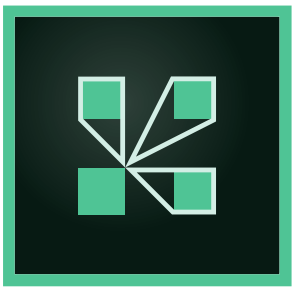
# Adobe® Connect

## Security Overview



At Adobe, we take the security of your digital experiences seriously. From our rigorous integration of security into our internal software development processes and tools to our cross-functional incident response teams, we strive to be proactive and nimble. What's more, our collaboration with partners, researchers, and other industry organizations helps us understand the latest security best practices and trends to continually integrate best of breed security practices into the products and services we offer.

This white paper describes the defense-in-depth approach and security procedures implemented by Adobe to bolster the security of your Adobe® Connect Hosted Multi-Tenant or Adobe Connect Managed Services experience and associated data.

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## About Adobe Connect

Adobe Connect is a secure web conferencing platform that offers immersive online meeting experiences for collaboration, virtual classrooms, and large-scale webinars. Powering end-to-end, mission-critical web conferencing solutions on virtually any device, Adobe Connect enables organizations to fundamentally improve productivity through collaboration. Adobe Connect is available in two primary deployment options:

**Adobe Connect Hosted Multi-tenant,** which uses a combination of Adobe and co-located infrastructure in a shared cloud deployment.

**Adobe Connect Managed Services,** which uses the Amazon Web Services (AWS) cloud infrastructure in a private cloud deployment. Each ACMS customer has private images provisioned for the Adobe Connect application, database and storage.

On-premise deployment of Adobe Connect is also available upon request.

## Adobe Connect Solution Components

Adobe Connect includes two components, the Adobe Connect application suite and the Adobe Connect Server. All deployment options require both components however, the location of the Adobe Connect Server changes based on the chosen deployment option (hosted, managed service, or on-premise).

### Adobe Connect Application Suite

Adobe Connect is composed of five (5) web-based software solutions:

**Adobe Connect Meeting**—Create, manage, and conduct online meetings, webinars, and virtual classrooms with polling, screen sharing, chat, live PowerPoint viewing and annotation, webcams, on-demand video, moderated Q&A, and more.

**Adobe Connect Training**—Create, manage, deploy, and track eLearning courses and curricula, complete with enrollment tracking capabilities, assessment tools, learner management, and reporting.

**Adobe Connect Events**—Manage the full lifecycle of large- and small-scale events through email notification, event catalogs, registration management, reporting, and analytics.

**Adobe Presenter**—Rapidly create eLearning content and high-quality, on-demand multimedia presentations that can include narration, quizzes, and video.

**Adobe Connect Central**—Use account-related information and content to create meetings, manage presentations, create curriculums and events, view and download reports, and more.

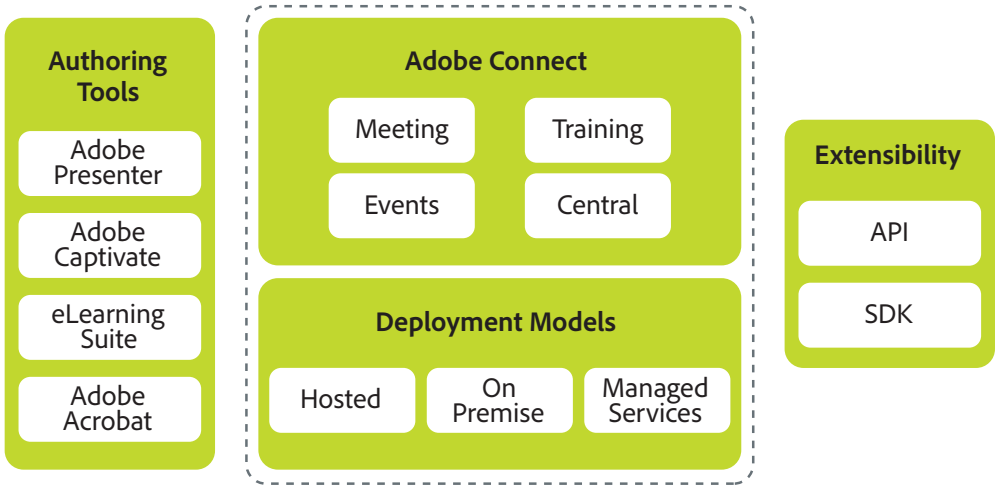


Figure 1: Adobe Connect Product Architecture

### Adobe Connect Server

Adobe Connect Server is an open platform server that delivers enterprise-class scalability with support for clustered environments and provides the reliability and redundancy to seamlessly support thousands of concurrent users.

In addition to the five Adobe Connect software solutions, you can also publish training content and multimedia presentations directly to an Adobe Connect Server from Adobe Captivate®. What's more, since Adobe Connect Server is an open platform, you can extend and integrate it with other, non-Adobe systems through a comprehensive set of APIs and a software development kit (SDK).

## Adobe Connect Server Architecture

As a multi-tier server, Adobe Connect Server separates logical functions across independent processes.

### Web Server

The application layer of Adobe Connect Server is built on J2EE using Apache Tomcat. Apache HTTP Server provides the web server functionality. The web server contains and executes all the business logic necessary for delivering content to users.

