Acrobat
Application Security Guide
(all versions)

Acrobat® Family of Products

Adobe Application Security Guide for the Adobe® Acrobat Family of Products.

Contents

1 Application Security Overview

This *Application Security Guide* describes configuration details for the Acrobat family of products, including sandboxing (Protected View and Protected Mode), enhanced security, scripting controls, attachments, and other features. The primary goal here is to encourage enterprise stakeholders who configure and deploy clients to manage them in a secure way. This content is designed for IT administrators, workflow owners, and technically savvy users who need to customize their application's security capabilities.

Adobe provides a security model designed to help you protect your environment from security attacks. You should explore the options for tuning applications for the desired security level. The big picture is relatively simple: Acrobat products allow you to apply application-wide protections and disable risky features while at the same time allowing you to selectively assign trust to files, folders, hosts, protocols, apis, and other workflow components.

Note

The easiest way to propagate settings across your organization is to configure an installed application and then use the Customization Wizard's registry feature to copy the settings to the application installer.

Best practice checklist

Protect your systems and users

1. Enable Protected Mode.
2. Enable Protected View.
3. Enable Enhanced Security.
4. Review the JavaScript controls and set as needed.
5. Review the attachment white and black lists.
6. Review multimedia restrictions.
7. Review settings for XObjects, 3D content, and Flash.

Assign trust to workflow components

1. Set up privileged locations for files, folders, and hosts.
2. Use Trust Manager to configure internet access if you need more control than that offered by Privileged Locations.
3. Set up cross domain access if you need it.
4. For digital signature workflows, set certificate trust and control user interaction with signed PDFs via certificates, seed values, etc.

Many HKCU settings have an HKLM mirror so that IT can disable, lock, and control permissions in a way that prevents end user changes.

Additional resources

Core Documentation

Resource	Description

Preference Reference	A dictionary of plist and registry configuration preferences.
Enhanced Security Quick Key	A one page guide to enhanced security configuration.
JavaScript Quick Key	A one page guide to JavaScript execution workflows and configuration.
IT-centric videos	A series of configuration and deployment videos for enterprise IT.

Specs, Tools, Whitepapers

Resource	Description
JavaScript Blacklist Tool	This LABs utility allows IT to modify the JS API blacklist for any Acrobat product.
Flash Security in Acrobat	Describes the security model when Flash runs inside a PDF document.
Cross Domain Policy File Specification	A specification and guide for creating server-based cross domain policy files with examples.

News

Resource	Description
Security Bulletins & Advisories	Keep abreast of the latest updates which mitigate security issues.
Security Notification Service	Receive alerts about vulnerabilities and updates.
Incident Response Team Blog	Get news and pre-notification of updates about all Adobe products.
Secure Software Eng. Team Blog	Track news and events from Adobe and the security software industry.

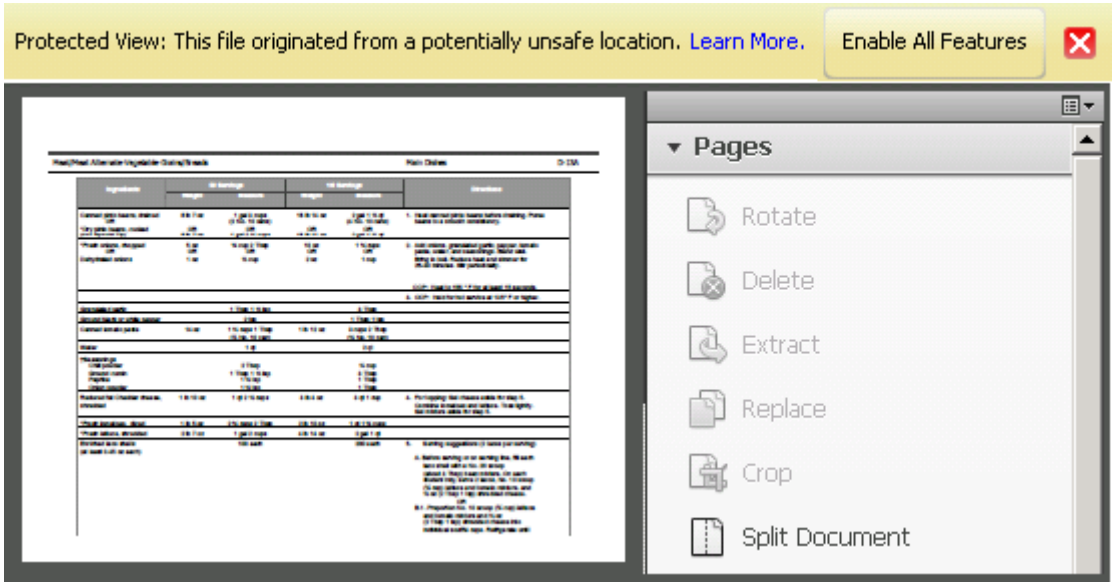
2 Protected View

On Windows, Acrobat 10.1 introduced a sandbox called Protected View (PV). With 11.0, the feature is improved and extended to Reader. PV is a highly secure, read-only mode that blocks most actions and application behavior until the user decides whether or not to trust the document.

> **Note**
>
> In Reader, Protected View is only supported when Protected Mode is enabled. There can by no HKCU or HKLM Protected Mode registry preference set to 0 (off) when Protected View is enabled.

PV is another defense-in-depth feature that is tightly integrated with the existing enhanced security feature. PV in Acrobat leverages the successful sandbox implementation already in place for Adobe Reader while providing a user experience that should be familiar to Microsoft Office 2010 users.

Protected View



2.1 Overview

Under the covers, the PV sandbox is similar to Reader's Protected Mode sandbox, but is built on a stronger model which provides greater protections. Just like Reader, Acrobat strictly confines the execution environment of untrusted programs; that is, any PDF and the processes it invokes. When PV is enabled, Acrobat assumes some or all PDFs are potentially malicious based on user preferences and confines processing to a restricted sandbox.

Due to the rich nature of Acrobat's capabilities, Acrobat's behavior with PV enabled is slightly more complex than Reader's. The Acrobat team has specifically tailored application behavior for two types of scenarios: viewing PDFs with the standalone application and viewing PDFs with a browser. The rationale behind providing two protection experiences was driven by a need to preserve usability as well as the right level of functionality and security in each mode.

2.1.1 PV in a standalone product

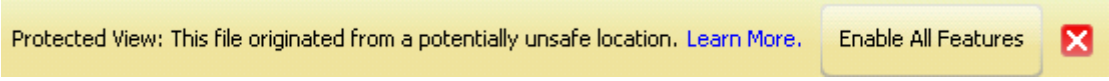
Note

With 11.x, PV behaviors in the standalone product and the browser are identical.

In the standalone application, behavior is simple and parallels the Protected View provided by Office 2010. During a file download and/or save, web browsers and email programs typically mark documents such as Internet files and attachments with a "potentially unsafe" flag. When you open such a document, Acrobat displays a warning bar at the top of the viewing window. In this state, many of Acrobat's features that interact with and change the document are disabled and the associated menu items are greyed out in order to limit user interaction.

The view is essentially read-only, and the disabled features prevent any embedded or tag-along malicious content from tampering with your system. Once you've decided to trust the document, choosing **Enable All Features** exits PV, re-enables all menu items, and provides permanent trust for the file by adding to enhanced security's list of privileged locations (see Integration with enhanced security. The document is now open in a full, unsandboxed Acrobat process.

Protected View: Yellow message bar



2.1.2 PV in a browser

When a PDF is opened in a browser, Protected View provides a streamlined experience that doesn't utilize a warning bar. Instead, browser-based PDFs provide a Reader-like experience for documents that have been "rights enabled." That is, all of Reader's features are available in addition to features that become enabled when a document author uses Acrobat to extend features to Reader users. These features include signing existing form fields, adding new signature fields, saving form data, etc.

In this respect, a PDF in the browser's Protected View is more capable than a PDF in the standalone Protected View. On the other hand, the browser-based capabilities are always limited while the standalone application enables users to achieve full functionality with a single click of a button.

Protected View 10.x: standalone vs browser functionality

Feature	Standalone	Browser
Drag-drop PDFs to the reading or navigation pane	No	Yes
Printing	No	Yes
Advanced Printing	No	No
Saving	No	Yes
Pan and Zoom	No	No
Loupe Tool	No	No
Reading mode	No	Yes
Full screen mode	No	Yes

Protected View 11.x: standalone vs browser functionality

Feature	Standalone	Browser
Drag-drop PDFs to the reading or navigation pane	No	No

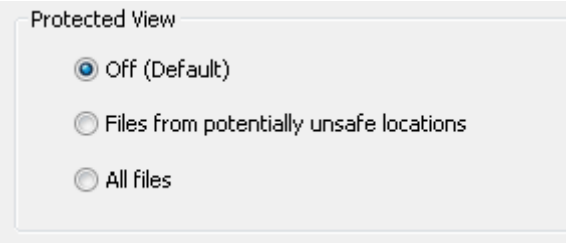
Printing	No	No
Advanced Printing	No	No
Saving	No	No
Pan and Zoom	No	No
Loupe Tool	No	No
Reading mode	No	Yes
Full screen mode	No	No

2.2 Configuration

2.2.1 UI and registry config

Protected View can be enabled, disabled, and configured in other ways to provide the level of security you need. That is, you decide when and how to use Protected View based on your level of trust for the PDFs you interact with.

1. Go to **Preferences > Security (Enhanced)**.
2. In the Protected View panel, select one of the following to set `iProtectedView`:



Registry configuration enables pre and post deployment configuration via the Customization Wizard, scripts, GPO, and other IT-centric methodologies. The application often uses internal keys that aren't visible by default. If the requisite key does not exist, manually create it.

2.2.2 Trust overrides

There are several ways to assign trust so that this feature works in a trusted context:

- Users can trust documents on-the-fly when the PDF opens: When the Yellow Message Bar appears, choose the **Options** button and then trust the document **once** or **always**.
- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a `tID` at:
- Choose **Trust sites from my Win OS security zones**. Trust is assigned when PV is set to Potentially Unsafe locations. When set to All Files, then OS trusted sites does allow PDFs to open outside of PV.

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\<cTrustedSites or TrustedFolders>\]
"(All of the cabs are populated)"
```

2.2.3 Locking Protected View

Protected View can be locked so that the end user cannot change the setting. When locked, the user interface is disabled (greyed out). To do so, simply set the HKLM key as you would HKCU:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown]
"iProtectedView"
```

2.2.4 Enabling logging

Logging is available for users who need to troubleshoot problems where a workflow or plugin does not work when Protected Mode is enabled. The log may provide guidance as to whether a custom policy file should be used to re-enable broken workflows or plugins.

In addition to enabling logging via the UI (above), you can turn on logging and configure a log file location via the registry.

To enable logging, specify a log file location:

1. Go to `HKEY_CURRENT_USER\Software\Adobe\Adobe Acrobat\(version)\Privileged`.
2. Right click and choose **New > REG_SZ Value**.
3. Create `tBrokerLogfilePath`.
4. Right click on `tBrokerLogfilePath` and choose **Modify**.
5. Set the value. For example: `C:\DOCUME~1\<username>\LOCALS~1\Temp\BrL4FBA.tmp`

Policy logging for a policy violation:

```
[08:12/13:46:16] real_path: \BaseNamedObjects\ZonesCacheCounterMutex
[08:12/13:46:16] Consider modifying policy using this policy rule: MUTANT_ALLOW_ANY
[08:12/13:46:16] NtCreateMutant: STATUS_ACCESS_DENIED
[08:12/13:46:16] real_path: \BaseNamedObjects\ZonesLockedCacheCounterMutex
[08:12/13:46:16] Consider modifying policy using this policy rule: MUTANT_ALLOW_ANY
[08:12/13:46:16] NtCreateKey: STATUS_ACCESS_DENIED
[08:12/13:46:16] real path: \REGISTRY\USER\S-1-5-21-762979615-2031575299-929701000-51250\Software\Microsoft\Windows NT\CurrentVersion\Winlogon
[08:12/13:46:16] Consider modifying policy using this policy rule: REG_ALLOW_ANY
[08:12/13:46:16] NtCreateKey: STATUS_ACCESS_DENIED
[08:12/13:46:16] real path: \REGISTRY\USER\S-1-5-21-762979615-2031575299-929701000-51250\Software\Microsoft\Windows NT\CurrentVersion\Winlogon
[08:12/13:46:16] Consider modifying policy using this policy rule: REG_ALLOW_ANY
```

2.2.5 Policy configuration

Protected view prevents a number of actions which IT can bypass by creating a white list of allowed actions. The component that reads these policies is called a "broker." The broker performs actions based on those policies, and when an admin provides a properly configured policy file, the broker can bypass the application's default restrictions.

The broker first reads and applies all custom policies prior to applying the default policies. Since custom policies take precedence, they are useful for fixing broken workflows, supporting third party plug-ins, and cases where an unsupported machine configurations cause the Protected Mode to impair required functionality.

Configurable policies have two requirements:

- They must reside in the Reader install directory adjacent to the AcroRd32.exe in the install folder:

```
D:\Program Files (x86)\Adobe\Acrobat (version)\Acrobat\
```

- The name of the policy file must be `ProtectedModeWhitelistConfig.txt`.

2.2.5.1 Enabling custom policies

To allow the application to read and use a policy file, registry configuration is required. To enable policy files:

1. Go to `HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\Adobe Acrobat\10.0\FeatureLockDown`.

2. Right click and choose **New > DWORD Value**.
3. Create `bUseWhitelistConfigFile`.
4. Right click on `bUseWhitelistConfigFile` and choose **Modify**.
5. Set the value to 1 to enable the white list.

2.2.6 Verifying PV is on

While you can verify whether the application has Protected View enabled by viewing the Enhanced Security panel, it is also possible to verify the document you are currently viewing is subject to Protected View's protections.

> **Note**
>
> When using the standalone application, verification should be obvious since a document that opens in Protected View displays the Yellow Message Bar.

To verify if the browser-based document you are viewing is opened in Protected View:

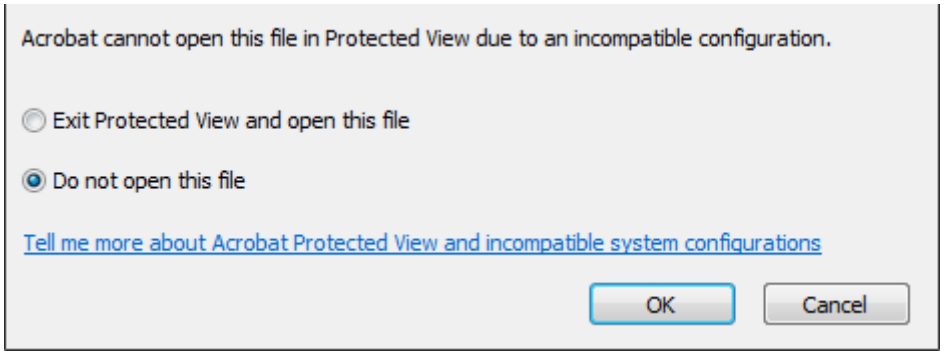
1. Open a PDF in a browser.
2. Right click on the document.
3. Choose **Document Properties > Advanced tab**. When Protected Mode or View is invoked, the status will be **Protected Mode: On**.

2.3 Unsupported configurations

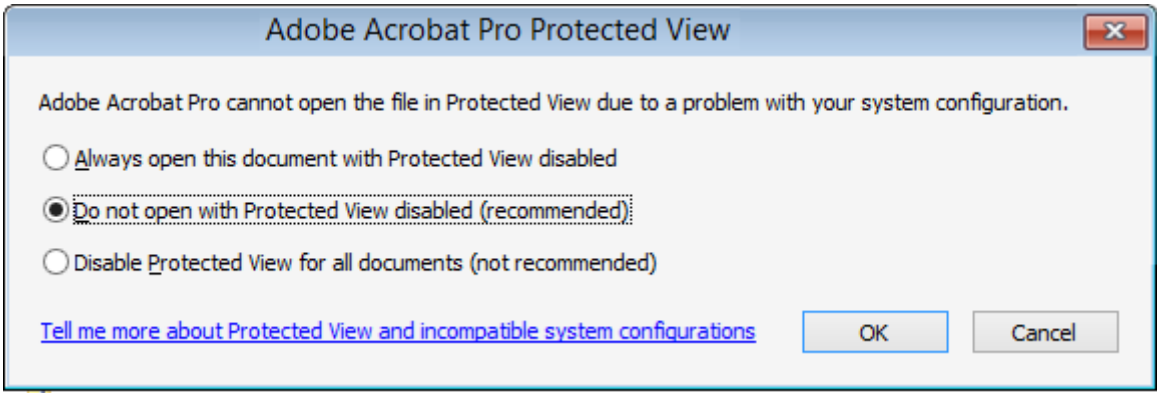
When Protected View cannot launch due to an unsupported configuration, a dialog alerts the user of the incompatibility and provides the user with the option to disable Protected View.

Unsupported configurations for Acrobat running in Protected View change across releases as the product evolves. For example, Protected Mode supports Citrix and Windows Terminal Services deployments with 10.1. For a list of unsupported configurations and workarounds, see http://kb2.adobe.com/cps/860/cpsid_86063.html.

Unsupported configuration dialog for 10.x



Unsupported configuration dialog for 11.x



2.4 FAQs

Design principles

Some of the high-level design criteria for Protected View include the following:

- **PDFs in a browser are more functional than PDFs in a Reader's sandbox**: For PV in a browser, the UI provides access to all of the features provided by Reader as well as the features that are available for any rights enabled document when viewed in Reader.
- **As secure as sandboxed Reader**: Acrobat leverages the same technology and implementation as Reader and is just as secure.
- **Transitioning out of PV should be simple**: In PV, exiting the read-only mode is as simple as choosing **Enable All Features**.
- **Disabled features should not be hidden**: If a feature is not enabled in the sandbox, the UI still displays the disabled feature in the menu as a greyed out item.
- **Trust can be assigned to documents so that they bypass PV restrictions**: Because of its integration with enhanced security, users can specify files, folders, and hosts as privileged locations that are not subject to PV trust restrictions. PDFs originating from a privileged location will not open in PV.

System requirements?

Due to the fundamental differences in OS and product implementations, sandbox designs must be tailored to each environment. The current release includes support for the following:

- Adobe Acrobat 10.1 or later.
- Windows 32 and 64 bit platforms, including XP SP3. Adobe's initial efforts focus on hardening its Windows products because there are more Windows users and Windows applications with proven sandboxing implementations.
- Any supported browser. PDFs opened in a browser run inside Acrobat's sandboxed process. For IE, Acrobat uses IE's trust zone settings.

When should Protected View be enabled or disabled?

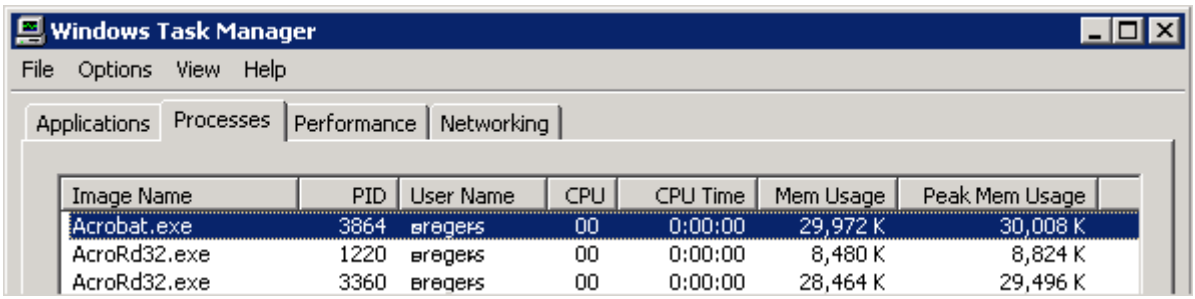
Protected View should be enabled all the time for casual users who interact with PDFs in unsecure environments. There are a limited number of cases where you might want to disable Protected View:

- In enterprise settings where PDF workflows are entirely confined to trusted environments under an administrator's control.
- If you have third-party or custom plugins that cause issues when running in Protected View. For example, some workflows that use ActiveX plugins may not work by default.

How many processes should be running when I use Protected View?

Open the process explorer or task manager. When in Protected View, two AcroRd32.exe processes will be running alongside the Acrobat.exe process. More processes will appear based on how many browser instances you have viewing a PDF, invoked shell extensions, and iFilter.

Protected View: processes



3 Protected Mode

Protected Mode (PM) was introduced with Reader 10.0 on Windows. It transparently protects users against attacks by sandoxing application processes. Protected Mode is one of the most powerful features in Reader's security arsenal. Note that many dot releases have NOT included a Reader update for Windows because the application is not subject to many vulnerabilities when Protected Mode is enabled.

Note

In Reader 11.0, Protected View is only supported when Protected Mode is enabled. There can by no HKCU or HKLM Protected Mode registry preference set to 0 (off) when Protected View is enabled.

3.1 Overview

What is a "sandbox" and Protected Mode?

For application developers, sandboxing is a technique for creating a confined execution environment for running untrusted programs. In the context of Adobe Reader, the "untrusted program" is any PDF and the processes it invokes. When Reader sandboxing is enabled, Reader assumes all PDFs are potentially malicious and confines any processing they invoke to the sandbox.

Sandboxes are typically used when data (such as documents or executable code) arrives from an untrusted source. A sandbox limits, or reduces, the level of access its applications have. For example, creating and executing files and modifying system information such as certain registry settings and other control panel functions may be prohibited.

If a process P runs a child process Q in a sandbox, then Q's privileges would typically be restricted to a subset of P's. For example, if P is running on a system, then P may be able to look at all processes on the system. Q, however, will only be able to look at processes that are in the same sandbox as Q. Barring any vulnerabilities in the sandbox mechanism itself, the scope of potential damage caused by a misbehaving Q is reduced.

The Reader sandbox leverages the operating system's security controls, and processes execute under a "principle of least privileges." Thus, processes that could be subject to an attacker's control run with limited capabilities and must perform actions such as reading and writing through a separate, trusted process. This design has two primary effects:

- All PDF processing such as PDF and image parsing, JavaScript execution, and 3D rendering happens in the sandbox and are subject to its limits; for example, processes cannot access other processes.
- Processes that need to perform some action outside the sandbox boundary must do so through a trusted proxy called a "broker process."

Sandboxing is relatively new for most enterprise applications because it is difficult to implement in mature software (e.g. millions of lines of code) that is already deployed across an almost limitless number of environments. A few recently shipped products that demonstrate the sandboxing proof of concept include Microsoft Office 2007 MOICE, Google Chrome's rendering engine, and Office 2010 Protected View. The challenge is to enable sandboxing while keeping user workflows functional *and* without turning off features on which users depend. The ultimate goal is to proactively provide a high level of protection rather than just fixing bugs and vulnerabilities as they appear.

System requirements

Due to the fundamental differences in OS and product implementations, sandbox designs must be tailored to each environment. The current release includes support for the following:

- Adobe Reader 10.0.
- Windows 32 and 64 bit platforms, including XP. Much like Google's Chrome, Adobe's initial efforts are focused on hardening its Windows products because there are more Windows users and Windows applications with proven sandboxing implementations.
- Any supported browser. PDFs opened in a browser run inside the Reader sandboxed process without any dependency on the browser or the browser's trust zones.

3.2 Changes across releases

Evolution of Protected Mode

Version	Change
10.0	Protected Mode introduced in Reader.
10.x-11.0	Many changes and improvement were made for dot releases as described at http://helpx.adobe.com/acrobat/kb/protected-mode-troubleshooting-reader.html
11.0	See Read policy changes for 11.0

3.3 Configuration

While different users will have different security needs, casual users who interact with PDFs in unsecure environments should enable Protected Mode all the time.

There are a limited number of cases where you might want to disable Protected Mode:

- When you want to use an unsupported feature such as Accessibility on XP.
- In enterprise settings where PDF workflows are entirely confined to trusted environments under an administrator's control.
- If you have third-party or custom plugins that cause issues when running in Protected Mode. For example, some workflows that use ActiveX plugins may not work by default.

