to keep the value from 15 through 50. If you leave the box blank or enter 0, no cache is used, and content is mirrored on Adobe Connect or any external volumes. Before configuring this feature, see “[Configuring shared storage](#)” on page 57.

22 If you choose to install CQ servers, specify the External Host Settings.

- **Is your CQ environment is SSL enabled?** Select the checkbox, if you plan to access CQ setup via https.
- **CQ Author server URL*** Provide the FQDN of the CQ Author server, along with the port. If CQ Author server is clustered, provide the load balancer URL.
- **CQ Publish server URL*** Provide the FQDN of the CQ Publish server, along with the port. If CQ Publish server is clustered, provide the load balancer URL.
- **Adobe Connect Host Cookie Prefix*** A text string that is used as a prefix for the Adobe Connect Host cookie.

23 If you choose to install the CQ Author server, specify the cluster and author settings.

- **Is CQ Author Server clustered** Select the checkbox if your CQ Author server is a cluster.
- **Node designation*** If your CQ Author server is clustered, then one node is designed as the master node and all the other nodes are designated as Slave. Choose the node designation of the machine on which you are installing CQ Author server.
- **Master Node IP*** Provide the IP of the master node if you are installing CQ Author instance on a slave node.

***Note:** Before installing a Slave node of a CQ server, deploy the corresponding Master node. Latter must be available on the network, while installing the former.*

- **Hostname (ie http://)*** Specify the host name URL of the author.
- **Port*** Specify the port of the CQ Author server. The default value is 4502.
- **Publish Hosts*** Specify the FQDN and port of all the Publish servers.

24 If you choose to install CQ Publish server, specify its settings.

- **Hostname (ie http://)*** Specify the host name of the CQ Publish server.
- **Port*** Specify the port of the Publish server. The default value is 4503.
- **Adobe Connect Host Cookie Prefix*** A text string that is used as a prefix for the Adobe Connect Host cookie.

***Note:** Cookie prefix you specify here, must exactly match the cookie prefix specified on the External Host Settings screen.*

25 If you install CQ Author or Publish server, create a password for CQ administration.

***Note:** Credentials of CQ administrators must be the same for all the CQ Author and Publish servers. Also, these credentials are required for subsequent upgrades and should be carefully managed. It is not possible to upgrade, in the future, without these credentials.*


26 If you chose to install Flash Media Gateway, enter the following settings and click next. The settings do not take effect instantaneously. When you click OK to confirm the settings, Adobe Connect restarts all Flash Media Gateway servers. The settings are pushed to all Flash Media Gateway servers in a cluster.

- **Username** The user name for the SIP profile that Flash Media Gateway server uses to create SIP sessions, for example sipUN1.
- **Password** The password for the SIP profile that Flash Media Gateway server uses to create SIP sessions.
- **SIP Address** The address of the SIP server for the SIP profile that Flash Media Gateway server uses to create SIP sessions, for example, 10.12.13.14.
- **Default Host** The default host for the SIP profile. This parameter is the SIP server address to use if registration with the SIP server fails. This parameter is set to the same value as SIP Address.
- **Port Lower Limit** The lowest port number that can be used for RTP audio data. The default value is 5000.
- **Port Upper Limit** The highest port number that can be used for RTP audio data. The default value is 6000.

- **Registration Expiration** The interval, in seconds, at which Flash Media Gateway renews its registration with the SIP server. The default value is 2400 seconds (40 minutes).
- **SIP Port** The port on which Flash Media Gateway server listens for SIP requests. The default value is 5060.
- **Registration** Choose whether a Flash Media Gateway server must register on the SIP server.

27 Fill in the requested values to create an account administrator, and then click Next.

Every Adobe Connect account needs at least one administrator to perform tasks in the Adobe Connect Central web application. Upgraded accounts already have at least one account administrator, but you can add an additional one here.

 *If the person installing Adobe Connect is not the Administrator who maintains Adobe Connect, then select the option to change the password at next login.*

28 Fill in requested information for any telephony adaptors you want to install. For more information on telephony adaptors, see “[Choosing to install integrated telephony adaptors](#)” on page 14.

If you don’t have all the required information but want to install the adaptor anyway, select Install But Do Not Configure. When you are ready to enter the required information, run the installer again.

29 Review the Pre-Installation summary. Click Previous to change these settings. Click Install to install the software.

30 On the Initializing Adobe Connect service screen, do one of the following and click Next:

- Select Start Adobe Connect (recommended).
- Choose the Application Management Console. Select Do not start Adobe Connect now.

31 If you chose to start Adobe Connect, a message reports that the service is starting.

32 Click Done to quit the Installer.

33 If you chose to open Adobe Connect, Adobe Connect Central opens. If you chose to open the Application Management Console, it opens.

34 Ensure that your installation of Adobe Connect is configured and functioning as expected. See “[Verify your installation](#)” on page 28 for the verification instructions.

Uploading a new license file during migration

After migrating an Adobe Connect installation, upload your `license.txt` file as follows:

- 1 Log in to the Adobe Connect Server.
- 2 Launch the Application Console Manager by accessing `http://localhost:8510/console/` in a web browser.
- 3 Click License Settings.
- 4 Click the Browse button and browse to the `license.txt` file.
- 5 Click the Save button.

Upgrading to Adobe Connect 9.3

You can upgrade your existing Adobe Connect installation by running the installer. To prepare for migration from a previous version and for the available upgrade options, see “[Preparing to migrate](#)” on page 6.

- 1 Verify that the computer is connected to the Internet.

- 2 Log on to the computer as an Administrator. By default, Adobe Connect installer requires a different local administrator account, than the one you are logged in with. Keep the credentials of a local administrator account handy, using which you want to upgrade Adobe Connect.
- 3 Close all applications.
- 4 Extract the files from the Adobe Connect ESD file to a location on your hard disk. *[extract-dir]* denotes this location.
- 5 Double-click the `install.exe` file. Adobe Connect 9.3 installation file is available at *[extract_dir]\Connect\9.3.1\Disk1\InstData\VM\install.exe*. In case of DVD, double-click the `install.exe` file at *[DVD Drive]\Connect\9.3.1\Disk1\InstData\VM*.
- 6 Select a language and click OK to continue.
- 7 On the Introduction screen, click Next to continue.
- 8 On the License Agreement screen read the agreement, select I accept the terms of the License Agreement, and click Next.
- 9 On the Deployment Options screen, select Deploy Adobe Connect to install Adobe Connect. Provide the credentials of a local administrator account, than the one logged in, to install Adobe Connect.

Note: Ensure that the local administrator account has the rights to install services. For more information, see [Add the Log on as a service Right to an Account](#).

- 10 Select Perform pre-deployment tasks in the background without affecting the live server. If you select this option, the installer starts to install Adobe Connect and other selected components without deploying them. To deploy them, re-run the installer later and select Deploy Adobe Connect. You can run the installer with both the options selected, if necessary.
- 11 On Choose Products screen, select one or more products as follows:
 - To upgrade Adobe Connect Server from a previous version to 9.x, select Adobe Connect Server.
 - To upgrade an existing installation of CQ Author Server or to install a new instance of CQ Author Server, select CQ Author Server.
 - To upgrade an existing installation of CQ Publish Server or to install a new instance of CQ Publish Server, select CQ Publish Server.
 - To install a telephony adaptor, select the necessary adaptor.
- 12 On the Updating Existing Install screen, the existing installation directory is automatically identified. Take a backup of your database and click the checkbox to confirm.
- 13 On the Database Connect screen, provide the database details and the credentials of the database administrator. Click Next.

Note: If you are using an embedded database Microsoft SQL Server 2005 Express Edition, it is upgraded to Microsoft SQL Server 2008 Express Edition. Adobe Connect installer does not upgrade an external database. If you are using an external database that is not supported, upgrade it to the supported database.

- 14 If you choose to upgrade CQ server, the Adobe Connect Admin Settings screen is displayed. This screen is not applicable when installing CQ server for the first time. Provide the host URL and port of the existing Adobe Connect installation.
- 15 If you choose to upgrade CQ servers, follow these steps. These steps are not required when installing a CQ server for the first time.
 - a On the CQ External Host Settings screen, provide the URL and port of the CQ server and cookie prefix. For a cluster behind a load balancer, provide the URL of the load balancer. This screen is applicable only when upgrading CQ server, while upgrading Adobe Connect.

- b If you choose to upgrade the CQ server, on the CQ Admin Settings screen, provide the credentials of the administrator of the CQ server.

Note: If you do not have the CQ server's administrator credentials handy, click *Skip Password Verification* to skip upgrading the CQ server. To upgrade CQ server later, follow the instructions available in [this](#) article.

- 16 If you are installing CQ servers for the first time, and not upgrading CQ servers, then follow Steps 21-23 of “[Installing Adobe Connect and associated products](#)” on page 22.
- 17 If you choose to install any telephony adaptors, provide the details of the selected telephony adaptors.
- 18 If the files in your existing installations are customized, Migration screen displays a list of the files and whether these files will migrate or not. Unselect the files you do not wish to migrate. Click Next.
- 19 On the Pre-Installation Summary screen, review the changes you selected. When satisfied, click Install. To change settings, click Previous and edit settings.

Verify your installation

Perform the following tasks to confirm that your installation was successful and that all standard components are working correctly. When you are ready to deploy Adobe Connect, see “[Deploying and configuring Adobe Connect](#)” on page 33.

To change configuration settings you entered in the installer, use the Application Management Console. Choose Start > Programs > Adobe Connect Server > Configure Connect Server.

Adobe Connect 9.3 logs are created in the `[extract_dir]\Connect\9.3.1\Disk1\InstData\VM\` folder. In case this location is read-only, the log file is created in the `{user folder}\Local Settings\Temp\AdobeConnect`.

Log in to Adobe Connect Central

Adobe Connect Central is a web application that lets you administrate Adobe Connect Server. If you can log in to Adobe Connect Central, the database and Adobe Connect Server can communicate with each other.

- 1 Open a browser and enter the following URL: `http://[hostname]`.

Note: The `[hostname]` parameter is the value you set for Adobe Connect Host in the Network Settings screen in the installer.

- 2 Enter the user name and password for the account administrator you created in the installer.

Note: After you create additional users, you can log in to Adobe Connect Central with any user account.

Verify Adobe CQ installation

If you choose to install Adobe CQ Author and Publish instances, verify their installation.

- 1 Check whether the Adobe CQ Author and Publish server is available on the network. Check for all nodes within a cluster.
- 2 Edit an event or an email template in Adobe Connect. Successful editing and saving of a template indicates that CQ instances are working as desired. For more information about editing templates, see Adobe Connect Events in the [Using Adobe Connect guide](#).

Verify that Adobe Connect services are started

Adobe Connect Server runs as the following Windows services:

- Adobe Connect Service
- Adobe Connect Telephony Service
- Flash Media Administration Server
- Flash Media Gateway
- Flash Media Server (FMS)
- Adobe Connect CQ-Author server
- Adobe Connect CQ-Publish server

More Help topics

[“Start and stop the servers”](#) on page 76

Verify that you can send e-mail notifications

If you didn't enter a value in the SMTP Host field in the Installer, Adobe Connect cannot send e-mail notifications. If you entered an SMTP Host, do the following to verify that Adobe Connect can send e-mail notifications:

- 1 Click the Administration tab on the Adobe Connect Central home tab.
- 2 Click the Users and Groups tab.
- 3 Click New User.
- 4 On the New User Information page, enter the required information. A partial list of options follows:
E-mail Use the new user's e-mail address. Make sure the E-mail the new user account information, login, and password option is selected.
New Password Create a password of 4 to 16 characters.
- 5 Click Next to continue.
- 6 Under the Edit Group Membership heading, select a group, assign the user to the group, and click Finish.
- 7 Allow enough time for the user to check for the e-mail notification.

If the user received the notification, Adobe Connect is functional and you can send e-mail messages using your e-mail server.

- 8 If the e-mail doesn't arrive, do the following:
 - a Make sure the e-mail address is valid.
 - b Make sure the e-mail wasn't filtered as spam.
 - c Make sure that you configured Adobe Connect with a valid SMTP host, and make sure the SMTP service works outside Adobe Connect.
 - d Contact Adobe Support at www.adobe.com/support/programs/connect.

Verify that you can use Adobe Presenter

To verify that you can use Adobe Presenter, publish a Microsoft PowerPoint presentation to Adobe Connect for compilation into a Flash presentation, and then view it.

- 1 If you haven't already done so, install Adobe Presenter on a desktop client machine on which PowerPoint is already installed.
- 2 Launch a browser and open Adobe Connect Central using the FQDN of your Adobe Connect server (for example, connect.example.com).
- 3 Click Resources > Getting Started.
- 4 On the Getting Started page, click on Publish Presentations > Install Adobe Presenter.
- 5 Run the installer.
- 6 If you don't have a PowerPoint presentation, create and save a presentation of one or two slides.
- 7 Open the Adobe Connect Publish wizard by selecting Publish from the Adobe Presenter menu in PowerPoint.
- 8 Select Connect and enter the information for your server.
- 9 Log in with your e-mail address and password, and follow the steps in the Publish wizard. Make sure that you are enrolled in the Authors group (Administration > Users and Groups in Adobe Connect Central).

When you complete the steps in the Publish wizard, Adobe Presenter uploads your PowerPoint presentation to Adobe Connect, which compiles into a Flash presentation.

- 10 When the compilation is complete, go to the Content tab in Adobe Connect Central and search for your presentation.
- 11 Open your presentation to view it.

Verify that you can use Training (if enabled)

Note: Adobe Connect Training is an optional feature that must be enabled in your license.

- ❖ Go to the Training tab in Adobe Connect Central.

If the Training tab is visible and accessible, Training is functioning. Make sure that you are enrolled in the Training Managers group (Administration > Users and Groups).

Verify that you can use Meeting (if enabled)

Note: Adobe Connect Meeting is an optional feature that must be enabled in your license.

To verify that Adobe Connect Meeting is functional, you must be enrolled in the Meeting Hosts group or the Administrators group.

- 1 Log in to Adobe Connect Central as a user who is enrolled in the Meeting Hosts group or the Administrators group.
- 2 Click the Meetings tab and select New Meeting.
- 3 On the Enter Meeting Information page, enter the required information. For the Meeting Access option, select the Only Registered Users and Accepted Guests May Enter the Room option. Click Finish to create the meeting.
- 4 Click the Enter Meeting Room button.
- 5 Log in to enter the meeting as a Registered User.
- 6 If the Adobe Connect Add-in window appears, follow the instructions to install it.

If the meeting room opens, Adobe Connect Meeting is functional.

Verify that you can use Events (if enabled)

Note: Adobe Connect Events is an optional feature that must be enabled in your license.

- 1 Log in to Adobe Connect Central as a user who is enrolled in the Events Managers group or the Administrators group.
- 2 Go to the Event Management tab in Adobe Connect Central.

If this tab is visible and accessible, Adobe Connect Events is functioning.

Install Adobe Connect Edge Server

Follow the steps below if you want to install the Adobe Connect Edge Server.

Note: Adobe Connect 8 Edge Server is compatible with Adobe Connect 9.x.

Run the installer

- 1 Contact Adobe Connect Platinum maintenance and support for Edge Server installer. For the contact information, see <http://www.adobe.com/support/programs/connect/>.
- 2 Close all other applications and run the installer provided by Adobe.
- 3 Select a language from the Select Setup Language dialog box. Click OK to continue.
- 4 On the Setup screen click Next to continue.
- 5 On the License Agreement screen, read the agreement, select I Accept The Agreement, and click Next.
- 6 Do one of the following:
 - Click Next to accept the default installation location (C:\Connect), or click Browse to select a different location, and then click Next.
 - If Adobe Connect Edge Server is already installed on this computer, the Update Existing Adobe Connect Edge Server Install screen appears. Click Next.
- 7 On the Select Start Menu Folder screen do one of the following:
 - Click Next to accept the default location of the Start Menu shortcuts.
 - Click Browse to select a different location.
- 8 In the Ready To Install dialog box, review the location where Adobe Connect Edge Server will be installed and where the Start Menu folder will be installed. Click Back to review or change these settings, or click Install.
- 9 Click Finish to exit the Adobe Connect Edge Server installation.

More Help topics

[“Deploying Adobe Connect Edge Server”](#) on page 37

Uninstalling the servers

If you want to uninstall the servers, follow the instructions in this section.

Uninstalling Adobe Connect and Adobe CQ

Adobe Connect, CQ Author, and CQ Publish servers can be uninstalled by following the below steps.

Note: *Uninstalling Adobe Connect does not uninstall SQL Server and user-generated data such as, log files and content folders.*

- 1 Select Start > Programs > Adobe Connect Server > Uninstall Connect Server.

Important: *If you want to keep the content, back up the content files before you delete the root folder (in the following step). For information about backing up Adobe Connect data, see “[Back up files](#)” on page 7. For information about backing up CQ servers, see [Backup CQ repository](#).*

- 2 Delete the root Adobe Connect folder. By default, the location is C:\Connect. This folder contains the following folders: 9.3.1, logs, and content. The Adobe_Connect_Install.log file is located in the 9.3.1 folder.
- 3 (Optional) Uninstall Microsoft SQL Server. For information, see <http://msdn.microsoft.com>.

Uninstalling Adobe Connect Edge Server

- 1 Select Start > Settings > Control Panel > Add or Remove Programs > Adobe Connect Edge Server > Remove.
- 2 Delete the root Adobe Connect folder. By default, the location is C:\Connect.

Uninstalling Flash Media Gateway

Flash Media Gateway uninstalls when you uninstall Adobe Connect. You can also run the following program to uninstall Flash Media Gateway: Program Files\Adobe\Flash Media Gateway\Uninstall_Flash Media Gateway\Uninstall Flash Media Gateway.exe.

Chapter 4: Deploying and configuring Adobe Connect

Use the Application Management Console to configure Adobe Connect Server

After you install Adobe® Connect™, Flash Media Gateway, Adobe CQ, or Adobe Connect Edge Server and complete the first phase of configuration with the Application Management Console, configure any of the optional features and deploy the server.

Use the Application Management Console to configure Adobe Connect Server application settings and directory service settings and to see which features are enabled on your server.

When you install the server, the installer prompts you to enter the application settings. After you install the server, you can use the Application Management Console to edit these settings.

To configure directory service settings, open the Application Management Console after you install the server.

❖ To open the Application Management Console, do one of the following:

- Choose Start > Programs > Adobe Connect Server > Configure Adobe Connect Server.
- In a browser, open the following URL: `http://localhost:8510/console`.

Note: If another application is running on port 80, the Application Management Console cannot open. Stop the application running on port 80 and reopen the Application Management Console. To check whether an application is running on port 80, open the Command Prompt and enter `netstat -a -n -o | findstr LISTEN | findstr ":80 "`.

More Help topics

[“Integrating with a directory service”](#) on page 40

[“Deploying Universal Voice”](#) on page 46

Deploying Adobe Connect

Deploy Adobe Connect server

- 1 On your DNS server, define a fully qualified domain name (FQDN) for Adobe Connect (such as `connect.mycompany.com`). Map the domain name to the static IP address of the computer hosting Adobe Connect.
- 2 If you want Adobe Connect to be available outside your network, configure the following ports in a firewall:
 - 80** The default port for the Adobe Connect application server. The tertiary port for the meeting server (Flash Media Server).
 - 1935** The default port for the meeting server (Flash Media Server).
 - 443** The default port for SSL. The secondary port for the meeting server (Flash Media Server).

- 3 If Adobe Connect and Adobe CQ are on different domains, add the parameter
`ENABLE_CQ_PARAMETER_AUTH=true` in the `custom.ini` file.

Note: Adobe Connect 9.2 onwards, if you have installed Adobe Connect server and Adobe CQ server on the same domain, the value of `DOMAIN_COOKIE` parameter is defined in the `custom.ini` file.

- 4 Optionally, if Adobe Connect traffic is routed through a gateway (with a different IP address), make sure the firewalls are configured to accept requests from the gateway IP address.