### Application Server

The Adobe Connect Server application server manages users, groups, on-demand content, and client sessions, among other tasks. Some of the application server's specific duties include access control, security, compliance, quotas, and licensing, as well as auditing and management functions, such as clustering, failover, and replication. It also transcodes media, such as Microsoft PowerPoint and Adobe PDF, to a format that allows viewing without the original application.

### Streaming Communication Server

Adobe Connect Server includes an embedded instance of Adobe Media Server that acts as the meeting server. This component handles all the real-time streaming of audio and video, synchronization of data, and delivery of rich media content. Adobe Media Server also plays a vital role in reducing server load and latency by caching frequently accessed streams and shared data.

Adobe Media Server uses the Real-Time Messaging Protocol (RTMP) but can also be configured to use Secure Sockets Layer (SSL) for increased data security.

### Database

The Adobe Connect Server database persistently stores transactional and application metadata, including user, group, content, and reporting information. Adobe Connect Server can use either the embedded database engine (Microsoft SQL Server Express) or the full version of Microsoft SQL Server. Check the Adobe Connect system requirements for the most up-to-date information.

When deploying Adobe Connect Server in a cluster, the full version of Microsoft SQL Server must be used and cannot be installed on the same computer as the Adobe Connect Server. Standard cluster and hot-swap configurations for a Microsoft SQL Server are supported for scalability and failover.

### HTML Authoring/Publishing

Adobe Connect Server uses Adobe Experience Manager (AEM), a web content management system, to create and manage HTML-based templates used for event email notifications, landing pages, and user self-registration. Users can also author and subsequently publish web pages using AEM.

AEM requires at least one author and one publisher instance within the Adobe Connect Server deployment when the Adobe Connect Events module is enabled. All web-page authoring is done in the Adobe Experience Manager author instance and replicated in the publish instance.

The publish instance is the read-only view of the web pages that have been authored in the Adobe Experience Manager author instance. Multiple Adobe Experience Manager author and publish instances can be configured within a server cluster to provide increased scalability and failover.

### Analytics

Adobe Connect provides a range of out-of-the-box reports as well as custom reports that can be configured by customers. Optionally, Adobe Analytics can be used with either Adobe Connect Hosted Multi-Tenant or Adobe Connect Managed Service deployments to provide more robust reporting and analytics for Adobe Connect events. These analytics reports track viewing of landing pages, responses to registration questions, attendance, participation in polls, Q&A, and file download activity during meetings.

### Media Transcoding

Adobe Connect Server provides a number of file conversion utilities to automatically convert popular document formats into high-quality files to display in the meeting room. It converts the PowerPoint file format (e.g., .ppt and .pptx) into small, vector-based files, providing a high-quality, resolution-independent display for all participants. The conversion also accurately reproduces hyperlinks and virtually all of the original animations contained within each slide.

Each Adobe Connect client pre-caches the individual slides when they are loaded into a meeting room, using minimal bandwidth to maintain synchronization across all users and ensuring the lowest latency transitions. Adobe Connect Server displays animations exactly as they appear in the original slides and keeps all hyperlinks clickable. Other supported file formats, such as PDF, are similarly converted.

## Adobe Connect Data Flow

Adobe Connect uses the HTTP, HTTPS, RTMP, and RTMPS protocols. RTMP is optimized to deliver real-time, rich media streams. RTMPS is the secure implementation of RTMP.

The data flow paths for connections between both the Adobe Connect client for desktop browsers and the Adobe Connect HTML client and the Adobe Connect Server are described in this section.