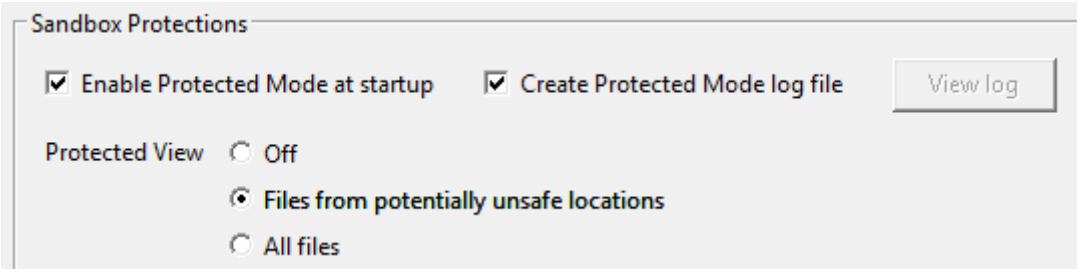
3.3.1 UI and registry config

1. Go to **Edit > Preferences > General**.
2. In the Application Startup panel, check or uncheck **Enable Protected Mode at startup**.
3. When the dialog appears asking if you would like to continue, choose **Yes**. This preference sets:

```
[HKEY_CURRENT_USER\Software\Adobe\Acrobat Reader\10.0\Privileged]
"bProtectedMode"=(0 = off; 1 = on)
```

1. Choose whether or not you would like to have a log file created.
2. Restart the application.

Protected Mode preference



Note

The application uses an internal key. The actual key does not exist by default and so does not appear until the key is manually created.

3.3.2 Trust overrides

None. PM is designed to protect users transparently and without impacting other features.

3.3.3 PM and shell extensions

While Protected Mode can be disabled for PDFs viewed with the product, Adobe continues to protect you when 3rd party software invokes a Reader process; that is, Protected Mode sandboxing cannot be disabled for shell extensions. For example, when you use Windows Explorer to preview a PDF in the Preview Pane, it starts a Reader process to display the preview. In such cases, Task Manager shows that two AcroRd32.exe processes spawn and that the operation is occurring with Protected Mode enabled.

3.3.4 Logging registry config

Logging is available for users who need to troubleshoot problems where a workflow or plugin does not work when Protected Mode is enabled. The log may provide guidance as to whether a custom policy file should be used to re-enable broken workflows or plugins.

In addition to enabling logging via the UI (above), you can turn on logging and configure a log file location via the registry.

To enable logging, specify a log file location:

1. Go to `HKEY_CURRENT_USER\Software\Adobe\Acrobat Reader\10.0\Privileged`.
2. Right click and choose **New > REG_SZ Value**.
3. Create `tBrokerLogfilePath`.
4. Right click on `tBrokerLogfilePath` and choose **Modify**.
5. Set the value. For example: `C:\DOCUME~1\<username>\LOCALS~1\Temp\BrL4FBA.tmp`.

Policy logging for a policy violation:

```
[08:12/13:46:16] real_path: \BaseNamedObjects\ZonesCacheCounterMutex
[08:12/13:46:16] Consider modifying policy using this policy rule: MUTANT_ALLOW_ANY
[08:12/13:46:16] NtCreateMutant: STATUS_ACCESS_DENIED
[08:12/13:46:16] real_path: \BaseNamedObjects\ZonesLockedCacheCounterMutex
[08:12/13:46:16] Consider modifying policy using this policy rule: MUTANT_ALLOW_ANY
[08:12/13:46:16] NtCreateKey: STATUS_ACCESS_DENIED
[08:12/13:46:16] real path: \REGISTRY\USER\S-1-5-21-762979615-2031575299-929701000-51250\Software\Microsoft\Windows NT\CurrentVersion\Winlogon
[08:12/13:46:16] Consider modifying policy using this policy rule: REG_ALLOW_ANY
[08:12/13:46:16] NtCreateKey: STATUS_ACCESS_DENIED
[08:12/13:46:16] real path: \REGISTRY\USER\S-1-5-21-762979615-2031575299-929701000-51250\Software\Microsoft\Windows NT\CurrentVersion\Winlogon
[08:12/13:46:16] Consider modifying policy using this policy rule: REG_ALLOW_ANY
```

3.3.5 Locking Protected Mode

Protected Mode can be locked as enabled or disabled as follows:

1. Go to `HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown`.
2. Right click and choose **New > DWORD Value**.
3. Create bProtectedMode.
4. Right click on the key and choose **Modify**.
5. Set the value as follows:

    - **0**: Disables the feature.
    - **1**: Enables the feature.

3.3.6 Verifying the current mode

There are two ways to verify if the application is running in Protected Mode:

- Open the process explorer or task manager. When protected mode is on, two reader processes run.
- When a file is open, choose **File > Properties > Advanced tab** and view the Protected Mode status. When Protected Mode is enabled, the status will be **Protected mode: On**.

3.3.7 Policy configuration

Protected mode prevents a number of actions which IT can bypass by creating a white list of allowed actions. The component that reads these policies is called a "broker." The broker performs actions based on those policies, and when an admin provides a properly configured policy file, the broker can bypass the application's default restrictions.

The broker first reads and applies all custom policies prior to applying the default policies. Since custom policies take precedence, they are useful for fixing broken workflows, supporting third party plug-ins, and cases where unsupported machine configurations cause the Protected Mode to impair required functionality.

Configurable policies have two requirements:

- They must reside in the Reader install directory adjacent to AcroRd32.exe in the install folder. for example: `D:\Program Files (x86)\Adobe\Reader 10.0\Reader\`
- The name of the policy file must be `ProtectedModeWhitelistConfig.txt`.

3.3.7.1 Enabling custom policies

To allow the application to read and use a policy file, registry configuration is required. To enable policy files:

1. Go to HKEY_LOCAL_MACHINESOFTWAREPoliciesAdobeAcrobat Reader10.0FeatureLockDown.
2. Right click and choose **New > DWORD Value**.
3. Create `bUseWhitelistConfigFile`.
4. Right click on `bUseWhitelistConfigFile` and choose **Modify**.
5. Set the value to 1 to enable the white list.

3.3.7.2 Creating policies

Once you've enabled policies as described in Enabling custom policies, you can write and deploy a policy file. A policy file is a set of policy-rules. There can be one per line, empty lines, or full-line comments that begin with a semi-colon. Each policy rule (one on each line) has the format:

```
POLICY_RULE_TYPE = pattern string
```

Pattern strings denote file names, registry locations, exe paths, etc. These strings support the following:

- *: Matches zero or more characters. Only one in series allowed. For example:
    - FILES_ALLOW_ANY = c:temp
    - REG_ALLOW_ANY = HKEY_CURRENT_USERSoftware(SomeProgram)
    - SECTION_ALLOW_ANY = imejp
- **?**: Matches a single character. One or more in series are allowed.
- **Environment variables**: For example, %SystemRoot% could be used in:

```
PROCESS_ALL_EXEC = %SystemRoot%\system32\calc.exe
```

Adobe-provided policy rules include those shown below.

Protected mode policy rules

Policy rule	Description
FILES_ALLOW_ANY	Allows open or create for any kind of access that the file system supports.
FILES_ALLOW_DIR_ANY	Allows open or create with directory semantics only.
REG_ALLOW_ANY	Allows read and write access to a registry key.
PROCESS_ALL_EXEC	Allows the creation of a process and return fill access on the returned handles.
NAMEDPIPES_ALLOW_ANY	Allows creation of a named pipe.
EVENTS_ALLOW_ANY	Allows the creation of an event with full access.
MUTANT_ALLOW_ANY	Allows creation of a mutant with full access (MUTANT_ALL_ACCESS)
SECTION_ALLOW_ANY	Allows creation/opening of a section with full access
FILES_ALLOW_READONLY (11.0 and later)	Allows read access to a specific path.

Policy configuration file

```
; Files Section
FILES_ALLOW_ANY = c:\temp\*
FILES_ALLOW_ANY=%APPDATA%\Citrix\*
; Processes
PROCESS_ALL_EXEC = %SystemRoot%\system32\calc.exe
; Registry
REG_ALLOW_ANY = HKEY_CURRENT_USER\Software\(SomeProgram)
; Mutants
MUTANT_ALLOW_ANY = *imejp*
; Sections
SECTION_ALLOW_ANY = *imejp*
```

3.4 Read policy changes for 11.0

While Protected Mode in Reader 10.x prevented arbitrary writes to file locations in the user's profile area such as My Documents, Pictures, Downloads folder, %AppData%, etc., it did not prevent the reading of files. In 11.0, Reader's Protected Mode does prevent the sandbox from reading arbitrary files in these

locations. This enhancement makes it harder for malicious PDFs to steal user's confidential information.

3.4.1 Read policy overview

In Reader 11 Protected Mode, the sandboxed AcroRd32.exe process only has read access to those files and folders under the `%USERPROFILE%` for the following:

1. The correct functioning of Adobe Reader itself; for example `%appdata%\Adobe\Acrobat\11.0\*`.

2. PDFs explicitly opened by the user via the File Open dialog or double-clicking.

While `%USERPROFILE%` is protected, the actual implementation is not based on folder names but rather on the ACL (access control entry) of the folders. Any folder or file that grants `Everyone` or `BUILTIN\Users` groups read access is not protected with read-restrictions. Other folders such as the per-user profile folder that don't grant such an access are protected. Note that many user-account protected network shares don't grant access to everyone. So, again, those would be protected.

3.4.2 User experience

There is no UI to turn read-restrictions on or off: this feature is an enhancement to the existing Protected Mode feature and is always enabled as part of it.

Read-warning dialogs

Like Protected Mode generally, the new behavior should be transparent to users except for new confirmation dialogs that may now appear under certain scenarios. A few confirmation dialogs are necessary for workflows that required Reader in Protected Mode to read arbitrary files. These files include files that were neither explicitly opened by the user nor required by Reader to store its preferences and so weren't white-listed for access. In such cases, the broker is forced to check with the user before granting the Protected Mode sandbox read access to those files. As the feature evolves in the course of A11 development, it is expected that users will rarely encounter situations where they will see these dialogs.

A confirmation dialog is shown for the following cases:

- When the user clicks a link in a PDF that points to another PDF on the user's disk ("interdoc PDF link"). Note that this is not applicable for internet links (where a different dialog is already shown), but only to links to PDFs on the local disk.
- When the PDF has a multimedia annotation references a media file kept at a read-restricted location on the user's disk or a network share.
- When a PDF tries to access data from an FDF file kept at a read-restricted location on the user's disk or a network share.
- When an FDF or XFDF is opened and it tries to reference a PDF file kept at a read-restricted location on the user's disk or a network share.
- When the user tries to open a review from the review tracker.

Note that these are restricted to access to the user's disk or network share, not an HTTP(S) URL. So these dialogs almost never appear in the browser. For example, in a browser situation, an FDF or PDF in cases 3 or 4 above will be on a HTTP(S) server, and so will not be impacted. Also, most "interdoc PDF links" in the web will be to PDF on the web, not the user's machine or network share.

Search-warning dialogs

Finally, it is impossible to securely support the index search and Reader's desktop search features via **Edit > Advanced Search > Show more options with read-restrictions enabled**. So if the user tries to use any of the following features, a warning is thrown: "The operation you are trying to perform potentially requires read access to your drives. Do you want to allow this operation?".

If the user allows the operation, read-restrictions are temporarily disabled while that Reader process is running. In this case, Protected Mode is ON, but it will temporarily grant the sandbox read access to all of

the user's files. Once the user restarts the Reader process, Protected Mode read-restrictions will again be in place. The idea is that rather than having the user turn Protected Mode completely off to use these index-search or desktop-search features, it is better to turn off just read-restrictions temporarily.

The dialog appears in the following scenarios:

1. When the user tries to open an index (PDX) file.
2. When the user tries to search inside an already selected or shelved index, inside a folder, or in an index linked to a PDF.

3.4.3 Policy rules

The new read policy includes the new FILES_ALLOW_READONLY rule that works just like the FILES_ALLOW_ANY rule, but grants read-only access to a specific path. Admins can use the FILES_ALLOW_READONLY rule of the config policy to grant read-only access to certain areas of the user's disk.

3.5 Unsupported configurations

For complete details, see http://helpx.adobe.com/acrobat/kb/protected-mode-troubleshooting-reader.html.

Limitations with Protected Mode enabled include the following:

- 3rd party plugins may require modification.
- XP only: Accessibility features may or may not work. For example, some assistive technologies may not be able read document content while in Protected Mode.
- Citrix and WTS environments are supported with 10.1 and later.
- Protected Mode and Protected View are not supported until 10.1 and later.

Note

When a screen reader like JAWS or Window-Eyes is already running when Reader is started for the first time on XP systems, a warning is shown instructing the user to turn Protected Mode off manually. On Vista and Windows 7, screen readers do work normally.

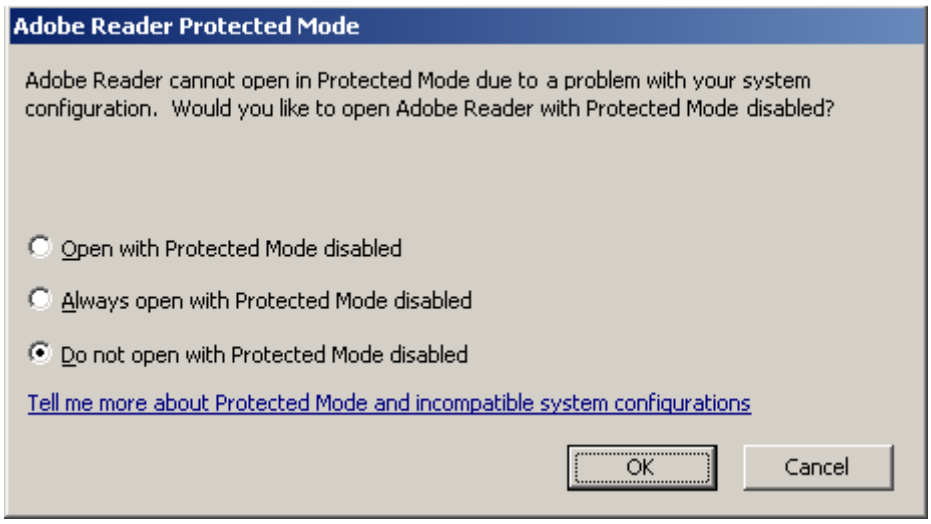
When Protected Mode cannot launch due to an unsupported configuration, Reader displays a dialog alerting the user of the incompatibility and provides the user with the option to disable Protected Mode.

Note

"Adobe Reader cannot open in Protected Mode due to a problem with your system configuration. Would you like to open Adobe Reader with Protected Mode disabled?"

Unsupported configurations for Reader running in Protected Mode change across releases as the product evolves. For example, Protected Mode supports Citrix and Windows Terminal Services deployments with 10.1.

Protected Mode: Unsupported configuration dialog



3.6 FAQs

Does Adobe have plans for Protected Mode in Acrobat?

Yes. With the release of 10.1, Acrobat's Protected View is a sandbox mode similar to the Protected View feature in Microsoft Office 2010.

Is there a reason why Acrobat X is not sandboxed vs. Reader X?

In order to reduce our attack surface, and most effectively thwart malicious activity, we always follow the common security strategy of protecting the greatest number of end-users as expediently as possible.

Is Reader X on Mac OSX less vulnerable?

While Protected Mode is not available for Macintosh, Adobe has not seen any targeted attacks against Unix and Mac Reader so far.

Is Adobe Reader X sandboxed on Unix and Mac?

While sandboxing technologies do exist on the Unix and Mac platforms, we have not seen targeted attacks against Unix and Mac Reader so far and therefore it's not a priority at this point in time.

What configuration are not supported?

For a current list of issues, see http://helpx.adobe.com/acrobat/kb/protected-mode-troubleshooting-reader.html.

Does the fact that Protected Mode invoke two Reader processes affect updating and patching?

No. The patching mechanism will remain the same as before. Broker and sandboxed processes do not get patched separately.

Is the Reader Sandbox similar to the low integrity Protected Mode of Internet Explorer?

No. Despite the name similarities, Reader's Protected Mode the sandbox we have implemented is a more effective at mitigating threats in applications on desktop windows than just running a process at low integrity. While our sandbox indeed runs at at low integrity, it is a much more constrained computing environment.

Is Remote Desktop Services supported?

Yes. Remote Desktop Services (formerly known as Terminal Services) is supported.

What is the difference between Microsoft's Application Virtualization Sandbox technology and Reader X's Protected Mode?

Sandboxing leverages the Operating System's security model to sandbox an application. Virtualization uses another software program to segregate the application from the host operating system. With virtualization the end users have to deal with the overhead of managing and patching the OS and the application separately and there is also the performance impact of rendering the application in a virtualized environment. For more information please refer to our technical blog posts.

What is the difference between Protected Mode in Microsoft IE browser and Reader X Protected Mode?

The sandbox we have implemented is more effective at mitigating threats in applications on desktop windows than just running a process at low integrity. While our sandbox runs at a low integrity, it is a much more constrained computing environment. For more information please refer to our technical blog posts.

What effect does Protected Mode have on a PDF viewed in Citrix?

Citrix is not supported. When Protected Mode cannot launch due to an unsupported configuration, Reader displays a dialog alerting the user of the incompatibility and provides the user with the option to disable Protected Mode.

What is the percentage increase in memory footprint because of Protected Mode?

Very little.

Will Protected Mode have any effect on viewing LC Reader-Extended PDFs?

It should work fine out of the box.

Is there any special status for certified documents so that one can disable Protected Mode only with certified documents?

No.

Can the security policies for the broker be configured through Customization Wizard or downloaded from a server?

No. Custom policies should be tailored to meet your business requirements and deployed by an administrator.

Are there any unforeseen major issues with the rich PDF types containing content e.g. interactive multimedia, geo, and 3D with Reader X?

Not many. The feature is designed to be transparent.

Do plug-ins have read and write permissions to things like config files that maybe stored on the user's system?

Plug-ins will not be able to write log files to non-whitelisted locations. They can continue to write logs to the Temp directory (as returned by GetTempPath() Windows API or equivalent Acrobat API). Another white-listed location is Adobe Reader's own appdata area.

Does the Protected Mode impair a PDF's ability to access trusted web sites?

No.

Can I still save Acrobat forms on my own computer?

Yes. There is no change in behavior.

Is Protected Mode the reason why Reader X runs with two AcroRd32.exe processes?

Yes. One of the processes is the sandboxed process and the other one is the broker.

If multiple PDFs are open (either standalone or within the browser), is the number of spawned processes the same?

Yes. There will only be two processes. However, if PDFs are open in both the browser and standalone application, one process pair will be used for each.

Can my plug-in create and update a preference file in the 'C:Documents and SettingsloggedinuserApplication DataAdobeAcrobat10.0Preferences' folder?

Yes, Reader X allows writing to these type of locations.

Will plug-ins that access web services via an URL work?

Yes, it should work.

Will Protected Mode affect the functioning of URLs in a PDF?

No.

Will the broker allow an embedded Flash Player 10.1 instance to access hardware features such as GPU acceleration and a system.capabilities object?

Yes.

Will the broker in Reader X be initially setup with default locations approved for writing? Will plug-in developers be able to add "safe" locations to the broker's list?

Plugins could leverage the broker white-list config file to extend the file/registry locations writable by the sandbox.

Do shell extensions work in Reader X?

Shell extensions run inside a sandbox when Reader is the default owner of PDFs. The shell extensions we support include Thumbnails, Properties, Preview, and they all operate as they did in 9.x, except that they will run sandboxed.

The iFilter shell extension has a limitation with Microsoft Desktop Search and is not installed with Reader X.

Does the Reader X need to go through the broker if we are saving a Reader extended document? Yes.

Are the policies in the broker process configurable by the users?

Custom policies can be setup by the administrator or plugin-installers.

Is PM a pure whitelisting mechanism to allow/deny access to the OS, or is it a mix of blacklisting and whitelisting policies working together in the broker?

Both.

If Reader X needs to make OS calls through the broker, is there additional overhead (such as more threads) which has a performance impact?

Performance of Reader X is comparable to Reader 9. There are no additional threads.

What is the user experience like for screen readers invoked via viewing a PDF in the browser?

Most accessibility features work. In some cases they do not work on XP. For a list of known issues, see http://kb2.adobe.com/cps/860/cpsid_86063.html.

Why do we see 2 Reader processes in the Task Manager with the same name?

The Reader X application now has 2 processes: one for the target (sandbox) and the broker.

What if I inadvertently kill one of the processes?

Killing any of the processes brings down the entire Reader X application.

When custom policies fail for certain workflows, what are the options other than disabling Protected Mode?

One option is to add custom policies to bypass protected mode restrictions.

Can plug-in developers write their own broker?

No, we do not currently provide the option for developers to write their own brokers, but we may do so for future releases.

Do the Broker and the Sandbox processes share both the WindowStation and the Desktop?

Yes.

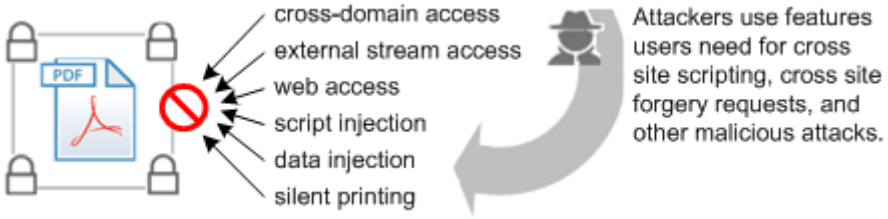
4 Enhanced Security

Introduced in version 9.0-8.17 and enabled by default for the 9.3 and 8.2 updates, enhanced security "hardens" your application against risky actions by doing the following for any document not specifically trusted:

- Prevents cross domain access. It forces requests for new content to adhere to a "same-origin" policy and blocks web attacks such as cross site scripting and cross site request forgeries.
- Prohibits script and data injection via an FDF, XFDF, and XDP NOT returned as the result of a post from the PDF.
- Blocks stream access to XObjects such as external images.
- Stops silent printing to a file or hardware printer.

The feature is designed to let you decide what content to trust and help you selectively bypass those restrictions for trusted files, folders, and hosts. These trusted domains--called privileged locations--are exempt from enhanced security rules. There are several other methods for establishing trust, and just as you tune your browser, so should you tune your application so that it operates at a risk level appropriate for your environment.

Enhanced security: effect on workflows



4.1 Feature interaction

This feature interacts with other features that also assign trust. When content is trusted as a result of a cross domain policy file, for example, that content is not subject to enhanced security restrictions. It is important to understand the various ways that trust can be assigned prior to configuring applications and setting up workflows. Workflows should be designed for compatibility with enhanced security enabled, so keep in mind that the following features interact with enhanced security:

- **Internet access permissions**: While enhanced security prevents access to different origin locations that try to return data, scripts, or content to the calling PDF, internet access can be set on a per site basis via the Trust Manager. Trust Manager settings may or may not override enhanced security settings depending on your application version and particular workflow.
- **Import and export of FDF, XFDF (form), and XDP data**: Data file behavior is fundamentally altered when this feature is on.
- **Certified document workflows**: Access to a certified document may or may not be allowed depending on whether:
    - The signing certificate's fingerprint is in a cross domain policy file, or
    - The signing certificate is trusted or chains up to a trust anchor that is trusted for privileged networked operations.

4.2 Changes across releases

Changes across releases: Enhanced security

Version	Change
9.0	Enhanced security introduced.
9.1	Support added for bypassing enhanced security restrictions by assigning trust to certified documents when the SHA1 hash of the public key is specified in a cross domain policy file. Certificates can be trusted for privileged networked operations such as cross domain access.
8.1.7 & 9.2	Enhanced security added for 8.1.7.
8.2 & 9.3	• Enhanced security turned on by default. • Enhanced security settings may take precedence of Trust Manager internet access settings. • A non-intrusive Yellow Message Bar (YMB) that doesn't block workflows replaces many of the modal dialogs. Depending on how the client is configured, the YMB appears at the top of the document and offers the user to trust the document "once" or "always." The YMB does not appear for silent printing or xobject access. • Cross domain logging can be enabled and the log viewed via the user interface. • Cross domain policy files support all the mime types specified in the Cross Domain Policy File Specification.

4.3 Configuration

The following preference rules apply irrespective of the user's platform:

- Windows, Macintosh, and UNIX platforms use similarly named keys.
- When configuring paths, use your product (Adobe Acrobat or Acrobat Reader) and version (9.0 or 8.0).
- For 8.x, only one key (`bEnhancedSecurityStandalone`) controls behavior for both standalone and browser modes.
- Preferences are usually boolean. True (1) enables the feature. False (0) disables the feature.
- Both `cTrustedFolders` and `bDisableTrustedFolders` control the behavior for folders AND files.
- Preferences may or may not be visible in the registry by default when the value has been set by the application. It is often the case that the UI must be exercised to actually write the value to the preference file or registry. When configuring preferences, it is usually expedient to toggle all the values and restart the application. Doing so writes the values to the registry and lets you change the preference setting without needing to create the key from scratch.

4.3.1 UI and registry config

To enable enhanced security, do the following:

1. Choose **Edit > Preferences** (Windows) or **<application name> > Preferences** (Macintosh).
2. Select **Security (Enhanced)** in the Categories panel.
3. Check the **Enable Enhanced Security** checkbox.
4. **Windows only**: If your workflows involve cross domain access enabled by accessing a server-based cross domain policy file, check **Create log file**. This step is typically only need when troubleshooting. Logging is not available on Macintosh.