To restore the customizations, redo them in the new `ConnectProSvc.conf`. For help deploying Adobe Connect, contact Adobe Support at www.adobe.com/support/programs/connect.

More Help topics

“[Port requirements](#)” on page 3

Deploy a cluster of Adobe Connect servers

- 1 Install and configure Adobe Connect on a dedicated server.
Use the same serial number and license file each time you install Adobe Connect. Do not install the embedded database engine and, if your shared storage requires a user name and password, do not start Adobe Connect from the installer.
- 2 If your shared storage requires a user name and password, do the following to add them to the Adobe Connect Service:
 - a Open the Services control panel.
 - b Double-click Adobe Connect Service.
 - c Click the Log On tab.
 - d Click the This account radio button and enter the shared storage user name into the box. The user name syntax is `[subdomain\]username`.
 - e Enter and confirm the shared storage password.
 - f Click Apply then click OK.
- 3 Do the following to start Adobe Connect:
 - a In the Services control panel, select Flash Media Server (FMS) and click Start the service.
 - b In the Services control panel, select Adobe Connect Service and click Start the service.
- 4 Choose Start > Programs > Adobe Connect Server > Configure Adobe Connect Server to open the Application Management Console. Click Next.
- 5 On the Database Settings screen, enter the information for the SQL Server database and click Next.
If Adobe Connect successfully connected to the database, you see a confirmation and the Database Settings. Click Next.
- 6 On the Server Settings screen, do the following and click Next:
 - a Enter an account name.
 - b In the Adobe Connect Host field, enter the name of Adobe Connect server.
 - c Enter an HTTP port number. This number could be 80 or 8080 depending on the load balancer.
 - d Enter the external name of the cluster node.
 - e Enter the domain name of the SMTP host and system and support email addresses.

- f If you're using shared storage, enter the path to the volume or volumes (separate multiple volumes with semicolons)
 - g Enter the percentage of the Adobe Connect server you want to use as a local cache.
***Note:** Content is written to the local cache and the shared storage volume. Content is kept in the local cache for 24 hours after it was last used. At that time, if the cache percentage has been exceeded, the content is purged.*
 - 7 Upload the license file and click Next.
 - 8 Create an administrator and click Finish.
 - 9 Repeat steps 1 through 8 for each server in the cluster.
 - 10 To configure the load balancer do the following:
 - a Configure the load balancer to listen on port 80.
 - b Add all cluster node names to the configuration file of the load balancer.
***Note:** For detailed information about configuring the load balancer, see the vendor documentation.*
 - 11 Open a web browser and enter the domain name of the load balancer, for example, <http://connect.example.com>.
- For help deploying a cluster, contact Adobe Support at www.adobe.com/support/programs/connect.

More Help topics

[“Configuring shared storage”](#) on page 57

Verifying operations in a cluster

If one computer in a cluster shuts down, the load balancer routes all HTTP requests to a running computer in the cluster.

When a meeting starts, the application server assigns a primary and backup host to the meeting room based on load. When the primary host shuts down, clients reconnect to the backup host.

It's also a good idea to verify that content uploaded to one server in a cluster is replicated to the other computers in the cluster.

The following procedures assume that the cluster contains two computers, Computer1 and Computer2.

Verifying load balancing and meeting failover

- 1 Start Adobe Connect on both computers.
 - a Select Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.
 - b Select Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.
- 2 Log in to Adobe Connect Central from the following URL:

http://[hostname]

For *hostname*, use the Adobe Connect Host value you entered in the Application Management Console.

- 3** Select the Meetings tab and click a meeting link to enter a meeting room.

Create a new meeting if necessary.

- 4 Stop Adobe Connect on Computer2.
 - a Select Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server

- b** Select Start > Programs > Adobe Connect Server > Stop Adobe Connect Meeting Server.

If meeting failover was successful, the meeting should still have a green connection light.

- 5** In Adobe Connect Central, click on any tab or link.

If the load balancer is working, you should still be able to send successful requests to Adobe Connect Central and receive responses.

If the cluster contains more than two computers, apply this start-stop procedure to each computer in the cluster.

Verify content replication

- 1** Start Adobe Connect on Computer1.

- a** Select Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.

- b** Select Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server

- 2** Stop Adobe Connect on Computer2.

- a** Select Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server

- b** Select Start > Programs > Adobe Connect Server > Stop Adobe Connect Meeting Server.

- 3** Log in to Adobe Connect Central from the following URL:

`http://[hostname]`

For *hostname*, enter the Adobe Connect Host value you entered in the Application Management Console.

- 4** Upload a JPEG image or other content to Adobe Connect on Computer1:

- Make sure that you are a member of the Authors group. (If you are an Account Administrator, you can add yourself to the Authors group in Adobe Connect Central.)
- Click the Content tab.
- Click New Content and follow the steps displayed in your browser for adding content.

After your test content is uploaded, a User Content page opens and displays a list of the content that belonged to you.

- 5** Click the link to the newly uploaded test content.

A Content Information page with a URL for viewing your test content opens.

- 6** Make a note of the URL; you will use it in step 10.

- 7** Click the URL.

- 8** Start Computer2, wait until Adobe Connect has fully started, and then stop Computer1.

If you have configured an external storage device, you don't need to wait for Computer2 to stop; the required content is copied from the external device.

- 9** Close the browser window in which you were viewing the test content.

- 10** Open a new browser window and go to the URL to view your test content.

If your test content is displayed, replication to Computer2 was successful. A blank window or an error message means that replication failed.

Configuring Dispatcher for AEM bundled with Adobe Connect

To load balance the traffic on the clustered AEM servers installed as a part of Adobe Connect Events solution, you can use a Dispatcher. Use [Adobe PackageShare](#) to obtain the latest Dispatcher installation file for your operating system and web server. The supported web servers are listed at [Supported Platforms](#). To know more about Dispatcher, see <http://docs.adobe.com/docs/en/dispatcher.html>.

Follow these instructions to install and configure the Dispatcher:

- 1 Download and install the Dispatcher using the instructions available at [Installing Dispatcher](#).
- 2 For the load balancing purpose, follow the Dispatcher configuration instructions till Defining Page Renderers section at [Configuring Dispatcher](#).
- 3 To configure the AEM instance to use the Dispatcher, follow the [Setting up AEM User Accounts](#) section.
- 4 Edit the `custom.ini` file of Adobe Connect installation to update the following attributes. Use `https` instead of `http` if you have configured SSL.
 - Set the value of `CQ_AUTHOR_SERVER` parameter as
`http://[author_dispatcher_URL]:[author_dispatcher_port]`.
 - Set the value of `CQ_PUBLISH_SERVER` parameter as
`http://[publish_dispatcher_URL]:[publish_dispatcher_port]`.
- 5 Restart Adobe Connect servers and Dispatchers.

Deploying Adobe Connect Edge Server

Adobe Connect Edge Server installation workflow

1. Design edge server zones.

You can set up edge servers or clusters of edge servers in different locations, or *zones*, to allocate and balance access to Adobe Connect. For example, you could set up an edge server in San Francisco for West Coast users and an edge server in Boston for East Coast users.

2. Install Adobe Connect Edge Server.

Install Adobe Connect Edge Server on each computer in each zone. For example, if you have a cluster of edge servers in a zone, install Adobe Connect Edge Server on each computer in the cluster. See “[Install Adobe Connect Edge Server](#)” on page 31.

3. Modify the DNS server for each zone.

Map the FQDN of the origin Adobe Connect server to the static IP address of Adobe Connect Edge Server in each zone. See “[Deploying Adobe Connect Edge Server](#)” on page 37.

4. Configure the edge server.

You must add configuration parameters to the `custom.ini` file on each Adobe Connect Edge Server. See “[Deploying Adobe Connect Edge Server](#)” on page 37.

5. Configure the origin server.

You must add configuration parameters to the custom.ini file on each Adobe Connect server. Also, you must set the External Name of the edge server in the Application Management Console on the origin server. See [“Deploying Adobe Connect Edge Server”](#) on page 37.

6. Set up a load balancer.

If you set up multiple edge servers in a zone, you must use a load balancer to balance the load between edge servers and configure it to listen on port 80. The edge servers listen on port 8080. For more information, see the documentation provided by the vendor of the load balancer.

Deploy Adobe Connect Edge Server

Before you deploy edge servers, you should have Adobe Connect and any additional features (for example, SSL, a directory service integration, single sign-on, or shared content storage) running successfully.

- 1 On your DNS server, map the FQDN of the origin server to the static IP address of the edge server. If you're installing edge servers in multiple zones, repeat this step for each zone.

Note: Alternatively, you can use a hosts file; if you do, every client must have a hosts file that points the static IP address of the edge server to FQDN of the origin server.

- 2 On the Adobe Connect Edge Server, open the file `[root_install_dir]\edgeserver\win32\conf\HttpCache.xml` and replace the computer name in the HostName tag with the FQDN of the edge server computer, for example, `edge1.mycompany.com`.

```
<!-- The real name of this host. -->
<HostName>edge1.yourcompany.com</HostName>
```

- 3 On the Adobe Connect Edge Server, create a new file `[root_install_dir]\edgeserver\custom.ini` file and enter the following parameters and values:

FCS_EDGE_HOST The FQDN of the edge server, for example, `FCS_EDGE_HOST=edge1.yourcompany.com`.

FCS_EDGE_REGISTER_HOST The FQDN of the Adobe Connect origin server, for example,
`FCS_EDGE_REGISTER_HOST=connect.yourcompany.com`.

FCS_EDGE_CLUSTER_ID The name of the cluster. Each edge server cluster must have a unique ID. Each computer within the cluster must have the same ID. The recommended format is `companyname-clustername`, for example, `FCS_EDGE_CLUSTER_ID=yourcompany-us`.

Note: Even if you are only deploying one Adobe Connect Edge Server, you must configure this parameter.

FCS.HTTPCACHE_BREEZE_SERVER_NORMAL_PORT The IP address or domain name and port number of the computer where Adobe Connect is installed, for example,
`FCS.HTTPCACHE_BREEZE_SERVER_NORMAL_PORT=connect.yourcompany.com:80`. The Adobe Connect Edge Server connects to the Adobe Connect origin server at this location.

FCS_EDGE_PASSWORD (Optional) A password for the edge server. If you set a value for this parameter, you must set the same value for every edge server and origin server.

FCS_EDGE_EXPIRY_TIME (Optional) The number of milliseconds in which the edge server must register itself to the origin before it expires from the cluster and the system fails over to another edge. Start with the default value,
`FCS_EDGE_EXPIRY_TIME=60000`.

FCS_EDGE_REG_INTERVAL (Optional) The interval, in milliseconds, at which the edge server attempts to register with the origin server. This parameter determines how often the edge server makes itself available to the origin server. Start with the default value, `FCS_EDGE_REG_INTERVAL=30000`.

DEFAULT_FCS_HOSTPORT (Optional) To configure the edge server ports, add the following line:

```
DEFAULT_FCS_HOSTPORT=:1935,80,-443.
```

The minus sign (-) in front of 443 designates port 443 as a secure port that receives only RTMPS connections. If you attempt an RTMPS connection request to port 1935 or 80, the connection will fail. Similarly, an unsecured RTMP connection request to port 443 will fail.

Note: If your edge server uses an external hardware accelerator, port 443 does not have to be configured as a secure port.

The following are sample values for the config.ini file:

```
FCS_EDGE_HOST=edge.yourcompany.com
FCS_EDGE_REGISTER_HOST=connect.yourcompany.com
FCS_EDGE_CLUSTER_ID=yourcompany-us
FCS.HTTPCACHE_BREEZE_SERVER_NORMAL_PORT=connect.yourcompany.com:80
```

4 Restart the edge server.

5 On the Adobe Connect origin server, open the `[root_install_dir]\custom.ini` file in a text editor and map the value of the `FCS_EDGE_CLUSTER_ID` parameter to a zone ID; the syntax is `edge.FCS_EDGE_CLUSTER_ID=zone-id`. Even if you are only deploying one edge server, you must map the cluster ID to a zone ID.

Each edge server cluster must have a zone ID. A zone ID can be any positive integer greater than 0. For example, you could have three clusters mapped to zones 1 to 3:

```
edge.yourcompany-us=1
edge.yourcompany-apac=2
edge.yourcompany-emea=3
```

The following is a sample custom.ini file for the origin server:

```
DB_HOST=localhost
DB_PORT=1433
DB_NAME=breeze
DB_USER=sa
DB_PASSWORD=#V1#4cUsRJ6oeFwZLnQPpS4f0w==
# DEBUG LOGGING SETTINGS
HTTP_TRACE=yes
DB_LOG_ALL_QUERIES=yes
# EDGE SERVER SETTINGS
edge.yourcompany-us=1
```

Note: If you set an `FCS_EDGE_PASSWORD` parameter in the `config.ini` file on the edge server, set the same password in the `custom.ini` file on the origin server.

6 Restart the origin server.

7 On the origin server, open the Application Management Console (Start > Programs > Adobe Connect Server > Configure Adobe Connect Server). Select the Application Settings tab, then select Server Settings and, in the Host Mappings section, enter the External Name for the edge server. The External Name should be identical to the value set for the `FCS_EDGE_HOST` parameter on the edge server.

8 On the origin server, configure the Windows firewall so the edge servers can access port 8506.

9 Repeat steps 2-4 for each edge server in each zone.

10 Repeat steps 5-7 for each origin server in each zone.

For help deploying edge servers, contact Adobe Support at www.adobe.com/support/programs/connect.

More Help topics

[“Choosing to deploy Adobe Connect Edge Server”](#) on page 14

Integrating with a directory service

Directory service integration overview

You can integrate Adobe Connect with a directory service to authenticate users against the LDAP directory and to avoid manually adding individual users and groups. User accounts are created automatically in Adobe Connect through manual or scheduled synchronizations with the directory of your organization.

To integrate with Adobe Connect, your directory server must use Lightweight Directory Access Protocol (LDAP) or secure Lightweight Directory Access Protocol (LDAPS). LDAP is an Internet client-server protocol for lookup of user contact information from an LDAP-compliant directory server.

Adobe Connect connects as an LDAP client to an LDAP directory. Adobe Connect imports users and groups, and synchronizes information about these users and groups with the LDAP directory. You can also configure Adobe Connect to authenticate users against the LDAP directory.

Any LDAP-compliant directory service may integrate with Adobe Connect. For a list of certified LDAP directories, see www.adobe.com/go/learn_cnn_sysreqs_en.

About LDAP directory structure

LDAP directories organize information according to the X.500 standard.

A user or group in an LDAP directory is called an *entry*. An entry is a collection of attributes. An attribute consists of a type and one or more values. Types use mnemonic strings, such as `ou` for organizational unit or `cn` for common name. Attribute values consist of information such as phone number, e-mail address, and photo. To determine your organization's LDAP directory structure, contact your LDAP administrator.

Each entry has a *distinguished name* (DN) that describes a path to the entry through a tree structure from the entry to the root. The DN for an entry in the LDAP directory is a concatenation of the name of the entry (called a *relative distinguished name*, RDN) and the names of its ancestor entries in the tree structure.

A tree structure may reflect geographical locations or departmental boundaries within a company. For example, if Alicia Solis is a user in the QA department of Acme, Inc. in France, the DN for this user might be as follows:

```
cn=Alicia Solis, ou=QA, c=France, dc=Acme, dc=com
```

Importing directory branches

When importing users and groups from an LDAP directory into Adobe Connect, you specify a path to a section of the LDAP tree by using the DN of the section. This specifies the scope of the search. For example, you may want to import only the users of a particular group within your organization. To do this, you need to know where the entries for that group are located in the directory tree structure.

A common technique is to use the organization's Internet domain as the root for the tree structure. For example, Acme, Inc. might use `dc=com` to specify the root element in the tree. A DN that specifies the Singapore sales office for Acme, Inc. might be `ou=Singapore, ou=Marketing, ou=Employees, dc=Acme, dc=com`. (In this example, `ou` is an abbreviation for organizational unit, and `dc` is an abbreviation for domain component.)

Note: Not all LDAP directories have a single root. In this situation, you can import separate branches.

Importing users and groups

There are two ways of structuring user and group entries in an LDAP directory: under the same node of a branch or under different branches.

If users and groups are under the same node in an LDAP branch, user and group settings for importing entries contain the same branch DN. This means that when you import users, you must use a filter to select only users, and when you import groups, you must use a filter to select only groups.

If users and groups are under different branches in the tree, use a branch DN that selects the user branch when you import the users and the group branch when you import the groups.

You can also import sub-branches to import users from all branches below a certain level. For example, if you want to import all the employees in the sales department, you might use the following branch DN:

```
ou=Sales, dc=Acme, dc=com
```

However, salespeople might be stored in sub-branches. In that case, on the User Profile Mapping screen, set the Subtree Search parameter to `true` to ensure that users are imported from the sub-branches below that level in the tree.

Filtering selected entries

A filter specifies a condition that an entry must satisfy to be selected. This restricts the selection of entries within a part of the tree. For example, if the filter specifies `(objectClass=organizationalPerson)`, only entries that have the attribute `organizationalPerson` are selected for import.

Note: The attribute `objectClass` must be present in every entry in a LDAP directory.

Internal and external users and groups

Users and groups that you create directly in Adobe Connect rather than importing them from an LDAP directory are called *internal* users and groups. Users and groups imported into the Adobe Connect database from an LDAP directory are called *external* users and groups.

To ensure that imported groups are kept synchronized with the external LDAP directory, you cannot add internal users and groups to external groups. However, you can add external users and groups to internal groups.

If the value of the login or name of an imported user or group entry matches the login for an existing internal user or group, synchronizing the directories changes the imported user or group from internal to external and places a warning in the synchronization log.

Integrate Adobe Connect with an LDAP directory

Directory service integration takes place in the Directory Service Settings tab of the Application Management Console. Use an Administrator account.

You can configure one directory server for user authentication and LDAP synchronization. The configuration can point to one or several branches of the directory service.

1. Open the Application Management Console.

Choose Start > Programs > Adobe Connect Server > Configure Adobe Connect Server.

2. Enter LDAP server connection settings.

Select the Directory Service Settings tab. Enter values on the LDAP Settings > Connection Settings screen and click Save.

When you click Save, Adobe Connect tests the LDAP connection. If the test fails, you see the following message: Your settings were successfully saved but LDAP connectivity could not be verified. Please check your LDAP URL and port.

| Field | Default value | Description |
|---------------------------------------|---------------|---|
| LDAP Server URL | No default. | Usual form is <code>ldap://[servername:portnumber]</code> . If your organization uses a secure LDAP server, use <code>ldaps://</code> . If you do not specify a port, Adobe Connect uses the standard LDAP port (389) or LDAPS port (636). LDAPS requires SSL certificates. If you configure Adobe Connect to work in a Microsoft Active Directory forest where the Global Catalog is enabled, use the Global Catalog (standard port: 3268). |
| LDAP Connection Authentication Method | No default. | The mechanism for authenticating the credentials (LDAP user name, LDAP password) of the LDAP service account for Adobe Connect (admin rights). Simple (standard authentication - recommended). Anonymous (no password - your LDAP server must be configured to allow anonymous login). Digest MD5 (configure your LDAP server to allow digest authentication). |
| LDAP Connection Username | No default. | Administrative login on the LDAP server. |
| LDAP Connection Password | No default. | Administrative password on the LDAP server. |
| LDAP Query Timeout | No default. | Time that can elapse before the query is canceled, in seconds. If you leave the field empty, there is no timeout. Set this value to 120. |
| LDAP Entry Query Page Size Limit | No default. | The page size of the results returned from the LDAP server. If this box is blank or 0, a page size is not used. Use this field for LDAP servers that have a maximum results size configured. Set the page size to less than the maximum results size so all the results are retrieved from the server in multiple pages. For example, if you try to integrate a large LDAP directory that can only display 1000 users and there are 2000 users to import, the integration fails. If you set the Query Page Size to 100, the results would be returned in 20 pages and all users would be imported. |

The following is an example of LDAP syntax for connection settings:

```
URL:ldap://ldapserverserver.mycompany.com:389
UserName:MYCOMPANY\jdoe
Password:password123
Query timeout:120
Authentication mechanism:Simple
Query page size:100
```

3. Map Adobe Connect and LDAP directory user profiles.

Choose the User Profile Mapping tab, enter values, and click Save.

| Field | Default value | Description |
|------------|---------------|---|
| Login | No default. | The directory service login attribute. |
| First Name | No default. | The directory service first name attribute. |
| Last Name | No default. | The directory service last name attribute. |
| E-mail | No default. | The directory service email attribute. |

If you have defined custom fields, they are added to the User Profile Mapping screen. This example maps an Adobe Connect user profile to an Active Directory LDAP user profile; Network Login is a custom field.