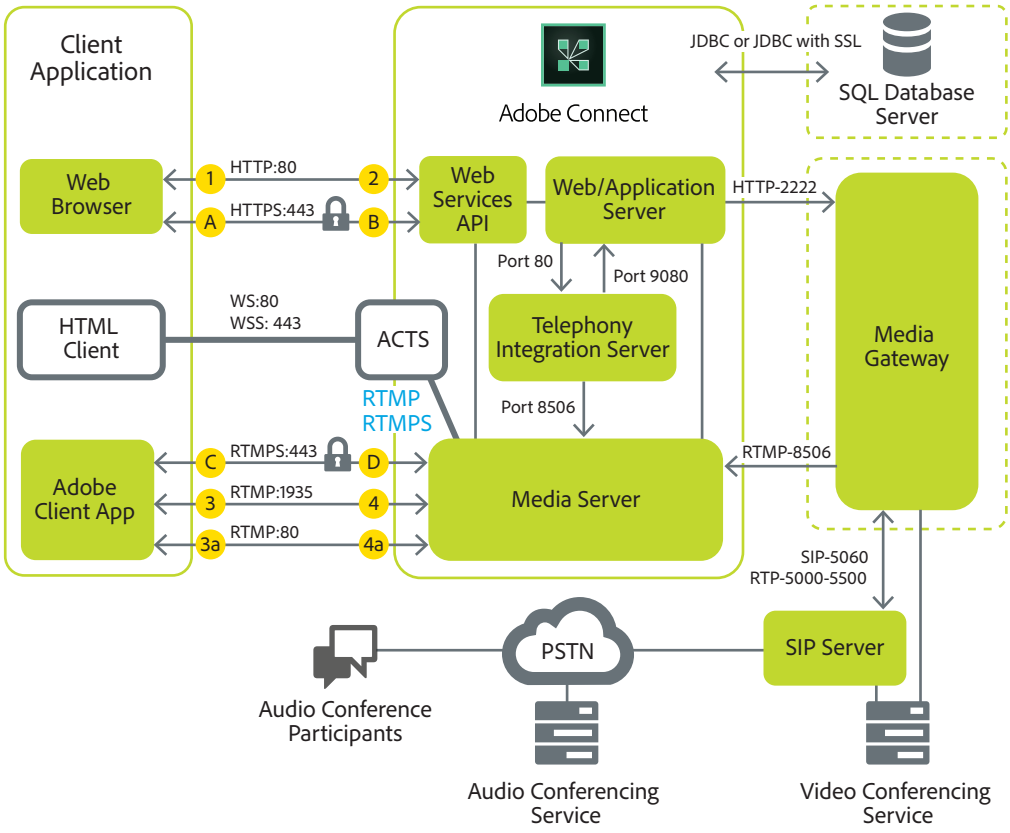


Figure 2: Adobe Connect Data Flow Diagram

## Using Adobe Connect Client for Desktop Browsers

### *Unencrypted Connections*

Adobe Connect unencrypted connections use the HTTP and RTMP protocols and follow the paths indicated by the associated ***numerals*** (e.g., 1, 2, 3, etc.) in the Adobe Connect Data Flow Diagram above. By default, data in transit is encrypted.

1. The Adobe Connect client requests a meeting or content URL over HTTP:80.
2. The web server responds and transfers the content or provides the Adobe Connect client with information to connect to the meeting.
3. The Adobe Connect client requests a connection to the meeting over RTMP:1935.

3a. The Adobe Connect client requests a connection to the meeting but can only connect over RTMPT:80.

4. Adobe Media Server responds and opens a persistent connection for Adobe Connect streaming traffic.

4a. Adobe Media Server responds and opens a tunneled connection for Adobe Connect streaming traffic.

### *Encrypted Connections*

Adobe Connect encrypted connections use HTTPS and RTMPS and follow the paths indicated by the associated ***letters*** (e.g., A, B, C, etc.) in the Adobe Connect Data Flow Diagram above.

A. The Adobe Connect client 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 Adobe Connect client with information to securely connect to the meeting.

C. The Adobe Connect client requests a secure connection to Adobe Media Server over RTMPS:443.

D. Adobe Media Server responds and opens a secure, persistent connection for Adobe Connect streaming traffic.

## Using Adobe Connect HTML Client

Adobe Connect HTML Client uses the standard web server ports to communicate with Adobe Connect Server, including Port 80 (HTTP) and Port 443 (HTTPS).

*Note: Only training, webinar, and meeting participants can join using the Adobe Connect HTML client. Presenters/hosts must use the Adobe Connect client for desktop browsers.*

### Data Encryption

As information flows between Adobe Connect client applications and Adobe Connect Server, industry-standard data encryption methods safeguard the confidential information contained within the traffic.

**Adobe Connect Hosted Multi-Tenant**—Provides encryption in transit with a single key for all customers, using Transport Layer Security (TLS) encryption 1.1 and 1.2. Adobe Connect encrypts passwords stored in the database, but no other encryption at-rest is used.

**Adobe Connect Managed Services**—Provides both encryption in-transit as well as encryption at-rest. The customer can determine the version of TLS that is most appropriate for their needs. All data is encrypted using AES-256.

## Adobe Connect Security Architecture

### Administrator features

Customers control users, content, access, and features through the administration controls of Adobe Connect. Customers retain ownership of their content and data. The compliance and control settings are account-wide settings that broadly consist of the following:

- **Disable undesired functionality**—Administrators can turn off certain functional modules as needed
- **Disable screen sharing**—Administrators can prevent sharing of desktop, windows, or applications. They can also restrict screen sharing to specific applications or prevent specified applications from being shared.
- **Record and retain communications for auditing purposes**—Administrators can force recordings for all meetings, log all chat messages in files, and show a notice or disclaimer to all participants. Recordings can also be disabled for all meetings.
- **Control access to meetings**—Administrators and hosts can completely disable guest access so that guests can no longer request entry. Hosts can also automatically deny access to specific users and groups. Unlike the previous two categories, meeting access control settings are enforced on a per-meeting basis rather than for the entire system or hosted account.

An administrator or limited administrator can also customize the permissions list for a file or folder. These permissions include:

- **Manage**—Users or groups with Manage permission for a folder or file can view, delete, move, and edit the file or folder. They can also, view reports for files in that folder, set permissions for the file or folder, and create new folders. However, they cannot publish to that folder.
- **Denied**—Users or groups with a Denied permission setting for a folder or file cannot view, publish, or manage this folder or file.
- **Publish**—Users or groups with a Publish permission setting for a folder or presentation can publish, update, and view presentations, as well as view reports for files in that folder. However, these users must also be members of the Built-in Author group, as well as have Publish permission, to publish content to this folder.

- **View**—Users or groups with a View permission setting for a folder or file can view any content in the folder or an individual file.

Administrators can also give meeting hosts the ability to mandate a passcode for Adobe Connect sessions. If a user incorrectly enters a password five (5) times, the account is locked out for five (5) minutes and the user is notified by email that the account has been temporarily suspended.

Users can reset their passwords to create their own passwords based on the password policy set by the account administrator. Administrators can mandate a password change or set a temporary password for any user. Meeting hosts can lock out new participants, expel current participants, disable remote control, and disable the ability of participants to change their displayed name.