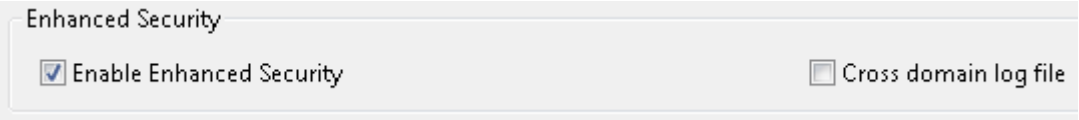
The UI sets the following

```
[HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager]
"bEnhancedSecurityStandalone"=dword:00000001
"bEnhancedSecurityInBrowser"=dword:00000001
```

Note

When viewing a PDF in a browser, users do not have direct access to the application's Preferences panel. To configure enhanced security while browsing on the fly, right click on the PDF displayed in the browser and choose **Page Display Preferences**. For versions 9.x and 8.2 and later, enhanced security settings are managed separately for the application running as a standalone application versus in a browser.

Enhanced security panel: Windows



4.3.2 Locking enhanced security

Enhanced security can be locked as enabled or disabled. To do so:

1. Go to `HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown`.
2. Right click and choose **New > DWORD Value**.
3. Create `bEnhancedSecurityStandalone` and/or `bEnhancedSecurityInBrowser`.
4. Right click on the key and choose **Modify**.
5. Set the value as follows:

   - **0**: Disables enhanced security and locks the feature.
   - **1**: Enables enhanced security and locks the feature.

Registry Configuration: Enhanced security locked as enabled

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown]
"bEnhancedSecurityStandalone"=dword:00000001
"bEnhancedSecurityInBrowser"=dword:00000001
```

4.3.3 Macintosh configuration

Enhanced security preferences cannot be locked on Macintosh systems.

Before continuing, install some plist editor such as PlistEdit Pro. Change the root path to reflect the product (Acrobat or Reader) and version number (9.0 or 8.0) you are using.

To configure the settings:

1. Navigate to the .plist file:

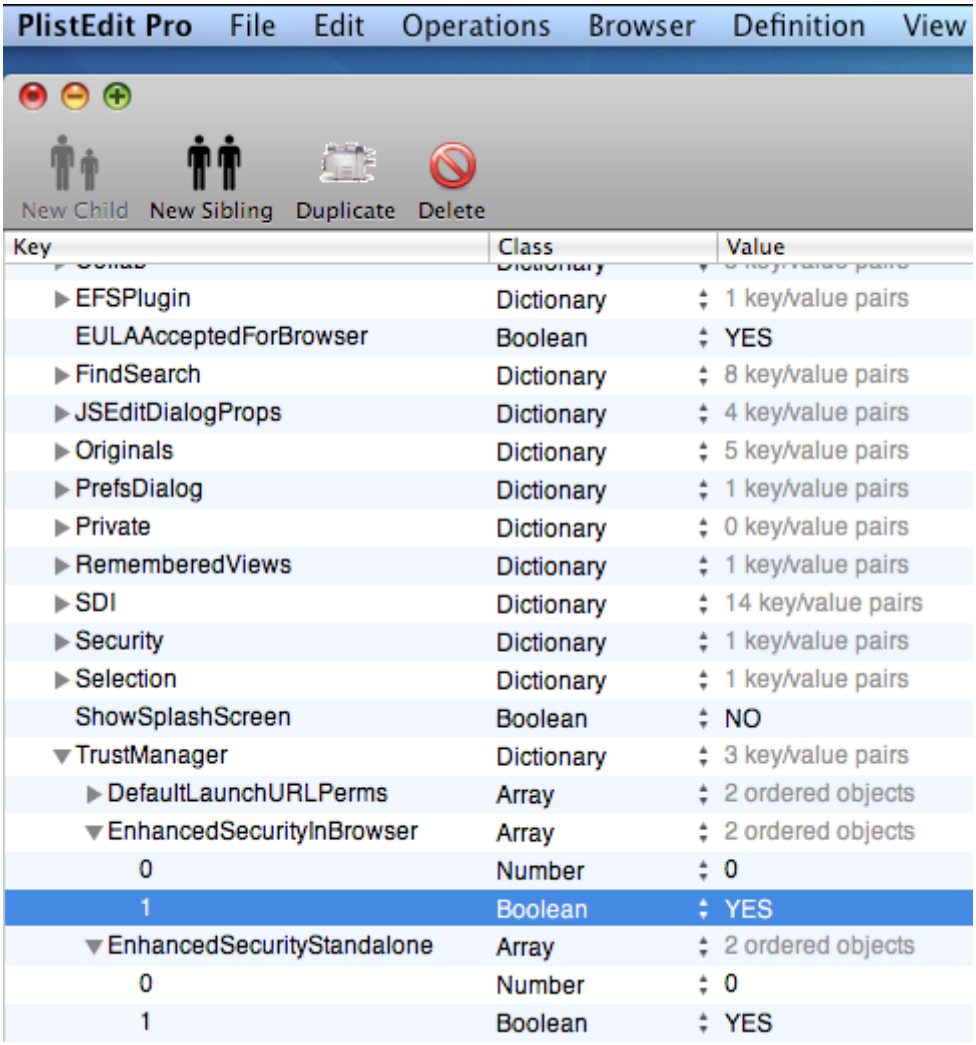
- Mactel: UserLibraryPreferencescom.adobe.Acrobat.Pro_x86_9.0.plist
- Mactel: UserLibraryPreferencescom.adobe.Acrobat.Pro_x86_8.0.plist
- PowerPC machine: UserLibraryPreferencescom.adobe.Acrobat.Pro_ppc_8.0.plist
- PowerPC machine: UserLibraryPreferencescom.adobe.Acrobat.Pro_ppc_9.0.plist
- PowerPC machine: UserLibraryPreferencescom.adobe.Reader_ppc_8.0.plist
- PowerPC machine: UserLibraryPreferencescom.adobe.Reader_ppc_9.0.plist

2. Go to **TrustManager**.
3. Set `EnhancedSecurityInBrowser` (Boolean YES/NO).
4. Set `EnhancedSecurityStandalone` (Boolean YES/NO).
5. Exit the editor.

Note

Do not configure Number. For 8.x, only one key (`bEnhancedSecurityStandalone`) controls behavior for both standalone and browser modes. Do not set `EnhancedSecurityInBrowser`.

Preferences: Enhanced security settings for UNIX



4.3.4 UNIX configuration

Enhanced security preferences cannot be locked on UNIX systems.

To configure the settings:

1. Navigate to the .preferences file. For example:

    - ~/.adobe/Acrobat/9.0/Preferences/reader_prefs
    - ~/.adobe/Acrobat/8.0/Preferences/reader_prefs

2. Navigate to /TrustManager.
3. Add and set the keys in the file.
4. Save and exit.

> **Note**
>
> For 8.x, only one key (`bEnhancedSecurityStandalone`) controls behavior for both standalone and browser modes. Do not set `bEnhancedSecurityInBrowser`.

Preferences: Enhanced security settings for UNIX

```
/TrustManager
  [/c <<
    /EnhancedSecurityInBrowser [/b false]
    /EnhancedSecurityStandalone [/b false]
  >>]
```

4.4 Trust overrides

There are several ways to assign trust so that this feature works in a trusted context:

- Specifying trusted URLs via Trust Manager
- Trusting certificates for privileged network operations
- Server side management of cross domain access
- Users can trust documents on-the-fly when the PDF opens: When the Yellow Message Bar appears, choose the **Options** button and then trust the document **once** or **always**.
- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a tID under each cab/dict at:

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cCrossdomain]
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cDataInjection]
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cExternalStream]
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cScriptInjection]
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cSilentPrint]
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cWeblink]
```

4.4.1 Privileged locations

The most common way to assign trust to files, folders, and hosts is via *privileged locations*.

4.4.2 Internet Access

There are two ways to control internet access:

- The Trust Manager's Internet Access settings allow you to *trust* individual web-based files, directories, and specific hosts (wildcards are supported).
- *8.1 Internet access* settings in the Trust Manager support both global and granular trust of all or specific URLs.

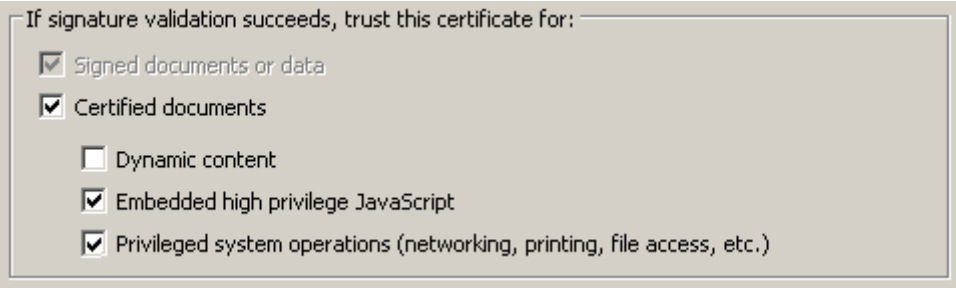
4.4.3 Certificate trust

When enhanced security is on, a certified document can bypass its restrictions if the following conditions are true:

- The document is certified; that is, the first signature in the document is a certification signature.
- The certification signature is valid.
- The document recipient has specifically trusted the signer's certificate for privileged network operations.

Configure certificate trust as described in *9.4 Per-certificate trust*.

Setting certificate trust



4.4.4 xdomain policy files

Enhanced security's cross domain restrictions can also be bypassed and managed at the server.

Managing cross domain access at the server

Clients have the capability of automatically detecting and using crossdomain.xml policy files to access content from a different origin. Administrators can configure the policy file as needed so that clients can access trusted content. For more information, see the Cross Domain Policy File Specification.

Enabling cross domain access for specific PDFs

For a PDF that comes from a server, the server has a domain and hence the PDF has a domain; however, a stand-alone PDF residing on a user's machine has no domain. When such a PDF accesses a server, Acrobat's default behavior is to consider that communication as cross domain.

To allow a "domain-less," local PDF to access a server, it must be signed either with a certification signature or a "reader enabled" signature (the hidden signature applied during Reader enablement) and registered in a cross domain policy file. Again, the signature can be one of two types:

- **A certification signature in a certified document**: Best for certified document workflows and when high privileged JavaScript should be permitted.
- **A Reader enabled signature applied by a LiveCycle ES server**: PDFs that are granted additional usage rights are signed by the server. Using this fingerprint allows customers with many Reader extended documents to continue accessing the server after enhanced security is enabled without having to change their forms.

The fingerprint for the certificate that was used for the signing is registered in the cross domain file on the server. In effect, the cross domain file on the server is saying "files signed with this certificate may access this server." To register the fingerprint, an administrator extracts the SHA-1 hash of the public key from the signing certificate and places it in the cross domain policy file.

4.5 User experience

The user experience with enhanced security enabled and there is untrusted content in the workflow is significantly different than when enhanced security is disabled. The feature is specifically designed so that users and admins can preconfigure trust or assign it on the fly so that workflows remain operational even with the extra security and restrictions that enhanced security provides.

4.5.1 FDF, XFDF, and XDP

XFDF, FDF, and XDP files are data files which simplify moving form, certificate, server, and other data from one machine to another. This data transfer usually involves some mechanism such as data injection into a PDF form field, installing files, executing a script, and so on. Because these actions represent a potential security risk, enhanced security restricts this functionality unless the data containing file has been assigned trust in some way. Trust assignment can occur via privileged locations, a trusted certificate, or by cross domain policy files. Rules for opening a PDF via FDF lists the high level rules defining the behavior.

Note

If you distribute forms that request data from a server, the user may find that filled form fields become blank after being asked to trust a document from the Yellow Message Bar. If you find that your workflow is impaired, Adobe recommends that you leave enhanced security enabled and assign trust as needed via one of the available methods prior to sending such a form.

Exceptions

XFDF and XDP files use the same rules as FDF with the following exceptions:

- XFDF does not support script injection.
- XDP is only affected by these rules if the PDF is externally referenced (not embedded).

Rules for opening a PDF via FDF

Action	Data file location	PDF location	8.x behavior	9.x behavior
Opening a target PDF	local	local	PDF opens. No authentication required.	No change.
Opening a target PDF	local	server	PDF opens	Allow via dialog or enable enhanced security and set privileged location.
Opening a target PDF	server	server	PDF opens. No authentication required.	No change.
Opening a target PDF	https server	local	Blocked	Http hosted FDFs cannot open local files.
Data injection	n/a	n/a	Allowed	Allowed if: * Data retuned via a form submit with url#FDF. * FDF has no /F or /UF key. * cross-domain policy permits it.
Data injection	server	browser	Allowed	Allowed if: * Link to PDF contains #FDF=url. * FDF has no /F or UF key. * cross domain policy permits it.
Data injection	server	Acrobat/Reader	Allowed	Allowed if: * PDF makes EFS POST/GET and FDF sends data in https response to same PDF. * cross domain policy permits it.
Data injection	Varied	Varied	Allowed	Allow via dialog or enable enhanced security and set privileged location.
Script injection	Any	Any	Allowed	Blocked if enhanced security is on and FDF is not in a privileged location.

FDF restriction examples

The following are examples of disallowed actions when enhanced security is on:

- If the PDF opens in the browser, and the URL to the PDF contains a #FDF=url, then the FDF data specified by that url may be injected into the open PDF if the FDF has no /F key and if the PDF may receive data from the FDF based on the cross domain policy.
- If the PDF opens in the Acrobat/Reader standalone application and the FDF data comes back in the https response to a POST/GET initiated by the PDF, then the FDF data may be injected into the open PDF if the PDF specified in the FDF is the PDF that made the POST/GET and if the PDF may receive data from the FDF based on the cross domain policy (i.e. * in crossdomain.xml).

FDF permissions examples

The following are examples of scenarios where FDF data injection does need a user-authorization dialog when enhanced security is on:

- You submit data from a PDF in the browser and the URL has #FDF at the end. The returned FDF has an /F key pointing to a different PDF which needs to get loaded (everything is happening in the browser). The FDF data gets injected into the second PDF.
- Same as above, except it all happens in Acrobat rather than in the browser. In this case, the #FDF at the end of the URL is not needed.
- The "spontaneous FDF" case: In the browser, an unsolicited FDF arrives (via a link from an HTML page before, and Acrobat is not running yet), and the FDF has an /F key for a PDF that it needs to open and populate.
- Opening a link of the form `http://A.com/file.pdf#FDF=http://B.com/getFDF`.

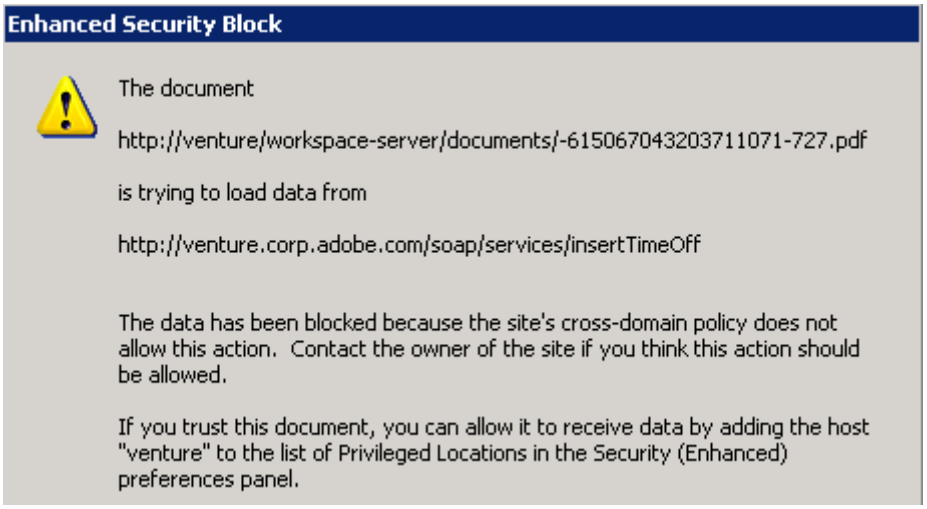
4.5.2 Dialogs and warnings

Beginning with the 9.3 and 8.2 updates, a non-intrusive Yellow Message Bar (YMB) that doesn't block workflows replaces many of the modal dialogs. Depending on how the client is configured, the YMB appears at the top of the document and offers the user to trust the document "once" or "always."

4.5.2.1 9.2, 8.1.7, and earlier

Pre 9.3 and 8.2, the application displayed modal dialogs whenever a risky behavior was invoked. The user had to click through the dialog to continue.

Enhanced Security: Data access dialog (pre 9.3 and 8.2)



4.5.2.2 9.3, 8.2, and later

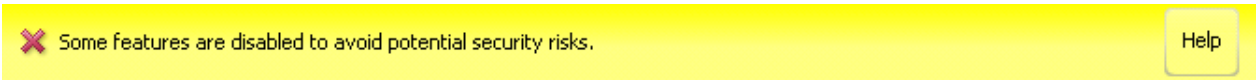
With 9.3 and 8.2, many warning messages were moved to an unobtrusive Yellow Message Bar at the top of the document. If the administrator has not disabled the feature, users can choose to trust a document

once or always for the particular action. A choice of "always" adds the document or host to the privileged locations list. The message and the options button choices varies depending on the type of blocked content.

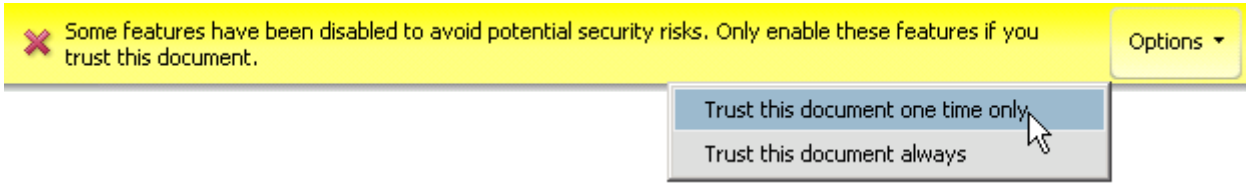
Note

Workflows where end users or administrators assign trust to files, folders, and hosts avoid the appearance of the YMB and most other modal dialogs.

Yellow Message Bar: Cross domain access



Yellow Message Bar: JavaScript injection



4.6 Examples

4.6.1 Default settings: 10.0+

The default settings are similar to 9.3.4. See Changes across releases.

4.6.2 Default settings: 9.3/8.2

The default settings for 9.3 and 8.2 are as follows:

- Enhanced security is enabled.
- Privileged locations are enabled. The locations list is empty.

End users have the option to disable the feature or to leave it enabled and add privileged locations for trusted files, folders, and hosts. Adobe recommends that enhanced security is enabled and care exercised when assigning trust.

Administrators can of course configure all the options as well as lock down the user interface so that users can't change the settings. In many enterprise settings, admins will enable enhanced security, preconfigure trust, and lock all settings. See the examples below.

Default enhanced security settings (Windows 9.3 and 8.2)

```
[HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager]
"bTrustOSTrustedSites"=dword:00000001
"bEnhancedSecurityStandalone"=dword:00000001
"bEnhancedSecurityInBrowser"=dword:00000001
```

4.6.3 Most restrictive settings

The following examples show the most restrictive settings with the features locked. This results in the following:

- All enhanced security protections will be in place.
- Only administrators can configure privileged locations.
- End users cannot change any of the settings.
- Documents and workflows that are subject to these protections will need to have trust assigned by some mechanism that the security model recognizes as a trustworthy way to bypass these restrictions. Possibilities include those listed in Bypassing enhanced security restrictions.

Note

10.x products use the same settings.

Most restrictive enhanced security settings: 9.x and 10.x

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<Adobe Acrobat OR Acrobat Reader><9.0 or 10.0>\FeatureLockDown]
"bEnhancedSecurityStandalone"=dword:00000001
"bEnhancedSecurityInBrowser"=dword:00000001
"bDisableTrustedFolders"=dword:00000001
"bDisableTrustedSites"=dword:00000001
"bDisableOSTrustedSites"=dword:00000001
```

4.6.4 Least restrictive settings

"Secure by default" is Adobe's recommended best practice. However, you can disable all the features if you are already operating within a secured environment. The following examples show the least restrictive settings with the features not locked.

Note

10.x products use the same settings.

Least restrictive enhanced security settings: 9.x and 10.x

```
[HKEY_CURRENT_USER\Software\Adobe\(Adobe Acrobat or Acrobat Reader)\(9.0 or 10.0)\TrustManager]
"bEnhancedSecurityStandalone"=dword:00000000
"bEnhancedSecurityInBrowser"=dword:00000000
"bTrustOSTrustedSites"=dword:00000001
```

4.7 Troubleshooting and FAQs

See Enhanced Security FAQ.

5 JavaScript Controls

JavaScript support is one of Acrobat's and Adobe Reader's most powerful features, and Adobe provides several controls that enable tuning application behavior so that JavaScript (JS) executes within your desired level of security where unrestricted access to JS APIs is undesirable or workflows do not leverage this feature at all.

5.1 Permissions basics

There are a number of JavaScript controls that allow you to balance needed features with the level of security needed for your workflows. At a high level, these options include:

- **Restrict JavaScript**: Turn off JavaScript altogether or restrict JS by API.
- **Trust JavaScript**: Allow JavaScript globally, by API, or by trusting specific document for it.

Configuration is possible either through the user interface, the registry, or both as follows:

- **User interface**:
    - Application trust can be set by choosing **Preferences > JavaScript**.
    - Document trust can be assigned in some workflows via the Yellow Message Bar's **Options** button.
    - High privileged API trust can be assigned via certificate trust in certified document workflows.
- **Registry-level preferences (and plist)**: As described in subsequent sections, many settings are available to administrators.

JS Workflow: Simple view

Restricting JavaScript	How?	Trusting JavaScript	How?
Disable JavaScript	Registry or UI	Enable JS; allow once or always	Registry or UI
Blacklist specific APIs	Registry	Allow blacklisted APIs for trusted locations	Registry
Use high privileged JS	In the document	Allow high privileged APIs for trusted locations	Registry or certificate trust

5.2 Workflow diagrams

For a visual overview, see the JavaScript Quick Key

5.3 Changes across releases

Evolution of JavaScript execution

Version	Change

8.1.7 & 9.2	• JavaScript blacklist introduced thereby allowing selective blocking of vulnerable APIs. Default lists are null. • A non-intrusive Yellow Message Bar (YMB) that doesn't block workflows replaces many of the modal dialogs. Depending on how the client is configured, the YMB appears at the top of the document and offers the user to trust the document "once" or "always." • `cAlwaysTrustedForJavaScript` can override the global JS off preference for specifically trusted documents. • cJavaScript can override the high privileged JS restrictions for specifically trusted documents.
8.2 & 9.3	None.
9.3.4	`cJavaScriptURL` is introduced as part of enhanced security. An untrusted document that tries to invoke an URL via JS displays the YMB.
10.1.1	• Changes to the global variable and user JavaScripts features are made more secure. These changes require action by IT as described in Migrating to 10.1.1+. • JavaScript Blacklist Framework Tool is introduced which provides IT with a GUI for managing JS APIs.
11.0	`bEnableCertificateBasedTrust` provides a way to make certified documents trusted as a privileged location.

5.4 Disabling JavaScript

Global JS configuration may occur via the user interface or the registry/plist.

1. Go to **Preferences > JavaScript** (The exact path varies by product and platform).
2. In the JavaScript panel, uncheck **Enable Acrobat JavaScript**. This preference sets:

```
[HKCU\Software\Adobe\<product name>\<version>\JSPrefs]
"bEnableJS"=dword:00000000
```

Note

If JS is disabled, the user experience when a document tries to execute JavaScript varies by product version.

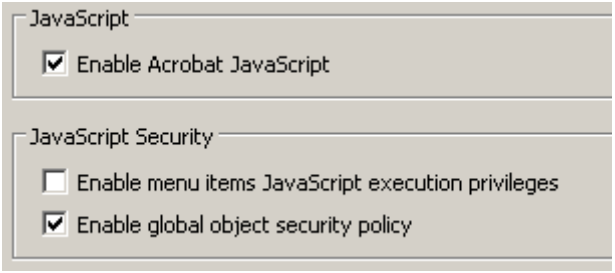
5.4.1 Trusted override

There are several ways to assign trust so that this feature works in a trusted context:

- Users can trust documents on-the-fly when the PDF opens: When the Yellow Message Bar appears, choose the **Options** button and then trust the document **once** or **always**.
- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a tID at:

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cAlwaysTrustedForJavaScript]
"t8"="C:\\someTrustedPDF"
```

JS Workflow: Enabling-disabling JS



5.5 Blacklisting JS APIs

The Acrobat JavaScript Blacklist Framework introduced in versions 9.2 and 8.1.7 provides granular control over the execution of specific JavaScript APIs. This mechanism allows selective blocking of vulnerable APIs so that you do not have to resort to disabling JavaScript altogether. The blacklist is maintained in the Windows registry and the Macintosh OS X FeatureLockdown file. On Windows, there are two blacklists, one for enterprise administrators, and one for Adobe patches and updates.