Login:mail
FirstName:givenName
LastName:sn
Email:userPrincipalName
NetworkLogin:mail

4. (Optional) Add a user branch.

Click Add to add user information from a particular branch of your company. Enter values in the Branch and Filter fields and click Save.

If you want to import users from subbranches, select True from the Subtree Search menu; otherwise, select False.

For more information, see “[About LDAP directory structure](#)” on page 40.

| Field | Default value | LDAP attribute/notes |
|----------------|---------------|--|
| Branch DN | No default. | DN (distinguished name) of the branch root node. A link to the selected branch is displayed. |
| Filter | No default. | The query filter string. |
| Subtree Search | True | True or False. A value of True initiates a recursive search of all subtrees in the branch. |

5. Map Adobe Connect and LDAP directory group profiles.

Select the Group Profile Mapping tab, enter values, and click Save.

Note: Adobe Connect group profiles do not support custom fields.

| Field | Default value | LDAP attribute/notes |
|--------------|---------------|---|
| Group Name | No default. | The directory service group name attribute. |
| Group Member | No default. | The directory service group member attribute. |

The following is a mapping between LDAP group entry attributes and an Adobe Connect group profile:

Name:cn
Membership:member

6. (Optional) Add a group branch.

Click Add to add user information from a branch of your organization. Enter values in the Branch and Filter fields and click Save.

If you want to import groups from subbranches, select True from the Subtree Search menu; otherwise, select False.

For more information, see “[About LDAP directory structure](#)” on page 40.

| Field | Default value | LDAP attribute/notes |
|----------------|---------------|---|
| Branch DN | No default. | DN (distinguished name) of the branch root node. Each branch in the organization has its own LDAP DN attribute. A link to the selected branch is displayed. |
| Filter | No default. | The query filter string. |
| Subtree Search | True | A Boolean value of true or false. A value of true initiates a recursive search of all subtrees in the branch. |

The following example shows one LDAP syntax for adding a branch of the organization and defining its groups:

```
DN: cn=USERS,DC=myteam,DC=mycompany,DC=com
Filter: (objectClass=group)
Subtree search: True
```

7. Enter authentication settings.

Select the Authentication Settings tab. If you want to authenticate Adobe Connect users against the directory service of your organization, select “Enable LDAP Directory authentication”. If you do not select this option, Adobe Connect uses native authentication (user credentials stored in the Adobe Connect database).

If you check “Enable Connect fall-back on unsuccessful LDAP Directory authentication”, Adobe Connect uses native authentication.

Note: This option can be useful in the event of a temporary LDAP connectivity failure on your network. However, LDAP credentials can be different from credentials in the Adobe Connect database.

Check “Create Connect user account upon successful LDAP Directory authentication” to provision first-time users on the Adobe Connect server if LDAP authentication is successful. If any user in your directory service is allowed to use Adobe Connect, leave this option checked and select “Internal” as user account type. For more information, see [“Internal and external users and groups”](#) on page 41.

Check “Enable group enrollment on first login only” to create a login ID in Adobe Connect and place users into specified groups when users log into Adobe Connect for the first time. Enter the groups in the Group names box.

8. Schedule synchronization.

Select the Synchronization Settings tab. On the Schedule Settings screen, select the Enable scheduled synchronization check box to schedule regular synchronizations either once daily, weekly, or monthly at a certain time. For more information, see [“Recommended practices for synchronization”](#) on page 45.

You can also perform a manual synchronization on the Synchronization Actions screen.

9. Set a password policy and a deletion policy.

Select the Policy Settings tab, choose a Password Setup Policy and a Deletion Policy, and click Save. For more information about password policy, see [“Managing passwords”](#) on page 44.

Note: If you select the Delete users and groups... option, during a synchronization, all external users that have been deleted from the LDAP server are also deleted from the Adobe Connect server.

10. Preview the synchronization.

Select the Synchronize Actions tab. In the Preview Directory Synchronization section, click Preview. For more information, see [“Recommended practices for synchronization”](#) on page 45.

Managing passwords

If you do not enable LDAP authentication, you must choose how Adobe Connect authenticates users.

When Adobe Connect imports user information from an external directory, it does not import network passwords. Therefore, implement another method for managing passwords for users imported into the Adobe Connect directory.

Notifying users to set a password

On the Policy Settings screen of the Synchronization Settings tab, you can choose to send an e-mail to imported users with a link that lets them set a password.

Set the password to an LDAP attribute

You can choose to set the initial password of an imported user to the value of an attribute in directory entry of that user. For example, if the LDAP directory contains the employee ID number as a field, you could set the initial password for users to their employee ID number. After users log in using this password, they can change their passwords.

Recommended practices for synchronization

As an administrator, you can synchronize Adobe Connect with the external LDAP directory in two ways:

- You can schedule synchronization so that it takes place at regular intervals.
- You can perform a manual synchronization that immediately synchronizes the Adobe Connect directory with the organization's LDAP directory.

Before you import users and groups in an initial synchronization, it's a good idea to use an LDAP browser to verify the connection parameters. The following browsers are available online: LDAP Browser/Editor and LDAP Administrator.

Important: Do not reboot your LDAP server or run parallel jobs during synchronization. Doing so can cause users or groups to be deleted from Adobe Connect.

Scheduled synchronizations

Scheduled synchronizations are recommended because they ensure that Adobe Connect has an up-to-date picture of the users and groups imported from the organization's LDAP directory.

If you are importing a large number of users and groups, the initial synchronization might consume significant resources. If this is the case, it's a good idea to schedule this initial synchronization at an off-peak time, such as late at night. (Alternatively, you can do the initial synchronization manually.)

To set up a scheduled synchronization, use the Synchronization Settings > Schedule Settings screen in the Application Management Console.

When a synchronization takes place, Adobe Connect compares LDAP directory entries to Adobe Connect directory entries and imports only those entries that contain at least one changed field.

Previewing the synchronization

Before you import users and groups in an initial synchronization, Adobe recommends that you test your mappings by previewing the synchronization. In a preview, users and groups are not actually imported, but errors are logged; you can examine these errors to diagnose problems in the synchronization.

To access the synchronization logs, use the Synchronization Logs screen. Each line of the log shows a synchronization event; the synchronization produces at least one event for each principal (user or group) processed. If any warnings or errors are generated during the preview, they are listed in a second warning log.

Log file values

The synchronization logs store values in a comma-separated format. In the following tables, *principal* refers to user and group entries. The following values are included in the log entries:

| Field | Description |
|--------------|--|
| Date | The formatted date-time value, with time to the millisecond. The format is yyyyMMdd'THHmmss.SSS. |
| Principal ID | The login or group name. |

| Field | Description |
|----------------|--|
| Principal type | A single character: U for user, G for group. |
| Event | The action taken or condition encountered. |
| Detail | Detailed information about the event. |

The following table describes the different kinds of events that can appear in the synchronization log files:

| Event | Description | Detail |
|----------------|--|--|
| add | The principal was added to Adobe Connect. | An abbreviated XML packet that describes the updated fields using a series of tag pairs in the format <code><fieldname>value</fieldname></code> (for example, <code><first-name>Joe</first-name></code>). The parent node and non-updated fields are omitted. |
| update | The principal is an external user and some fields were updated. | |
| update-members | The principal is an external group, and principals were added to or removed from membership in the group. | An abbreviated XML packet that describes the added and removed members. The parent node is omitted: <code><add>ID list</add></code> <code><remove>ID list</remove></code> The ID list is a series of <code><id>principal ID</id></code> packets where <code>principal ID</code> is an ID that would be listed in the Principal ID column, such as a user login or group name. If there are no members of an ID list, the parent node is output as <code><add/></code> or <code><remove/></code> . |
| delete | The principal was deleted from Adobe Connect. | |
| up-to-date | The principal is an external principal in Adobe Connect and is already synchronized with the external directory. No changes were made. | A user or group created in Adobe Connect is considered an internal principal. A user or group created by the synchronization process is considered an external principal. |
| make-external | The principal is an internal principal in Adobe Connect and was converted to an external principal. | This event permits the synchronization to modify or delete the principal and is usually followed by another event that does one or the other. This event is logged in the warning log. |
| warning | A warning-level event occurred. | A warning message. |
| error | An error occurred. | Java exception message. |

About LDAPS

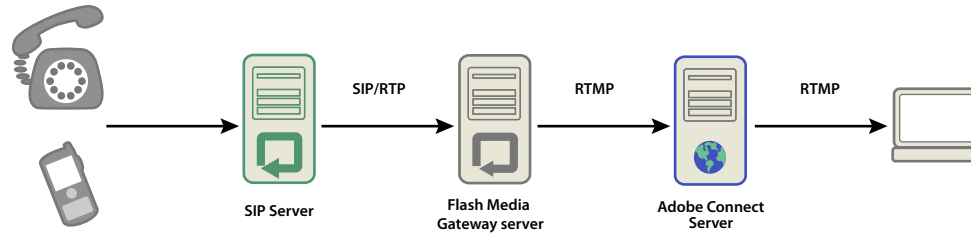
Adobe Connect supports the secure LDAP protocol, *LDAPS*, natively. The LDAP directory server must provide SSL connectivity. To connect securely to an LDAP directory server, use the LDAPS protocol in the connection URL, as follows: `ldaps://exampleDirectoryServer:portNumber`.

Deploying Universal Voice

Workflow for deploying Universal Voice

Note: For a comparison of Universal Voice and integrated telephony adaptors, see “[Adobe Connect audio and video conferencing options](#)” on page 16.

Adobe Connect Universal Voice uses a component called Flash Media Gateway to send and receive audio from a SIP server. Install Flash Media Gateway and configure it to communicate with a SIP server. The SIP server can be hosted by a third-party or part of your company's infrastructure. (SIP providers are also called *VoIP providers*.)



Audio flows from a phone, through an audio conference server (not pictured), through a SIP server, through Flash Media Gateway, to an Adobe Connect meeting room.

Note: Adobe Connect supports two-way communication and video devices.

Follow this workflow to implement the Universal Voice solution:

- 1 To install and configure Universal Voice, you must have the following:
 - Adobe Connect
 - SIP provider credentials
- 2 Install Flash Media Gateway.

You can install Flash Media Gateway on the same computer as Adobe Connect Server or on a dedicated computer. You can deploy Flash Media Gateway on a single computer or in a cluster of servers. The Flash Media Gateway installer is part of the Adobe Connect Server installer. See [“Installing Adobe Connect and associated products”](#) on page 22.
- 3 Configure Flash Media Gateway to connect to a SIP server.
- 4 Open ports. See [“Flash Media Gateway ports and protocols”](#) on page 47.

If a firewall uses NAT, see [“Configuring Flash Media Gateway to communicate from behind a firewall that uses NAT”](#) on page 48.
- 5 To install Flash Media Gateway on a cluster of computers, see [“Deploy Flash Media Gateway on a cluster of servers”](#) on page 51.
- 6 To create a dialing sequence and test the audio connection, see [Configure audio providers for universal voice](#).
- 7 If you can't hear audio in an Adobe Connect meeting, see [“Troubleshoot Universal Voice issues”](#) on page 52.

Flash Media Gateway ports and protocols

Note: To view a diagram of how data flows between a SIP provider, Flash Media Gateway, and Adobe Connect Server, see [“Data flow”](#) on page 9.

Flash Media Gateway listens for requests from Adobe Connect Central Application Server on the following port:

| Port number | Bind address | Protocol |
|-------------|---------------|----------|
| 2222 | */Any Adaptor | HTTP |

Flash Media Gateway initiates a connection with Flash Media Server like a regular RTMP client. Flash Media Server listens for Flash Media Gateway on the following port:

| Port number | Bind address | Protocol |
|-------------|---------------|----------|
| 8506 | */Any Adaptor | RTMP |

Flash Media Gateway communicates with the audio conferencing provider over the SIP and RTP protocols on the following ports:

| Direction | Rule |
|---------------------------------|--|
| Flash Media Gateway to Internet | SRC-IP=<Server-IP>, SRC-PORT=5060, DST-IP=ANY, DST-PORT=5060 |
| Internet to Flash Media Gateway | SRC-IP=ANY, SRC-PORT=5060, DST-IP=<Server-IP>, DST-PORT=5060 |
| Flash Media Gateway to Internet | SRC-IP=<Server-IP>, SRC-PORT=5000_TO_6000, DST-IP=ANY, DST-PORT=ANY_HIGH_END |
| Internet to Flash Media Gateway | SRC-IP=ANY, SRC-PORT=ANY_HIGH_END, DST-IP=<Server-IP>, DST-PORT=5000_TO_6000 |

Note: ANY_HIGH_END means any port above 1024. The default port range is 5000-6000. You can change these values in the Application Management Console. Alternatively, you can also update these values from the sip.xml file of Flash Media Gateway, by configuring the nodes `portUpperLimit` and `portLowerLimit`.

Configuring Flash Media Gateway to communicate from behind a firewall that uses NAT

Note: You may not need to complete this task if your firewall is SIP-capable or SIP-aware. Also, in some cases the ALG (application-level gateway) for SIP in a firewall can cause problems. If you can't enable successful communication through ALG, disable ALG for SIP in the firewall and use the technique described in this section.

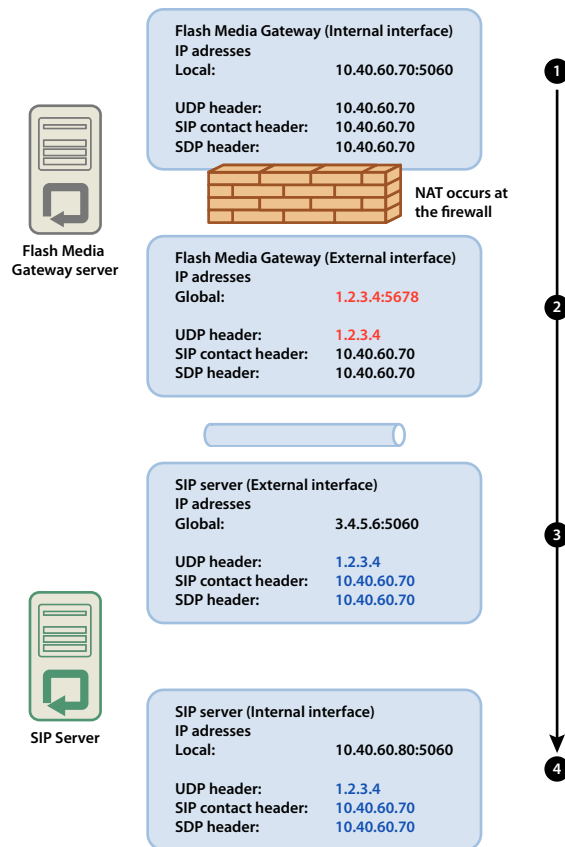
Network address translation (NAT) is a process that allows networks to use fewer external IP addresses and to obscure internal IP addresses. NAT changes the IP address and port number of packets flowing out of a network. The internal IP addresses are changed to an external IP address. NAT also tries to direct responses sent to the external IP address to the correct internal IP addresses.

When Flash Media Gateway is behind a firewall that uses NAT, it may not be able to receive packets from the SIP server. NAT changes the local IP address and the UDP header (packet source) IP address to match the external IP address.

The UDP header IP address is the same as the Flash Media Gateway external IP address. Therefore, if the SIP server uses the UDP header IP address to send a reply, the reply finds Flash Media Gateway.

The contact header IP address is the same as the Flash Media Gateway local IP address. Therefore, if the SIP server uses the SIP contact header IP address to send a reply, the reply can't find Flash Media Gateway. The local IP address is hidden behind the firewall and not visible to the SIP server.

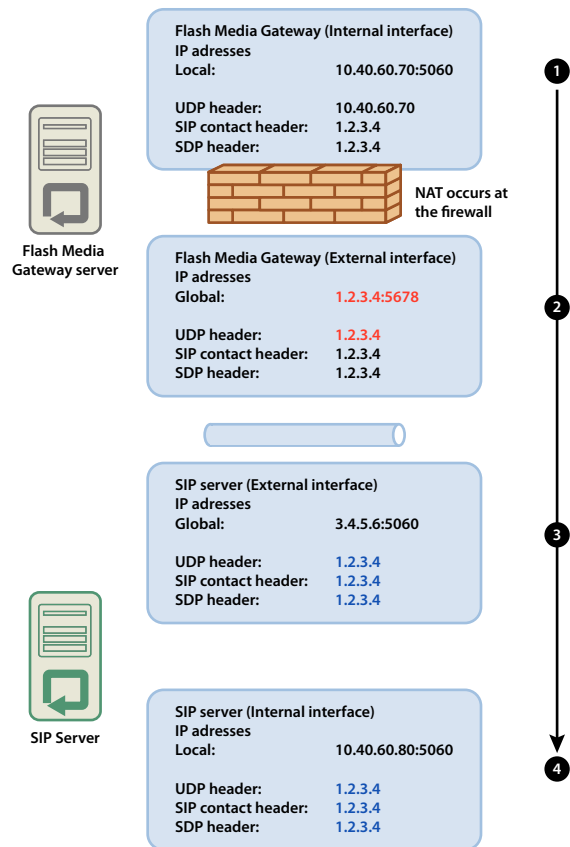
The following image shows how NAT changes the IP addresses at the firewall:



NAT changes the IP address

- Flash Media Gateway (internal interface). The UDP header (packet source IP address) and the SIP contact header IP address are the same as the local IP address.
- Flash Media Gateway (external interface). NAT changes the UDP header IP address to the global IP address.
- SIP server (external interface). The packet reaches the global interface on the SIP server. To reach the internal interface, directly forward the port. If the port is not forwarded, the packet is lost and communication breaks.
- SIP server (internal interface). The packet is processed when it reaches this interface. If the SIP server uses the UDP header IP address to send a reply the reply reaches Flash Media Gateway successfully. If the SIP server uses the contact header IP address, the reply cannot reach Flash Media Gateway.

The following image shows a successful configuration in which the SIP contact header IP address is same as the Flash Media Gateway external IP address. This change allows packets to be routed back to Flash Media Gateway from the SIP server.



A configuration that allows successful communication

To ensure that Flash Media Gateway can receive packets successfully from a SIP server, do the following:

- 1 On Flash Media Gateway, open the `[root_install_dir]/conf/sip.xml` file in a text editor. (The default root installation folder is `C:\Program Files\Adobe\Flash Media Gateway`.)
 - a Create a `<globalAddress>` tag under the `<Profile>` tag. Enter the Flash Media Gateway external IP address, as in the following:

```
...
<Profiles>
  <Profile>
    <profileID> sipGateway </profileID>
    <userName>141583220 00 </userName>
    <password></password>
    <displayName> sipGateway </displayName>
    <registrarAddress>8.15.247.100:5060</registrarAddress>
    <doRegister>0</doRegister>
    <defaultHost>8.15.247.100:5060</defaultHost>
    <hostPort> 0 </hostPort>
    <context> sipGatewayContext </context>
    <globalAddress>8.15.247.49</globalAddress>
    <supportedCodecs><codecID> G711u </codecID><codecID> speex </codecID>
  </supportedCodecs>
</Profile>
</Profiles>
...
```

In a cluster, each Flash Media Gateway server must have a unique external IP address.

Important: If the external IP address is dynamic, you must reconfigure Flash Media Gateway every time the external IP address changes.