## Adobe Connect User Authentication

Adobe Connect uses standard access control lists with password policy options and Transport Layer Security (TLS) encryption to secure access, content, and data. Passwords can be set to expire as well as require certain characters. Administrators can mandate that a password include a number, a capital letter, and/or a special character as well as require passwords to be of a minimum and/or a maximum length. In addition, old passwords can be tracked to prohibit reuse.

Administrators can configure the number of old passwords that can be tracked. Adobe Connect allows administrators to provision user accounts in several ways:

1. Manual provisioning through the use of a .csv file
2. Using the Adobe Connect Events module
3. Using the webservice API
4. For Adobe Connect Managed Services, using LDAP/AD synchronization

Authentication takes place on the login screen of the Adobe Connect client or through the webservice API. For Adobe Connect Managed Services, administrators can also enable HTTP header authentication as well as LDAP/AD authentication.

### Single Sign-On

Adobe Connect provides support for Security Assertion Markup Language (SAML). This feature must be enabled by request to Adobe Customer Support. In addition, several of Adobe's trusted partners have developed custom solutions for single sign-on (SSO) for all deployment models. These solutions take advantage of the open and published webservice API.

For Adobe Connect Managed Services and on-premise deployments, HTTP header authentication and login page customization for the purpose of redirection, and LDAP synchronization and authentication are also available.

Adobe Connect Central handles application and service entitlement. More information is available here.

## Adobe Connect Hosted Multi-Tenant Data Centers

Adobe understands the importance of securing data collection, data content serving, and reporting activities over the Adobe Connect network, composed of Adobe-managed infrastructure. To this end, the network architecture for this Adobe-hosted implementation leverages industry best practices for security design, including segmentation of development and production environments, DMZ segments, hardened bastion hosts, and unique authentication.

Adobe Connect Hosted is hosted on Adobe servers in four (4) locations around the world in a shared cloud (multi-tenant) deployment. These data centers are located in Oregon; Virginia; the United Kingdom; and Australia.

Adobe generally hosts the customer's deployment in a data center located in the customer's corresponding region. For Adobe Connect Hosted Multi-Tenant, multiple customer deployments reside on the same cluster of servers.

## Adobe Connect Managed Services Data Centers

Adobe relies upon certified cloud infrastructure providers to operate, manage, and control the components from the hypervisor virtualization layer down to the physical security of the facilities in which Adobe Connect Managed Services operates. These providers also operate the cloud infrastructure used by Adobe to provision a variety of basic computing resources, including processing and storage. This infrastructure includes facilities, network, and hardware, as well as operational software (e.g., host OS, virtualization software, etc.) that supports the provisioning and use of these resources. Adobe requires these providers to adhere to industry-standard practices as well as a variety of security compliance standards.

Adobe certified cloud service providers monitor electrical, mechanical, and life support systems and equipment, and environmental states to help with the immediate identification of service issues. In order to maintain the continued operability of equipment, Adobe cloud providers are required to perform ongoing preventative maintenance.

## Data Center Security

Adobe takes the security at all its data centers – whether Adobe owned or leased – very seriously and maintains standards for security best practices as well as security compliance requirements.

### *Data Protection, Monitoring, and Availability*

#### Segregating Client Data

Adobe Connect Hosted Multi-Tenant relies on application permissions to isolate one customer from another. The only access to these servers and databases is via secure access using the Adobe Connect application. All other access to the application and data servers is made only by authorized Adobe personnel and is conducted via encrypted channels over secure management connections.

Adobe also separates its corporate testing environments from its production environments to avoid use of customer data in testing environments.

#### Data Storage and Backup

backs up customer content and data for Adobe Connect on a weekly basis, with daily differentials for disaster recovery purposes. These backups are also replicated to a hot failover site that is geographically removed from the primary data center. Adobe tests backups quarterly. The combination of backup procedures provides quick recovery from short-term backup as well as off- site protection of data.

By default, Adobe stores all Adobe Connect data using high-durability storage services provided by its cloud infrastructure partners. To help provide durability, PUT and COPY operations synchronously store customer data across multiple facilities and redundantly store objects on multiple devices across multiple facilities in a provider region. In addition, providers calculate checksums on all network traffic to detect corruption of data packets when storing or retrieving data.

#### Access Controls

Only authorized users within the Adobe intranet or remote users who have completed the multi-factor authentication process to create a VPN connection can access administrative tools. In addition, Adobe logs all server connections for auditing.

#### Logging

In order to protect against unauthorized access and modification, Adobe captures network logs, OS-related logs, and intrusion detections. Sufficient storage capacity for logs is identified, periodically reviewed, and, as needed, expanded to help ensure that log storage is not exceeded. Systems generating logs are hardened and access to logs and logging software is restricted to authorized Adobe Digital Marketing Information Security Team personnel.

## Secure Management

Adobe deploys dedicated network connections in order to enable secure management of the Adobe Connect. All management connections to the servers occur over encrypted Secure Shell (SSH), Secure Sockets Layer (SSL), or Virtual Private Network (VPN) channels and remote access always requires two-factor authentication. Unless the connection originates from a list of trusted IP addresses, Adobe does not allow management access from the Internet.