Blacklist rules of operation

- Blacklist settings do not apply to 3D JavaScript.
- If a blacklisted script is encountered, all other scripts in the document are blocked. Only documents that don't contain any blacklisted JavaScript will be given permission to run other JavaScripts.
- The two blacklists interact so that the more restrictive setting takes precedence; that is, if one blacklist blocks an API and the other does not, the API is blocked.

5.5.1 Blacklist locations

- **Macintosh**: Policy deployment is specific to Windows, so Macintosh, has only one update/path blacklist at `Contents::MacOS::Preferences > FeatureLockDown/cJavaScriptPerm/tBlackList`. This location is updated by Acrobat patch installers.

The JS API blacklist may reside in two locations on Windows.

- **Windows: Enterprise list**: This blacklist helps enterprises roll out policies that block exploitable API(s) from executing in their environment. Populating the blacklist in this location is the responsibility of the enterprise. Adobe patches never modify this registry location.

```
[HKLM\SOFTWARE\Policies\Adobe\<product>\<version>\FeatureLockDown\cJavaScriptPerms\]
"tBlackList"
```

- **Windows: Adobe's update/patch list**: The Adobe blacklist is modified by Acrobat and Adobe Reader patches whenever an API is deemed vulnerable. APIs are also removed from the blacklist whenever a fix for a vulnerability is provided by the current patch.

```
[HKLM\SOFTWARE\Adobe\<product>\<version>\JavaScriptPerms\]
"tBlackList"
```

Note

On a 64 bit Windows system, the path is `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Adobe`.

5.5.2 Blacklist configuration

The manual steps described below require administrator privileges on a machine and should only be undertaken by someone experienced in registry-level configuration. In most cases, configuration occurs via the Customization Wizard prior to client deployment or via a scripting mechanism post-deployment.

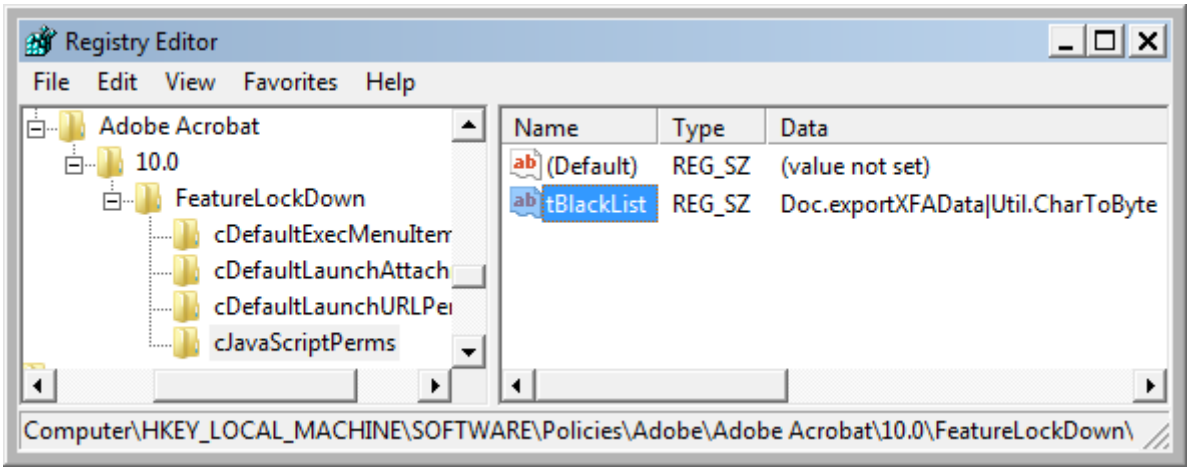
To manually configure a blacklist:

1. Open the registry editor.
2. Go to `HKLM\SOFTWARE\Policies\Adobe\<product>\<version>\FeatureLockDown\cJavaScriptPerms\`.
3. Create `cJavaScriptPerms` if it does not exist by right clicking and choosing **New Key**.
4. Create `tBlackList`: right click in the right hand panel and choose **New > String value**.
5. Enter `tBlackList`.
6. Right click on `tBlackList` and choose **Modify**.
7. Add the APIs to block as a pipe-separated list in for the format of `<some Object Name>.<Some API Name>`. For example:

```
Util.CharToByte|App.alert|Collab.getIcon
```

8. Exit and restart the application.

cJavaScriptPerms: Registry configuration



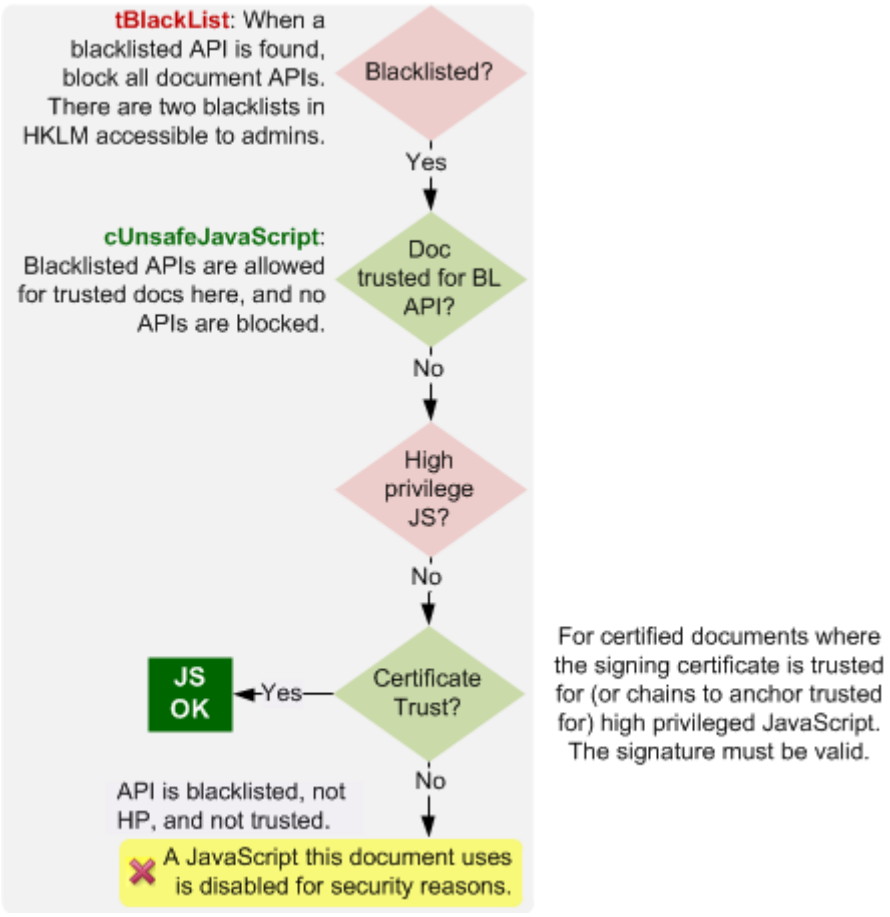
5.5.3 Trusted override

There are several ways to assign trust so that the APIs continue to function in a trusted context:

- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a `tID` at:

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\<cTrustedSites or TrustedFolders>\]
"cUnsafeJavaScript"
```

JS Workflow: Blacklisted APIs



5.5.4 JS blacklist tool

Adobe intends to periodically release beta and experimental tools, utilities, and scripts on LABS. This informal pre-release program provides a way to help customers while opening up channels for feedback that will help improve the product and related enterprise resources. Items posted on LABs should be tested by your organization in order to determine their compatibility with the particulars of your environment.

One such tool is the JavaScript Blacklist Framework Tool for Acrobat and Adobe Reader. The tool offers protections against an entire class of vulnerabilities that target JavaScript APIs.

5.5.4.1 Installation

To install the tool:

1. Go to LABS at http://labs.adobe.com/technologies/acrobat/.
2. Verify the following:

    - You have the Microsoft .NET 4.0 framework. If you don't, the tool's installer should prompt you to install it.
    - You are using it for Reader and Acrobat 9.2 and 8.1.7 and later versions as well as any 10.x version.

3. Agree to the Terms of Use and download the installer.
4. Unzip and run the installer.

5. Choose **Next**.
6. Choose an installation directory or accept the default (Under Program FilesAdobe).
7. Choose whether the blacklist will apply to everyone or just the current user.

> **Note**
> The Disk Cost button is just a default button. The disk size is very small.

8. Choose **Next**.
9. Choose **Next** again to confirm the installation.
10. Choose **Close**.

5.5.4.2 Usage

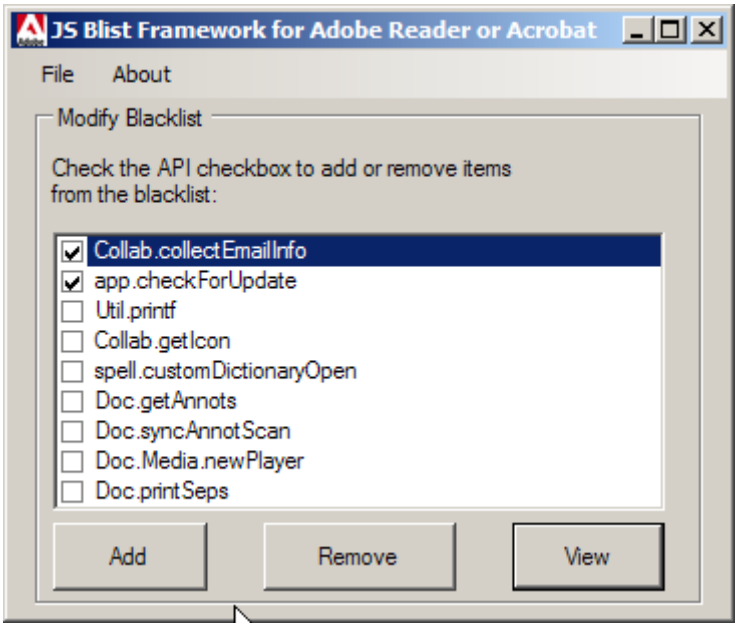
The tool presents a list of JavaScript APIs that have been attacked in the past. It retrieves a current list of APIs from an Adobe server but presents a default list if an Internet connection is unavailable.

To use the tool:

1. Choose **Start > Programs > JS Blacklist Framework for Adobe Reader or Acrobat**.
2. Check and uncheck multiple APIs to Add or Remove them to and from the blacklist.
3. Choose **Add** or **Remove**.
4. Choose View to see what's currently blacklisted.

> **Note**
> The data is saved in a text file in the application's installation directory. Simply check and uncheck multiple APIs to Add or Remove them to and from the blacklist.

Blacklist tool



5.6 Disabling menu-invoked JS

Beginning with Acrobat 7.0, execution of JavaScript through a menu event is no longer privileged. By default, this setting is off.

1. Go to **Preferences > JavaScript** (The exact path varies by product and platform).
2. In the JavaScript Security panel, set **Enable menu items JavaScript execution privileges**. This values sets:

```
[HKCU\Software\Adobe\<product name>\<version>\JSPrefs]
"bEnableMenuItems"
```

Note

Enables executing JS by clicking menu items. When off, privileged JS calls can be executed via the menu unless they have been wrapped in the app.trustFunction. Executing non-privileged JS calls via menu items is not blocked whether this box has been checked or not.

5.6.1 Trusted override

There are several ways to assign trust so that this feature works in a trusted context:

- Choose **Preferences > JavaScript** and check **Enable menu items JavaScript execution privileges**.
- Enabling via a trusted function: Trusted functions allow privileged code that normally requires a privileged context to execute to execute in a non-privileged context. For details and examples, see the `app.trustedFunction` in the JavaScript for Acrobat API Reference. This feature was introduced in Acrobat 7.0.
- Add the requisite function to:

```
HKLM\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown\cDefaultExecMenuItems\
"tWhiteList"
```

5.7 Disabling global object access

By default, global object access is not allowed.

1. Go to **Preferences > JavaScript** (The exact path varies by product and platform).
2. In the JavaScript Security panel, set **Enable global object security policy** as needed. This values sets:

```
[HKCU\Software\Adobe\<product name>\<version>\JSPrefs]
"bEnableGlobalSecurity"
```

Note

Toggles on and off the ability of a script to access objects outside of the current document sandbox. If enabled, JavaScript objects are globally accessible.

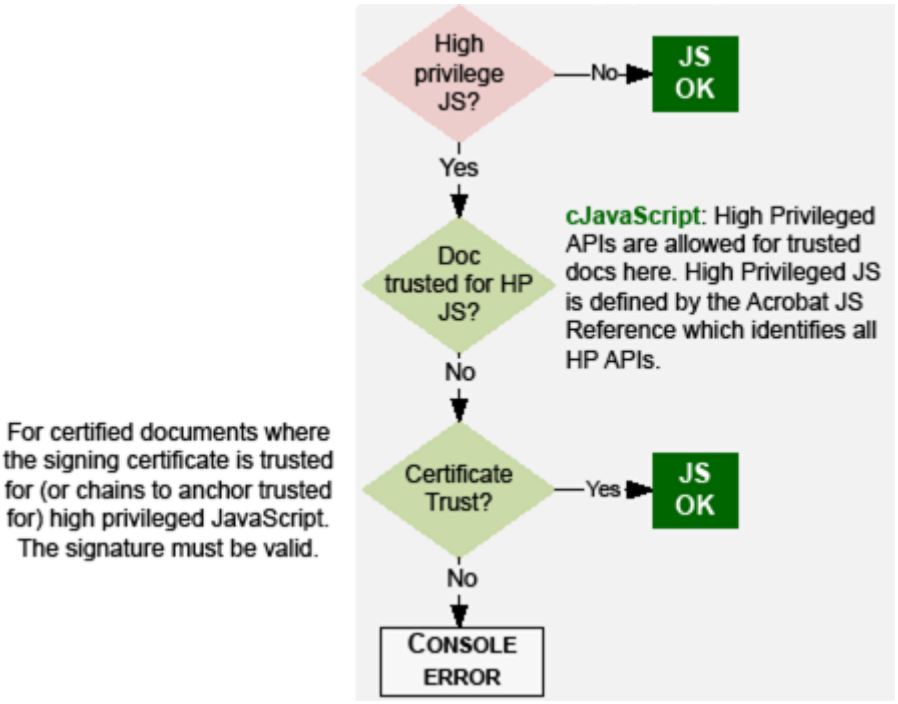
5.8 High privileged JavaScript

High privileged JavaScript is restricted by default.

High privilege JavaScripts are Acrobat methods with security restrictions. These are marked by an "S" in the third column of the quick bar in the JavaScript for Acrobat API Reference. These methods can be executed only in a privileged context, which includes the console, batch, menu (for versions prior to 7.x), and application initialization events. All other events (for example, page open and mouse-up events) are considered non-privileged. The description of each security-restricted method indicates the events during which the method can be executed.

Beginning with Acrobat 6.0, security-restricted methods can execute in a non-privileged context if the document is certified and the certifier's certificate is trusted for executing embedded high privilege JavaScript. In Acrobat versions earlier than 7.0, menu events were considered privileged contexts.

JS Workflow: High privileged APIs



5.8.1 Trusted override

There are several ways to assign trust so that this feature works in a trusted context:

- Configure certificate trust for digital signature workflows as described below.
- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a tID at either:
- **Administrator list**: This list requires administrator rights to modify and locks down the feature. It resides at:

```
HKLM\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown\(cTrustedSites or TrustedFolders)\cJavaScript
```

- **User list**: The user list is for the current user only and is editable via the user interface. It resides at:

```
HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cJavaScript
```

5.8.1.1 Certificate trust

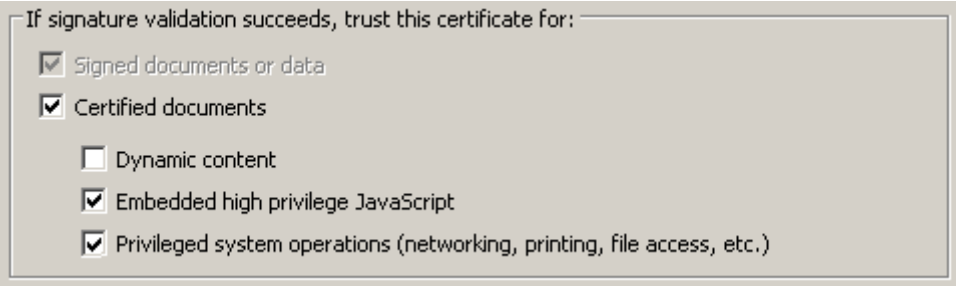
You can control script behavior on a per-certificate basis or by using trust anchors. If a signer's certifying certificate chains up to another certificate (a trust anchor) that allows high privileged JavaScript, then high privileged JavaScript will run in that document. For example, some enterprises may issue a MyCompany certificate that allows high privileged JavaScript. If all employee certificates use ExampleCompany as a trust anchor, then they can send and receive certified documents within the company that allow high privileged JavaScript execution.

Thus, certificate trust settings can override blacklist settings under the following conditions:

- The document must be certified.
- The certification signature must be valid.
- The signer's certificate is trusted for or chains up to a trust anchor trusted for executing high privilege JavaScript.

Configure certificate trust as described in *9.4 Per-certificate trust*.

Certificate trust settings



5.9 Certified document trust

11.0 introduces a new setting that elevates certified documents to a privileged location. When enabled, certified documents with a valid certification signature whose certificate chains to a trusted root are trusted in the same way as privileged locations and can therefore override JavaScript restrictions. For details, see *9.3 Certified document trust*.

5.10 JavaScript invoked URLs

With 9.3.4, `cJavaScriptURL` is introduced as part of enhanced security. An untrusted document that tries to invoke an URL via JS displays the YMB by default. The user is given the option to trust the document for such actions via the Options button on the YMB.

An untrusted document that tries to invoke an URL via JS displays the YMB by default. The user is given the option to trust the document for such actions via the Options button on the YMB.

5.10.1 Trusted override

There are several ways to assign trust so that this feature works in a trusted context:

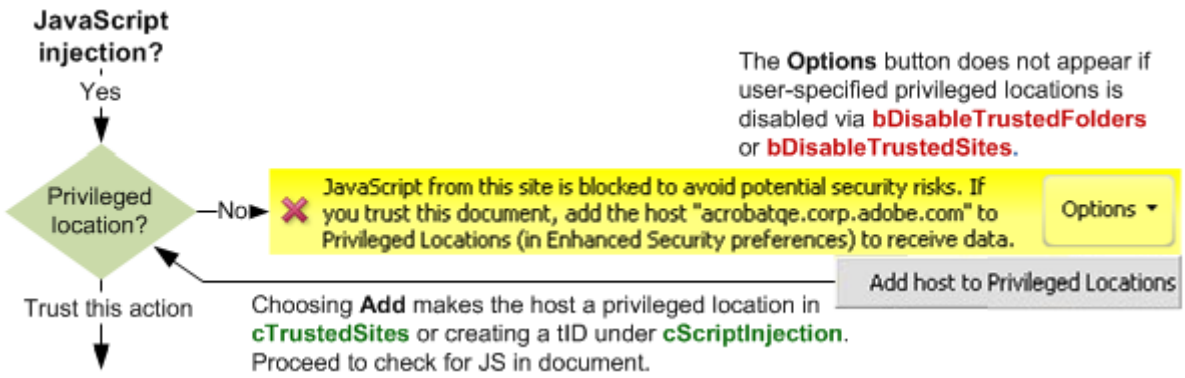
- Users can trust documents on-the-fly when the PDF opens: When the Yellow Message Bar appears, choose the **Options** button and then trust the document **once** or **always**.
- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a tID at:

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cJavaScriptURL]
"t8"="C:\\someTrustedPDF"
```

5.11 JavaScript injection

You can block JS injection by enabling *Enhanced Security*.

Yellow message bar: JavaScript injection



5.11.1 Trusted override

There are several ways to assign trust so that this feature works in a trusted context:

- Users can trust documents on-the-fly when the PDF opens: When the Yellow Message Bar appears, choose the **Options** button and then trust the document **once** or **always**.
- Create a privileged location via the UI for the file, folder, or host.
- Create a privileged location via the registry/plist by placing a tID at:

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\(cTrustedSites or TrustedFolders)\cScriptInjection]
"t8"="C:\\someTrustedPDF"
```

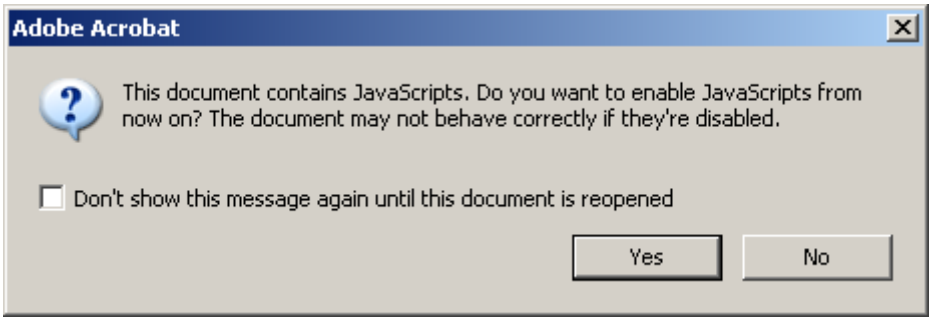
5.12 Workflow changes by version

Acrobat and Adobe Reader have always provided controls for managing JavaScript. Over time, these controls have become more rich in an effort to provide granular control over document behavior. The behavior across versions is as follows:

5.12.1 9.1 and 8.1.6 and earlier

- If the application has JavaScript enabled:
    - Non-high privileged JavaScript runs.
    - High privileged JS will run if permitted to do so by other controls.
- If the application has JavaScript disabled:
    - Non-high privileged JavaScript invokes a dialog stating that the document contains JavaScript. Users are asked whether they would like to enable JS from now on for all documents. If the user selects the **Yes** button, the JavaScript preference is enabled for the application from then on
    - High privileged JavaScript will not execute unless the user has established a prior trust relationship with the document via a trusted certificate or privileged location.

What happens when JS is off

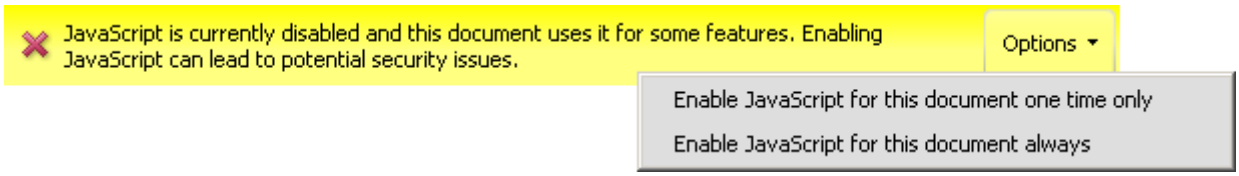


5.12.2 9.2 and 8.1.7 and later

These versions will behave as follows:

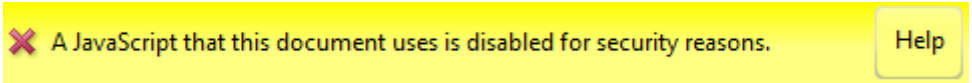
- If the application has JavaScript enabled:
    - Non-high privileged JavaScript runs.
    - High privileged JS will run if permitted to do so by other controls.
- If the application has JavaScript disabled:
    - Any JavaScript invokes a Yellow Message Bar warning about the script. Users have two options:
        - **Enable JavaScript for this document one time only**
        - **Enable JavaScript for this document always**: This option stores a unique document ID in `HKCU\Software\Adobe\<product name>\<version>\TrustManager\cTrustedFolde`

Yellow message bar: JS off warning (9.2 and 8.1.7 and later)



- High privileged JavaScript will not execute unless the user has established a prior trust relationship with the document via a trusted certificate or privileged location.
- If JavaScript is enabled and a blacklisted JavaScript is encountered, the Document Message Bar warns the user about the script and no script is executed even if they are not blacklisted. A NotAllowedError exception is thrown on the JavaScript console.

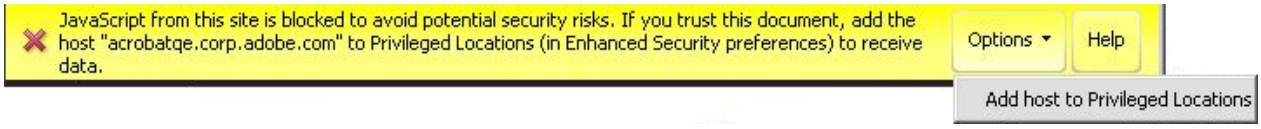
Yellow message bar: Blacklisted JS warning



9.3 and 8.2 and later

Encountering an attempt to inject JavaScript over cross domain communications results in a YMB.

Yellow message bar: Blacklisted JS warning



5.12.3 Migrating to 10.1.1+

5.12.3.1 Affected users

These changes for 10.1.1 impact **existing** workflows that use persistent global variables (Windows and Macintosh) or custom JavaScripts (Windows only). Enterprise IT should take action to preserve workflows that leverage these features.

5.12.3.2 Overview

Due to Adobe's high interest in security, changes to existing Acrobat and Adobe Reader functionality are periodically released to further strengthen the product's resistance to malicious attacks. As part of this effort, 10.1.1 introduces changes to the JavaScript feature that stores global variables and executes user-defined scripts.

Prior to 10.1.1, end users could place JavaScript files in %ApplicationData%Adobe<product name><version>JavaScripts, and these files would execute automatically on application startup. For example, IT might place a JS file for modifying the product user interface by hiding or adding menu items on a Windows XP machine in `C:\Documents and Settings\(username)\Application Data\Adobe\Acrobat\10.0\JavaScripts`. Additionally, the folder contains glob.js and glob.settings.js, two files which the product can read and write to when storing global variables.

By design, Acrobat processes do not write to the `%ApplicationData%\Acrobat\Privileged\10.0` folder. Additionally, sandboxed processes are specifically prohibited from writing to that folder. Thus, the most secure operation involves enabling Protected View in Acrobat and Protected Mode in Reader, thereby sandboxing all processes. Additionally, 10.1.1 introduces the following changes:

- New user JS location: The user JavaScript folder is moved from
    - **Vista and Windows 7**: `Users\(username)\AppData\Roaming\Adobe\Acrobat\10.0\JavaScripts` to `Users\(username)\AppData\Roaming\Adobe\Acrobat\Privileged\10.0\JavaScripts`. For example, the new path might be: `C:\Users\JoeUser\AppData\Roaming\Adobe\Acrobat\Privileged\10.0\JavaScripts`
    - **XP**: `Documents and Settings\(username)\Application Data\Adobe\Acrobat\10.0\JavaSc` `Documents and Settings\(username)\Application Data\Adobe\Acrobat\Privileged\10.` For example, the new path might be: `C:\Documents and Settings\JoeUser\Application Data\Adobe\Acrobat\Privileged\10.`

> **Note**
>
> This is a Windows-only change. Also, the change does not impact the behavior of `C:\Program Files\Adobe\(product name and version)\(product name)\JavaScripts`.

- New format and location for persistent global variables: Variable settings stored in glob.settings.js and glob.js now reside in a new directory at `%ApplicationData%\Adobe\Acrobat\10.0\JSCache`. The key value pairs read from the ASCab are used to initialize the persistent global variables. No settings are saved as JavaScript files in this directory.

5.12.3.3 What you should do

If you have not stored variables as persistent global variables or placed custom JavaScripts in the affected directories, then you can ignore this change. However, if you have done either, maintain the integrity of your workflows by doing the following:

Global variable issues

- Verify glob.js and glob.settings.js do not store anything other than key value pairs and scalar values. Workflows that use these files to store other methods will break.
- Since any data residing in glob.js and glob.setting.js at the time of applying 10.1.1 will be lost, maintain the integrity of your workflows by doing the following:

1. For Acrobat, you can either:

    - Copy the JavaScript in the existing glob.js and glob.setting.js files from the old JavaScripts folder and execute it in the JavaScript console in a new Acrobat session. This will export the stored global variables to the new Acrobat session. Or,
    - Copy glob.js and glob.setting.js from the old JavaScripts folder to the `%Program Files%/Adobe/Reader/JavaScript` folder and then delete the original files. Restart the product to export the variables to the new format.

> **Note**
>
> For Adobe Reader, you can only use the latter method since the JavaScript console is not available unless you have enabled it as described at http://blogs.adobe.com/pdfdevjunkie/2008/10/how_to_use_the_javascript_debu.html.

2. Manually execute the JavaScript setPersistent method on all global variables to ensure they are correctly migrated to the new format. For example, run the following JavaScript in the console:

```
for (var name in global) global.setPersistent("global."+name, true);
```

User JavaScript issues (Windows only)

Copy all user-created JavaScript files from `%APPDATA%\Adobe\Acrobat\10.0\JavaScripts` to `%APPDATA%\Adobe\Acrobat\Privileged\10.0\JavaScripts`.

6 Attachments

Acrobat products provide a way for you to add, remove, open, and save file attachments. However, attachments represent a potential security risk because they can contain malicious content, open other dangerous files, or launch applications. Certainly file types such as .bin, .exe, .bat, and so on will be recognized as threats by most users and are not allowed as attachments.

To mitigate the risk inherent in attachments:

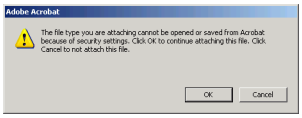
- Know what the content is and from where it originated.
- Be aware of dangerous file types and how the application manages those types. Adobe applications maintain Black lists and white lists which control application behavior.
- Prevent attachments from opening other files and launching applications. This is the default behavior. For details about changing this behavior, see Allowing attachments to launch applications.

6.1 Black lists and white lists

The applications store a list of some of these good (white) and bad (black) file types in the registry. Application behavior is controlled by the file type's membership in a list:

- File types on the white list: These can be attached and may be opened or saved if the file extension is associated with the requisite program.
- File types on the black list: These can be attached, but a warning dialog appears stating that they cannot be saved or opened from the application. No actions are available for these files.
- File types not on any list: These can be attached without a warning dialog. Trying to open or save them invokes a dialog which allows the user to perform the action just once or to add them to the good type (white) list or bad type (black) list.

Attachment: Dangerous type warning



You can attach file types that are on the black list because a document recipient may have a less restrictive black list than you (the sender). While the recipient may be able to open the file, the attacker will not be able to execute or open it from within the application. Attempting to open a prohibited file type results in a warning that the action is not allowed.

Attachment: "Cannot open" warning

6.2 Configuration

6.2.1 UI and registry config

The default application behavior for file types in the attachment list can be modified manually as needed. New file extensions can be added to the list, existing ones removed, and the behavior changed for file types already in the list.

Permissions settings are as follows:

- 0: User is warned that the file may be unsafe and is given two choices: open or permanently set the behavior to Prohibited.
- 1: User is warned that the file may be unsafe and is given three choices: open or permanently set the behavior to Allowed or Prohibited.
- 2: Always open this file type.
- 3: This file type does not open and a warning message appears.

Windows

> **Note**
>
> This HKLM setting does not work for any version of Reader 10.x with Protected Mode enabled.

Modifying the registry settings in HKLM requires administrator rights. To edit the registry to modify the default behavior of file attachments in Windows:

Navigate to `HKLM\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown\cDefaultLaunchAttachmentPerms`.

2. Double click the `tBuiltInPermList` value.
3. Edit or add an extension and value in the format of <.extension>:<0-3>. For example, `zip:1`.

> **Note**
>
> The ordering of the entries is irrelevant, but it is important that the list has no duplicate entries.

Attachment permissions by file type

```
version:1|.ade:3|.adp:3|.app:3|.arc:3|.arj:3|.asp:3|.bas:3|.bat:3|.bz:3|.bz2:3|
.cab:3|.chm:3|.class:3|.cmd:3|.com:3|.command:3|.cpl:3|.crt:3|.csh:3|.desktop:3|
.dll:3|.exe:3|.fxp:3|.gz:3|.hex:3|.hlp:3|.hqx:3|.hta:3|.inf:3|.ini:3|.ins:3|
.isp:3|.its:3|.job:3|.js:3|.jse:3|.ksh:3|.lnk:3|.lzh:3|.mad:3|.maf:3|.mag:3|.mam:3|
.maq:3|.mar:3|.mas:3|.mat:3|.mau:3|.mav:3|.maw:3|.mda:3|.mdb:3|.mde:3|.mdt:3|.mdw:3|
.mdz:3|.msc:3|.msi:3|.msp:3|.mst:3|.ocx:3|.ops:3|.pcd:3|.pi:3|.pif:3|.prf:3|.prg:3|
.pst:3|.rar:3|.reg:3|.scf:3|.scr:3|.sct:3|.sea:3|.shb:3|.shs:3|.sit:3|.tar:3|.taz:3|
.tgz:3|.tmp:3|.url:3|.vb:3|.vbe:3|.vbs:3|.vsmacros:3|.vss:3|.vst:3|.vsw:3|.webloc:3|
.ws:3|.wsc:3|.wsf:3|.wsh:3|.z:3|.zip:3|.zlo:3|.zoo:3|.pdf:2|.fdf:2|.jar:3|.pkg:3|
.tool:3|.term:3
```

Macintosh

To edit the registry to modify the default behavior of file attachments in Macintosh:

LockDown file and edit it in a text editor. This file is normally located in `Application> <version number><product name>/<application> [version number] Professional/Contents/Mac`

2. Hold the Ctrl key and click the application file in `Applications/Adobe Acrobat <product name>`.
3. Choose **Show Package Contents**.
4. Navigate to **Contents > MacOS > Preferences**.

5. Locate the `FeatureLockDown` file in the Preferences folder, and open it in a text editor.
6. Find `BuiltInPermList [/s`.
7. Edit or add an extension and value in the format of <.extension>:<0-3>. For example, `.zip:1`.

Linux

To edit the registry to modify the default behavior of file attachments in Linux:

1. Navigate to
   `<install location>/Adobe/<application and version/Reader/globalPrefs`.
2. Open AttachmentPerms in a text editor.
3. Edit or add an extension and value in the format of `<.extension>:<0-3>`. For example, `.zip:1`.

Adding Custom Attachment Extensions

To add custom extensions, add your own file extension entries to the very end of the list. The method is the same on both Windows and Macintosh. Use the following format for each custom extension:

`|.FILEEXTENSION:PERMVALUE`

For example, to add the extension .`ext` with a value of Always Allowed, you would add:

`.ext:2`

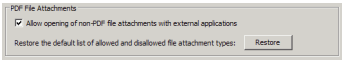
6.2.2 Resetting attachment permissions

Because the registry list could grow over time and users do not have direct access to the lists through the user interface, resetting the list to its original state may result in the highest level of security.

To reset the black and white lists:

1. Choose **Preferences > Trust Manager**.
2. In the PDF File Attachments panel, choose **Restore**.

Attachment panel in Trust Manager



6.2.3 Allowing attachments to launch applications

The Trust Manager enables users to control whether or not non-PDF attachments can open with other applications. By default, this option is enabled so that common file types such as .doc (not on the application's black list) can be easily opened in the appropriate application.

To set attachment preferences:

1. Choose **Preferences > Trust Manager**.
2. Configure **Allow opening of non-PDF file attachments with external applications**:

   - Checked: Default. The application uses its stored black list to determine whether Acrobat should let the attachment launch an application action, so the attachment can be opened.
   - Unchecked: Clicking or opening an attachment will never result in launching it's associated viewing application. Use this option if a higher level of security is needed.

6.2.4 Modifying permissions on-the-fly

Users can indirectly manage the registry list of which file types can be opened and saved. In other words, the list in Attachment black list can be extended one at a time as each attached file is opened. Administrators can modify the registry.

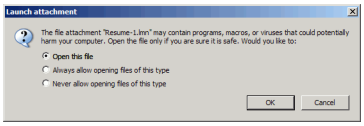
To add a file to a black or white list, attach the new file type to a document and then try to open it:

1. **Acrobat**: Choose **Document > Attach a File** and attach a file type not on the black or white list (e.g. `yfile.xyz`)
2. Open the file by highlighting it in the Attachments pane and choosing **Open**.
3. When the Launch Attachment dialog appears, choose one of the following:

    - **Open this file**: Opens the files without changing the registry list.
    - **Always allow opening files of this type**: Adds the file type to the white list and prevents future warnings.
    - **Never allow opening files of this type**: Adds the file type to the black list and does not open it.

4. Choose **OK**.

Launch Attachment dialog



6.3 Blacklisted extensions

Attachment black list

Extension	Description
.ade	Access Project Extension (Microsoft)
.adp	Access Project (Microsoft)
.app	Executable Application
.asp	Active Server Page
.bas	BASIC Source Code
.bat	Batch Processing
.bz	Bzip UNIX Compressed file
.bz2	Bzip 2 UNIX Compressed file (replaces BZ)
.cer	Internet Security Certificate file (MIME x-x509-ca-cert)
.chm	Compiled HTML Help
.class	Java Class file
.cmd	DOS CP/M Command file, Command file for Windows NT
.com	Command
.command	Mac OS Command Line executable
.cpl	Windows Control Panel Extension (Microsoft)
.crt	Certificate file
.csh	UNIX csh shell script
.exe	Executable file
.fxp	FoxPro Compiled Source (Microsoft)

.gz	Gzip Compressed Archive
.hex	Macintosh BinHex 2.0 file
.hlp	Windows Help file
.hqx	Macintosh BinHex 4 Compressed Archive
.hta	Hypertext Application
.inf	Information or Setup file
.ini	Initialization/Configuration file
.ins	IIS Internet Communications Settings (Microsoft)
.isp	IIS Internet Service Provider Settings (Microsoft)
.its	Internet Document Set, International Translation
.jar	Java Archive
.job	Windows Task Scheduler Task Object
.js	JavaScript Source Code
.jse	JScript Encoded Script file
.ksh	UNIX ksh shell script
.lnk	Windows Shortcut file
.lzh	Compressed archive (LH ARC)
.mad	Access Module Shortcut (Microsoft)
.maf	Access (Microsoft)
.mag	Access Diagram Shortcut (Microsoft)
.mam	Access Macro Shortcut (Microsoft)
.maq	Access Query Shortcut (Microsoft)
.mar	Access Report Shortcut (Microsoft)
.mas	Access Stored Procedures (Microsoft)
.mat	Access Table Shortcut (Microsoft)
.mau	Media Attachment Unit
.mav	Access View Shortcut (Microsoft)
.maw	Access Data Access Page (Microsoft)
.mda	Access Add-in (Microsoft), MDA Access 2 Workgroup (Microsoft)
.mde	Access MDE Database file (Microsoft)
.mdt	Access Add-in Data (Microsoft)
.mdw	Access Workgroup Information (Microsoft)
.mdz	Access Wizard Template (Microsoft)
.msc	Microsoft Management Console Snap-in Control file (Microsoft)
.msi	Windows Installer file (Microsoft)
.msp	Windows Installer Patch
.mst	Windows SDK Setup Transform Script
.ocx	Microsoft Object Linking and Embedding (OLE) Control Extension
.ops	Office Profile Settings file
.pcd	Visual Test (Microsoft)
.pkg	Mac OS X Installer Package
.pif	Windows Program Information file (Microsoft)
.prf	Windows System file
.prg	Program file
.pst	MS Exchange Address Book file, Outlook Personal Folder file (Microsoft)

.rar	WinRAR Compressed Archive
.reg	Registration Information/Key for Windows 95/98, Registry Data file
.scf	Windows Explorer Command
.scr	Windows Screen Saver
.sct	Windows Script Component, Foxpro Screen (Microsoft)
.sea	Self-expanding archive (used by Stuffit for Mac files and possibly by others)
.shb	Windows Shortcut into a Document
.shs	Shell Scrap Object file
.sit	Compressed archive of Mac files (Stuffit)
.tar	Tape Archive file
.tgz	UNIX Tar file Gzipped
.tmp	Temporary file or Folder
.url	Internet Location
.vb	VBScript file or Any VisualBasic Source
.vbe	VBScript Encoded Script file
.vbs	VBScript Script file, Visual Basic for Applications Script
.vsmacros	Visual Studio .NET Binary-based Macro Project (Microsoft)
.vss	Visio Stencil (Microsoft)
.vst	Visio Template (Microsoft)
.vsw	Visio Workspace file (Microsoft)
.webloc	Mac OS Finder Internet Location
.ws	Windows Script file
.wsc	Windows Script Component
.wsf	Windows Script file
.wsh	Windows Script Host Settings file
.zip	Compressed Archive file
.zlo	ZoneLabs ZoneAlarm Mailsafe Renamed .PIF file
.zoo	An early compressed file format

7 Cross Domain Configuration

This document describes how to configure the Acrobat family of products to allow cross domain access for PDFs in one domain that attempt to access data from another domain. By default, when requested content is not from the same origin as the requesting document, Acrobat and Adobe Reader automatically attempt to load a server-based policy file from that domain to get permission for such access. Default behavior is subject to customization by administrators, IT, workflow stakeholders, and others who need to enable or disable cross domain access.

Changes across releases: Cross domain support

Version	Change
9.0	Support for controlling cross domain access via policy files is introduced. The implementation leverages the Flash model.
9.1	Support for allowing cross domain access on a per document basis by identifying certified documents by the SHA-1 hash of the signing certificate's public key. The hash is added to the cross-domain policy file.
8.1.7 & 9.2	Enhanced security added for 8.1.7.
8.2 & 9.3	• Enhanced security turned on by default. Enhanced security takes precedence of Trust Manager internet access settings. • On Windows, the ability to trust sites that the user already trusts via Internet Explorer can be configured via the user interface or registry. • A non-intrusive Yellow Message Bar (YMB) that doesn't block workflows replaces many of the modal dialogs. Depending on how the client is configured, the YMB appears at the top of the document and offers the user to trust the document "once" or "always." • Cross domain logging can be enabled and the log viewed via the user interface. • cross-domain policy files support all the mime types specified in the Cross Domain Policy File Specification.

7.1 Cross domain basics

7.1.1 Same-origin policies

As the Acrobat family of products became more powerful over the years (i.e. support for JavaScript and web service interaction), the line between document and application gradually blurred. With the addition of interactive form features, multimedia, and scripting, PDFs became more capable with each release. On the one hand, support for JavaScript and dynamic content within a Web page allows developers to add rich interactivity and behaviors to their content. Yet these features can be abused by attackers, and default configurations for clients that support them make such attacks even more dangerous.

One of the earliest attempts to combat such attacks was Netscape's same-origin policy introduced with Netscape Navigator 2.0. The policy prevented a document or script loaded from one origin from accessing resources loaded from another origin. To counter the same-origin policy, a wide variety of attack patterns evolved, including cross-site scripting (XSS) and cross-site request forgery (XSRF). These attack patterns have one thing in common: they exploit the trust shared between a user and a website by circumventing its primary protection mechanism (the same-origin policy).

Adobe began addressing this problem several releases ago by implementing a standardized cross-domain security model that has evolved over the years into a robust, secure solution. By providing controls for who may receive data from whom, Adobe clients such as Flash and rich PDF documents are safe and extremely flexible.

7.1.2 Cross domain workflow

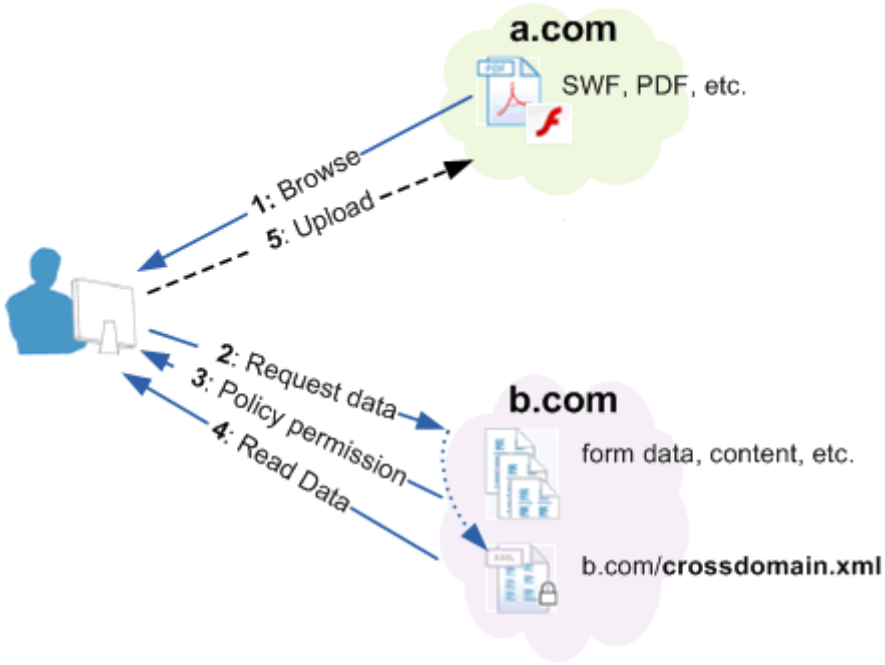
A cross-domain policy file is an XML document that grants a web client, such as Adobe Flash Player or Adobe Acrobat permission to handle data across domains. When a client hosts content from a particular source domain and that content makes requests directed towards a domain other than its own, the remote domain needs to host a cross-domain policy file that grants access to the source domain, allowing the client to continue the transaction.

As shown below, b.com hosts a policy file that grants permission for a file on a.com to load data from some or all of the b.com site. The b.com administrator should exercise care because policy files give permission for files from other domains to operate with users' credentials when accessing b.com.

The user browses to a file on a.com (1). The file from a.com obtains permission from b.com's policy file (2) to load data from b.com (3). If b.com hosts a policy and requires credentials for access then any documents served from the domains listed in b.com's policy file gain the right to use those credentials on the user's behalf. Now that the a.com file has access to data from b.com, the document can upload the b.com data back to its own server at a.com (4)

It is important here to compare a user's and a.com's server's access to b.com. If the user is able to access b.com because both are inside a network firewall or because a required login returned an HTTP cookie, then the user has greater privileges than the a.com server. In this situation, it may be risky to create a policy file on b.com because files from a.com must then be trusted not to disclose data that is private to b.com, the user, or both. Therefore, an administrator should limit the number and location of policy files. It should always be possible to easily audit the current set of permissions and control who can add and modify policy files.

Cross domain workflow



How can a.com and b.com interchange data safely?

1: The user opens a file from a.com.

2: The a.com file contacts b.com and . . .
the client automatically checks for a cross domain policy file,

3: If a policy file is found, the client reads its permissions.

4: If the permissions allow access, the b.com data is read.

5: The client now has permission to relay b.com data to a.com.

7.1.3 When you need cross domain access

Cross domain access is permitted for Acrobat and Adobe Reader default installations in versions 9.2/8.17 and earlier. You can prevent such access by turning on the enhanced security feature.

Cross domain support is specifically intended for organizations that want the heightened level of security assurance that the enhanced security feature provides but still need to maintain access to data that would otherwise be restricted. While data access permissions may be defined within the client using the "privileged locations" panel provided by the enhanced security preference, Acrobat's cross domain support becomes important when:

- Enhanced security is enabled because uncontrolled cross domain access should not be permitted.
- You require selective cross domain access and need to leverage other features such as document fingerprint recognition based on a certificate.
- You want to centrally manage cross domain access permissions from a single, server based location.
- Workflows include data requests from multiple and even many domains (see above) for returning form data, SOAP requests, references to streaming media such as audio and video, Net.HTTP.request, and so on.

7.1.4 When you don't need cross domain support

The following cases do not require leveraging Adobe's cross domain feature:

- Enhanced security is turned off.
- Enhanced security is turned on, but the document and/or data is in a privileged location.
- Data upload; for example, when a form sends data to a server, but no data is sent back into the form.
- A form sends and receives data to a server on the same host as the one on which the form is hosted.
- A user clicks on a hyperlink: such data requests offer protection via warning dialogs or the Yellow Message Bar.
- A user participates in a shared workflow such as a document review using a collaboration server. The dialog presented to the user is considered adequate warning that downloading may occur.
- Cross domain access is permitted for users who have already trusted the certificate in a certified document's certification signature. The signature must be valid and the certificate must be trusted for **Privileged network operations**.
- Web service proxy alternative: When forms are opened in the browser, a web service calls back to the origin serving the document is allowed by default in the cross-domain security policy and therefore does not require configuration of a crossdomain.xml at the site of the Web service. This typical LiveCycle deployment pattern allows developers to employ the Web Service Proxy pattern. In this design pattern, new Web services are authored using LiveCycle at the same origin as the hosted document which then acts as a proxy to call the third-party Web service (similar to Web mash-ups).

Note

Cross-domain restrictions do not apply to data requested by Reader for non-document request operations. For example, if Adobe Reader requests a timestamp from a remote server to validate a digital signature, it is not restricted because the data was not requested by the document.

same-origin and cross-domain examples

PDF Location:	Received data location:	x-domain required?	allow-access-from domain examples
c:test.pdf	c:xyz.data	No	N/A
c:test.pdf	smb://smb_server/xyz.data	No	N/A
\smb_servertest.pdf	smb://smb_server/xyz.data	No	N/A
\smb_servertest.pdf	c:xyz.data	No	N/A
c:test.pdf	http://xyz.com/xyz.data	Yes	Use certificate fingerprint
\smb_servertest.pdf	http://xyz.com/xyz.data	Yes	Use certificate fingerprint
http://www.xyz.com/test.pdf	http://www.xyz.com/xyz.data	No	N/A
http://www.xyz.com/test.pdf	https://www.xyz.com/xyz.data	Yes	*.xyz.com or www.xyz.com
https://www.xyz.com/test.pdf	http://www.xyz.com/xyz.data	Yes	• *.xyz.com • www.xyz.com
http://www.xyz.com/test.pdf	http://www.xyz.com:8080/xyz.data	Yes	secure="false" should follow each entry: * *.xyz.com * www.xyz.com

http://www.xyz.com/test.pdf	http://www.xyz.com/xyz.data	No	N/A
http://www.xyz.com/test.pdf	http://xyz.com/xyz.data	No	N/A
http://www.xyz.com/test.pdf	http://bar.com/xyz.data	Yes	• *.xyz.com • www.xyz.com
http://www.xyz.com/test.pdf	http://www.bar.com/foo.data	Yes	• *.xyz.com • www.xyz.com

7.1.5 PDFs in a standalone application vs. the browser

Acrobat and Adobe Reader behave similarly with respect to data access, and their behavior is consistent whether running in the browser or as a standalone application. However, behavior inside and outside of a browser varies because of differences in http(s) request handling:

- **PDF viewed in a browser**: When the application is run from inside the browser, the application behaves similarly to Flash running in the browser: Same domain requests do not require a check, and cross domain checks do.
- **PDF viewed in a standalone application**: When the application runs outside of a browser, such as viewing a document on a local file system or opened as an attachment in e-mail, data requests from an http[s] server are blocked. A check is always required (the server must have a cross-domain policy file containing a wild card, or the local file must be in a privileged location).
- Local files: A PDF can be opened directly from a local disk or referenced by a *file:URL*. Files have no domain when the URL does not begin with http or https and is referenced as follows:
    - file://
    - \serverfolderfile.pdf
    - C:folderfile.pdf.

> **Note**
>
> Access to these files via a cross domain file should be provided by a certificate fingerprint.

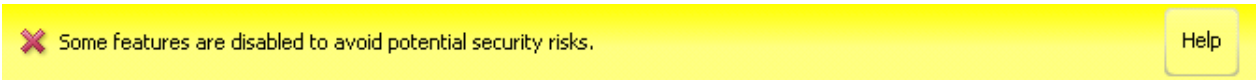
7.1.6 User experience

For trusted documents, cross domain access should be secure and transparent. When trust is not assigned, an attempt at cross domain access results in a Yellow Message Bar (YMB) warning the user of such an attempt. The YMB's appearance varies based on the following:

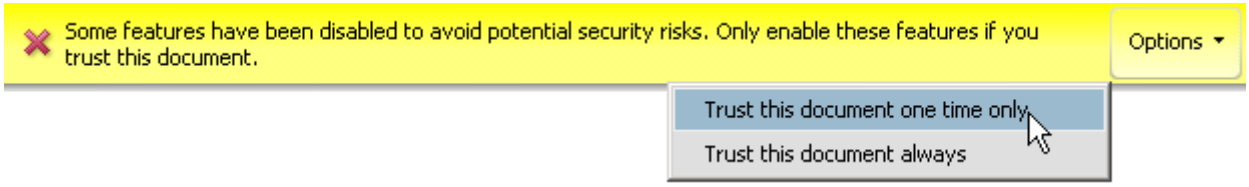
- Enhanced security is enabled and an administrator has disabled the privileged locations feature. In this case, the user sees a warning but is not given any option to trust the action. It is also likely the administrator has enabled and locked enhanced security. Remedies include:
    - Having the administrator assign trust via a privileged location or cross-domain policy file.
    - Having the document owner/author sign the document with a certificate you trust for privileged network operations.

- Enhanced security is enabled and privileged locations are not locked. Here the warning button appears with an options button. The user is provided with the option to trust the document once or always. Trusting the document "always" results in adding the document as a privileged location.

Yellow message bar: Cross domain access not locked



Yellow message bar: Cross domain access locked



7.2 Policy file configuration

A cross-domain policy is simply a user-defined set of permitted data access rules encapsulated in a crossdomain.xml file. It is only viable on servers that communicate via HTTP, HTTPS, or FTP. A cross-domain policy file is an XML document that grants a web client permission to handle data across one or more domains. When a client hosts content from a particular source domain and that content makes requests directed towards a domain other than its own, the remote domain would need to host a cross-domain policy file that grants access to the source domain, allowing the client to continue with the transaction. Policy files grant read access to data as well as permit a client to include custom headers in cross-domain requests.

The cross domain feature introduced with 9.0 allows administrators to:

- Create a cross-domain policy based on a specification.
- Configure access to a broad range of locations relative to the requestor.
- Locate the policy according to a flexible set of rules.

7.2.1 Policy file syntax

An XML policy file contains a single <cross-domain-policy> tag, which contains zero or more <allow-access-from> tags. Each <allow-access-from> tag contains a *domain* attribute specifying either an exact IP address, an exact domain, or a wildcard domain (an asterisk followed by a suffix which matches only domains that end with the specified suffix).

The full syntax of crossdomain.xml files is beyond the scope of this document, as those details are available in the Cross Domain Policy File Specification DTD and XSDs are available to define the generic policy file schema as well as each different type of policy file (either HTTP, HTTPS, FTP) since policy files hosted in each of those contexts are slightly different.

Note

Because Acrobat and Flash share the same cross domain model, the specification as well as much of the Flash documentation may prove useful to you.

7.2.2 Policy file best practices

Workflow developers should have a thorough understanding of what is and isn't allowed when enhanced security is enabled. For example, a cross-domain policy file may be needed if privileged locations are not set. same-origin and cross-domain examples shows examples of combinations of PDF and server locations for both same-origin and cross-domain data requests.

- Use same-origin communications exclusively if you can.
- Never use a standalone * wildcard to provide unlimited cross domain access. Keep your permissions as granular as possible.
- Don't hard code the hostname of same-origin communications.
- Choose one full qualified domain name. Use a redirect for alternate variations.
- Use a "www" domain name when you staging and production servers and want cross domain access to work consistently without modification during the development-deployment life cycle.
- Use SSL consistently (don't use cross domain files to help http://example.com and https://example.com communicate with each other. Use secure="false" if you have to mix and match http and https.
- For local files and files referenced by a file URL, provide access via a certificate fingerprint.

7.2.3 Typical policy

Policy files grant read access to data, permit a client to include custom headers in cross-domain requests, and grant permissions for socket-based connections. The most common location for a policy file on a server is in the root directory of a target domain with the filename crossdomain.xml (e.g. http://example.com/crossdomain.xml)—the default location that clients check when a policy file is required. Policy files hosted this way are known as master policy files. allow-access-from: Allowing access to root domains shows a typical URL (i.e. non-socket) master policy file which allows access to the example.com root domain with and without the www subdomain as well as any subdomains.

allow-access-from: Allowing access to root domains

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <site-control permitted-cross-domain-policies="master-only"/>
   <allow-access-from domain="*.example.com"/>
   <allow-access-from domain="www.example.com"/>
   <allow-http-request-headers-from domain="*.adobe.com" headers="SOAPAction"/>
</cross-domain-policy>
```