- b** Restart the Flash Media Gateway service. See “[Start and stop Flash Media Gateway](#)” on page 77.
- 2** On the firewall between the Flash Media Gateway server and the SIP server directly forward the SIP port (5060 by default) and all RTP voice ports (5000 - 6000 by default) toward the Flash Media Gateway server. The ports open at the firewall must be the same as the ports open on the Flash Media Gateway server.

Note: The servers can communicate without port forwarding. However, without port forwarding calls may disconnect unexpectedly, especially after long durations.

Configure the Flash Media Gateway log level

A high log level can cause audio glitches when the load on Flash Media Gateway is high. Higher log levels write more information to the log. Writing to the log uses processing power and leaves less power for transmitting audio. For best performance, Adobe recommends setting the log level for audio data to 4.

- 1** Open the fmsmg.xml file in a text editor (By default, the file is located at C:\Program Files\Adobe\Flash Media Gateway\conf.)
- 2** Set logLevel to 4:

```
<logLevel>4</logLevel>
```
- 3** Restart Flash Media Gateway.

Deploy Flash Media Gateway on a cluster of servers

Flash Media Gateway installed on a computer with two processors can make 100 calls simultaneously. To handle a higher load increase the number of processors or add more Flash Media Gateway servers to the cluster.

To deploy a cluster of servers, install Flash Media Gateway on its own computers and install Adobe Connect Server on its own computers. Do not install Adobe Connect Server and Flash Media Gateway on the same computers.

When you deploy Flash Media Gateway on a cluster of servers, Adobe Connect Server handles load balancing and failover. Adobe Connect Edge Server does not require any additional configuration.

- 1 Run the installer on every server in the cluster and choose to install Flash Media Gateway. See “[Installing or Upgrading to Adobe Connect 9](#)” on page 22.

***Note:** For information about deploying Adobe Connect Server in a cluster, see “[Deploy a cluster of Adobe Connect servers](#)” on page 34.*

- 2 On one Adobe Connect server, open the Application Management Console at <http://localhost:8510/console>.
- 3 Select Flash Media Gateway settings and click Add to add and configure additional Flash Media Gateway servers.

***Note:** Use the Application Management Console on one server to enter configuration parameters for all the servers in the cluster. The Application Management Console pushes the configuration settings to every server in the cluster.*

Troubleshoot Universal Voice issues

If you can't hear audio from a Universal Voice audio conference in a meeting room, do the following:

- 1 Make sure that the volume is up on the computer. If you're using headphones, make sure they're plugged into the output jack.
- 2 Test the dial-in sequence. See [Test a dialing sequence](#).
- 3 Verify that Flash Media Gateway is configured successfully:
 - a Open the Application Management Console (<http://localhost:8510/console>) on Adobe Connect Server and click Flash Media Gateway Settings. The status of each Flash Media Gateway must be “Active”.
 - b If the status is not active, open the `[root_install_dir]/custom.ini` file. Make sure that you see the following entries:

```
FMG_ADMIN_USER=sa
FMG_ADMIN_PASSWORD=breeze
```

If you don't see the entries, enter them and restart Adobe Connect Central Application Server.

- 4 Contact Adobe Support at www.adobe.com/support/programs/connect.

If you don't see an option to add a Video Telephony pod in the meeting room Pods menu:

- ❖ Ensure that Video Telephony Pod is not disabled in Adobe Connect Central > Administration > Compliance and Control.

Configuring a video telephony device to work with Adobe Connect

You can enable a video telephony device on a Flash Media Gateway (FMG) installation, so that it is integrated with Adobe Connect. The steps to do so are described in [Configure FMG for a video telephony device to work with Adobe Connect](#) article.

Deploying integrated telephony adaptors

Integrated telephony adaptors are Java extensions that let Adobe Connect connect to an audio bridge. You can install any number of integrated telephony adaptors when you install Adobe Connect. For more information, see [“Preparing to install integrated telephony adaptors”](#) on page 16.

After installing one or more adaptors, see the following topics to verify and configure the installation.

- [“Avaya telephony adaptor”](#) on page 53
- [“InterCall telephony adaptor”](#) on page 54
- [“MeetingOne telephony adaptor”](#) on page 54
- [“PGi NA telephony adaptor”](#) on page 55
- [“PGi EMEA telephony adaptor”](#) on page 55
- [“Arkadin telephony adaptor”](#) on page 56

To configure additional adaptor capabilities after installation is complete, see [Configure Adobe Connect Telephony Adaptors](#).

Avaya telephony adaptor

Complete the following two tasks to confirm the adaptor is working as expected.

Confirm that telephony is enabled

- 1 Log in to Adobe Connect Central.
- 2 Click Administration > Audio Providers.

If telephony is successfully enabled, you’ll see Avaya in the Providers list. Select Avaya and click Edit to enable or disable the adaptor for the entire Adobe Connect account.

- 3 To add an Avaya audio profile, click My Profile > My Audio Profiles > New Profile. From the Provider list, select Avaya.

For more information, see [Configure audio providers for universal voice](#).

Test audio in a meeting

- ❖ Before you deploy Adobe Connect to a production environment, record at least two minutes of a meeting. View the meeting archive to confirm that audio recorded correctly.

Disabling the adaptor

If you want to disable the Avaya adaptor:

- 1 Stop Adobe Connect Telephony Service.
- 2 Open the `[root_install_dir]\telephony-service\conf\telephony-settings.xml` file.
- 3 Set the `enabled` attribute of the `<telephony-adaptor>` tag to `false`, as in the following:

```
<telephony-adaptor id="avaya-adaptor" class-name="com.macromedia.breeze_ext.telephony.AvayaAdaptor" enabled="false">
```
- 4 Restart Adobe Connect Telephony Service.

InterCall telephony adaptor

Complete the following two tasks to confirm the adaptor is working as expected.

Confirm that telephony is enabled

- 1 Log in to Adobe Connect Central.
- 2 Click Administration > Audio Providers.
If telephony is successfully enabled, you'll see InterCall in the Providers list. Select InterCall and click Edit to enable or disable the adaptor for the entire Adobe Connect account.
- 3 To add an InterCall audio profile, click My Profile > My Audio Profiles > New Profile. From the Provider list, select InterCall.
For more information, see [Configure audio providers for universal voice](#).

Test audio in a meeting

Before you deploy Adobe Connect to a production environment, record at least two minutes of a meeting. View the meeting archive to confirm that audio recorded correctly.

Disabling the telephony adaptor

If you want to disable the InterCall adaptor:

- 1 Stop Adobe Connect Telephony Service.
- 2 Open the `[root_install_dir]\TelephonyService\conf\telephony-settings.xml` file.
- 3 Set the `enabled` attribute of the `<telephony-adaptor>` tag to `false`, as in the following:

```
<telephony-adaptor id="intercall-adaptor" class-name="com.macromedia.breeze_ext.telephony.Intercall.IntercallTelephonyAdaptor" enabled="false">
```
- 4 Restart Adobe Connect Telephony Service.

MeetingOne telephony adaptor

Complete the following two tasks to confirm the adaptor is working as expected.

Confirm that telephony is enabled

- 1 Log in to Adobe Connect Central.
- 2 Click Administration > Audio Providers.
If telephony is successfully enabled, you'll see MeetingOne in the Providers list. Select MeetingOne and click Edit to enable or disable the adaptor for the entire Adobe Connect account.
- 3 To add an MeetingOne audio profile, click My Profile > My Audio Profiles > New Profile. From the Provider list, select MeetingOne.
For more information, see [Configure audio providers for universal voice](#).

Test audio in a meeting

Before you deploy Adobe Connect to a production environment, record at least two minutes of a meeting. View the meeting archive to confirm that audio recorded correctly.

Disabling the telephony adaptor

If you want to disable the MeetineOne adaptor:

- 1 Stop Adobe Connect Telephony Service.
- 2 Open the `[root_install_dir]\TelephonyService\conf\telephony-settings.xml` file.
- 3 Set the `enabled` attribute of the `<telephony-adaptor>` tag to `false`, as in the following:

```
<telephony-adaptor id="meetingone-adaptor" class-  
name="com.meetingone.adobeconnect.MeetingOneAdobeConnectAdaptor" enabled="false">
```

- 4 Restart Adobe Connect Telephony Service.

PGi NA telephony adaptor

Complete the following three tasks to ensure the adaptor is working as expected.

Configure domain names

Adobe Connect uses HTTP over port 443 to communicate with PGi. Make sure that Adobe Connect can communicate with the domain **csaxis.premconf.com**.

Confirm that telephony is enabled

- 1 Log in to Adobe Connect Central.
- 2 Click Administration > Audio Providers.

If telephony is successfully enabled, you'll see PGi NA in the Providers list. Select PGi NA and click Edit to enable or disable the adaptor for the entire Adobe Connect account.
- 3 To add an PGi NA audio profile, click My Profile > My Audio Profiles > New Profile. From the Provider list, select PGi NA.

For more information, see [Configure audio providers for universal voice](#).

Test audio in a meeting

Before you deploy Adobe Connect to a production environment, record at least two minutes of a meeting. View the meeting archive to confirm that audio recorded correctly.

Disabling the telephony adaptor

If you want to disable the Premiere NA adaptor:

- 1 Open the `[root_install_dir]\TelephonyService\conf\telephony-settings.xml` file.
- 2 Set the `enabled` attribute of the `<telephony-adaptor>` tag to `false`, as in the following:

```
<telephony-adaptor id="premiere-adaptor" class-  
name="com.macromedia.breeze_ext.premiere.gateway.PTekGateway" enabled="false">
```

- 3 Restart Adobe Connect.

PGi EMEA telephony adaptor

Complete the following three tasks to ensure the adaptor is working as expected.

Configure domain names

Adobe Connect uses HTTP over port 443 to communicate with PGi. Make sure that Adobe Connect can communicate with the domain **euaxis.premconf.com**.

Confirm that telephony is enabled

- 1 Log in to Adobe Connect Central.

- 2 Click Administration > Audio Providers.

If telephony is successfully enabled, you'll see PGi EMEA in the Providers list. Select PGi EMEA and click Edit to enable or disable the adaptor for the entire Adobe Connect account.

- 3 To add a PGi EMEA audio profile, click My Profile > My Audio Profiles > New Profile. From the Provider list, select PGi EMEA.

For more information, see [Configure audio providers for universal voice](#).

Test audio in a meeting

Before you deploy Adobe Connect to a production environment, record at least two minutes of a meeting. View the meeting archive to confirm that audio recorded correctly.

Disabling the telephony adaptor

If you want to disable the PGi EMEA adaptor:

- 1 Stop Adobe Connect Telephony Service.
- 2 Open the `[root_install_dir]\TelephonyService\conf\telephony-settings.xml` file.
- 3 Set the `enabled` attribute of the `<telephony-adaptor>` tag to `false`, as in the following:

```
<telephony-adaptor id="premiere-emea-adaptor" class-  
name="com.macromedia.breeze_ext.premiere.gateway.EMEA.PTekGateway" enabled="false">
```

- 4 Restart Adobe Connect Telephony Service.

Arkadin telephony adaptor

Complete the following three tasks to ensure the adaptor is working as expected.

Confirm that telephony is enabled

- 1 Log in to Adobe Connect Central.

- 2 Click Administration > Audio Providers.

If telephony is successfully enabled, you'll see Arkadin in the Providers list. Select Arkadin and click Edit to enable or disable the adaptor for the entire Adobe Connect account.

- 3 To add a Arkadin audio profile, click My Profile > My Audio Profiles > New Profile. From the Provider list, select Arkadin.

For more information, see [Configure audio providers for universal voice](#).

Test audio in a meeting

Before you deploy Adobe Connect to a production environment, record at least two minutes of a meeting. View the meeting archive to confirm that audio recorded correctly.

Disabling the telephony adaptor

To disable the Arkadin adaptor:

- 1 Stop Adobe Connect Telephony Service.
- 2 Open the `[root_install_dir]\TelephonyService\conf\telephony-settings.xml` file.
- 3 Set the `enabled` attribute of the `<telephony-adaptor>` tag to `false`, as shown below:

```
<telephony-adaptor id="arkadin-adaptor" class-  
name="com.macromedia.breeze_ext.arkadin.ArkadinAdaptor" enabled="true">
```
- 4 Restart Adobe Connect Telephony Service.

Hide the Flash Media Gateway user in the Attendee list

Note: This section applies only to integrated telephony adaptors that have been configured for Universal Voice.

When a meeting room connects to Flash Media Gateway, the connection appears as a user in the Attendee list. To hide the Flash Media Gateway user in the Attendee list, configure the audio conference number in the `custom.ini` file. Use the same number for all computers in a cluster. You can get the audio conference number from your SIP provider. Or, if your account administrator has configured an audio provider in Adobe Connect Central, you can find the number in the meeting room.

- 1 Open the `[root_install_dir]\custom.ini` file in a text editor.
- 2 Add the following parameter:

```
UV_NUMBER={audio_conference_telephone_number}
```



```
// Example:  
UV_NUMBER=4155551212
```
- 3 Save and close the `custom.ini` file.
- 4 Do the following to restart the server:
 - a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
 - b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Configuring shared storage

About shared storage

You can use the installer or the Application Management Console to configure Adobe Connect to use NAS and SAN devices to manage content storage. Content is any file published to Adobe Connect, such as courses; SWF, PPT, or PDF files; and archived recordings.

The following are possible shared storage configurations:

- Content is copied to the primary external storage device and pulled to each Adobe Connect server's content folder as needed. Old content is purged from each server's content folder to make room for new content as needed. This configuration frees resources on the application server which is especially helpful in a large cluster. (Enter a value in the Shared Storage box and the Content Cache Size box.)

- Content is copied to all servers and the primary external storage device. This configuration is recommended for small clusters unless you have a large amount of content that is randomly accessed. (Enter a value in the Shared Storage box; leave Content Cache Size blank.)

Note: *If you have an Adobe Connect cluster and don't configure shared storage devices, the cluster works in full mirroring mode (content published to Adobe Connect is copied to all servers) and content is never automatically removed from any servers.*

Configure shared storage

If you didn't configure shared storage during installation, you can do so by following the instructions in this section.

- If you're configuring shared storage for one Adobe Connect server, follow the instructions in the first task.
- If you're configuring shared storage for a cluster, follow the instructions in the first task for one computer in the cluster and then follow the instructions in the second task for all the other computers in the cluster.

More Help topics

[“Supported content storage devices”](#) on page 5

Configure shared storage

Adobe Connect should be configured without shared storage and running on one server before you proceed.


- 1 Configure a shared volume on a external storage device.

The account under which the Adobe Connect service runs must have read and write permissions on the shared volume.

- 2 (Optional) If you are updating an existing Adobe Connect server to use shared storage volumes, you must copy the content from one of the existing servers to the shared volume.

- a Stop the server (Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server and Stop Adobe Connect Meeting Server).

- b Copy the folder[*root_install_dir*]\content\7 to the shared volume you created in step 1.

 *Some computers in a cluster may have extra content. Adobe Connect cannot use these files but if you want to copy them to the shared volume for archival purposes, you could write and run a script that compares the content of every computer with the content of the shared volume.*

- c Start Adobe Connect (Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server and Start Adobe Connect Central Application Server).

- 3 On the Adobe Connect server, choose Start > Control Panel > Administrative Tools > Services to open the Services window, select Adobe Connect Service, and do the following:

- a Right-click and select Properties.
- b Select the Log On tab.
- c Select This account and if the shared volume has a username and password, enter them and click Apply.

- 4 Restart Adobe Connect (application server only).

- a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.

- b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

- 5 Open the Application Management Console (Start > Programs > Adobe Connect Server > Configure Adobe Connect Server).

- 6 On the Application Settings tab, select the Server Settings tab, scroll down to the Shared Storage Settings section and enter a folder path in the Shared Storage box (for example, `\\volume\directory`).

If the primary storage device fills up, you can add another device to the primary position. Separate the paths by semicolons (;): `\\volume\directory;\\volume2\directory`.

***Note:** Writing (copying to the storage folder) is performed only on the first folder. Reading (copying from the storage folder) is performed in sequence starting with the first folder until the file is found.*

- 7 (Optional) To configure the content folder on Adobe Connect to act like a cache (assets are removed automatically when space is needed and are restored on demand), enter a value in the Content Cache Size box.

The content cache size is a percentage of the disk space to use as a cache. Adobe recommends that you set the value between 15 and 50 because the cache can grow well beyond the set size. The cache is purged only after viewed content has expired (24 hours after it was last viewed).

- 8 Click Save and close the Application Management Console.
- 9 Restart Adobe Connect (application server only).
 - a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
 - b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Configure shared storage for additional servers in a cluster

- 1 Install Adobe Connect but do not start it. If Adobe Connect is installed and already running, stop it.
- 2 On the Adobe Connect server, choose Start > Control Panel > Administrative Tools > Services to open the Services window, select Adobe Connect Service, and do the following:
 - a Right-click and select Properties.
 - b Select the Log On tab.
 - c Select This account and if the shared volume has a username and password, enter them and click Apply.
- 3 Start Adobe Connect.
 - a Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.
 - b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.
- 4 (Optional) If you are installing Adobe Connect for the first time, follow the steps in “[Deploy a cluster of Adobe Connect servers](#)” on page 34.
- 5 Click Save and close the Application Management Console.

Configuring Help and Resources links

Adding Support and Status links to the Help menu

Account Administrators can add a Status Page link and a Support Page link to the Help menu in Meeting rooms. The links are to HTML pages that you design. The Status Page could provide information about the current status of the Adobe Connect system. The Support Page could provide information about getting support using Adobe Connect. If you do not define these links, they are not available in the Help menu.

- 1 Open the `RootInstallationFolder\custom.ini` file in a text editor.
- 2 To edit the Status Page link, set `STATUS_PAGE = "http://connect.mycompany.com/status.html"`.

3 To edit the Support Page link, set `SUPPORT_PAGE="http://connect.mycompany.com/support.html"`.

The URLs can be absolute or relative to the domain of the meeting server. Start absolute URLs with “http://” or “https://”. Start relative URLs with “/”.

4 Do the following to restart Adobe Connect:

- a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
- b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Redirect the Adobe Connect Central Resources links

The Adobe Connect Central Home page has a Resources tab that provides links to a Getting Started page, Adobe Connect Central Help, Adobe Connect Documentation, and ConnectUsers.com. You can redirect these links to different locations.

Note: You cannot redirect ConnectUsers.com because it goes to a web site.

1 Open the page you want to edit in an HTML editor. In each file path, substitute the placeholder *lang* with the two letter language code. For example, the code for English is “en”.

| Page | Location | Notes |
|-----------------------------|---|---|
| Getting Started | appserv/common/help/lang/support/startmain.htm | You can edit this file in Adobe Connect Server version 7 and later. |
| Adobe Connect Central Help | appserv/common/help/lang/connect/9.0/using/AH_HOME.html | Changing this file also changes the Help link at top of Adobe Connect Central. You can edit this file in Adobe Connect Server version 7 and later. |
| Adobe Connect Documentation | appserv/common/help/lang/go/doc.html | You can edit this file in Adobe Connect Server version 7.5 and later. |

2 For each of these files, put the following as the total content of the file:

```
<!-- =====
This is used by Adobe Connect to redirect to the desired webpage.
If there is a particular place where you would like users to be sent,
please customize the URL below.
===== -->
<META HTTP-EQUIV=Refresh CONTENT="0; URL=http://desiredpage.com">
```

3 Edit the value of the URL attribute to target your content. The URL can be a relative path or an absolute path.

For example, to redirect the doc.html file to documentation on your organization’s server, you might use the URL `http://www.mycompany.com/support/documentation/connectpro`.

Configuring account notification settings

Set the time that monthly reports are sent

Adobe Connect sends a monthly email about the capacity of your account. By default, account capacity monthly reports are sent at 3:00 UTC. Add the parameters to the custom.ini file and set the desired values to send the email at a different time.