## Secure Network Architecture

Adobe requires all certified cloud infrastructure providers to employ network devices, including firewall and other boundary devices, to monitor and control communications at the external boundary of the network and at key internal boundaries within the network. These boundary devices employ rule sets, access control lists (ACL), and configurations to enforce the flow of information to specific information system services. ACLs, or traffic flow policies, exist on each managed interface to manage and enforce the flow of traffic. Adobe works with our cloud infrastructure providers to enforce the most up-to-date ACLs.

## Change Management

Adobe Connect follows a Change Approval Board (CAB) process for any and all changes that could impact customer experience. The CAB process focuses upon enforcing stability and availability, while permitting an agile response to emerging issues, and providing internal process transparency and accountability.

The Adobe Connect release schedule is typically one major release every 12 to 18 months, with a minor release following the major release by six months and patches as needed.

While most maintenance does not require downtime, when it does, a typical downtime maintenance window will fall on a Friday evening from 8pm-midnight Pacific Time. Adobe Connect maintenance windows that include downtime are scheduled on an as-needed basis and are typically used for more involved maintenance (major releases) that will require part of the system to be unavailable for a period of time. There is no option for delaying or scheduling maintenance on the hosted service. All patches, updates, and hotfixes are tested prior to deployment. Prior to deployment, manager approval is required.

All Adobe certified cloud service providers are responsible for authorizing, logging, testing, approving, and documenting routine, emergency, and configuration changes to existing infrastructure in accordance with industry norms for similar systems. Providers schedule updates to minimize any customer impact.

## Patch Management

In order to automate patch distribution for Adobe Connect components, Adobe uses internal patch and package repositories as well as industry-standard patch and configuration management. Depending on the role of the host and the criticality of pending patches, Adobe distributes patches to hosts at deployment and on a regular patch schedule. If required, Adobe releases and deploys emergency patch releases on short notice.

Adobe cloud infrastructure providers maintain responsibility for patching systems that support the delivery of IaaS services, such as the hypervisor and networking services.

## Firewalls and Load Balancers

The firewalls implemented on all Adobe servers, whether in Adobe-owned data centers or at a certified cloud infrastructure provider, deny all Internet connections except those to Port 80 for HTTP and Port 443 for HTTPS. The firewalls also perform Network Address Translation (NAT). NAT masks the true IP address of a server from the client connecting to it. The load balancers proxy incoming HTTP/HTTPS connections and also distribute requests that enable the network to handle momentary load spikes without service disruption.

Adobe implements fully redundant firewalls and load balancers, reducing the possibility that a single device failure can disrupt the flow of traffic.

### Non-Routable, Private Addressing

All Adobe servers containing customer data, whether in Adobe-owned data centers or at a certified cloud infrastructure provider, are configured with non-routable IP addresses (RFC 1918). These private addresses, combined with firewalls and NAT, help prevent an individual server on the network from being directly addressed from the Internet, greatly reducing the potential vectors of attack.

### Intrusion Detection

Both network intrusion detection and host intrusion detection (NIDS and HIDS) are integrated into our centralized security incident and event management system (SIEM) and are continuously monitored by the Digital Marketing Information Security Team. The security team follows up on intrusion notifications by validating the alert and inspecting the targeted platform for any sign of compromise. Adobe regularly updates all sensors and monitors them for proper operation.

### Network Monitoring

Monitoring tools help detect unusual or unauthorized activities and conditions at ingress and egress communication points. As with its own data centers, Adobe ensures its infrastructure providers offer protection against traditional network security issues, including:

- Distributed Denial of Service (DDoS) attacks
- Man-in-the-Middle (MITM) attacks
- IP Spoofing
- Port Scanning
- Packet sniffing by other tenants

Adobe monitors all its servers, routers, switches, load balancers, and other critical network equipment on the Adobe Connect network 24 hours a day, 7 days a week, 365 days a year. The Adobe Network Operations Center (NOC) receives notifications from the various monitoring systems and will immediately attempt to fix an issue or escalate the issue to the appropriate Adobe personnel. Additionally, Adobe contracts with multiple third parties to perform external monitoring.

## *Physical and Environmental Controls*

### Physical Facility Security

Adobe physically secures all hardware in Adobe-owned or leased hosting facilities against unauthorized access. All facilities that contain production servers for Adobe Connect include dedicated, 24-hour on-site security personnel and require these individuals to have valid credentials to enter the facility. Adobe requires PIN or badge credentials—and, in some cases, both—for authorized access to data centers. Only individuals on the approved access list can enter the facility. Some facilities include the use of man-traps, which prevent unauthorized individuals from tailgating authorized individuals into the facility.

Cloud infrastructure provider data centers are housed in nondescript facilities and the provider controls physical access both at the perimeter and at building ingress points using professional security staff, video surveillance, intrusion detection systems, and other electronic means. Authorized staff must pass two-factor authentication a minimum of two times to access data center floors. All visitors and contractors are required to present identification and are signed in and continually escorted by authorized staff. When an employee no longer has a legitimate business need for these privileges, their access is immediately revoked, even if they continue to be an employee at our partner. All physical access to data centers is logged and audited routinely.

### Fire Suppression

All Adobe data center facilities, whether owned or leased by Adobe, employ an air-sampling, fast-response smoke detector system that alerts facility personnel at the first sign of a fire. In addition,

each facility must install a pre-action, dry-pipe sprinkler system with double interlock to ensure no water is released into a server area without the activation of a smoke detector and the presence of heat.

Adobe cloud infrastructure providers provide automatic fire detection and suppression equipment in all data centers. The fire detection system utilizes smoke detection sensors in all data center environments, mechanical and electrical infrastructure spaces, chiller rooms and generator equipment rooms. These areas are protected by either wet-pipe, double-interlocked pre-action, or gaseous sprinkler systems.

### Controlled Environment

Every data center facility must include an environmentally controlled environment, including temperature and humidity control as well as fluid detection, to prevent overheating and reduce the possibility of service outages. Adobe requires a completely redundant heating, ventilation, and air conditioning (HVAC) system and always-available facility teams to handle environmental issues that might arise. If the environmental parameters move outside those defined by Adobe, environmental monitors alert both Adobe and the cloud infrastructure provider's Network Operations Center (NOC).

### Video Surveillance

All facilities hosting Adobe Connect services, both Adobe owned and leased from certified cloud infrastructure providers, must provide professional security staff in order to control physical access both at the perimeter and at building ingress points, using video surveillance to monitor entry and exit point access, intrusion detection systems, and other electronic means. Adobe requires that data center facilities also monitor physical access to equipment and may review video logs when issues or concerns arise in order to determine access.

### Backup Power

Multiple power feeds from independent power distribution units help to ensure continuous power delivery, 24 hours a day, seven days a week, at all facilities hosting Adobe Connect services. Adobe also requires automatic transition from primary to backup power and that this transition occurs without service interruption. Each data center facility must provide redundancy at every level, including generators and diesel fuel contracts. Uninterruptible Power Supply (UPS) units provide back-up power in the event of an electrical failure for critical and essential loads in the facility. Additionally, each facility must conduct regular testing of its generators under load to ensure availability of equipment.

### Disaster Recovery

In the event that an Adobe-owned or leased data center is unavailable due to a problem at the facility, a local situation, or a regional disaster, both Adobe and its cloud infrastructure providers follow industry best practices to ensure an effective and accurate recovery.

## Risk & Vulnerability Management

### Penetration Testing

Adobe approves and engages with leading third-party security firms to perform penetration testing that can uncover potential security vulnerabilities and improve the overall security of Adobe products and services. Upon receipt of the report provided by the third party, Adobe documents these vulnerabilities, evaluates their severity, considers their priority, and then creates a mitigation strategy or remediation plan. Please review our white paper on secure engineering practices for more information.

### Incident Response and Notification

New vulnerabilities and threats evolve each day and Adobe strives to respond to mitigate newly discovered threats. In addition to subscribing to industry-wide vulnerability announcement lists, including US-CERT, Bugtraq, and SANS, Adobe also subscribes to the latest security alert lists issued by major security vendors. You can learn more about our incident response programs and systems on Adobe.com.

### Forensic Analysis

For incident investigations, the Adobe Connect team adheres to the Adobe forensic analysis process that includes complete image capture or memory dump of an impacted machine(s), evidence safe-holding, and chain-of-custody recording.

## Customer Data Confidentiality

Adobe treats customer data as confidential. Adobe does not use or share the information collected on behalf of a customer except as may be allowed in a contract with that customer and as set forth in the Adobe Terms of Use and the Adobe Privacy Policy. Adobe Systems Incorporated also certifies to the Privacy Shield Framework.

## Adobe Security Organization

As part of our commitment to the security of our products and services, Adobe coordinates all security efforts under the Chief Security Officer (CSO). The office of the CSO coordinates all product and service security initiatives and the implementation of the Adobe Secure Product Lifecycle (SPLC).

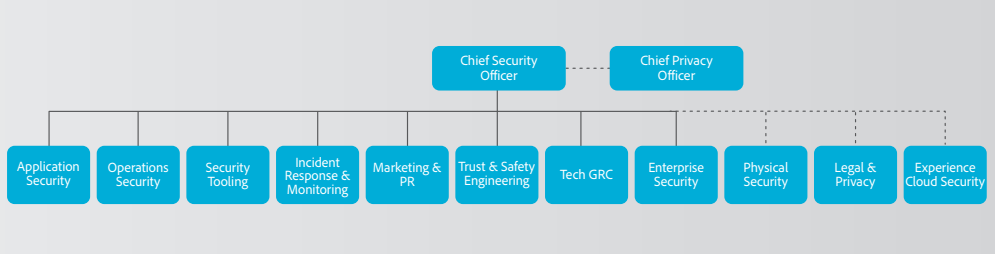


Figure 4: Adobe Security Organization

The CSO also manages the Adobe Secure Software Engineering Team (ASSET), a dedicated, central team of security experts who serve as consultants to key Adobe product and operations teams, including the Adobe Connect team. ASSET researchers work with individual Adobe product and operations teams to strive to achieve the right level of security for products and services and advise these teams on security practices for clear and repeatable processes for development, deployment, operations, and incident response.

### Adobe Secure Product Development

As with other key Adobe product and service organizations, the Adobe Connect organization employs the SPLC process. A rigorous set of several hundred specific security activities spanning software development practices, processes, and tools, the Adobe SPLC is integrated into multiple stages of the product lifecycle, from design and development to quality assurance, testing, and deployment. ASSET security researchers provide specific SPLC guidance for each key product or service based on an assessment of potential security issues. Complemented by continuous community engagement, the Adobe SPLC evolves to stay current as changes occur in technology, security practices, and the threat landscape.