- 1 Open the *RootInstallationFolder\custom.ini* file and add the following parameters to the file with the desired values:

THRESHOLD_MAIL_TIME_OF_DAY_HOURS The UTC hour when the monthly reports for capacity notifications are sent. This value must be an integer from 0 through 23. This parameter can be set only in the custom.ini file; it cannot be set in Adobe Connect Central.

THRESHOLD_MAIL_TIME_OF_DAY_MINUTES The minute when the monthly reports for capacity notifications are sent. This value must be an integer from 0 through 59. This parameter can be set only in the custom.ini file; it cannot be set in Adobe Connect Central.

***Note:** If either of the preceding parameters is not specified or is specified incorrectly, the email is sent at 3:00 (UTC).*

The following are sample values added to the custom.ini file:

```
THRESHOLD_MAIL_TIME_OF_DAY = 5  
THRESHOLD_MAIL_TIME_OF_MINUTES = 30
```

- 2 Do the following to restart Adobe Connect:

- a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
- b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Set capacity thresholds

Adobe Connect account administrators can set capacity thresholds in Adobe Connect Central. When the account exceeds these thresholds, a notification is sent. You can add parameters in the custom.ini file that set the default capacity thresholds in Adobe Connect Central.

For more information about configuring account notifications in Adobe Connect Central, see the “Administering Adobe Connect” chapter in *Using Adobe Connect guide* at http://www.adobe.com/go/learn_cnn9_usingweb_en.

- 1 Open the *RootInstallationFolder\custom.ini* file and add any of the following parameters to the file with the desired values:

THRESHOLD_NUM_OF_MEMBERS The default threshold percentage for the Authors and Meeting Hosts quota. This value must be an integer from 10 through 100 and divisible by 10. If the value is not specified or is incorrectly specified, the value is 80.

THRESHOLD_CONC_USERS_PER_MEETING The default threshold percentage for the Concurrent Users per Meeting quota. This value must be an integer from 10 through 100 and divisible by 10. If the value is not specified or is incorrectly specified, the value is 80.

THRESHOLD_CONC_MEETING_USERS_PER_ACCOUNT The default threshold percentage for the Account-wide Meeting Attendees quota. This value must be an integer from 10 through 100 and divisible by 10. If the value is not specified or is incorrectly specified, the value is 80.

THRESHOLD_CONC_TRAINING_USERS The default threshold percentage for the Concurrent Learners quota. This value must be an integer from 10 through 100 and divisible by 10. If the value is not specified or is incorrectly specified, the value is 80.

The following are sample values added to the custom.ini file:

```
THRESHOLD_NUM_OF_MEMBERS = 90  
THRESHOLD_CONC_USERS_PER_MEETING = 90  
THRESHOLD_CONC_MEETING_USERS_PER_ACCOUNT = 90  
THRESHOLD_CONC_TRAINING_USERS = 75
```

2 Do the following to restart Adobe Connect:

- a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
- b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Configuring the session timeout value

Adobe Connect sessions include Adobe Connect Meeting and Adobe Connect Central. The session timeout specifies how long a session can be idle before the server disconnects it. When a session is disconnected, the user is redirected to the Adobe Connect Central login page.

The Adobe Connect session timeout value is 30 minutes. Account administrators can change this value in the Adobe Connect Central Administration tab. System administrators can also change the session timeout value in the custom.ini file. The value in Adobe Connect Central takes precedence over the value in the custom.ini file.

To configure session timeout in the custom.ini file:

- 1 In a text editor, open `[root_install_dir]\custom.ini`.
- 2 Add the following parameter and set it to the desired value, in seconds:

```
SESSION_TIMEOUT = 3600
```

Note: This value changes the session timeout from 30 minutes to 60 minutes.

- 3 Save the custom.ini file.
- 4 Restart the application server and the meeting server.

Important: Before Adobe Connect 8, the session timeout was 16 hours. You may need to update applications that use the Adobe Connect Web Services API to catch a session timeout and re-authenticate.

More Help topics

[“Start and stop the servers”](#) on page 76

Configuring PDF to SWF conversion

About PDF conversion

You can use the Share pod in an Adobe Connect meeting room to share PDF documents. Hosts and presenters can synchronize the navigation for all attendees and use the whiteboard overlay to collaborate. You can load PDF documents into the Share pod from the desktop or from the Adobe Connect content library. Sharing documents in the Share pod offers the following advantages over screen sharing:

- Hosts and presenters can preload and organize documents in the meeting room.
- Higher quality viewing experience for all attendees.

- Lower bandwidth requirement for participants and presenters.
- Easier for multiple presenters to work together.
- Easier to collaborate using the whiteboard.

When the PDF documents are shared in a Share pod, Adobe Connect converts them to Flash format. Adobe Connect Server offers configuration parameters to control the PDF conversion.

Configure PDF to SWF conversion

- 1 Install the Microsoft Visual C++ 2010 Redistributable Package (x86) package, available at <http://www.microsoft.com/en-us/download/details.aspx?id=5555>. Install 32-bit version of the package, even if you have a 64-bit operating system.
- 2 Open the *RootInstallationFolder\custom.ini* file in a text editor.
- 3 Edit any of the following configuration parameters:

| Parameter | Default Value | Description |
|---------------------------------|---------------|--|
| ENABLE_PDF2SWF | true | A Boolean value specifying whether PDF to SWF conversion is enabled or not for the server. Set this parameter to false to disable conversion due to performance concerns. |
| PDF2SWF_PAGE_TIMEOUT | 5 | The timeout value per page, in seconds. |
| PDF2SWF_CONVERTER_PORTS_START | 4000 | The lowest value of the range of ports used for PDF to SWF conversions. |
| PDF2SWF_CONVERTER_PORTS_END | 4030 | The highest value of the range of ports used for PDF to SWF conversions. |
| PDF2SWF_CONCURRENCY_LIMIT | 3 | The maximum number of concurrent Pdf to SWF conversions that can take place on an application server. If an application server receives more requests, the requests are queued. |
| PDF2SWF_QUEUE_LIMIT | 5 | The maximum number of PDF to SWF conversions that can wait in a queue at one time. If an application server receives more requests, a user sees the message "Adobe Connect could not convert the file for viewing, please retry after some time." An administrator sees the following in the logs: <status code="request-retry"><exception>java.lang.Exception: Conversion Load too much on server. |
| PDF2SWF_TIMEOUT_NUMBER_OF_PAGES | 3 | The maximum number of pages that are allowed to timeout before the conversion is stopped. |

- 4 Restart Adobe Connect Central Application Server. See "Start and stop Adobe Connect" on page 76.

Configuring single sign-on (SSO)

About single sign-on

Single sign-on is a mechanism that allows a user to authenticate once and gain access to multiple applications. Single sign-on uses a proxy server to authenticate users so they don't need to log in to Adobe Connect.

Adobe Connect supports the following single sign-on mechanisms:

HTTP header authentication Configure an authentication proxy to intercept the HTTP request, parse the user credentials from the header, and pass the credentials to Adobe Connect.

Microsoft NT LAN Manager (NTLM) authentication Configure Adobe Connect to attempt to automatically authenticate connecting clients against a Windows domain controller using the NTLMv1 protocol. Microsoft Internet Explorer on Microsoft Windows can negotiate NTLM authentication without prompting the user for credentials.

Note: NTLM authentication doesn't work on edge servers. Use LDAP authentication instead.

Note: Mozilla Firefox clients may be able to negotiate NTLM authentication without prompting. For information about configuration, see this [Firefox document](#).

You can write your own authentication filter as well. For more information, contact Adobe Support.

Configure HTTP header authentication

When HTTP header authentication is configured, Adobe Connect login requests are routed to an agent positioned between the client and Adobe Connect. The agent can be an authentication proxy or a software application that authenticates the user, adds another header to the HTTP request, and sends the request to Adobe Connect. On Adobe Connect, you must uncomment a Java filter and configure a parameter in the custom.ini file that specifies the name of the additional HTTP header.

More Help topics

“[Start and stop Adobe Connect](#)” on page 76

Configure HTTP header authentication on Adobe Connect

To enable HTTP header authentication, configure a Java filter mapping and a header parameter on the computer hosting Adobe Connect.

- 1 Open the file `[root_install_dir]\appserv\web\WEB-INF\web.xml` and do the following:
 - a Remove the comment tags around the filter and filter-mapping elements for `HeaderAuthenticationFilter`.
 - b Add comment tags around the `NtlmAuthenticationFilter` filter and filter-mapping elements.

- 2 Stop Adobe Connect:

- a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
 - b Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Meeting Server.

- 3 Add following line to the custom.ini file:

```
HTTP_AUTH_HEADER=header_field_name
```

Your authentication agent must add a header to the HTTP request that is sent to Adobe Connect. The name of the header must be `header_field_name`.

- 4 Save the custom.ini file and restart Adobe Connect:

- a Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.
 - b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Write the authentication code

The authentication code must authenticate the user, add a field to the HTTP header that contains the user login, and send a request to Adobe Connect.

- 1 Set the value of the `header_field_name` header field to an Adobe Connect user login.
- 2 Send an HTTP request to Adobe Connect at the following URL:

```
http://connectURL/system/login
```

The Java filter on Adobe Connect catches the request, looks for the `header_field_name` header, then looks for a user with the ID passed in the header. If the user is located, the user is authenticated and a response is sent.

- 3 Parse the HTTP content of the Adobe Connect response for the string "OK" to indicate a successful authentication.
- 4 Parse the Adobe Connect response for the `BREEZESSESSION` cookie.
- 5 Redirect the user to the requested URL on Adobe Connect, and pass the `BREEZESSESSION` cookie as the value of the `session` parameter, as follows:

```
http://connectURL?session=BREEZESSESSION
```

Note: You must pass the `BREEZESSESSION` cookie in any subsequent requests to Adobe Connect during this client session.

Configure HTTP header authentication with Apache

The following procedure describes a sample HTTP header authentication implementation that uses Apache as the authentication agent.

- 1 Install Apache as a reverse proxy on a different computer than the one hosting Adobe Connect.
- 2 Choose Start > Programs > Apache HTTP Server > Configure Apache Server > Edit the Apache httpd.conf Configuration file and do the following:

- a Uncomment the following line:

```
LoadModule headers_module modules/mod_headers.so
```

- b Uncomment the following three lines:

```
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_connect_module modules/mod_proxy_connect.so
LoadModule proxy_http_module modules/mod_proxy_http.so
```

- c Add the following lines to the end of the file:

```
RequestHeader append custom-auth "ext-login"
ProxyRequests Off
<Proxy *>
Order deny,allow
Allow from all
</Proxy>
ProxyPass / http://hostname:[port]/
ProxyPassReverse / http://hostname:[port]/
ProxyPreserveHost On
```

- 3 Stop Adobe Connect:
 - a Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
 - b Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Meeting Server.
- 4 On the computer hosting Adobe Connect, add the following lines of code to the custom.ini file (located in the root installation directory, C:\Connect, by default):

```
HTTP_AUTH_HEADER=custom-auth
```

The `HTTP_AUTH_HEADER` parameter should match the name configured in the proxy. (In this example, it was configured in line 1 of step 2c.) The parameter is the additional HTTP header.

- 5 Save the `custom.ini` file and restart Adobe Connect:
 - a Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.
 - b Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.
- 6 Open the file `[root_install_dir]\appserv\web\WEB-INF\web.xml` and do the following:
 - a Uncomment the complete `HeaderAuthenticationFilter` filter.
 - b Comment out the complete `NtlmAuthenticationFilter` filter.

Configure NTLM authentication

NTLMv1 is an authentication protocol used with the SMB network protocol in Microsoft Windows networks. You can use NTLM to allow a user to prove their identity to a Windows domain once and thereafter be authorized to access another network resource, such as Adobe Connect. To establish the user's credentials, the user's web browser automatically performs a challenge and response authentication with the domain controller through Adobe Connect. If this mechanism fails, the user can log into Adobe Connect directly. Only Internet Explorer on Windows supports single sign-on with NTLMv1 authentication.

Note: Set up Adobe Connect and NTLM on Windows 2003, as Adobe Connect supports NTLM v1. Also, Windows 7 and later versions do not support NTLM v1 SSO.

Note: By default, Windows Server 2003 domain controllers require a security feature called SMB signatures. SMB signatures are not supported by the default configuration of the NTLM authentication filter. You can configure the filter to work within this requirement. For more information on this and other advanced configuration options, see the [JCIFS NTLM HTTP authentication documentation](#).

Add configuration parameters

Do the following for each host in an Adobe Connect cluster:

- 1 Synchronize LDAP users from your domain in Adobe Connect via 8510 Management Console. To integrated Connect with LDAP, see “[Integrate Adobe Connect with an LDAP directory](#)” on page 41.

Important: After synchronizing LDAP in Adobe Connect, filter LDAP data in such a way that NTLM Domain username is populated to Adobe Connect database. Otherwise NTLM SSO login does not work and you notice logon failures in `debug.log`.

- 2 Edit Login Policies for Adobe Connect, to change login to DOMAIN username. By default its email but NTLM does not allow email.
- 3 Open the `[root_install_dir]\custom.ini` file in a text editor and add the following parameters:

```
NTLM_DOMAIN=[domain]
NTLM_SERVER=[WINS_server_IP_address]
```

The value `[domain]` is the name of the Windows domain that users are members of and authenticate against, for example, CORPNET. You may need to set this value to the pre-Windows 2000 compatible version of the domain name. For more information, see [TechNote 27e73404](#). This value is mapped to the filter property `jcifs.smb.client.domain`. Setting the value directly in the `web.xml` file overrides the value in the `custom.ini` file.

The value `[WINS_server_IP_address]` is the IP address or a comma-separated list of IP addresses of WINS servers. Use the IP address, the host name does not work. The WINS servers are queried in the order specified to resolve the IP address of a domain controller for the domain specified in the `NTLM_DOMAIN` parameter. (The domain controller authenticates users.) You can also specify the IP address of the domain controller itself, for example, 10.169.10.77, 10.169.10.66. This value is mapped to the filter property `jcifs.netbios.wins`. Setting the value in the `web.xml` file overrides the value in the `custom.ini` file.

- 4 Save the `custom.ini` file.
- 5 Open the file `[root_install_dir]\appserv\web\WEB-INF\web.xml` in a text editor and do the following:
 - a Remove comments tags around the entire `NtlmAuthenticationFilter` and filter-mapping elements.
 - b Add comment tags to the `HeaderAuthenticationFilter` filter and filter-mapping elements.
- 6 Save the `web.xml` file.
- 7 Restart Adobe Connect.
 - a Choose Start > All Programs > Adobe Connect Server > Stop Adobe Connect Server.
 - b Choose Start > All Programs > Adobe Connect Server > Start Adobe Connect Server.

Reconcile login policies

Adobe Connect and NTLM have different login policies for authenticating users. Reconcile these policies before users can employ a single login.

The NTLM protocol uses a login identifier that can be a user name (jdoe), an employee ID number (1234), or an encrypted name, depending on the policy or the organization. By default, Adobe Connect uses an e-mail address (jdoe@mycompany.com) as a login identifier. Change the Adobe Connect login policy so that Adobe Connect shares a unique identifier with NTLM.

- 1 Open Adobe Connect Central.

To open Adobe Connect Central, open a browser window and enter the FQDN of the Adobe Connect Host (for example, `http://connect.mycompany.com`). You entered the Adobe Connect Host value on the Server Settings screen of the Application Management Console.

- 2 Select the Administration tab. Click Users and Groups. Click Edit Login and Password Policies.
- 3 In the Login Policy section, select No for Use e-mail address as the login.

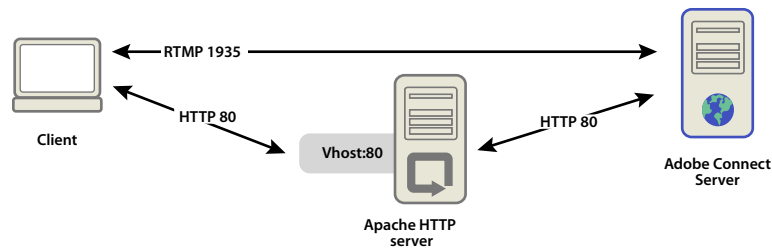
Configuring a reverse proxy in front of Adobe Connect

Using a reverse proxy

You can configure a reverse proxy in front of Adobe Connect. Traffic flows through the reverse proxy before it reaches Adobe Connect. Use this configuration to do the following:

- Keep Adobe Connect out of the DMZ.
Put the reverse proxy in the DMZ and put Adobe Connect behind your organization's firewall.
- Authenticate users before they reach Adobe Connect.

The reverse proxy authenticates users with another system and authorizes them to connect to Adobe Connect.



HTTP traffic flows through Apache HTTP Server to reach Adobe Connect.

Configure a reverse proxy

This example uses the Windows (32 bit) installation of Apache HTTP Server. The configuration is identical on any operating system Apache supports. This example does not use SSL; traffic to the Adobe Connect application server is not encrypted.

Note: Flush the reverse proxy cache when you upgrade Adobe Connect to ensure the new file versions are served.

Do the following to force all HTTP traffic to pass through Apache HTTP Server before it reaches Adobe Connect:

Note: RTMP traffic does not pass through Apache HTTP Server in this configuration.

1 Install Apache HTTP Server.

By default, the Apache configuration files are located in the folder C:\Program Files\Apache Software Foundation\Apache2.2\conf\.

2 Configure Apache to listen for all traffic on port 80.

Open the C:\Program Files\Apache Software Foundation\Apache2.2\conf\httpd.conf file in a text editor and add the following:

```
#
# Listen: Allows you to bind Apache to specific IP addresses and
# ports, instead of the default. See also the <VirtualHost>
# directive.
#
# Change this to Listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses.
#
#Listen 12.34.56.78:80
Listen 80
#
#
```

3 Load the modules required for operation as a reverse proxy.

In the same file (httpd.conf), uncomment the following lines:

```
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_http_module modules/mod_proxy_http.so
LoadModule proxy_connect_module modules/mod_proxy_connect.so
```

4 Link the httpd.conf file to the configuration file that directs connections to Adobe Connect.

Add the following line as the last line of the httpd.conf file:

```
Include conf/extra/httpd-connect.conf
```

5 Create a text file called httpd-connect.conf and save it to C:\Program Files\Apache Software Foundation\Apache2.2\conf\extra.

- 6 Add the following lines to the httpd-connect.conf file (insert your IP addresses and ports where requested):

```
#vhost for application server
<VirtualHost *:80>
ProxyRequests Off
ProxyPreserveHost On
ProxyPass / http://<IP-of-Adobe-Connect-Application-Server>:80/
ProxyPassReverse / http://<IP-of-Adobe-Connect-Application-Server>:80/
ServerName <FQDN of Apache host>
</VirtualHost>
```

- 7 Save the file and restart the Apache service.
- 8 Open the Adobe Connect Application Management Console in a browser: <http://localhost:8510/console/>
- 9 On the Server settings screen, do the following:
 - Set the Adobe Connect Host to the FQDN of the Apache HTTP Server.
 - Set the External Name to the FQDN of the computer hosting Adobe Connect Meeting Server.
- 10 Restart Adobe Connect Service (the application server) and Flash Media Server (FMS) service (the meeting server).
See [“Start and stop the servers”](#) on page 76.

RTMP is routed to Adobe Connect and HTTP is routed through Apache.

Hosting Adobe Connect Add-in

About Adobe Connect Add-in

The Adobe Connect Add-in is a version of Flash Player that includes enhanced features for Adobe Connect meetings.

When Adobe Connect Add-in is required, it's downloaded from an Adobe server in a seamless process that is hidden to the user. However, if your organization doesn't allow employees to download software from external servers, you can host Adobe Connect Add-in on your own server.

Meeting guests, registered users, and presenters are asked to download Adobe Connect Add-in if they have an old version installed and are promoted to host or presenter or given enhanced rights to the Share pod.

Meeting hosts and presenters are required to download Adobe Connect Add-in if it isn't installed or if an old version is installed.

Customize Adobe Connect Add-in download location

You can host Adobe Connect Add-in on your server and send users directly to the executable files. You may want to send users to a page with download instructions that contains links to the executable files. You can create your own download instruction page or use one provided by Adobe. The Adobe page is localized for all supported languages.