### Adobe Secure Product Lifecycle

A rigorous set of several hundred specific security activities spanning software development practices, processes, and tools, the Adobe SPLC was designed from the ground up to help keep your information safe and secure when you use Adobe products and services and is integrated into multiple stages of the product lifecycle. Adobe's SPLC must meet the standard of due care that is reasonably expected by customers, shareholders, partners, Adobe workers, and the business itself within the product lifecycle. Complemented by continuous community engagement, the Adobe SPLC evolves to stay current as changes occur in technology, security practices, and the threat landscape. Please review our secure engineering white paper for more information about the Adobe SPLC.

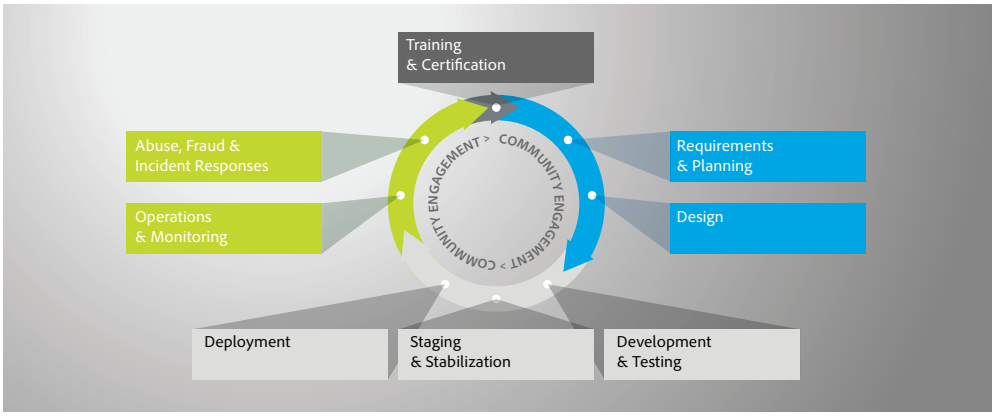


Figure 5: Adobe Secure Product Lifecycle (SPLC)

### Adobe Software Security Certification Program

As part of the Adobe SPLC, Adobe conducts ongoing security training within development teams to enhance security knowledge throughout the company and improve the overall security of our products and services. Employees participating in the Adobe Software Security Certification Program attain different certification levels by completing security projects.

The program has four levels, each designated by a colored 'belt': white, green, brown, and black. The white and green levels are achieved by completing computer-based training. The higher brown and black belt levels require completion of months- or year-long hands-on security projects. Employees attaining brown and black belts become security champions and experts within their product teams. Adobe updates training on a regular basis to reflect new threats and mitigations, as well as new controls and software languages. You can learn more about our security certification program here on Adobe.com.

Various teams within the Adobe Connect organization participate in additional security training and workshops to increase awareness of how security affects their specific roles within the organization and the company as a whole.

## Adobe Employees

Adobe maintains employees and offices around the world and implements the following processes and procedures company-wide to protect the company against security threats:

### Employee Access to Customer Data

Adobe maintains segmented development and production environments for Adobe Connect, using technical controls to limit network and application-level access to live production systems. Employees have specific authorizations to access development and production systems, and employees with no legitimate business purpose are restricted from accessing these systems.

### Background Checks

Adobe obtains background check reports for employment purposes. The specific nature and scope of the report that Adobe typically seeks includes inquiries regarding educational background, work history, court records, including criminal conviction records and references obtained from professional and personal associates, each as permitted by applicable law. These background check requirements apply to regular U.S. new hire employees, including those who will be administering systems or have access to customer information. New U.S. temporary agency workers are subject to background check requirements through the applicable temporary agency, in compliance with Adobe's background screen guidelines. Outside the U.S., Adobe conducts background checks on certain new employees in accordance with Adobe's background check policy and applicable local laws.

### Employee Termination

When an employee leaves Adobe, the employee's manager submits an exiting worker form. Once approved, Adobe People Resources initiates an email workflow to inform relevant stakeholders to take specific actions leading up to the employee's last day. In the event that Adobe terminates an employee, Adobe People Resources sends a similar email notification to relevant stakeholders, including the specific date and time of the employment termination.

Adobe Corporate Security then schedules the following actions to help ensure that, upon conclusion of the employee's final day of employment, he or she can longer access to Adobe confidential files or offices:

- Email Access Removal
- Remote VPN Access Removal
- Office and Datacenter Badge Invalidation
- Network Access Termination

Upon request, managers may ask building security to escort the terminated employee from the Adobe office or building.

### Facility Security

Every Adobe corporate office location employs on-site guards to protect the premises 24x7. Adobe employees carry a key card ID badge for building access. Visitors enter through the front entrance, sign in and out with the receptionist, display a temporary Visitor ID badge and are accompanied by an employee. Adobe keeps all server equipment, development machines, phone systems, file and mail servers, and other sensitive systems locked at all times in environment-controlled server rooms accessible only by appropriate, authorized staff members.

#### Virus protection

Adobe scans all inbound and outbound corporate email for known malware threats.