Send users directly to the executable files:

- 1 Locate the Adobe Connect language XML files on the server hosting Adobe Connect. The XML files are in the following two directories: `[root_install_dir]\appserv\common\intro\lang` and `[root_install_dir]\appserv\common\meeting\lang`.
- 2 In each language file, enter a path to the executable files for each platform:

```
<m id="addInLocation" platform="Mac OSX">/common/addin/ConnectAddin.z</m>
<m id="addInLocation" platform="Windows">/common/addin/setup.exe</m>
```

Note: These are the default locations of the add-in executable files. You can change the locations on your server and change the paths in the `addInLocation` section accordingly.

- 3 Locate the `AddinInfo.xml` file on the server hosting Adobe Connect. Change the default location for the add-in download. Enter a path to the executable files for each platform:

```
<m platform="Windows" id="addInLocation">/common/addin/setup.exe</m>
<m platform="Mac OS 10" id="addInLocation">/common/addin/ConnectAddin.z</m>
```

Send users to download instruction pages provided by Adobe

- 1 Locate the Adobe Connect language XML files on the server hosting Adobe Connect. The XML files are in the following two directories: `[root_install_dir]\appserv\common\intro\lang` and `[root_install_dir]\appserv\common\meeting\lang`.

- 2 In each language file and in the `AddinInfo.xml` file, enter the path to the download instruction page:

```
<m id="addInLocation" platform="Mac OSX">/common/help/#lang#/support/addindownload.htm</m>
<m id="addInLocation" platform="Windows">/common/help/#lang#/support/addindownload.htm</m>
```

Note: The path includes a `#lang#` string that Adobe Connect translates to the language of the meeting at runtime.

- 3 The `addindownload.htm` files include links to the add-in executable files at their default locations on Adobe Connect (`/common/addin/setup.exe` or `/common/addin/AdobeConnectAddin.z`). If you change the location of the executable files, update the links in the `addindownload.htm` page for each language.

Send users to download instruction pages you create

- 1 Locate the Adobe Connect language XML files on the server hosting Adobe Connect. The XML files are in the following two directories: `[root_install_dir]\appserv\common\intro\lang` and `[root_install_dir]\appserv\common\meeting\lang`.

- 2 In each language file and in the `AddinInfo.xml` file, add the following paths to the instruction page you created:

```
<m id="addInLocation" platform="Mac
OSX">common/help/#lang#/support/addin_install_instructions.html</m>
<m id="addInLocation"
platform="Windows">common/help/#lang#/support/addin_install_instructions.html</m>
```

Note: You can choose to create separate instruction pages for each platform.

- 3 Create an instruction page in each language you want to support. Include links on the instruction page to the add-in executable files for each platform.

Chapter 5: Security

SSL (secure sockets layer)

Securing Adobe® Connect™ protects your organization against loss of property and malicious acts. It is important to secure the infrastructure of your organization, Adobe Connect Server, and the database server used by Adobe Connect.

About SSL support

Adobe Connect Server is made up of two servers: Adobe® Flash® Media Server and the Adobe Connect application server. Flash Media Server is called the *meeting server* because it serves meetings over a real-time RTMP connection to the client. The Adobe Connect application server handles the HTTP connection between the client and the Adobe Connect application logic. Adobe Connect Server also connects to a SQL Server database.

Note: In the Start menu, the meeting server is called “Adobe Connect Meeting Server” and the application server is called “Adobe Connect Central Application Server”. In the Services window, the meeting server is called “Flash Media Server” and the application server is called “Adobe Connect Service”.

You can configure SSL for the application server, the meeting server, and the database.

Hardware-based solution Use an SSL accelerator for the most robust SSL configuration.

Software-based solution Use the native support for SSL in Adobe Connect.

Note: SSL is not supported on Microsoft® Windows® 98.

Adobe Connect uses the HTTP CONNECT method to request an SSL connection. Proxy servers must allow clients to use the CONNECT method. If clients cannot use the CONNECT method, RTMP connections tunnel over HTTP/HTTPS.

For information about configuring SSL, see [Configure SSL for Adobe Connect Server 8](#).

For help configuring SSL, contact Adobe Support at www.adobe.com/support/programs/connect.

Securing the infrastructure

Network security

Adobe Connect relies on several private TCP/IP services for its communications. These services open several ports and channels that must be protected from outside users. Adobe Connect requires that you place sensitive ports behind a firewall. The firewall should support stateful packet inspection (not only packet-filtering). The firewall should have an option to “deny all services by default except those explicitly permitted”. The firewall should be at least a dual-home (two or more network interfaces) firewall. This architecture helps prevent unauthorized users from bypassing the security of the firewall.

The easiest solution for securing Adobe Connect is to block all ports on the server except 80, 1935, and 443. An external hardware firewall appliance provides a layer of protection against gaps in the operating system. You can configure layers of hardware-based firewalls to form DMZs. If the server is carefully updated by your IT department with the latest Microsoft security patches, a software-based firewall can be configured to enable additional security.

Intranet access

If you intend to have users access Adobe Connect on your Intranet, place the Adobe Connect servers and the Adobe Connect database in a separate subnet, separated by a firewall. The internal network segment where Adobe Connect is installed should use private IP addresses (10.0.0.0/8, 172.16.0.0/12, or 192.168.0.0/16) to make it more difficult for an attacker to route traffic to a public IP and from the network address translated internal IP. For more information, see RFC 1918. This configuration of the firewall should consider all Adobe Connect ports and whether they are configured for inbound or outbound traffic.

Database server security

Whether you are hosting your database on the same server as Adobe Connect, make sure that your database is secure. Computers hosting a database should be in a physically secure location. Additional precautions include the following:

- Install the database in the secure zone of your intranet.
- Never connect the database directly to the Internet.
- Back up all data regularly and store copies in a secure off-site location.
- Install the latest patches for your database server.
- Use SQL trusted connections.

For information on securing SQL Server, see the Microsoft SQL security website.

Create service accounts

Creating a service account for Adobe Connect lets you run Adobe Connect more securely. Adobe recommends creating a service account and a SQL Server 2008 Express Edition service account for Adobe Connect. For more information, see the Microsoft articles “How to change the SQL Server or SQL Server Agent service account without using SQL Enterprise Manager in SQL Server 2000 or SQL Server Configuration Manager in SQL Server 2008” and “The Services and Service Accounts Security and Planning Guide”.

Create a service account

- 1 Create a local account called ConnectService that doesn't include any default groups.
- 2 Set the Adobe Connect Service service, the Flash Media Administration Server service, and the Flash Media Server (FMS) service to this new account.

- 3 Set “Full Control” for the following registry key:

HKLM\SYSTEM\ControlSet001\Control\MediaProperties\PrivateProperties\Joystick\Winmm

- 4 Set “Full Control” on the NTFS folders in the root Adobe Connect folder path (C:\Connect, by default).

Subfolders and files must have the same permissions. For clusters, modify the corresponding paths on each computer node.

- 5 Set the following logon rights for the ConnectService account:

Log on as a service—SeServiceLogonRight

Create an SQL Server 2008 Express Edition service account

- 1 Create a local account called ConnectSqlService that doesn't include any default groups.
- 2 Change the SQL Server 2008 Express Edition Service Account from LocalSystem to ConnectSqlService.
- 3 Set “Full Control” for ConnectSqlService for the following registry keys:

```
HKEY_LOCAL_MACHINE\Software\Clients\Mail  
HKEY_LOCAL_MACHINE\Software\Microsoft\Microsoft SQL Server\80  
HKEY_LOCAL_MACHINE\Software\Microsoft\Microsoft SQL Server\[databaseInstanceName]
```

For clusters, follow this step on every node in the cluster. Full Control permission applies to all the child keys of a named database instance

- 4 Set “Full Control” for ConnectSqlService on the database folders. Subfolders and files must also have the same permissions. For clusters, modify the corresponding paths on each computer node.
- 5 Set the following user rights for the ConnectSqlService service:

Act as part of the operating system—SeTcbPrivilege Bypass traverse checking—SeChangeNotify Lock pages in memory—SeLockMemory Log on as a batch job—SeBatchLogonRight Log on as a service—SeServiceLogonRight
Replace a process level token—SeAssignPrimaryTokenPrivilege

Securing single server installations

The following workflow summarizes the process of setting up and securing Adobe Connect on a single computer. It assumes that the database is installed on the same computer, and that users access Adobe Connect on the Internet.

1. Install a firewall.

Since you are allowing users to connect to Adobe Connect through the Internet, the server is open to an attack by hackers. By using a firewall, you can block access to the server and control the communications that occur between the Internet and the server.

2. Configure the firewall.

After installing your firewall, configure it as follows:

- Ports for Arkadin or InterCall telephony adaptors: 9080 or 9443.
- Inbound ports (from the Internet): 80, 443, 1935.
- Outbound ports (to the mail server): 25.
- Use the TCP/IP protocol only.

Since the database is located on the same server as Adobe Connect, you do not have to open port 1434 on the firewall.

3. Install Adobe Connect.

4. Verify that the Adobe Connect applications are working.

After installing Adobe Connect, verify that it is working properly both from the Internet and from your local network.

5. Test the firewall.

After you have installed and configured the firewall, verify that your firewall is working correctly. Test the firewall by attempting to use the blocked ports.

Securing clusters

Clusters (multi-server) systems are inherently more complex than single-server configurations. An Adobe Connect cluster can be located at a data center or geographically distributed across multiple network operation centers. You can install and configure servers hosting Adobe Connect in multiple locations and synchronize them through database replication.

Note: Clusters must use Microsoft SQL Server 2008 Enterprise Edition or Microsoft SQL Server 2012 Enterprise Edition and not the embedded database engine.

The following are important suggestions for securing clusters:

Private networks The simplest solution for clusters in a single location is to create an extra subnet for the Adobe Connect system. This approach offers a high level of security.

Local software firewalls For Adobe Connect servers that are located in a cluster but share a public network with other servers, a software firewall may be appropriate on each individual server.

VPN systems In multiserver installations hosting Adobe Connect in different physical locations, you may want to consider using an encrypted channel to communicate with the remote servers. Many software and hardware vendors offer VPN technology to secure the communications to remote servers. Adobe Connect relies on this external security if data traffic must be encrypted.

Security tips and resources

Security best practices

The following checklist describes best practices to you secure your Adobe Connect system:

Use SSL to protect network traffic You can secure the connection to the meeting server, the application server, or both.

Run only the services you need Do not run applications such as a domain controller, a web server, or an FTP server on the same computer as Adobe Connect. To minimize the chances that another application can be used to compromise the server, reduce the number of applications and services running on the computer that hosts Adobe Connect.

Update operating system security Check regularly for critical updates that close security holes and apply the required patches. A firewall eliminates some of these security problems. In general, keep your servers patched with all current security updates approved by Microsoft and the other relevant platform vendors.

Secure host systems If you store sensitive information on your servers, be aware of the physical security of your systems. Adobe Connect relies on the safety of the host system against intruders, so keep servers secure when private and confidential data is at risk. Adobe Connect is designed to take advantage of native environmental features such as file system encryption.

Use strong passwords Strong passwords protect data. Adobe Connect administrators can set login and password policies in the Adobe Connect Central. Adobe Connect installations often use Microsoft SQL Server 2008 Enterprise Edition, which also requires strong password protection.

Use LDAP for authentication It is a best practice to use LDAP for Adobe Connect authentication.

Perform regular security audits Audit your systems periodically to ensure that all security features are still operating as expected. For example, you can use a port scanner to test a firewall.

Security resources and references

The following resources help you secure your servers:

Network security The SANS (System Administration, Networking, and Security) Institute is a cooperative research and education organization including system administrators, security professionals, and network administrators. It provides network security courses, as well as certification in network security.

Security

SQL Server security The Microsoft SQL security resources page on the Microsoft website provides information on securing SQL Server.

Tools Nmap is a powerful port-scanning program that tells you what ports a system is listening on. It is available at no cost under the GNU Public License (GPL).

***Note:** The effectiveness of any security measure is determined by various factors, such as security measures provided by the server and the installed security software. Adobe Connect software is not intended to provide security for your server or the information on it. For more information, see the disclaimer of warranty in the applicable license agreement provided with Adobe Connect.*

Chapter 6: Administering Adobe Connect

Start and stop the servers

Start and stop Adobe Connect

You can start or stop Adobe Connect from the Start menu, the Services window, or the command line. Verify that the database is running before you start Adobe Connect.

Stop Adobe Connect from the Start menu

- 1 Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Application Server.
- 2 Choose Start > Programs > Adobe Connect Server > Stop Adobe Connect Meeting Server.

Start Adobe Connect from the Start menu

- 1 Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.
- 2 Choose Start > Programs > Adobe Connect Server > Start Adobe Connect Central Application Server.

Stop Adobe Connect from the Services window

- 1 Choose Start > Control Panel > Administrative Tools > Services to open the Services window.
- 2 Stop the Adobe Connect Server service.
- 3 Stop the Flash Media Server (FMS) service.
- 4 Stop the Flash Media Administration Server service.

Start Adobe Connect from the Services window

- 1 Choose Start > Control Panel > Administrative Tools > Services to open the Services window.
- 2 Start the Flash Media Server (FMS) service.
- 3 Start the Flash Media Server Administration Server service.
- 4 Start the Adobe Connect Server service.

Stop Adobe Connect from the command line

- 1 Choose Start > Run to open the Run window. Enter **cmd** to open a Command prompt.
- 2 Go to the `[root_install_dir]\appserv\win32` directory.
- 3 Enter the following command to stop Adobe Connect:

```
net stop ConnectPro
```

- 4 Enter the following to stop Flash Media Server:

```
net stop FMS
```

- 5 Enter the following to stop Flash Media Server Administration Server:

```
net stop FMSAdmin
```


Start Adobe Connect from the command line

- 1 Choose Start > Run to open the Run window. Enter **cmd** to open a Command prompt.
- 2 Go to the `[root_install_dir]\appserv\win32` directory.
- 3 Enter the following to start Flash Media Server:

```
net start FMS
```

- 4 Enter the following to start Flash Media Server Administrator Server:

```
net start FMSAdmin
```

- 5 Enter the following to start Adobe Connect:

```
net start ConnectPro
```

Start and stop Adobe Connect Telephony Service

You can start and stop the Adobe Connect Telephony Service from the Services window.

- 1 Choose Start > Control Panel > Administrative Tools > Services to open the Services window.
- 2 Select the Adobe Connect Telephony Service.
- 3 Choose Start, Stop, or Restart the service.

Start and stop Flash Media Gateway

You can start and stop Flash Media Gateway from the Services window or from the command line. Verify that Adobe Connect Server is running before you start Flash Media Gateway.

Start and stop Flash Media Gateway from the Services window

- 1 Choose Start > Control Panel > Administrative Tools > Services to open the Services window.
- 2 Select Flash Media Gateway Service.
- 3 Choose Start, Stop, or Restart the service

Start and stop Flash Media Gateway from the command line

- 1 Choose Start > Run to open the Run window. Enter **cmd** to open a Command prompt.
- 2 Enter the following to start Flash Media Gateway:

```
net start fmg
```

- 3 Enter the following to stop Flash Media Gateway:

```
net stop fmg
```

Start and stop Adobe Connect Edge Server

You can start Adobe Connect or stop Adobe Connect Edge Server from the Start menu, the Services window, and from the command line.

Stop Adobe Connect Edge Server from the Start menu

- ❖ Choose Start > Programs > Adobe Connect Edge Server > Stop Adobe Connect Edge Server.

Start Adobe Connect Edge Server from the Start menu

- ❖ Choose Start > Programs > Adobe Connect Edge Server > Start Adobe Connect Edge Server.

Stop Adobe Connect Edge Server from the Services window

- 1 Choose Start > Settings > Control Panel > Administrative Tools > Services to open the Services window.
- 2 Stop the Flash Media Server (FMS) service.
- 3 Stop the Flash Media Server Administration Server service.

Start Adobe Connect Edge Server from the Services window

- 1 Choose Start > Settings > Control Panel > Administrative Tools > Services to open the Services window.
- 2 Start the Flash Media Server Administration Server service.
- 3 Start the Flash Media Server (FMS) service.

Stop Adobe Connect Edge Server from the command line

- 1 Choose Start > Run to open the Run window. Enter **cmd** to open a Command prompt.
- 2 Enter the following to stop Flash Media Server:

```
net stop FMS
```

- 3 Enter the following to stop the Flash Media Server Administrator Server:

```
net stop FMSAdmin
```

Start Adobe Connect Edge Server from the command line

- 1 Choose Start > Run to open the Run window. Enter **cmd** to open a Command prompt.
- 2 Enter the following to start the Flash Media Server Administrator Server:

```
net start FMSAdmin
```

- 3 Enter the following to start Flash Media Server:

```
net start FMS
```

Managing and monitoring logs

About log files

Use Adobe Connect log files to view information about events that occur during operation. You can use the information in the log files to create monitoring mechanisms and reports, and to troubleshoot problems. Log files provide information about user activities and server performance. For example, log files can indicate the reason a user was denied access when attempting to log in, or the reason that a telephony connection failed.

Adobe Connect log files are in the *RootInstallationFolder*\logs folder.

The Apache Tomcat log files are in the *RootInstallation*\logs\tomcat folder.

Configuring log files

Adobe Connect uses the [Apache log4j](#) tool. Use the file *RootInstallationFolder*\appserv\conf\log4j.xml to configure logging. For more information, see [Log4j XML Configuration Primer](#).

To configure log appender, use the details provided at the [DailyRollingFileAppender](#) page.

Sample log file entry

The following sample entry from the `access.log` file includes a heading, a list of the fields used in the log entry, and the specific data for this log entry:

```
#Version: 1.0
#Start-Date: 2010-10-30 17:09:24 PDT
#Software: Adobe Connect Server
#Date: 2010-04-30
#Fields: date time x-comment x-module x-status x-severity x-category x-user x-access-request
time-taken db-logical-io db-transaction-update-count
2006-10-30 18:12:50 Not logged in. PRINCIPAL NO_ACCESS_NO_LOGIN W A PUBLIC
{cookie=breezxb5pqusyshfgttt, ip=138.1.21.100} GET http://joeuser.adobe.com&mode=xml 0 20/5 0
```

The following table explains the sample entry:

| Field | Data | Description |
|-----------------------------|-----------------------------------|--|
| date | 2010-10-30 | The date on which the logged event occurred. |
| time | 18:12:50 | The time when the logged event occurred. |
| x-comment | Not logged in. | Indicates that a user was unable to log in to the application server. |
| x-module | PRINCIPAL | The event occurred in the Principal module in the application server. |
| x-status | NO_ACCESS_NO_LOGIN | Indicates that the user was unable to log in. |
| x-severity | W | Identifies the event severity as a warning (W). |
| x-category | A | Indicates that the event is an access (A) issue (appearing in the <code>access.log</code> file). |
| x-user | PUBLIC | The current user; in this case, an unidentified guest, or public user. |
| x-access-request | http://joeuser.adobe.com&mode=xml | Source of the request. |
| time-taken | 0 | No time was required to process this request. |
| db-logical-io | 20/5 | 20 database reads were required and 5 rows of data were returned. |
| db-transaction-update-count | 0 | No database rows were updated in processing this request. |

Log file format

The Adobe Connect log files use the W3C Extended Log File Format and you can use any text editor to read them. For information about Adobe CQ log files, see [Configure CQ logging](#).

Log fields in the `access.log` and `error.log` files

Each log entry contains 11 log fields, which provide information about what type of event occurred, where it occurred, its severity, and other relevant data:

| Field | Format | Description |
|-----------------------------|----------------------|---|
| date | YYYY/MM/DD | Date on which transaction completed. |
| time | HH:MM:SS | Local computer time at which transaction completed. |
| x-comment | String | Contains human-readable information about the log entry. This field is always output as the left most field. |
| x-module | String | Indicates where the error occurred. |
| x-status | String | Indicates what event occurred. |
| x-severity | Text (one character) | Indicates whether the logged event is critical (C), error (E), warning (W), or information (I). |
| x-category | Text (one character) | Indicates whether the log entry represents an access (A) or system (S) event. |
| x-user | String | Text that represents current user. Applicable only if x-category is access (A); otherwise field is set to a single hyphen (-) to denote an unused field. |
| x-access-request | String | Text that represents the access request. This text can be a URL or an API name with passed parameters. Applicable only if x-category is access (A); otherwise this field is set to a single hyphen (-) to denote an unused field. |
| time-taken | Number | Time required to process the request (in seconds). Applicable only if x-category is access (A); otherwise this field is set to a single hyphen (-) to denote an unused field. |
| db-logical-io | String | Number of database reads required to process the request and the number of rows returned in <reads>/<rows> format. |
| db-transaction-update-count | String | Number of rows updated in transactions while processing the requests. If the request uses more than one transaction, this value is the sum of all updates. |

Module field entries

A module is a component of the server that manages some related set of operations. Each module belongs to either the application server or the meeting server. The x-module field indicates where the log event occurred:

| Log Entry for x-module Field | Description | Server |
|------------------------------|--|--------------------|
| ACCESS_KEY | Manages access keys. | Application server |
| ACCOUNT | Manages account operations. | Application server |
| ACL | Manages ACL-related operations. | Application server |
| AICC | Manages all AICC communication between server and content. | Application server |
| BUILDER | Performs SCO builds. | Application server |
| Client | Client methods. | Meeting server |
| CLUSTER | Manages all cluster-related operations. | Application server |
| CONSOLE | Manages all console-related operations. | Application server |
| Content | Share pod. | Meeting server |
| DB | Represents the database. | Application server |
| EVENT | Manages all event-related operations. | Application server |
| HOSTED_MANAGER | Manages system accounts (create, update, delete, settings, and so on). | Application server |

| Log Entry for x-module Field | Description | Server |
|------------------------------|--|--------------------|
| MEETING | Manages all meeting-related operations. | Application server |
| Misc | Miscellaneous module. | Meeting server |
| NOTIFICATION | Manages all e-mail operations. | Application server |
| PERMISSION | Manages all permission-related operations. | Application server |
| Poll | Poll pod. | Meeting server |
| PLATFORM_FRAMEWORK | Represents the platform framework. | Application server |
| PRINCIPAL | Manages all principal-related operations. | Application server |
| REPORT | Represents reports. | Application server |
| Room | Manages meeting room startup and shutdown. | Meeting server |
| RTMP | Represents RTMPHandler. | Application server |
| SCO | Manages all SCO-related operations. | Application server |
| SEARCH | Manages all search-related operations. | Application server |
| START_UP | Represents the startup component. | Application server |
| TELEPHONY | Manages all telephony-related operations. | Application server |
| TRACKING | Manages all transcript-related operations. | Application server |
| TRAINING | Manages all training-related operations. | Application server |

Comment and status field entries

The x-comment field and the x-status field indicate what type of event occurred. The x-status field provides a code for each logged event. The x-comment field provides a human-readable description of each logged event.

The following table lists the status codes, the comment associated with each status code, and an explanation of each logged event:

| Log Entry for x-status Field | Log Entry for x-comment Field | Description |
|------------------------------|---|---|
| ACCESS_DENIED | Client trying to access protected method. Access is denied. {1} | Logged when client attempts to access protected method. |
| BECAME_MASTER | Server {1} has been designated the master. | Logged when the scheduler quits and this server becomes the scheduler. |
| CLUSTER_CON_BROKEN | Server {1} unable to reach {2} on port {3} to perform cluster operations. | Logged when Adobe Connect is unable to reach another server in the cluster. |
| CLUSTER_FILE_TRANSFER_ERROR | Unable to transfer {1} from server {2}. | Logged when an error is thrown while transferring a file. |
| CONNECT | New client connecting: {1} | Logged when new client connects. |
| CONNECT_WHILE_GC | Connecting while the application is shutting down - forcing shutdown. | Logged when client attempts to connect while application is shutting down. |
| DB_CONNECTION_ERROR | Unable to connect to database {1}. | Logged when Adobe Connect cannot reach the database. |
| DB_CONNECTION_TIME_OUT | Timed out waiting for database connection. | Logged when database connection takes too long. |

| Log Entry for x-status Field | Log Entry for x-comment Field | Description |
|------------------------------|--|--|
| DB_VERSION_ERROR | Database {1} is incompatible with the current version of Adobe Connect. | Logged when the database is out-of-date. |
| DISCONNECT | A client is leaving. Details: {1} | Logged when client disconnects. |
| EXT_ERROR | External error thrown by a third party. | Logged when external code threw an error. |
| FMS_CON_BROKEN | Health check failed due to broken FMS service connection. | Logged when service connection is severed. |
| FMS_NOT_FOUND | Unable to connect to FMS at startup. | Logged when Adobe Connect is unable to establish the service connection at startup. |
| INTERNAL_ERROR | Internal error occurred. | Logged when internal error is thrown. |
| INVALID | - | Logged when invalid operation is attempted. |
| INVALID_DUPLICATE | Value {1} is a duplicate in the system. | Logged when value entered duplicates a value in the system. |
| INVALID_FORMAT | Field {1} of type {2} is invalid. | Value specified is invalid for this field. |
| INVALID_ILLEGAL_OPERATION | Illegal operation performed. | Requested operation is not legal. |
| INVALID_ILLEGAL_PARENT | - | Logged when an ACL has an invalid parent. For example, if folder A is inside folder B, folder B cannot be in folder A. |
| INVALID_MISSING | Field {1} of type {2} is missing. | Missing required value for this field. |
| INVALID_NO_SUCH_ITEM | Value {1} is an unknown in the system. | Requested item does not exist. |
| INVALID_RANGE | The specified value must be between {1} and {2}. | Logged when value entered is out of range. |
| INVALID_TELEPHONY_FIELD | Service provider did not validate the telephony authentication values. | Service provider unable to validate telephony account. |
| INVALID_VALUE_GTE | The specified value must be greater than or equal to {1}. | Logged when value entered is out of range. |
| INVALID_VALUE_LTE | The specified value must be less than or equal to {1}. | Logged when value entered is out of range. |
| KILLING_LONG_CONNECTION | Client has been in the room for 12 hours, disconnecting. | Logged when client connection is terminated after time limit is reached. |
| LICENSE_EXPIRED | Your license has expired and your account will be disabled on {1}. Please upload a new license file through the console manager to continue using Adobe Connect. | Logged when customer is using Adobe Connect during grace period and access is about to be cut off. |
| LICENSE_EXPIRY_WARNING | Your license will expire on {1}. Please upload a new license file through the console manager to continue using Adobe Connect. | Logged when license is 15 days or fewer from expiring. |
| MASTER_THREAD_TIMED_OUT | Master thread has not reported progress in {1} milliseconds. | Scheduler thread not running. |
| MEETING_BACKUP_END | Server {1} is no longer the backup for room {2}. | Meeting backup has ended. |
| MEETING_BACKUP_START | Server {1} is now the backup for room {2}. | Meeting backup has started. |
| MEETING_FAILOVER | Meeting {1} failed over to {2}. | Logged when a meeting fails over to this server. |

| Log Entry for x-status Field | Log Entry for x-comment Field | Description |
|---|--|---|
| MEETING_TMP_READ | Meeting template {1} read for room {2}. | Template read from meeting. |
| MEETING_TMP_WRITTEN | Meeting template {1} written to room {2}. | Template written to meeting. |
| NO_ACCESS_ACCOUNT_EXPIRED | Your account has expired. | Accessed account has expired. |
| NO_ACCESS_DENIED | Permission check failed. | Permission check error. |
| NO_ACCESS_LEARNER | No permission to take courses. | Must be a member of the learner group to take a course. |
| NO_ACCESS_LEARNING_PATH_BLOCKED | You have not fulfilled a prerequisite or preassessment. | Prerequisite or pre assessment error. |
| NO_ACCESS_NO_EXTERNAL_USER_MODIFICATION | External users cannot be modified. | User is not allowed to modify LDAP users. |
| NO_ACCESS_NO_LICENSE_FILE | Your license file has not been uploaded. | License file not found. |
| NO_ACCESS_NO_LOGIN | Not logged in. | Error thrown when user not logged in. |
| NO_ACCESS_NO_QUOTA | A {1} quota error occurred for account {2} with limit {3}. | Out of quota. |
| NO_ACCESS_NO_RETRY | You have reached the max limit and cannot take the course again. | User has exceeded course retry limit. |
| NO_ACCESS_NO_SERVER | Server not available | Requested server is not available. |
| NO_ACCESS_NOT_AVAILABLE | The requested resource is unavailable. | Logged when the requested resource is not available. |
| NO_ACCESS_NOT_SECURE | SSL request made on a non-SSL server. | Secure request made on non-secure server. |
| NO_ACCESS_PASSWORD_EXPIRED | Your password has expired. | Logged when a user password has expired. |
| NO_ACCESS_PENDING_ACTIVATION | Your account has not been activated yet. | Account is not activated yet. |
| NO_ACCESS_PENDING_LICENSE | Your account activation is pending a license agreement. | Account not usable until license agreement is read. |
| NO_ACCESS_SCO_EXPIRED | The course you tried to access is no longer available. | Course end date is passed. |
| NO_ACCESS_SCO_NOT_STARTED | Course is not open yet. | Course start date is not reached. |
| NO_ACCESS_WRONG_ZONE | Content accessed from wrong zone. | Thrown when content or user accesses a server in the wrong zone. |
| NO_DATA | Permission check failed. | Query did not return any data. |
| NO_DISKSPACE | Health check failed due to lack of disk space. | Logged when the account runs out of disk space. |
| NOT_AVAILABLE | Requested resource is not available. | Error thrown when resource is not available. |
| OK | - | Request successfully processed. |
| OPERATION_SIZE_ERROR | Operation too large to complete. | Logged when operation can't be completed because of size. |
| REQUEST_RETRY | Unable to process request. Please try again. | The request failed. |
| RESPONSE_ABORTED | Client that made request is not available to receive response. | Logged when user closes browser before server can send response back. |

| Log Entry for x-status Field | Log Entry for x-comment Field | Description |
|------------------------------|---|---|
| RTMP_SVC_BLOCKED | Adobe Connect service request blocked from {1} because the server has not fully started up yet. | Service connection requested from SCO but the server is still starting. |
| RTMP_SVC_CLOSED | Adobe Connect service connection closed for {1}. | Service connection closed for SCO. |
| RTMP_SVC_REQUEST | Adobe Connect service request received from {1}. | Service connection requested from SCO. |
| RTMP_SVC_START | Adobe Connect service connection established with {1}. | Service connection established with SCO. |
| SCRIPT_ERROR | Run-Time Script Error. Details: {1} | Logged when script error is detected. |
| SERVER_EXPIRED | Health check failed due to server expiry (expiry date={1}, current time={2}). | Logged when server does not pass health check before timing out. |
| SOME_ERRORS_TERMINATED | Some actions terminated with an error. | Logged when an error causes some actions to terminate. |
| START_UP_ERROR | Start up error: {1}. | Logged when an exception is thrown during startup. |
| START_UP_ERROR_UNKNOWN | Unable to start up server. Adobe Connect might already be running. | Logged when an unknown error is thrown during startup. JRUN prints the error. |
| TEL_CONNECTION_BROKEN | Telephony connection {1} was unexpectedly broken. | Logged when the telephony connection breaks. |
| TEL_CONNECTION_RECOVERY | Telephony connection {1} was reattached to conference {2}. | Logged when Adobe Connect recovers a connection to the conference again. |
| TEL_DOWNLOAD_FAILED | Unable to download {1} for archive {2}. | Logged when time-out occurs while downloading telephony audio files. |
| TOO_MUCH_DATA | Multiple rows unexpectedly returned. | Logged when an operation returns more data than expected. |
| UNKNOWN_TYPE | {1} | Logged when variable type is unknown. |

Note: In the preceding table, {1} and {2} are variables that are replaced with a value in the log entry.

Severity field entries

The x-severity field indicates how serious a condition is, which helps you determine the appropriate response level.

| Log Entry for x-severity | Meaning | Suggested Action | Example |
|--------------------------|----------|---|--|
| C | Critical | Configure third- party monitoring tools to alert pagers when a log entry with this severity level occurs. | Can't reach the database. Can't start or end a process. A failure is affecting the system. |

| Log Entry for x-severity | Meaning | Suggested Action | Example |
|--------------------------|---------|---|---|
| E | Error | Configure third- party monitoring tools to send an e-mail when a log entry with this severity level occurs. | Can't reach Adobe® Premiere® . Conversion failed. A failure is affecting a user or account, but not the whole system. |
| W | Warning | Generate and review periodic reports to identify possible operational and product improvements. | Disk or memory use has exceeded the specified threshold. |
| I | Info | Review log entries for auditing or RCA purposes. | Server started, stopped, or restarted. |

Category field entries

The x-category field indicates whether the event relates to access issues (A) or general system issues (S). All entries of category A appear in the access.log file, and all entries of category S appear in the error.log file.

| Log Entry for x-category field | Meaning | Description |
|--------------------------------|---------|--|
| A | access | Status code is related to access issues. Logged in access.log file. |
| S | system | Status code is related to general system issues. Logged in error.log file. |

Maintaining disk space

About maintaining disk space

The Adobe Connect system must have a minimum of 1 GB of free space. Adobe Connect does not have any built-in tools that monitor disk space—the administrator must monitor disk space with operating system utilities or third-party tools.

Content can be stored on the server hosting Adobe Connect, on external shared storage volumes, or both.

More Help topics

“[Configuring shared storage](#)” on page 57

Maintain disk space on Adobe Connect servers

- ❖ Do any of the following:
 - Use Adobe Connect Central to delete unused content. See [Delete a file or folder](#).
 - Replace your server disk with a bigger disk.

Note: *If the free disk space on the server falls below 1 GB, the server stops.*

Maintain disk space on shared storage devices

- ❖ Monitor the primary shared storage device for free space and available file system nodes. If either drops below 10%, add more storage to the device or add another shared storage device.

Note: *10% is a recommended value. Also, if you're using shared storage, set a maximum cache-size value in Application Management Console or the cache can fill up the disk.*

Clear the edge server cache

Adobe recommends that you create a weekly scheduled task to clear the edge server cache. It's a good idea to run the task during off-peak hours, such as early Sunday morning.

- 1 Create a cache.bat file to delete the cache directory. The entry in this file must use the following syntax:

```
del /Q /S [cache directory]\*.*
```

The default cache directory is C:\Connect\edgeserver\win32\cache\http. To delete the cache, use the following command:

```
del /Q /S c:\Connect\edgeserver\win32\cache\http\*.*
```

- 2 Select Start > Programs > Adobe Connect Edge Server > Stop Adobe Connect Edge Server.
- 3 Run the cache.bat file and verify that it deletes files in the cache directory.
Note: The directory structure remains, and any files that the edge server locks are not deleted.
- 4 Select Start > Programs > Adobe Connect Edge Server > Start Adobe Connect Edge Server.
- 5 Select Start > Control Panel > Scheduled Tasks > Add Scheduled Task.
- 6 Select cache.bat as the new file to run.
- 7 Repeat this procedure for each edge server.

Backing up data

About backing up data

There are three types of data you must back up at regular intervals: content (any files stored in the libraries), configuration settings, and database data.

If you aren't using shared storage devices, all the content in the libraries is stored in the *[root_install_dir]\content* folder (C:\Connect\content, by default). The configuration settings are stored in the custom.ini file in the root installation folder (C:\Connect, by default).

A database backup creates a duplicate of the data in the database. Regularly scheduled database backups can let you recover from many failures, including media failures, user errors, and permanent loss of a server. Back up the database daily.

You can also use backups to copy a database from one server to another. You can re-create the entire database from a backup in one step by restoring the database. The restoration process overwrites the existing database or creates the database if it does not exist. The restored database matches the state of the database at the time the backup was performed, minus any uncommitted transactions.

You create backups on backup devices, such as disk or tape media. You can use a SQL Server utility to configure your backups. For example, you can overwrite outdated backups, or you can append new backups to the backup media.

Follow best practices when backing up the database:

- Schedule a nightly backup.
- Maintain backups in a secure place, preferably at a site different from the site where the data resides.
- Keep older backups for a designated period in case the most recent backup is damaged, destroyed, or lost.

- Establish a system for overwriting backups, reusing the oldest backups first. Use expiration dates on backups to prevent premature overwriting.
- Label backup media to identify the data and prevent overwriting critical backups.

Use SQL Server utilities to back up the database:

- Transact-SQL
- SQL Distributed Management Objects
- Create Database Backup wizard
- SQL Server Management Studio

Back up server files

Back up and protect system data, just as you protect all the valuable assets of your organization.

It's a good idea to perform this procedure nightly.

1 Do the following to stop Adobe Connect:

- a** Select Start > Programs > Adobe Connect Server > Stop Adobe Connect Central Server.
- b** Select Start > Programs > Adobe Connect Server > Stop Adobe Connect Meeting Server.

2 Make a backup copy of the content directory.

The default location is C:\Connect.

3 Make a backup copy of the custom.ini file.

The default location is C:\Connect\.

4 Do the following to start Adobe Connect:

- a** Select Start > Programs > Adobe Connect Server > Start Adobe Connect Meeting Server.
- b** Select Start > Programs > Adobe Connect Server > Start Adobe Connect Central Server.

Back up the database

To back up any edition of Microsoft SQL Server, you can use Microsoft SQL Server Management Studio or the Command Prompt window.

The edition of SQL Server that installs with Adobe Connect Server does not include SQL Server Management Studio. However, you can download [Microsoft SQL Server Management Studio Express](#) from Microsoft.

Use SQL Server Management Studio to back up SQL Server

Important: Do not uninstall the database.

- 1** Open SQL Server Management Studio in Microsoft SQL Server.
- 2** In the Tree pane of the Object Explorer window, right-click on the database (named “breeze,” by default) and choose Tasks > Back Up.

Note: For complete instructions for SQL Server database backup and recovery, see the [Microsoft Support site](#).

Use the Command Prompt window to back up SQL Server

To access help information for database commands, type `osql ?` at the DOS prompt and press Enter.

Important: Do not uninstall the database.

- 1 Log on to the server hosting Adobe Connect Server.
- 2 Create a folder to store the database backup files.
This example uses the folder C:\Connect_Database.
- 3 Open the command prompt.
- 4 At the prompt, change to the directory where you installed the database. By default, the directory is C:\Program Files\Microsoft SQL Server\110\Tools\Binn.
- 5 At the prompt, enter **osql -E** to log in to the database engine and press Enter.
- 6 Enter **BACKUP DATABASE database-name TO DISK = 'C:\Connect_Database\database-name.bak'** to run a Microsoft SQL utility that backs up the Adobe Connect database and press Enter.

The default database name is *breeze*.

- 7 At the prompt, enter **go** and press Enter.

The command window displays messages regarding the backup.

- 8 At the prompt, enter **quit** and press Enter.
- 9 To verify that the backup was successful, confirm that the breeze.bak file exists in the C:\Connect_Database directory.
- 10 To restart your database, from your Windows desktop, select Start > Control Panel > Administrative Tools > Services. In the Services window, right-click SQL Server (MSSQLSERVER) and select Start from the context menu.

Building custom reports

Building custom reports using star schema views

Adobe Connect uses a database to store information about users, content, courses, and meetings. User activity populates the database. You can use tools such as Adobe® ColdFusion® Studio and Business Objects Crystal Reports to query star schema views and view the data. You can also use SQL-based tools such as SQL Query Analyzer.

The following Adobe Connect applications can output data to reports:

Adobe Connect Meeting Meeting attendance, meeting duration, and meeting content.

Adobe Presenter Content views, slide views, and presentation views.

Adobe Connect Training Course management information such as course attendee statistics, content viewing statistics, and quiz results.

Note: In addition, you can run reports from the Adobe Connect Central web application and either view or download them in CSV format. For more information, see [Generating reports in Adobe Connect Central](#).