## Adobe Connect Compliance

The Adobe Common Controls Framework (CCF) is a set of security activities and compliance controls that are implemented within our product operations teams as well as in various parts of our infrastructure and application teams. In creating the CCF, Adobe analyzed the criteria for the most common security certifications for cloud-based businesses and rationalized the more than 1,000 requirements down to Adobe-specific controls that map to approximately a dozen industry standards.

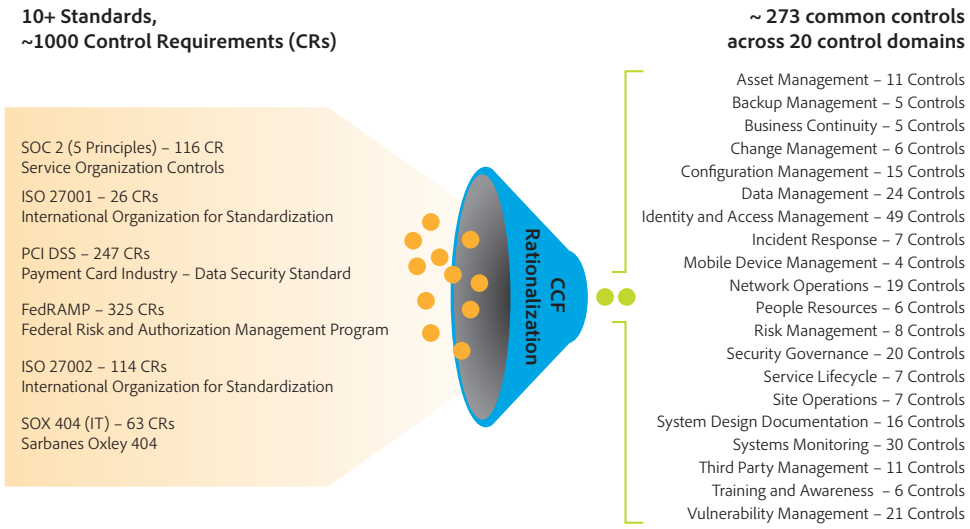


Figure 6: The Adobe Common Controls Framework (CCF)

## Current Regulations and Compliance for Adobe Connect Hosted Multi-Tenant

**SOC 2** is a set of security principles that define leading practice controls relevant to security, confidentiality and privacy. Adobe Connect Hosted is compliant with SOC 2-Type 2 (Security & Availability).

**ISO 27001** is a set of globally adopted standards that outline stringent security requirements and provide a systematic approach to managing the confidentiality, integrity, and availability of customer information. Adobe Connect Hosted is compliant with ISO 27001:2013.

**The Gramm-Leach-Bliley Act (GLBA)** requires that financial institutions safeguard their customers' personal data. Adobe Connect Hosted is "GLBA-ready," meaning that it enables our financial service customers to comply with the GLBA Act requirements for using service providers. Ultimately, the customer is responsible for ensuring compliance with their legal obligations, that our solutions meet their compliance needs, and that they secure the solutions in an appropriate way.

## Current Regulations and Compliance for Adobe Connect Managed Services

**SOC 2** is a set of security principles that define leading practice controls relevant to security, confidentiality, and privacy. Adobe Connect Managed Services is compliant with SOC 2-Type 2 (Security & Availability).

**ISO 27001** is a set of globally adopted standards that outline stringent security requirements and provide a systematic approach to managing the confidentiality, integrity, and availability of customer information. Adobe Connect Managed Services is compliant with ISO 27001:2013.

**The Gramm-Leach-Bliley Act (GLBA)** requires that financial institutions safeguard their customers' personal data. Adobe Connect Managed Services is GLBA-Ready, meaning that it enables our financial customers to comply with the GLBA Act requirements for using service providers. Ultimately, the customer is responsible for ensuring their compliance with their legal obligations, that our solutions meet their compliance needs, and that they secure the solutions in an appropriate way.

**The Federal Risk and Authorization Management Program (FedRAMP)** is a collection of mandatory standards established by the U.S. Federal Government for security assessment and purchase approval for cloud solutions. Adobe Connect Managed Services is compliant with FedRAMP.

**The Health Insurance Portability and Accountability Act (HIPAA)** is legislation that governs the use of electronic medical records, and it includes provisions to protect the security and privacy of personally identifiable health-related data, called protected health information (PHI).

Adobe Connect Managed Services is HIPAA-compliant, which means it can enable our enterprise customers to use our solutions in a way that they can meet their obligations under HIPAA regulations. Ultimately, the customer is responsible for ensuring their compliance with their legal obligations, that our solutions meet their compliance needs and that they secure the solution in an appropriate way.

**The U.S. Family Education Rights and Privacy Act (FERPA)** is designed to preserve the confidentiality of U.S. Student education records and directory information. Under FERPA guidelines, Adobe can contractually agree to act as a "school official" when it comes to handling regulated student data and therefore to enable our education customers to comply with FERPA requirements. Ultimately the customer is responsible for ensuring their compliance with their legal obligations, that our products meet their compliance needs and that they secure the products in an appropriate way. Adobe Connect Managed Services is FERPA-Ready.

## Conclusion

The proactive approach to security and stringent procedures described in this paper help protect the security of the Adobe Connect solution and your confidential data. At Adobe, we take the security of your digital experiences very seriously and we continuously monitor the evolving threat landscape to stay ahead of malicious activities and help ensure the protection of our customers' data.

For more information, please visit: http://www.adobe.com/security

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