SCO fact

| Column | Description |
|-----------------------------|-------------|
| dim_sco_details_sco_id | SCO id |
| dim_sco_details_sco_version | SCO version |

| Column | Description |
|-----------------------|--|
| max_retries | Maximum number of retries |
| owner_user_id | User id of the SCO owner |
| disk_usage_kb | Disk usage in kilobytes |
| passing_score | Passing score |
| max_possible_score | Maximum score |
| views | Number of views |
| unique_viewers | Number of unique users who have viewed the SCO |
| slides | Number of slides |
| questions | Number of questions |
| max_score | Maximum score |
| min_score | Minimum score |
| average_score | Average score |
| average_passing_score | Average passing score |
| total_registered | Average failing score |
| total_participants | Total registered users |
| account_id | Total participants |

SCO details dimension

| Column | Description |
|-------------------|-----------------------|
| sco_id | SCO id |
| sco_version | SCO version |
| sco_name | Name |
| sco_description | Description |
| sco_type | SCO type |
| sco_int_type | Integer type |
| is_content | Is SCO a content SCO? |
| url | URL |
| parent_name | Name of parent SCO |
| parent_sco_id | SCO id of parent SCO |
| parent_type | Type of parent SCO |
| date_sco_created | Date created |
| date_sco_modified | Date modified |
| sco_start_date | Start date |
| sco_end_date | End date |

| Column | Description |
|--------------------|----------------------------|
| version_start_date | Version start date |
| version_end_date | Version end date |
| sco_tag_id | Tag id |
| passing_score | Passing score |
| max_possible_score | Maximum possible score |
| linked_sco_id | Id of a linked SCO |
| linked_type | Type of a linked SCO |
| owner_user_id | Owner user id |
| storage_bytes_kb | Storage bytes in kilobytes |
| account_id | Account id |

Activity fact

| Column | Description |
|----------------------------------|---------------------|
| dim_activity_details_activity_id | Activity id |
| score | Score |
| passed | Passed |
| completed | Completed |
| peak_session_users | Peak session users |
| number_correct | Number correct |
| number_incorrect | Number incorrect |
| number_of_questions | Number of questions |
| number_of_responses | Number of responses |
| account_id | Account id |

Activity details dimension

| Column | Description |
|-------------------------------|---------------|
| activity_id | Activity id |
| dim_sco_details_sco_id | SCO id |
| dim_sco_details_sco_version | SCO version |
| dim_users_user_id | User id |
| dim_sco_details_parent_sco_id | Parent SCO id |
| score | Score |
| passed | Passed |
| completed | Completed |
| activity_type | Activity type |

| Column | Description |
|------------------------|-------------------------|
| role | Role |
| date_activity_started | Date started |
| date_activity_finished | Date finished |
| dim_cost_center_id | Cost center id |
| cost_center_audit_id | Audit id |
| session_start_date | Session start date |
| session_end_date | Session end date |
| attendance_activity | Is attendance activity? |
| session_id | Session id |
| account_id | Account id |

Curriculum test outs dimension

| Column | Description |
|--|--------------------|
| dim_sco_details_curriculum_sco_id | Curriculum id |
| dim_sco_details_curriculum_sco_version | Curriculum version |
| test_out_subject_sco_id | Subject SCO id |
| test_out_target_sco_id | Target SCO id |
| test_out_type | Test out type |
| account_id | Account id |

Curriculum prerequisites dimension

| Column | Description |
|--|--------------------|
| dim_sco_details_curriculum_sco_id | Curriculum id |
| dim_sco_details_curriculum_sco_version | Curriculum version |
| pre_requisite_subject_sco_id | Subject SCO id |
| pre_requisite_target_sco_id | Target SCO id |
| pre_requisite_type | Prerequisite type |
| account_id | Account id |

Curriculum completion requirements dimension

| Column | Description |
|--|--------------------|
| dim_sco_details_curriculum_sco_id | Curriculum id |
| dim_sco_details_curriculum_sco_version | Curriculum version |
| completion_subject_sco_id | Subject SCO id |
| completion_target_sco_id | Target SCO id |

| Column | Description |
|-----------------------------|-----------------------------|
| completion_requirement_type | Completion requirement type |
| account_id | Account id |

Slide views fact

| Column | Description |
|--------------------------------------|------------------|
| dim_slide_view_details_slide_view_id | Slide view id |
| dim_activity_details_activity_id | Activity id |
| slide_view_display_sequence | Display sequence |
| account_id | Account id |

Slide views details dimension

| Column | Description |
|-------------------|-------------------|
| slide_view_id | Slide view id |
| date_slide_viewed | Date slide viewed |
| slide_name | Slide name |
| slide_description | Slide description |
| account_id | Account id |

Answers fact

| Column | Description |
|----------------------------------|------------------|
| dim_answer_details_answer_id | Answer id |
| dim_activity_details_activity_id | Activity id |
| dim_question_details_question_id | Question id |
| answer_display_sequence | Display sequence |
| answer_score | Score? |
| answer_correct | Is correct? |
| account_id | Account id |

Answer details dimension

| Column | Description |
|---------------|---------------|
| answer_id | Answer id |
| date_answered | Date answered |
| response | Response |
| account_id | Account id |

Question fact

| Column | Description |
|----------------------------------|-----------------------------|
| dim_sco_details_sco_id | SCO id |
| dim_sco_details_sco_version | SCO version |
| dim_question_details_question_id | Question id |
| number_correct | Number of correct answers |
| number_incorrect | Number of incorrect answers |
| total_responses | Total responses |
| high_score | High score |
| low_score | Low score |
| average_score | Average score |
| account_id | Account id |

Question details dimension

| Column | Description |
|---------------------------|------------------|
| question_id | Question id |
| question_display_sequence | Display sequence |
| question_description | Description |
| question_type | Question type |
| account_id | Account id |

Question responses dimension

| Column | Description |
|----------------------------------|---------------------------|
| dim_question_details_question_id | Question id |
| response_display_sequence | Response display sequence |
| response_value | Value |
| response_description | Description |
| account_id | Account id |

Groups dimension

| Column | Description |
|-------------------|-------------------|
| group_id | Group id |
| group_name | Group name |
| group_description | Group description |
| group_type | Group type |
| account_id | Account id |

User groups dimension

| Column | Description |
|------------|-------------|
| user_id | User id |
| group_id | Group id |
| group_name | Group name |
| account_id | Account id |

User dimension

| Column | Description |
|---------------------|--------------------------|
| user_id | User id |
| login | Login |
| first_name | First name |
| last_name | Last name |
| email | E-mail address |
| user_description | User description |
| user_type | User type |
| most_recent_session | Most recent session date |
| session_status | Session status |
| manager_name | Manager name |
| disabled | Disabled |
| account_id | Account id |
| custom_field_1 | Custom field 1 value |
| custom_field_2 | Custom field 2 value |
| custom_field_3 | Custom field 3 value |
| custom_field_4 | Custom field 4 value |
| custom_field_5 | Custom field 5 value |
| custom_field_6 | Custom field 6 value |
| custom_field_7 | Custom field 7 value |
| custom_field_8 | Custom field 8 value |
| custom_field_9 | Custom field 9 value |
| custom_field_10 | Custom field 10 value |

Custom field names dimension

| Column | Description |
|-------------------|--------------------------|
| dim_column_name | Custom field column name |
| custom_field_name | Custom field name |

| Column | Description |
|------------|-------------|
| account_id | Account id |

Cost centers dimension

| Column | Description |
|-------------------------|-------------------------|
| cost_center_id | Cost center id |
| cost_center_name | Cost center name |
| cost_center_description | Cost center description |

Building custom reports from legacy database views

Note: Adobe Connect version 7 introduced star schema views that you can query to build custom reports. The legacy database views are still supported, but the star schema views are more standardized and robust.

Adobe Connect uses a database to store information about users, content, courses, and meetings. User activity populates the database. You can use tools such as Business Objects Crystal Reports to query the database and view the data. You can also use SQL-based tools such as SQL Query Analyzer.

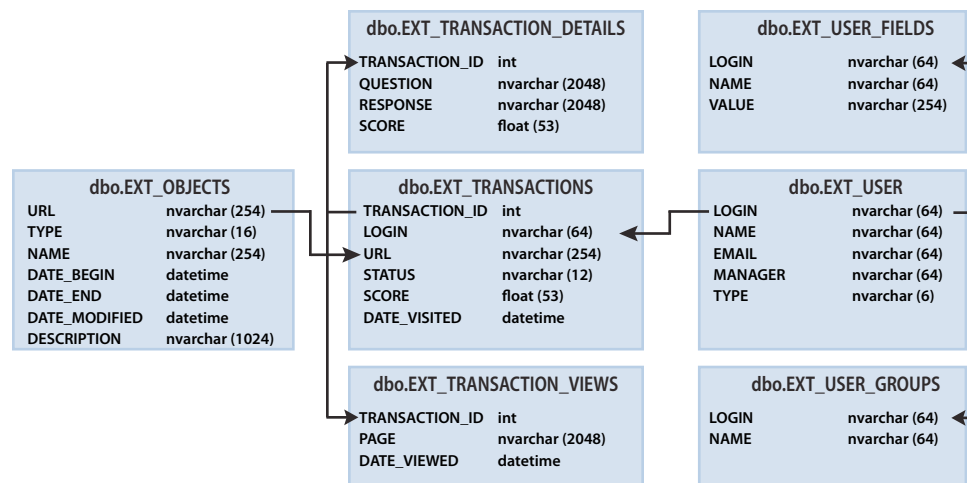
The following Adobe Connect applications can output data to reports:

Adobe Connect Meeting Meeting attendance, meeting duration, and meeting content.

Adobe Presenter Content views, slide views, and presentation views.

Adobe Connect Training Course management information such as course attendee statistics, content viewing statistics, and quiz results.

View relationships between database views



Arrows depict the entity relationships among the seven reporting views.

Note: The following are not supported: views that are not identified in this document, altering the views that are identified in this document, or direct access to the underlying database schema.

- ❖ Use a diagramming tool that connects to your database to see the relationships between the database views.

EXT_TRANSACTIONS

A unique transaction ID is generated each time a user interacts with an object. The EXT_TRANSACTIONS view returns the data listed in the following table:

| Column | Data type | Description |
|----------------|-----------|--|
| TRANSACTION_ID | INT | Unique ID for this transaction. |
| LOGIN | NVARCHAR | Name of user who carried out this transaction. |
| URL | NVARCHAR | Object that the user interacted with. |
| STATUS | NVARCHAR | Can be passed, failed, complete, or in-progress. |
| SCORE | FLOAT | How the user scored. |
| DATE_VISITED | DATETIME | Date this transaction was taken or viewed. |

Sample query and data The following query returns the data in the following table:

```
select * from ext_transactions where url = '/p63725398/' order by login, date_visited asc;
```

| TRANSACTION_ID | LOGIN | URL | STATUS | SCORE | DATE_VISITED |
|----------------|-------------------------------|-------------|-------------|-------|-------------------------|
| 10687 | test1-lnagaraj@test.enang.com | /p63725398/ | in-progress | 0.0 | 2006-12-15 00:56:16.500 |
| 10688 | test1-lnagaraj@test.enang.com | /p63725398/ | in-progress | 0.0 | 2006-12-15 00:56:16.500 |
| 10693 | test1-lnagaraj@test.enang.com | /p63725398/ | in-progress | 0.0 | 2006-12-15 00:58:23.920 |
| 10714 | test1-lnagaraj@test.enang.com | /p63725398/ | in-progress | 10.0 | 2006-12-15 01:09:20.810 |
| 10698 | test2-lnagaraj@test.enang.com | /p63725398/ | in-progress | 10.0 | 2006-12-15 01:00:49.483 |
| 10723 | test3-lnagaraj@test.enang.com | /p63725398/ | in-progress | 10.0 | 2006-12-15 01:11:32.153 |
| 10729 | test3-lnagaraj@test.enang.com | /p63725398/ | completed | 20.0 | 2006-12-15 01:12:09.700 |

Query notes The EXT_TRANSACTIONS view returns all existing transactions for a given user and training session. To view the latest transaction, check the maximum DATE_VISITED value.

You can filter on the STATUS and URL fields to get a list of passing users for a specific training session, for example:

```
select * from ext_transactions where url = '/p31102136/' and status = 'user-passed' order by login, date_visited asc;
```

Generating data User actions that generate data in this view:

- Attending a meeting
- Viewing a piece of content
- Taking a training session (a course or curriculum)

Excluded data •Certificate number, which does not exist in the database

- Maximum score, which is often unavailable

EXT_TRANSACTIONS_VIEWS

The EXT_TRANSACTIONS_VIEWS view retrieves data about the slides or pages that users view.

| Column | Data type | Description |
|----------------|-----------|--|
| TRANSACTION_ID | INT | Unique ID for this transaction (can be merged with TRANSACTION_DETAILS to summarize by URL). |
| PAGE | NVARCHAR | Slide or page number that was viewed. |
| DATE_VIEWED | DATETIME | Date this view occurred. |

Sample query and data The following query returns the data in the following table:

```
select * from ext_transaction_views where transaction_id = 10702 order by page asc;
```

| TRANSACTION_ID | PAGE | DATE_VISITED |
|----------------|------|-------------------------|
| 10702 | 0 | 2006-12-15 01:01:13.153 |
| 10702 | 1 | 2006-12-15 01:01:18.233 |
| 10702 | 2 | 2006-12-15 01:01:59.840 |
| 10702 | 3 | 2006-12-15 01:02:20.717 |

Generating data Data is generated in this view whenever a user views content or a training session.

EXT_USERS

The EXT_USERS view lists users and associated profile attributes:

| Column | Data type | Description |
|---------|-----------|--|
| LOGIN | NVARCHAR | Unique user identifier. |
| NAME | NVARCHAR | Unique user name. |
| EMAIL | NVARCHAR | Unique e-mail address. |
| MANAGER | NVARCHAR | The login of the manager. Manager is always set to NULL. |
| TYPE | NVARCHAR | User or guest. Type is always set to user. |

Sample query and data The following query returns the data in the following table:

```
select * from ext_users;
```

| LOGIN | NAME | EMAIL | MANAGER | TYPE |
|-------------------------------|-------------|-------------------------------|---------|------|
| test4-lnagaraj@test.enang.com | test4 laxmi | test4-lnagaraj@test.enang.com | NULL | user |
| test7-lnagaraj@test.enang.com | TEST7 laxmi | test7-lnagaraj@test.enang.com | NULL | user |

Generating data Data is updated in this view whenever a guest or user is created, updated, or deleted.

Excluded data •Password, which is not stored in plain text.

- Time zone and language, which are not available in human readable form. For example, PST is 323.
- Last login, which is too resource intensive to calculate. Instead, use a `max(date_visited)` query from the EXT_TRANSACTIONS view to retrieve this data.
- Active session, which is data from the EXT_TRANSACTION view. Instead, use a `STATUS='IN-PROGRESS'` query to retrieve this data.

- Deleted users do not appear in the EXT_USERS view. Deleted users continue to appear in the EXT_TRANSACTION view.
- Data on groups is not included in this view.
- Data on new and pre-defined user custom fields. This information is available for each user in the EXT_USER_FIELDS view.

EXT_USER_FIELDS

The EXT_USER_FIELDS view lists new and predefined custom fields for a specific user. It also lists custom fields for users who are converted to guests.

| Column | Data type | Description |
|--------|-----------|--------------------------------------|
| LOGIN | NVARCHAR | Unique user identifier. |
| NAME | NVARCHAR | Field name such as telephone number. |
| VALUE | NVARCHAR | Field value such as 415.555.1212. |

Sample query and data The following query returns the data in the following table:

```
select * from ext_user_fields where login = 'test4-lnagaraj@test.enang.com';
```

| LOGIN | NAME | VALUE |
|-------------------------------|----------------------|-------------------------------|
| test4-lnagaraj@test.enang.com | {email} | test4-lnagaraj@test.enang.com |
| test4-lnagaraj@test.enang.com | {first-name} | test4 |
| test4-lnagaraj@test.enang.com | {last-name} | laxmi |
| test4-lnagaraj@test.enang.com | {x-job-title} | sw engr 4 |
| test4-lnagaraj@test.enang.com | {x-direct-phone} | NULL |
| test4-lnagaraj@test.enang.com | {x-direct-phone-key} | NULL |
| test4-lnagaraj@test.enang.com | SSN | 777 |

Generating data Actions that generate data in this view: adding, creating, or updating new or predefined custom fields for one or more users.

EXT_USER_GROUPS

The EXT_USER_GROUPS view lists data about groups and associated group members. The EXT_USER_GROUPS view uses the data listed in the following table:

| Column | Data type | Description |
|--------|-----------|----------------|
| LOGIN | NVARCHAR | Name of user. |
| NAME | NVARCHAR | Name of group. |

Sample query and data The following query returns the data in the following table:

```
select * from ext_user_groups where login = 'lnagaraj@adobe.com';
```

| LOGIN | NAME |
|--------------------|-----------------|
| lnagaraj@adobe.com | {admins} |
| lnagaraj@adobe.com | {authors} |
| lnagaraj@adobe.com | {everyone} |
| lnagaraj@adobe.com | Laxmi Nagarajan |

Query notes Nesting of multiple groups is supported in version 5.1 and later. For example, if group A contains group B, and you are in group B, you are listed as a member of A.

Built-in groups, like the Administrators group, use code names in the schema, as in the following SQL query: `SELECT * FROM EXT_USER_GROUPS where group= '{admins}'`. The code name distinguishes built-in groups from user-defined groups.

Generating data User actions that generate data in this view:

- Creating, updating, or deleting a group
- Changing group membership

EXT_OBJECTS

The EXT_OBJECTS view lists all system objects (such as meetings, content, courses, and so on) and their attributes.

| Column | Data type | Description |
|---------------|-----------|---|
| URL | NVARCHAR | Unique identifier for the object. |
| TYPE | NVARCHAR | Either a presentation, course, FLV file, SWF file, image, archive, meeting, curriculum, folder, or event. |
| NAME | NVARCHAR | Object name as it appears in the content listing. |
| DATE_BEGIN | DATETIME | The date on which the object is scheduled to begin. |
| DATE_END | DATETIME | The date on which the object is scheduled to end. |
| DATE_MODIFIED | DATETIME | The date this object was modified. |
| DESCRIPTION | NVARCHAR | Object summary information entered when creating a meeting, content, course, or other object type. |

Sample query and data The following SQL query returns the data in the following table:

```
select * from ext_objects order by type asc;
```

| URL | TYPE | NAME | DATE_BEGIN | DATE_END | DATE_MODIFIED | DESCRIPTION |
|-------------|--------------|--------------------|-------------------------|-------------------------|-------------------------|----------------------|
| /p79616987/ | course | test api | 2006-12-08 23:30:00.000 | NULL | 2006-12-08 23:36:55.483 | NULL |
| /p47273753/ | curriculum | test review curric | 2006-12-14 21:00:00.000 | NULL | 2006-12-14 21:00:30.060 | NULL |
| /tz1/ | meeting | {default-template} | 2006-12-12 19:15:00.000 | 2006-12-12 20:15:00.000 | 2006-12-12 19:25:07.750 | release presentation |
| /p59795005/ | presentation | In-QUIZ-TEST1 | NULL | NULL | 2006-12-15 00:43:19.797 | managers meeting |

Query notes You can get all objects of a specific type by filtering on the TYPE field. For example, the following SQL query filters for courses and curriculums:

```
select * from ext_objects where type in ('course', 'curriculum');
```

Use the following SQL query to return a list of available system types:

```
select DISTINCT (type) from ext_objects;
```

Generating data User actions that generate data in this view:

- Creating or updating a meeting, course, or curriculum
- Uploading or updating content

Excluded data •Duration, which you can use `date_end - date_begin` to calculate.

- Size on disk, which exposes business rules regarding copies versus originals
- Folder ID
- Deleted objects do not appear in the EXT_OBJECTS view. Deleted objects do exist in the EXT_TRANSACTION view.