The `site-control` element here specifies that only this master policy file should be considered valid on this domain. Below that, the `allow-access-from element` specifies that content from the example.com requesting domain can access any data within the target domain (the domain in which this policy file has been saved). Finally, the `allow-http-request-headers-from` element indicates that a `SOAPAction` header is also allowed to be sent with requests made to the target domain from adobe.com.

7.2.4 Permissive vs. restrictive policies

The following is the least permissive master policy file definition. It enforces a meta-policy that restricts any policy file, including this one, from granting permissions of any type to any requesting domain:

cross-domain-policy: Least permissive policy

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <site-control permitted-cross-domain-policies="none"/>
</cross-domain-policy>
```

The following is the most permissive master policy file definition (*strongly not recommended*). It allows any policy file on the target domain to grant permissions, allows access to any of its file, and permits any header to be sent to the server. All of this possible even through HTTPS despite the source being HTTP:

cross-domain-policy: Least restrictive policy

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <site-control permitted-cross-domain-policies="all"/>
   <allow-access-from domain="*" secure="false"/>
   <allow-http-request-headers-from domain="*" headers="*" secure="false"/>
</cross-domain-policy>
```

7.2.5 Meta vs. master policies

While `Meta policy: Allowing non-master policy files` does not allow data access to this target domain, it does define a meta-policy that allows other policy files within this domain to determine how access is handled. In this case, the client is instructed to look for a policy file other than the master for permissions related to this domain.

Meta policy: Allowing non-master policy files

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <site-control permitted-cross-domain-policies="by-content-type"/>
</cross-domain-policy>
```

`Meta policy: allowing only a master policy` defines a meta-policy that allows only this master policy file to function for this target domain. It allows access to data on example.com and all of its subdomains:

Meta policy: allowing only a master policy

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <site-control permitted-cross-domain-policies="master-only"/>
   <allow-access-from domain="*.example.com"/>
</cross-domain-policy>
```

7.2.6 HTTP-HTTPS communications

`allow-access-from: Most permissive access` demonstrates the most permissive use of `allow-access-from` granting any other domain access to the files on this target domain, even if an HTTP source is accessing data on this domain through HTTPS. It should be obvious that this practice is not recommended.

allow-access-from: Most permissive access

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <allow-access-from domain="www.example.com" secure="false"/>
</cross-domain-policy>
```

7.2.7 Socket permissions

`allow-access-from: Socket policy` should be served to a client through a socket connection when requested with policy-file-request. It permits access to content from example.com or any of its subdomains through ports 507 and any port between 516 and 523 (including 516 and 523).

allow-access-from: Socket policy

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <allow-access-from domain="*.example.com" to-ports="507,516-523"/>
</cross-domain-policy>
```

7.2.8 Credential-based permissions

allow-access-from-identity: Required configuration

```
<allow-access-from-identity>
  <signatory>
    <certificate
      fingerprint="01:23:45:67:89:ab:cd:ef:01:23:45:67:89:ab:cd:ef:01:23:45:67"
      fingerprint-algorithm="sha-1"/>
  </signatory>
</allow-access-from-identity>
```

7.2.9 Friendly names and alias use

Any alias or friendly name can be used as long as your DNS server can resolve these names:

```
<allow-access-from domain="myalias.com" />
<allow-access-from domain="myfriendlyname" />
```

7.2.10 IP address

If you specify an IP address, access is granted only to files loaded from that IP address using IP syntax (for example, http://65.57.83.12/document.pdf), not those loaded using domain-name syntax. Acrobat does not perform reverse DNS lookup. The following lines enable access only to 105.216.0.40.

```
<allow-access-from domain="105.216.0.40" />
```

7.2.11 Header-based permissions

The following shows how to allow any requesting domain to send the `SOAPAction` header to this target domain.

allow-http-request-headers-from: Header usage with SOAPAction

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <allow-http-request-headers-from domain="*" headers="SOAPAction"/>
</cross-domain-policy>
```

The following allows the Authorization header and any header beginning with the characters X-Foo from www.example.com to be sent to this target domain. If a request is coming from foo.example.com, only headers beginning with the characters X-Foo are allowed, not Authorization:

allow-http-request-headers-from: Header usage with wildcard

```
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.adobe.com/xml/dtds/cross-domain-policy.dtd">
<cross-domain-policy>
   <allow-http-request-headers-from domain="www.example.com" headers="Authorization,X-Foo*"/>
   <allow-http-request-headers-from domain="foo.example.com" headers="X-Foo*"/>
</cross-domain-policy>
```

7.3 Certificate-based permissions

Acrobat and Adobe Reader 9.1 introduces an extension to cross-domain policies that enables cross domain access on a per document basis. You do so by identifying a certified document signed with a specific certificate that should be able to access web servers in another domain. Since these documents contain an embedded and unique public key certificate, a SHA-1 hash of the certificate can be used as an identifier, much like a fingerprint. The fingerprint is extracted from the document and placed in the crossdomain.xml file, thereby providing access.

Two types of certificate fingerprints are supported:

- Certificates extracted from a certified document. The signature must be valid. Documents signed with approval (sometimes called "ordinary") signatures are not supported.
- The certificate associated with the digital ID provided to the LiveCycle ES administrator so that the server can Reader enable documents and provide it with additional usage rights.

Note

The signature must be valid and the certificate must be trusted.

7.3.1 Certified documents

There are several methods for finding the certificate hash. At a high level, the steps involve opening the certificate in the Certificate Viewer and copying the **Value** data for the SHA1 digest field.

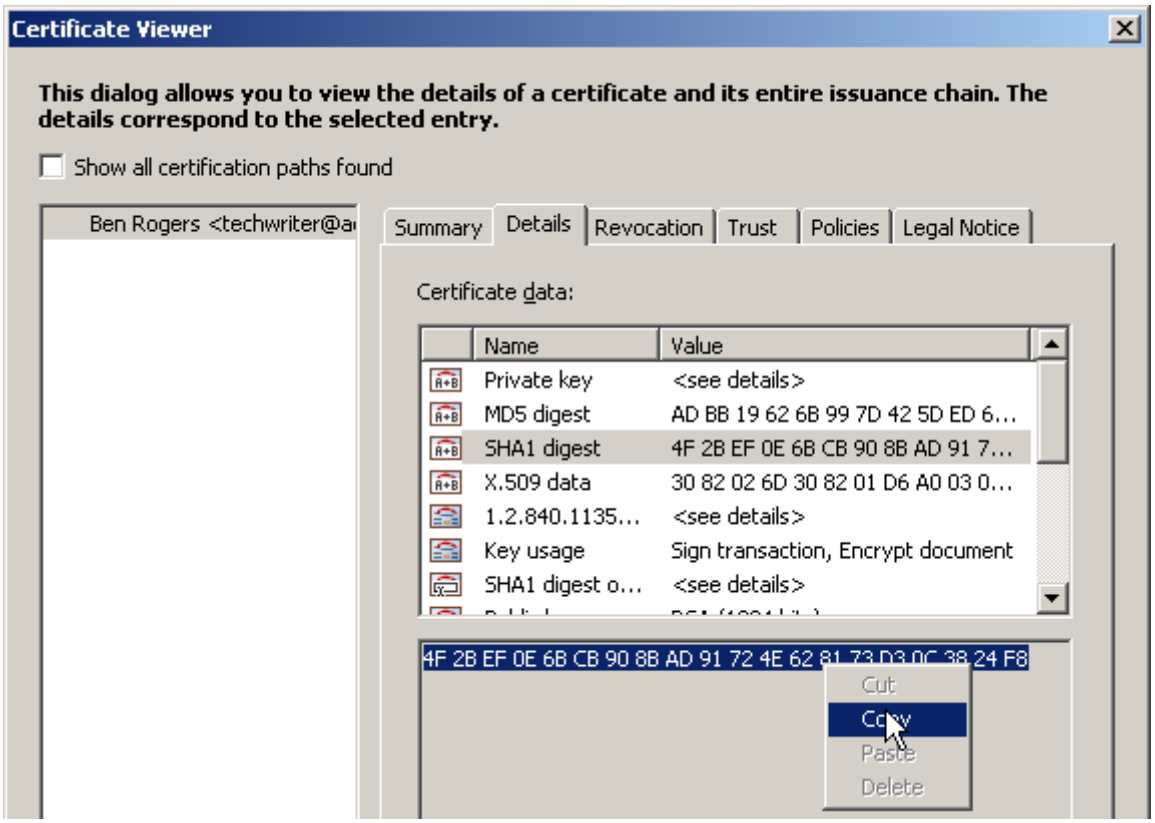
Note

If you are using a certificate hash for documents that are Reader enabled by a LiveCycle ES server, you should use the certificate issued in conjunction with the server. This certificate will be unique to your organization.

To extract a certificate hash from a certified document:

1. Open the certified document.
2. View the signature properties by doing one of the following:
    - Open the signature panel, right click on the signature and choose **Show Signature Properties**.
    - If the signature is visible, right click on the signature and choose **Show Signature Properties**.
3. Choose the Details tab in the Certificate Viewer to see the list of all data for the selected certificate.
4. In the Certificate Data pane, select the SHA1 digest field.
5. In the bottom pane, highlight and copy the hex data fingerprint.

Extracting the SHA1 hash from the certificate



7.3.2 Reader enabled documents

The digital ID delivered with LiveCycle ES so that it can Reader enable documents is a valuable commodity and should be protected. This task should only be undertaken by the LiveCycle ES administrator or someone identified as the certificate owner. It should not be handed off to others for any

reason.

Note

Other methods of extracting the certificate hash include using openSSL or importing the ID into the Windows store. Only one method is described here.

To extract a certificate hash:

1. Open Acrobat.
2. Do one of the following to open the Digital ID list:
    - 9.x: Choose **Advanced > Security Settings**.
    - 10.x: Choose **Tools > Sign and Certify > More Sign and Certify > Security Settings**.
    - 11.x: Choose **Edit > Preferences > Signatures > Identities and Trusted Certificates > More**.
3. Highlight **Digital IDs** in the left-hand tree.
4. Choose **Add ID**.
5. Navigate through the import dialogs.
6. Select (highlight) a digital ID in the right hand panel.
7. Choose **Certificate Details** icon at the top menu bar.
8. Choose the Details tab in the Certificate Viewer to see the list of all data for the selected certificate.
9. In the Certificate Data pane, select the **SHA1 digest** field.
10. In the bottom pane, highlight and copy the hex data fingerprint.

Note

You should now remove the ID from the machine so that it doesn't exist outside it's designated protected location.

7.3.3 Adding a certificate hash to a policy file

Full details appear in the Cross Domain Policy File Specification. At a high level, adding the certificate hash to the cross-domain policy file involves the following steps:

1. Navigate to the cross-domain policy file on the server.
2. Open the file and add an <allow-access-from-identity> block.
3. Add a `<signatory>` and `<certificate>` block as shown in `Typical allow-access-from-identity block`.
4. The `certificate` element should have the following attributes:
    - fingerprint: A 40 character string (colons and spaces are ignored).
    - fingerprint-algorithm: sha-1 is the only permitted value.

5. Save and close the policy file.

Typical allow-access-from-identity block

```
<allow-access-from-identity>
  <signatory>
    <certificate
      fingerprint="01:23:45:67:89:ab:cd:ef:01:23:45:67:89:ab:cd:ef:01:23:45:67"
      fingerprint-algorithm="sha-1"/>
  </signatory>
</allow-access-from-identity>
```

7.3.4 Fingerprint usage rules

- Multiple signatories require multiple `<allow-access-from-identity>` blocks.
- There must be one and only one `<signatory>` block inside an `<allow-access-from-identity>`.
- Only `<certificate>` is allowed inside a `<signatory>`. Since `<public-key>` is not supported for 9.1, <public-key> blocks encountered are skipped.
- The `fingerprint` attribute is required. If it is missing or malformed, the certificate block is skipped. The string must be 40 characters long not counting spaces or colons.
- The `fingerprint-algorithm` attribute is required. If it is missing or malformed, the certificate block is skipped. The string is case insensitive.

7.4 Server configuration

Policy files function only on servers that communicate over HTTP, HTTPS, or FTP.

7.4.1 Policy file host basics

When creating and using a policy file, the following rules apply:

- It's name must be crossdomain.xml.
- The file MIME type should be set to
    - 9.2/8.17: text/x-cross-domain-policy
    - 9.3/8.2: Any type supported by the specification.
- The file usually resides at the server's root. However, a master policy file can point to policies in other locations. While a "root" is defined differently by each server, it is always true that you should be able to enter the following in a browser to see the file:

```
http(s)://myserverroot.com/crossdomain.xml
```

- Non-master policies permit access only to files at or beneath their level in the directory tree. You can avoid the master policy requirement by calling the policy via JavaScript. See `Calling policies via JavaScript`.

7.4.2 Differences between Acrobat and Flash

The Acrobat family of products leverages the Flash model. However, there are differences.

- For 9.2, Acrobat requires that cross-domain policy files return from the server with the content-type text/cross-domain-policy.
- For 9.3, both clients support all of the mime types listed in the specification:
    - Any content type that starts with "text/"
    - application/xml
    - application/xhtml+xml

Note

Acrobat allows these content types with version 9.3

- The use of non-master policy files require a site to have a meta-policy of "by-content-type" or "all". If using "by-content-type", policy files need to be returned with a Content-Type of text/x-cross-domain-policy. While it's possible to use the meta-policy "all", this is risky if your site serves user-generated content. Normally a meta-policy is declared in the master policy file, but for those who can't write to the root directory, they can also declare a meta-policy using the X-Permitted-Cross-Domain-Policies HTTP response header.
- Acrobat does NOT support the Socket usage. However, Flash does support policy files that grant permissions for socket-based connections. For a socket connection, a policy file can be used for both same domain connections as well as connections made across domains.

7.4.3 Server setup examples

Administrators should be familiar with their systems and refer to the documentation provided for their particular server. Details will vary; however, the two high level rules include:

- Placing the policy file at the server's root. While a "root" is defined differently by each server, it is always true that you should be able to enter the following in a browser to see the file:

```
http(s)://myserverroot.com/crossdomain.xml
```

- Setting the policy file's MIME type.

7.4.3.1 JBoss

Copy the policy file to:

```
...\jboss\server\lc_turnkey\deploy\jboss-web.deployer\ROOT.war\crossdomain.xml
```

7.4.3.2 WebSphere

Generate a crossdomain.war application and deploy it to the application server.

1. Go to the WAS administrator console.
2. Choose **Install New Application**.
3. For the context root enter: /
4. For **Map virtual hosts for Web modules**, select your virtual host.
5. Choose **Finish**.

6. Specify the MIME type for the policy file:

    1. In the left hand column, choose **Environment > Virtual hosts**.
7. Select the** (host name) > MIME Types**.
8. **Configure the following:**

    - MIME Type: text/x-cross-domain-policy (or a type supported per the specification).
    - Extensions: xml
9. Choose **Apply** and **OK**. S
10. Start the application.

WebSphere: Mime type configuration for policy files

7.4.3.3 SAP Netweaver 7 and 7.1

y the policy file to
usr\sap\<Server ID>\J00(JC00 for Netweaver 7.0)\j2ee\cluster\apps\sap.com\com.sap.eng\crossdomain.x

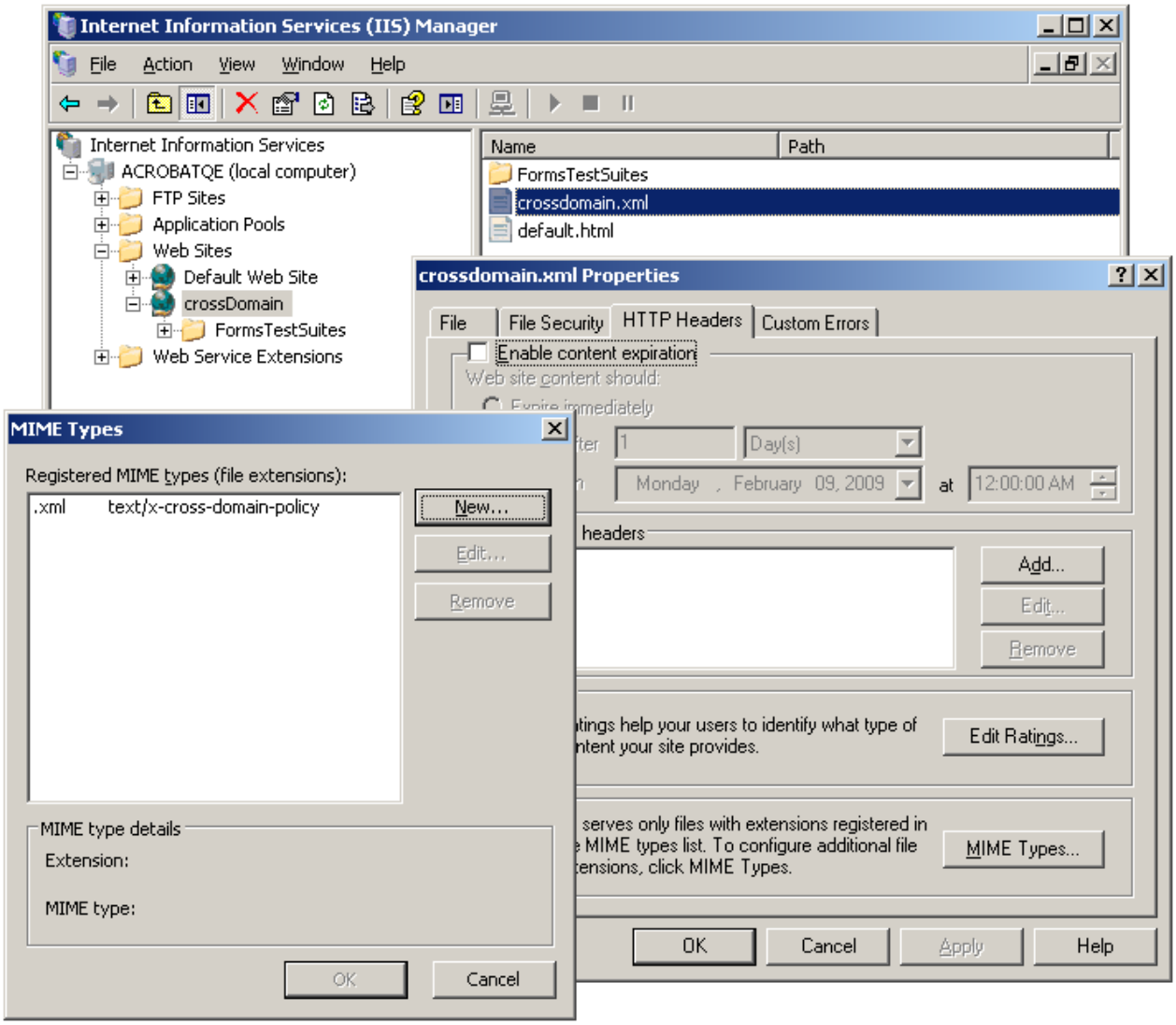
2. Specify the MIME type for the policy file:

    - For Netweaver 7.0, Netweaver 7.0 EhP 1, and Netweaver 2004:
        1. Open the Visual Administrator.
        2. Choose the Properties tab of the HTTP Provider Service running on the server process.
        3. Enter a new MIME type in the list that appears as a value for the MIME property. You must specify the file extension first and then the MIME type, and separate them by a comma. For example: `.xml,text/x-cross-domain-policy`.
        4. Choose **Save Properties.**
    - For Netweaver 7.1 and Netweaver 7.1 EhP1

1. Open NetWeaver Administrator.
2. Navigate to Java System Properties: **Configuration Management > Infrastructure**.
3. In the Services tab, select HTTP Provider Service. A list of all service properties is displayed on the Extended Details tab page.
4. Enter a new MIME type in the list that appears as a value for the MIME property. You must specify the file extension first and then the MIME type, and separate them by a comma. For example: `.xml,text/x-cross-domain-policy`.
5. Choose **Save Changes**.

7.4.3.4 Windows

Cross domain configuration on a Windows server



7.4.3.5 WebLogic

Setting the MIME type and policy file is relatively straightforward.

1. Navigate to <your WAR file>/web-inf folder.
2. In the weblogic.xml, set <wls:context-root>/</wls:context-root>.

3. In the web.xml set the mime-mapping tag:

```
<mime-mapping>
<extension>xml</extension>
  <mime-type>text/x-cross-domain-policy</mime-type>
</mime-mapping>
```

1. Deploy the `ear` file as usual.

7.5 Calling policies via JavaScript

One exception to the requirement that a master policy file be present is when a document specifies a policy via JavaScript.

When a master file is not used, the following rules are enforced:

- Acrobat can load policy files from arbitrary locations via the JavaScript method `app.loadPolicyFile(url)`; for example: `app.loadPolicyFile("http://www.example.com/sub/dir/pf.xml")`.

> **Note**
>
> There is a single cross domain file cache, so a call such as `app.loadPolicyFile(url)` will affect other PDFs opened during that client's session. For details, refer to the *JavaScript™ for Acrobat® API Reference* .

- SWFs can load policies from other locations via the JavaScript method `Security.loadPolicyFile`. Refer to the Flex documentation for more information.

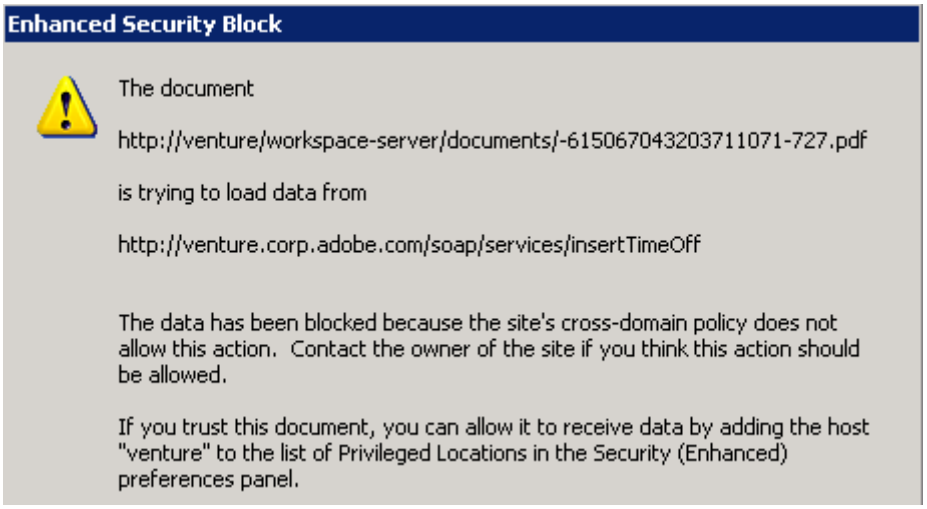
7.6 Troubleshooting

When cross domain access fails, users will likely see a dialog or the Yellow Message Bar. To troubleshoot the problem, enable logging and try again. The log error messages should indicate what's wrong.

You can verify the policy file is in the right location by entering the following in a browser to see the file:

```
http(s)://myserverroot.com/crossdomain.xml
```

Enhanced Security: Data access dialog (pre 9.3 and 8.2)

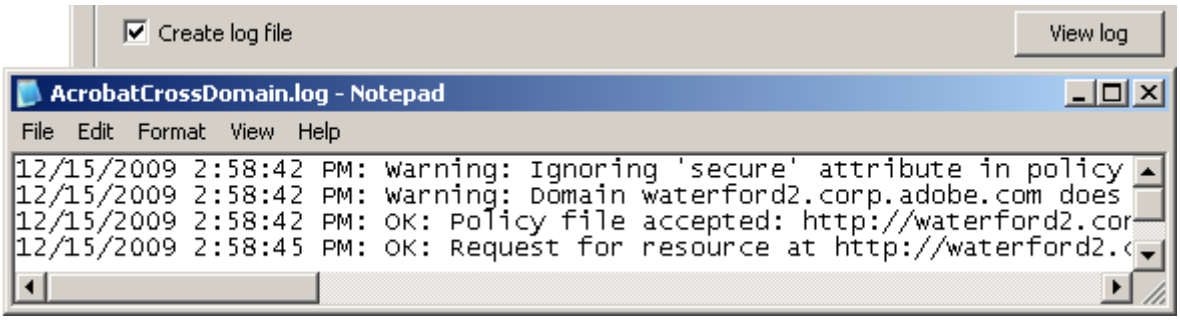


7.6.1 Enabling logging

If you need to debug cross domain access, enable logging.

> **Note**
> Logging is not available on Macintosh.

Cross domain logging

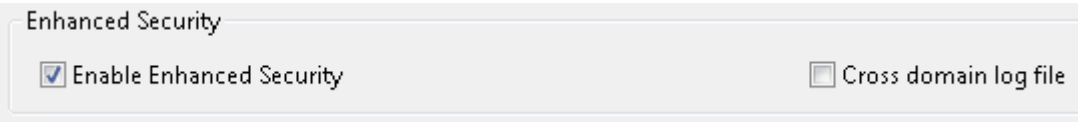


Logging: User interface configuration

The 9.3 and 8.2 updates and later allow configuration via the user interface. To do so:

1. Choose **Edit > Preferences** (Windows only).
2. Select Security (Enhanced) in the Categories panel.
3. Check Create log file.

Enhanced security panel



Logging: Registry configuration

Available for all versions beginning with 9.0.

1. Open the registry.
2. Create an AVPrivate key if it does not exist at:

   HKDCUSoftwareAdobe<Adobe Acrobat or Acrobat Reader><version>AVPrivate
3. Right click on AVPrivate and create a new DWORD.
4. Create a key called bCrossDomainLogging and set its value to 1.
5. Exit.
6. Navigate to Acrobat's user account Application Data. For example:

   - **XP**: C:Documents and Settings<user name>Application DataAdobe<application><version>
   - **Windows 7**: C:UsersusernameAppDataRoamingAdobeAcrobat9.0
7. Create an empty file called AcrobatCrossDomain.log.

Note

The log name is identical for Adobe Reader.

7.6.2 General log messages

Request for resource at %s by requestor from %s is permitted due to policy file at %s

A file attempted an operation that requires a policy file permission and the policy was found. The URLs indicate:

- The resource requested.
- Where the PDF was loaded from.
- The policy file granting the permission.

Note

It is possible that multiple policy files would have permitted the operation, but only one of them is mentioned in this type of log message.

Request for resource at %s by requestor from %s is denied due to lack of policy file permissions.

A file has attempted an operation that requires policy file permissions from a policy file, but the file or the required permissions were not found. The URLs in the message indicate:

- The resource requested.
- Where the PDF was loaded from.

The message may be caused by:

- A certificate fingerprint is not used. It must adhere to the rules described in Using certificates for cross domain access.
- A web service request was made by allow-http-request-headers-from but did not specify the allowed header type.

- No applicable policy file exists to authorize the operation. If you control the server where the resource resides, you may need to add a policy file on that server. Otherwise, you may need to proxy the operation through the file's own server.
- An applicable policy file exists, but the server where both the policy file and the resource are located is unreachable at the moment. Try pinging the server host to see if it appears to be reachable. If the file called *allowDomain* to load an applicable policy file, this message will generally be preceded by the message "Failed to load policy file from (URL)".

> **Note**
>
> Flash only: For a socket connection, you should see a message about being unable to reach the server. For any other request, you should see this message.

- The policy file does not grant permission for access by the file's domain. Try adding the domain to an existing policy file, moving the file to a domain authorized by an existing policy file, adding a new policy file, or proxying the request through the SWF file's own server.
- An applicable policy file exists, but it is in a non-default location and can't be found. Verify the files are correctly pointed to.
- A policy file exists but is invalid for some reason. In this case, this message should be preceded by a more specific message that shows the policy file URL and the problem that was found; see messages about failures to load policy files.

OK

No problem exists.

Policy file accepted %s

No problem exists.

Failed to load policy file from %s

There is no policy file or it could not be found. Verify a master policy file resides at the server root and that other files are correctly pointed to.

Warning <some message>

TBD

Error <some message>

TBD

[strict] Ignoring policy file at %s due to missing Content-Type.

The server did not return a content type. Verify it is configured to return text/x-cross-domain-policy.

[strict] Ignoring policy file at %s due to bad Content-Type '%s'."

The server returned a content type not supported by the client. The file MIME type should be set to text/x-cross-domain-policy. Like Flash, Acrobat will soon support these additional content-types:

- Any content type that starts with "text/"
- application/xml
- application/xhtml+xml

HTTP response headers not available on this platform. Strict policy file rules cannot be enforced.

The client made an HTTP request but was not able to see HTTP response headers. As detailed in the section on meta-policies, some of the new, strict policy file rules require that the client be able to access HTTP response headers; for example, so that Content-Type and X-Permitted-Cross-Domain-Policies information from the server is known. Any meta-policy information from servers will be unavailable.

For a list of precise effects and a list of browser configurations where this behavior is expected, see the browser dependency appendix. This warning should not indicate that previously working content will stop working; rather it indicates that the new, stricter rules cannot be enforced, which may result in reduced security for servers and users. The latest versions of most popular browsers enable Flash Player to see HTTP response headers, so upgrading your browser will usually eliminate this message.

The two features that require HTTP response header access are as follows:

- **Content-Type whitelist**: When the client has access to HTTP response headers, it rejects HTTP policy files that have non-textual Content-Type values, as well as those that have no Content-Type at all. With no access, it accepts HTTP policy files regardless of their Content-Type.
- **HTTP meta-policies**: When Flash Player has access to HTTP response headers, it honors the HTTP meta-policies declared in master HTTP policy files and X-Permitted-Cross-Domain-Policies response headers. With no access, all HTTP servers are assumed to have a meta-policy of all.

Browsers tested for HTTP response headers

Browser	No headers provided	Headers provided
Internet Explorer (Windows)	N/A	5.5 and later
Moselle Firefox	2.0.0.3 and earlier	2.0.0.4 and later
Safari (Macintosh)	2.x and earlier	3.x and later

[strict] Policy file requested from %s redirected to %s; will use final URL in determining scope.

An HTTP policy file request was redirected to a different location in the same domain.

If you see this warning, check the log to see if requests that depend on this policy file are in fact still succeeding. If they are not, you may need to add a non-redirected policy file at the originally requested URL. You can also put a non-redirected policy file at a different URL, which may require using JavaScript to use the new policy file URL. In any case, you should consider avoiding redirecting policy file requests, since they tend to make policy file debugging more difficult.

Ignoring policy file requested from %s because a cross-domain redirect to %s occurred.

An illegal attempt to retrieve a policy file from the first URL was redirected to a second URL in a different domain. This policy file has been ignored and will not authorize any operations.

Ignoring policy file at %s due to X-Permitted-Cross-Domain-Policies none-this-response

The server returned the HTTP response header X-Permitted-Cross-Domain-Policies: none-this-response thereby indicating that this HTTP response is not permitted to be used as a policy file.

This is usually used to prevent server scripts from generating policy files. This policy file has been ignored and will not authorize any operations. You may need to change your server configuration to avoid generating a none-this-response header.

7.6.3 Meta policy messages

Unrecognized meta-policy in HTTP header from %s %s

An invalid meta-policy was specified in an X-Permitted-Cross-Domain-Policies HTTP header. It has been ignored.

HTTP header from %s specifies meta-policy 'by-ftp-filename', which is only applicable to FTP, not HTTP.

A by-ftp-filename meta-policy was found in an X-Permitted-Cross-Domain-Policies HTTP response header, but it is only valid for FTP servers.

The X-Permitted-Cross-Domain-Policies header has been ignored, but any policy file at this URL has not necessarily been ignored (there should be a further error message if it is).

Conflicting meta-policy in HTTP header from %s %s

Multiple conflicting meta-policies were found in one or more X-Permitted-Cross-Domain-Policies HTTP header.

The entire meta-policy string is shown, as received from the server. If multiple X-Permitted-Cross-Domain-Policies headers were provided, they have been coalesced into a single header with semicolon-separated values as is normal for HTTP headers. The client applied the most restrictive meta-policy that was found in this string. It is generally not legal to provide multiple meta-policies in HTTP response headers; the only exception is none-this-response, which may be combined with any other meta-policy, but only affects the individual HTTP response where it is found.

Meta-policy %s in HTTP header from %s conflicts with previously established meta-policy %s

Meta-policies are incorrectly configured. It is likely that a less restrictive meta-policy was found in the HTTP header before a more restrictive policy. The less restrictive meta-policy may have been in effect for some time until the conflict was found later.

Ignoring <site-control> tag in policy file from %s. This tag is only allowed in master policy files.

A meta policy was specified in a non master policy file. The *site-control* tag is only legal in master policy files (/crossdomain.xml on an HTTP/HTTPS/FTP server, or a socket policy file from port 843).

The meta policy has been ignored, but the policy file has not necessarily been ignored (there should be a further error message if it is).

Ignoring <site-control> tag in policy file from %s. The 'by-content-type' meta-policy is only applicable to HTTP sites.

A *by-content-type* meta policy was incorrectly specified in the policy for an FTP server since it is only valid for HTTP and HTTPS servers.

The meta policy has been ignored, but the policy file has not necessarily been ignored (there should be a further error message if it is).

Ignoring <site-control> tag in policy file from %s. The 'by-ftp-filename' meta-policy is only applicable to FTP sites.

A *by-ftp-filename* meta policy was incorrectly specified in the policy for an HTTP(S) server.

The X-Permitted-Cross-Domain-Policies header has been ignored, but the policy file has not necessarily been ignored (there should be a further error message if it is).

Ignoring <site-control> tag in policy file from %s. The 'none-this-response' meta-policy is only allowed in the X-Permitted-Cross-Domain-Policies HTTP response header.

A none-this-response meta-policy was incorrectly specified. It is only valid in the X-Permitted-Cross-Domain-Policies HTTP response header and is intended as a mechanism by which HTTP servers can prevent server scripts from generating policy files.

The meta-policy has been ignored, but the policy file itself has not necessarily been ignored (there should be a further error message if it is).

Unrecognized meta-policy in policy file from %s %s

An invalid meta-policy was specified in the master policy file.

The meta-policy has been ignored, but the policy file itself has not necessarily been ignored (there should be a further error message if it is).

Meta-policy %s in policy file from %s conflicts with previously established meta-policy %s

Meta-policies are incorrectly configured. It is likely that a less restrictive meta-policy was found in the policy file before a more restrictive policy. The less restrictive meta-policy may have been in effect for some time until the conflict was found later.

Domain %s does not specify a meta-policy. All policy files from this domain will be ignored.

This common message appears when the client obtains a policy file from an HTTP, HTTPS, or FTP server that has not specified a meta-policy.

Domain %s does not specify a meta-policy. Applying default meta-policy 'all'. This configuration is deprecated.

This common message appears when the client obtains a policy file from an HTTP, HTTPS, or FTP server that has not specified a meta-policy.

Domain %s does not explicitly specify a meta-policy, but Content-Type of policy file %s is 'text/x-cross-domain-policy'. Applying meta-policy 'by-content-type'.

The client looked for a meta policy in the HTTP headers and in the master policy file, but did not find it. A policy file was returned with a Content-Type of text/x-cross-domain-policy, which indicates that the administrator deliberately made changes to support meta-policies.

Since the official Content-Type for HTTP policy files is in use, the client assumes a meta-policy of by-content-type for this domain. It is recommended that, for clarity, this server should explicitly declare a meta-policy, rather than relying on this implicit mechanism. This can be done using a <site-control> tag in the master policy file, or using the HTTP response header X-Permitted-Cross-Domain-Policies.

Ignoring policy file at %s due to meta-policy '%s'.

A meta-policy found in a *site-control* in the master policy file or in an X-Permitted-Cross-Domain-Policies HTTP header expressly forbids this file from being valid as a policy file, so this policy file will not authorize any operations.

If you intended for this policy file to be valid, change its Content-Type or its FTP filename or change the meta-policy.

Policy file at %s invalidates its own <allow-access-from> directives by declaring the meta-policy 'none'.

The policy file specifies a meta-policy of *none* as well as *allow-access-from*. Remove *allow-access-from*.

The declared meta-policy *none* means that no policy files are permitted on this server and that the master policy file is permitted to exist only to declare the meta-policy and cannot contain *allow-access-from*.

7.6.4 Policy file parsing/syntax errors

[strict] Ignoring policy file with incorrect syntax %s

The policy file syntax is incorrect. Refer to the Cross Domain Policy File Specification.

Ignoring invalid <allow-access-from> tag for domain '%s' in policy file at %s

The string identifying the domain was not recognized as valid. This particular <allow-access-from> directive will be ignored, although other directives in the same policy file may be valid and accepted.

Ignoring illegal port number specification '%s' in policy file at %s

The *to-ports* attribute in *allow-access-from* was not recognized as a valid port range.

Port ranges may include the wildcard *, individual port numbers, port ranges separated by dashes, or comma-separated lists of individual numbers and/or ranges. The *allow-access-from* is ignored, although other directives in the same policy file may be valid and accepted.

Ignoring 'secure' attribute in policy file from %s. The 'secure' attribute is only permitted in HTTPS and socket policy files.

A found a policy file contained one or more <allow-access-from> directives that specified the attribute secure="true|false", but this is neither an HTTPS policy file nor a socket policy file. Remove the secure attribute from this policy file.

The secure attribute has been ignored, but the <allow-access-from> directive is not necessarily being ignored (there will be a further error message if it is). The secure attribute is only legal in HTTPS policy files and socket policy files. This rule has been enforced since policy files were first introduced. This is because the policy file itself is not being transmitted over a tamper-resistant protocol, so a man-in-the-middle attacker could replace a secure="true" declaration with secure="false", which would then allow a non-HTTPS SWF file to retrieve data from this domain, contrary to the policy expressed in this policy file.

7.6.5 Flash only messages

Theoretically, Acrobat clients should not receive these messages. However, since Acrobat leverages the Flash model, these are provided for informational purposes.

Root-level SWF loaded %s

Only pertinent to Flash.

Found secure='true' in policy file from %s, but host %s does not appear to refer to the local machine. This may be insecure.

Only pertinent to Flash and socket policy files.

Request for resource at %s by requestor from %s has failed because the server cannot be reached.

Only pertinent to Flash.

Ignoring socket policy file at %s because it is too large. Socket policy files may not exceed 20 kilobytes.

Only pertinent to Flash and socket policy files.

Policy file from %s will permit SWF from %s to connect to a socket on host %s. This configuration is deprecated.

Only pertinent to Flash and socket policy files.

SWF from %s may not connect to a socket in its own domain without a policy file.

Only pertinent to Flash and socket policy files.

Policy file from %s does not permit SWF from %s to connect to a socket on host %s, due to meta-policy '%s'.

Only pertinent to Flash and socket policy files.

SWF from %s will be permitted to connect to a socket in its own domain without a policy file. This configuration is deprecated.

Only pertinent to Flash and socket policy files.

[strict] Requesting socket policy file from %s due to socket connection request from SWF at %s.

Only pertinent to Flash and socket policy files.

Timeout on %s (at 3 seconds) while waiting for socket policy file.

Only pertinent to Flash and socket policy files.

[strict] Local socket connection forbidden to host %s without a socket policy file.

Only pertinent to Flash and socket policy files.

8 External Content Access

8.1 Internet access

Your application can inform you when a PDF file is attempting to connect to an Internet site. Opening a Web page represents a security risk because malicious content can be transferred whenever a PDF communicates with the Internet. In addition to visible links in a PDF document, form fields can contain hidden JavaScript calls that open a page in a browser or silently requests data from the Internet.

8.1.1 Changes across releases

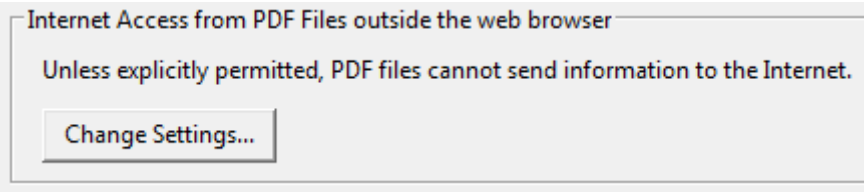
Changes across releases: URL access

Version	Change
9.0	None, but enhanced security is introduced which restricts cross domain communications when enabled.
9.1	None.
8.1.7 & 9.2	None.
8.2 & 9.3	Enhanced security is turned on by default. Enhanced security settings now take precedence over Trust Manager internet access settings.

8.1.2 Configuration

For 9.2 and earlier, this feature overrides enhanced security settings for files and folders. With 9.3, enhanced security settings take precedence. For example, with enhanced security enabled, files and folders can be trusted as privileged locations and access will be granted even if Trust Manager is set to "Block all." Also, cross domain access always requires specifically trusting those domains as a privileged location in the Enhanced Security panel--simply trusting those sites in the Trust Manager will not work.

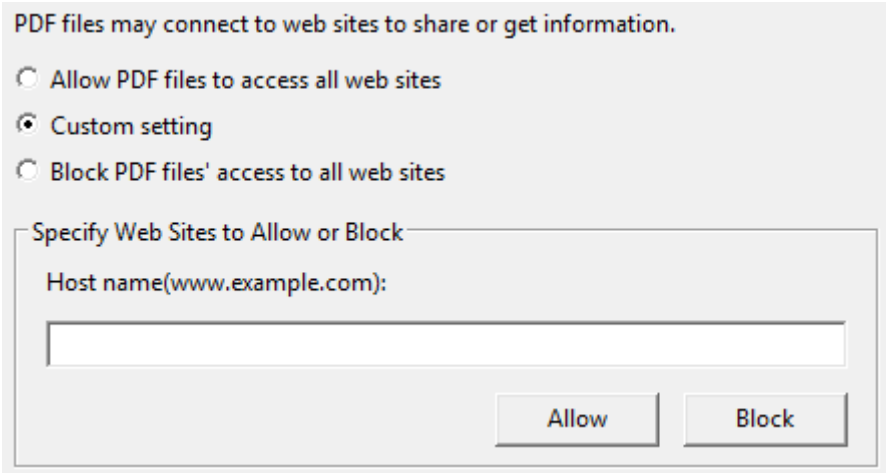
Internet access panel



To control web site access behavior:

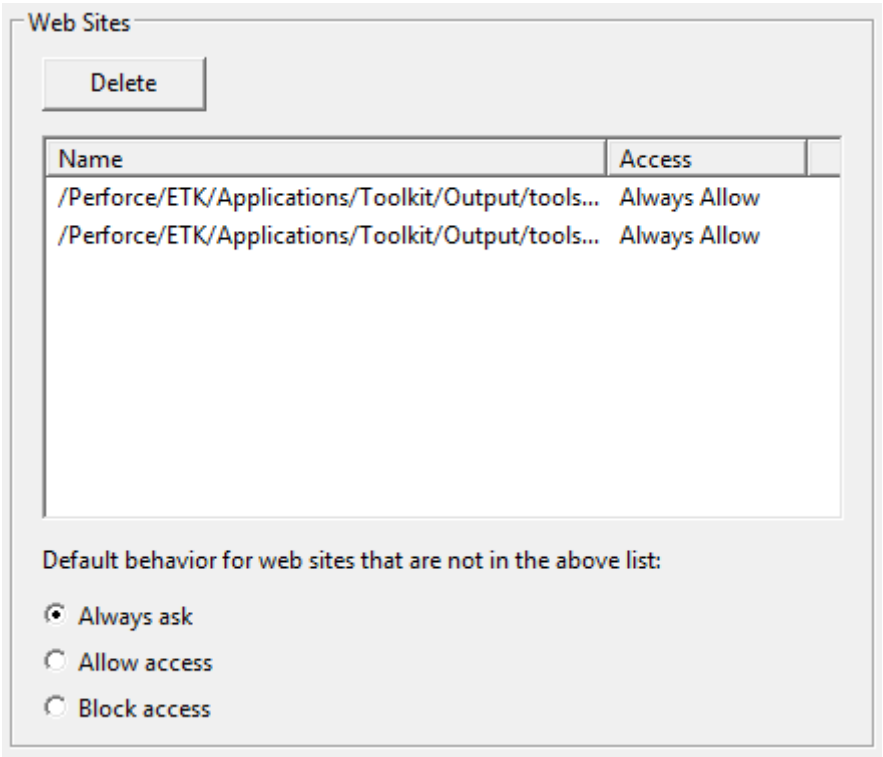
1. Choose **Preferences > Trust Manager**.
2. Choose **Change Settings** in the Internet Access... panel.
3. Choose whether to allow, block, or create custom settings for PDF access to web sites.
4. Choose **OK**.

Manage Internet Access dialog



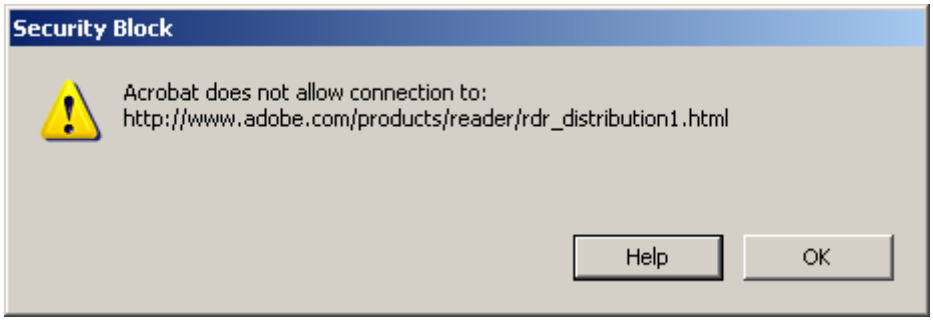
If you choose the custom settings option, the Web Sites panel becomes active and you can enter unique URLs. URLs must begin with www and end with a valid suffix. The Acrobat family of products maintains a white and black list of URLs called the Trust List. Users can specify whether or not URL access is allowed on a global or per-URL basis.

Manage Internet Access dialog

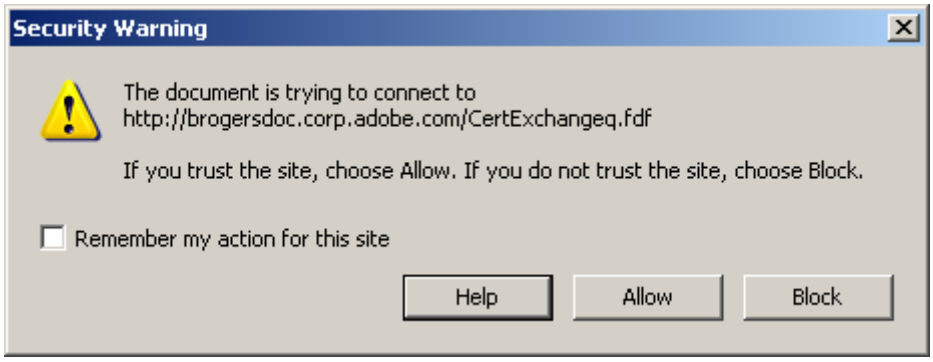


For URLs that aren't explicitly trusted or blocked (they are not on the white or black list), a warning appears whenever a document tries to access the Internet. When you check Remember my action for this site, the site is added to your URL white or black list.

Blocked URL alert



External connection warning



8.2 Multimedia (legacy)

Multimedia poses a security risk because it could potentially change the document's appearance or present security holes through multimedia players. There are two types of multimedia, and application behavior varies with each type:

- **Legacy multimedia**: Any multimedia content which uses 3rd party multimedia plug-ins for playing content is legacy multimedia. The Yellow Message Bar appears on playing the legacy multimedia.
- **Default supported multimedia**: Any multimedia content which uses the Authplay.dll for playing content is defined as non-legacy multimedia. Files like .flv and h.264 encoded files play by default. The Yellow Message Bar doesn't appear in the presence of these media types.

Changes across releases: Multimedia support

Version	Change
8.2 & 9.3	• Legacy multimedia support is disabled by default. For media types other than Flash, support must be manually enabled. • A non-intrusive Yellow Message Bar (YMB) that doesn't block workflows replaces many of the modal dialogs. Depending on how the client is configured, the YMB appears at the top of the document and offers the user to trust the document "once" or "always."

9.5 & 10.1.2	Multimedia trust is integrated into the Trust Manager framework and the following changes have been made: • The following UI items are removed from Preferences > Multimedia Trust (Legacy): **Clear your list of trusted documents** AND **Display permissions for ( ) Trusted documents ( ) Other documents**. • Legacy Multimedia trust (trust for media types that use a player other than the product's) is now stored as a privileged location at `cMultiMedia` rather than TMDocs.sav. The Trusted Documents list is not longer used.
11.0	The product no longer uses an embedded Flash player. Instead, the product leverages the user's system player such as the Flash Player plug-in for browsers which use the Netscape plug-in API for FireFox and Safari. It is therefore subject to the browser's security restrictions and limitations. For example, Flash local connections and `FileReference` are not allowed.

8.2.1 Configuration

To configure multimedia preferences:

1. Choose **Preferences > Multimedia Trust (legacy)**.
2. (Removed with 9.5 and 10.1.2): From the **Display Permissions for** radio buttons, choose **Trusted documents** or **Non-trusted documents**. The Trust Manager displays the selected trust preferences.

Note

Beginning with 9.5 and 10.1.2, trust for legacy multimedia formats is stored in `cMultiMedia`. Prior versions stored information about trusted and untrusted documents for legacy multimedia types in a file called TMDocs.sav.

3. Configure the Trust Options panel:
    1. Check or uncheck **Allow multimedia operations**.
    2. Set multimedia player permissions as follows: Select the player in the list and select an option from the **Change permission for selected multimedia player to** drop-down list:
        - **Always**: The player is used without prompting.
        - **Never**: Prevents the player from being used.
        - **Prompt**: Prompts the user to enable the player when a media clip tries to use that player.
    3. Select one or more of the playback options:
        - **Allow playback in floating window**: Opens the media in a separate window without a title bar.
        - **Allow playback in full-screen window**: Opens the media in full-screen mode.
4. Choose **OK**.

Note

Membership on the trusted document list is permanent until the list is manually cleared. Choose **Clear** to remove all documents from that list.

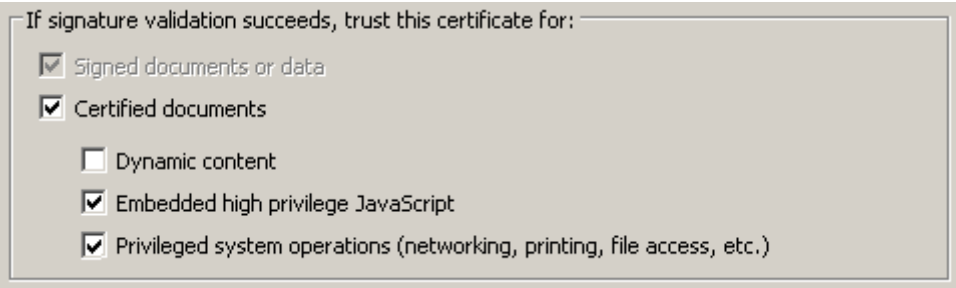
8.2.2 Trusted overrides

There are several ways to assign trust so that this feature works in a trusted context:

- For older product versions, add files to the trusted and untrusted documents lists via modal dialogs as described below.
- With 8.2 & 9.3 and later, users can trust documents on-the-fly when the PDF opens: When the Yellow Message Bar appears, choose the **Options** button and then trust the document **once** or **always**.
- Configure certificate trust as described in *9.4 Per-certificate trust*.
- With 9.5 & 10.1.2 and later, create a privileged location via the UI for the file, folder, or host.
- With 9.5 & 10.1.2 and later, create a privileged location via the registry/plist by placing a `tID` at:

```
[HKCU\Software\Adobe\<product name>\<version>\TrustManager\<cTrustedSites or TrustedFolders>\]
"cMultiMedia"
```

Certificate trust settings



8.2.3 Historical notes

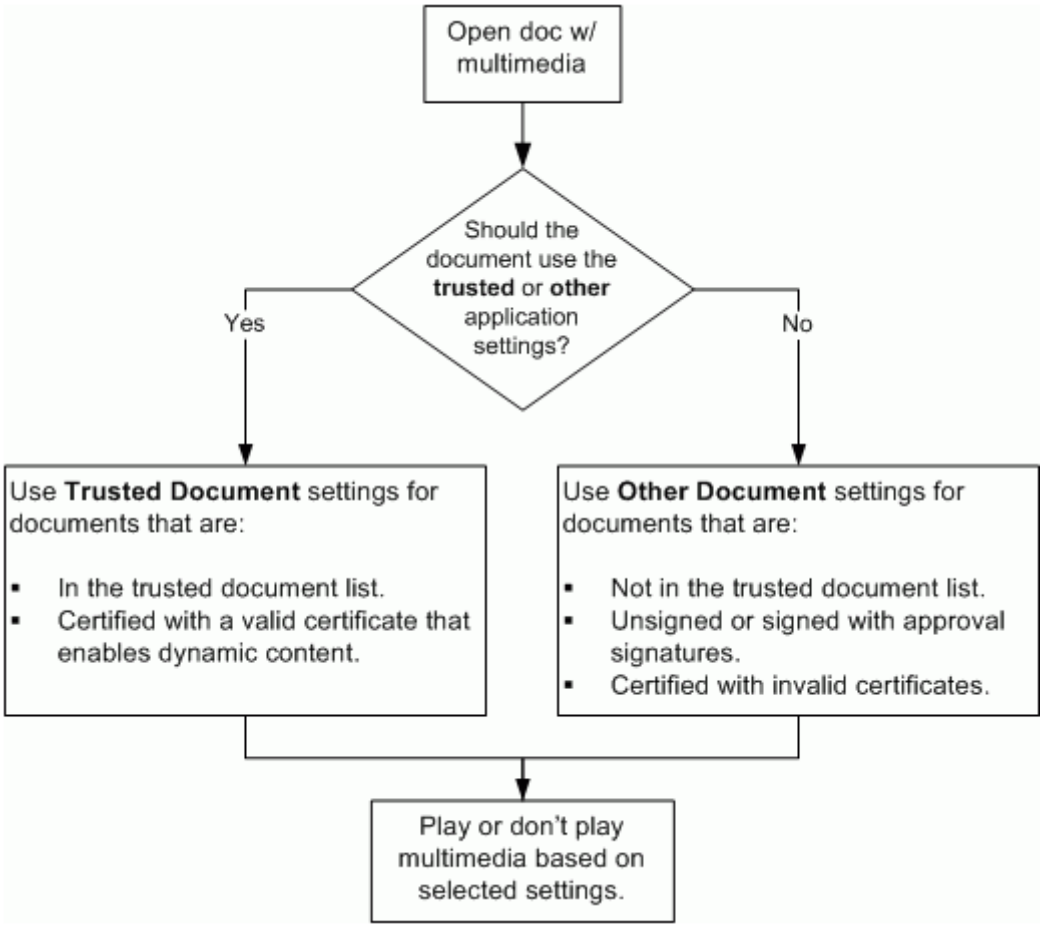
8.2.3.1 Pre-10.1-9.5 behavior

Trust is stored in TMDocs.sav. Once a document is trusted, it is added to the Trusted Document list and will always use the preferences set for trusted documents. You can clear this list by selecting Clear in the Multimedia Trust panel.

Note

Membership on the trusted document list is permanent until the list is manually cleared. Therefore, once a document is on that list, changing the certificate trust level to disallowing dynamic content will have no effect.

Multimedia behavior workflow

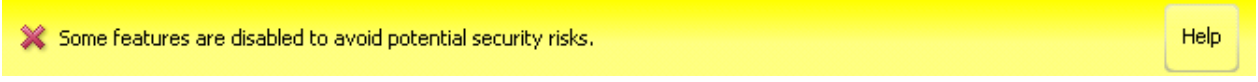


8.2.3.2 9.3-8.2 & later

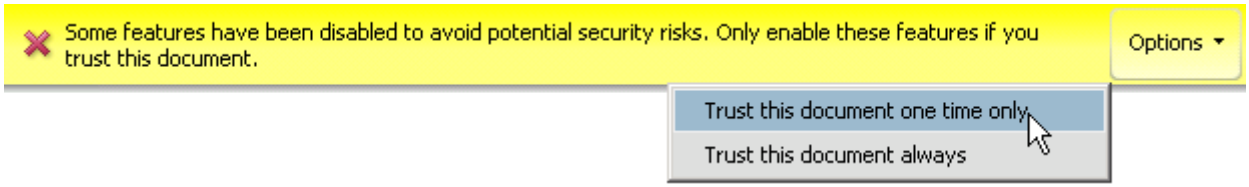
For 9.3 and 8.2, modal dialogs have been replaced by a Yellow Message Bar. The options button allows users to trust once or always. Choosing **Always** adds the item to the already existing Trusted Documents list.

> **Note**
>
> For versions 8.2-9.3 to 9.4.7-10.1.1, this feature does not interact with enhanced security and the Trusted Documents list is not the same as the privileged locations list. Trust is stored in a file called TMDocs.sav.

9.3-8.2 & later: Multimedia user trust assignment locked



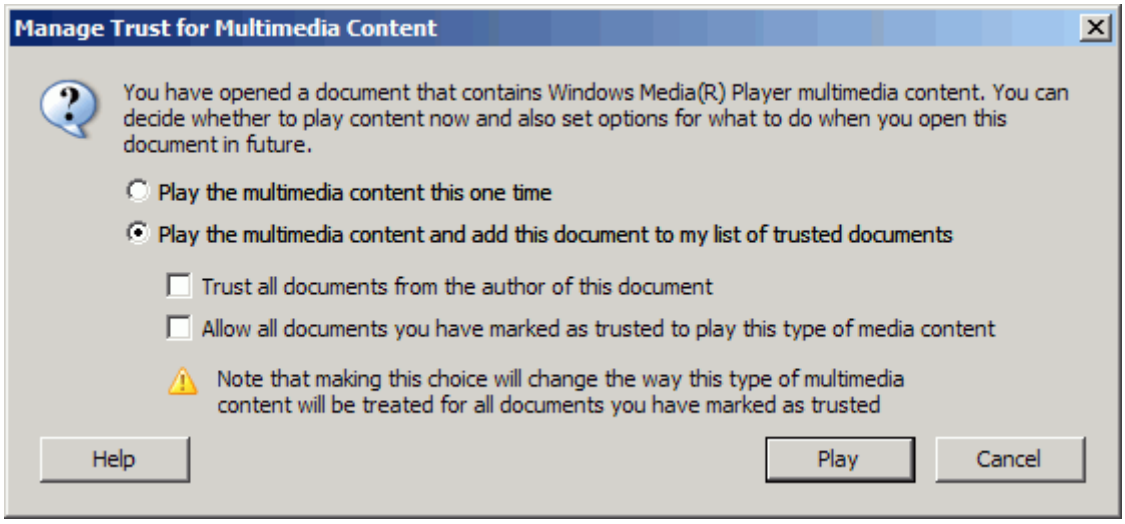
9.3-8.2 & later: Multimedia user trust assignment not locked



8.2.3.3 Up to 9.2-8.1.7

These product versions displayed the dialog below rather than the YMB.

9.2-8.1.7 and earlier: Manage Trust for Multimedia Content dialog



8.3 XObjects

Changes across releases: XObject (external stream) access

Version	Change
pre 9.2	External streams can be managed through preferences in the user interface.
8.1.7 & 9.2	External streams can be blocked by enabling enhanced security.

The application can inform you when a PDF file tries to access external content identified as a stream object by flags which are defined in the *PDF Reference*. For example, an URL might point to an image external to the document. Only PDF developers create PDF files with streams, so you may not need to enable access to external content. This feature interacts with enhanced security as shown below:

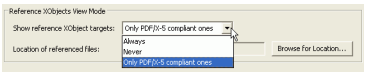
XObjects and enhanced security

XObject setting	Enhanced Security	Behavior
Never	On	No XObject access; proxy displays, if any.
Never	Off	No XObject access; proxy displays, if any.
Always	On (w/ privileged location set)	XObject displays.
Always	Off	No XObject access; proxy displays, if any.

To configure external content access:

1. Choose **Preferences > Page Display**.
2. Configure the Reference XObjects View Mode panel. Set **Show reference XObject targets** to:
    - Always
    - Never
    - Only PDF/X-5 compliant ones
3. Set the location of referenced files (if any).
4. Choose **OK**.

Resource access



8.4 3D content (9.5.1 and later)

9.x products change the default behavior with 9.5.1 because the dynamic nature of 3D provides the potential for it to be subject to security vulnerabilities. Several new changes have been implemented:

- 3D is disabled by default.
- The user interface has a new checkbox at **Preferences > 3D and Multimedia > Enable 3D Content**.
- 3D content has been integrated into the Trust Framework so that it's possible to display 3D content for trusted content even when 3D is disabled. The feature allows you to:
    - Disable or enable 3D content.
    - Trust files, folders, and hosts as privileged locations via **Preferences > Security (Enhanced) > Privileged Locations** panel so that when a PDF with 3D content opens:
        - If it is trusted, the 3D content renders.
        - If it is not trusted, a Yellow Message Bar appears which says "Some features have been disabled due to potential security risks. Only enable these features if you trust this document."
        - **Options** button provides the **Trust Once** and **Trust Always** options.
- Enterprise IT can configure the end user settings via `HKCU\Software\Adobe\<product name>\<version>\3D\bEnable3DContent`.
- Enterprise IT can disable and lock 3D rendering so that the user cannot change the setting via `HKLM\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown\bEnable3D`.

> **Note**
>
> This is a 9.5.1-only change since Protected Mode in 10.x products provides effective mitigation against 3D attack vectors.

8.5 Flash integration

Beginning with 9.5.1, Adobe Reader and Acrobat no longer include a Flash Player for displaying Flash in PDF files. Instead, rendering Flash content embedded in a PDF now requires that a Flash Player already resides on the user machine. This new strategy simplifies Acrobat and Reader deployments by reducing the number of future required updates should a security issue arise. Moreover, you can now manage and update Acrobat products and Flash individually.

If you open a PDF that requires Flash, a dialog prompts you to download and install the latest Flash player. To preinstall Flash, go here:

- **Windows**: Adobe Reader and Acrobat Flash Player Download for Windows
- **Macintosh**: Adobe Reader and Acrobat Flash Player Download for Mac

Note

Flash de-coupling is not available in Safari for this release. Otherwise, Acrobat 9.x products require the Flash Player browser plug-in (Safari and Firefox) version 11.2 or higher. Flash Player 11.2 stopped supporting Windows 2000 and Mac OS lower than 10.6. Therefore, users need at least Windows XP and Mac OS 10.6.x to view Flash content in a PDF.

Enterprise IT can control how Flash plays within PDFs by setting the bEnableFlash registry entry (Win) or EnableFlash plist entry (Mac). When set to 0, Flash only plays if the PDF is a trusted privileged location. The paths are as follows:

- **32 and 64-bit XP**:
  `HKLM\SOFTWARE\Policies\Adobe\[Adobe Reader|Adobe Acrobat]\9.0\FeatureLockDown\bEnableFlash`
- **64-bit Windows 7**:
  `HKLM\SOFTWARE\Wow6432Node\Adobe\[Adobe Reader|Adobe Acrobat]\9.0\ FeatureLockDown\bEnableFlash`
- **Macintosh**:
  `Contents::MacOS::Preferences << FeatureLockdown << /EnableFlash [ /b false ] >>`

Flash configuration

Setting	Behavior
bEnableFlash = 0	Flash does not play within PDFs.
bEnableFlash = 1	Default. Same as when the key is not present. Play Flash in any PDF file without restriction.

Note that this change results in two new behaviors:

- When `bEnableFlash = 0`, Flash content is rendered as an empty, white box and does not play. A yellow message bar also appears at the top of the document stating that "Some features are disabled to avoid potential security risks."
- When `bEnableFlash = 1`, Flash plays if there is a system player present. If a player is not found, then the user is prompted to download the latest version.

9 Trust Methods

Ideally, you've enabled and configured all of the product's security mechanisms and are now ready to assign trust to elements in your workflows. Available trust mechanisms include:

9.1 Privileged locations

Privileged locations (PLs) are synonumous with "trusted locations." PLs are the primary way that users and administrators can specify trusted content that should be exempt from security retrictions. The feature behaves as follows:

- A privileged location may be a file, folder, or host.
- There may be an HKCU list and an HKLM list: administrator's can lock down the feature in HKLM so that users cannot change the setting.
- Privileged locations can be permanently disabled or enabled by the administrator.
- The Trust Manager hive does not appear in the registry until the user interface is exercised. However, you can create it manually.
- Configuration may occur via the user interface or directly in the registry.
- If configured through the user interface, the privileged location ID only may or may not appear under under all the possible cabs. Functionality changes across releases, so test the UI and see what trust is assigned.
- Permissions granted by other features often overlap. For example, cross domain policies, internet access settings in Trust Manager, and certificate trust settings for certified documents sometimes interact so that the most permissive setting takes precedence. Users should TEST THEIR CONFIGURATION prior to deployment.
- All key (tID) names under a particular cab must be unique.
- You can also elevate Trusted Win OS zones to privileged locations.

9.1.1 Changes across releases

Evolution of the privileged location feature

Version	Change
9.0	Privileged locations introduced as a way to assign trust to content blocked when enhanced security is enabled.
8.1.7	Enhanced security added for 8.1.7.
8.2 & 9.3	• Enhanced security turned on by default, so the use of privileged locations becomes critical.
9.3.4	• `cJavaScriptURL` was introduced thereby adding a way to restrict JavaScript invoked URLs via enhanced security. Trust can be assigned through privileged locations. • Trusting a location as a privileged location also trusts that location for high privileged JavaScript. cJavaScript is populated. • Trusting a location as a privileged location also trusts that location for blacklisted JavaScript APIs. cUnsafeJavaScript is populated.

10.0	• Wildcards are supported when specifying hosts as privileged locations. • A sandbox for Reader is introduced called Protected Mode (PM). PM restrictions can be overridden via privileged locations.
10.1	• Folder trust is recursive by default. • `bDisableDefaultRecursiveFolderTrust` was introduced to disable the default recursive trust. • A sandbox for Acrobat is introduced called Protected View (PV). PV restrictions can be overridden via privileged locations.
9.5 & 10.1.2	• Wild card handling for trusted hosts now conforms to the Cross Domain Specification. • The error dialog for invalid trusted host names that use wildcards is improved. • A new preference (`cTrustedSitesPrivate`) allows IT to permit less restrictive wildcard usage when specifying trusted hosts. • `bDisableTrustedFolders` in HKLM now removes Options button from YMB when disabled and locked. • `bDisableJavaScript` in HKLM allows locking the JS engine off. An admin's privileged location list in HKLM can bypass this restriction. • The Win OS Security Zone setting in the Privileged Locations panel now includes Local Intranet zones in addition to the current Trusted Sites zone. The product should assign trust as Internet Explorer does. • LC Workspace XFA in Flex forms will now honor Win OS trust zone override. • Legacy multimedia trust is stored in cMultiMedia. Prior versions stored trust for legacy multimedia type in a file called TMDocs.sav. Possible values include:

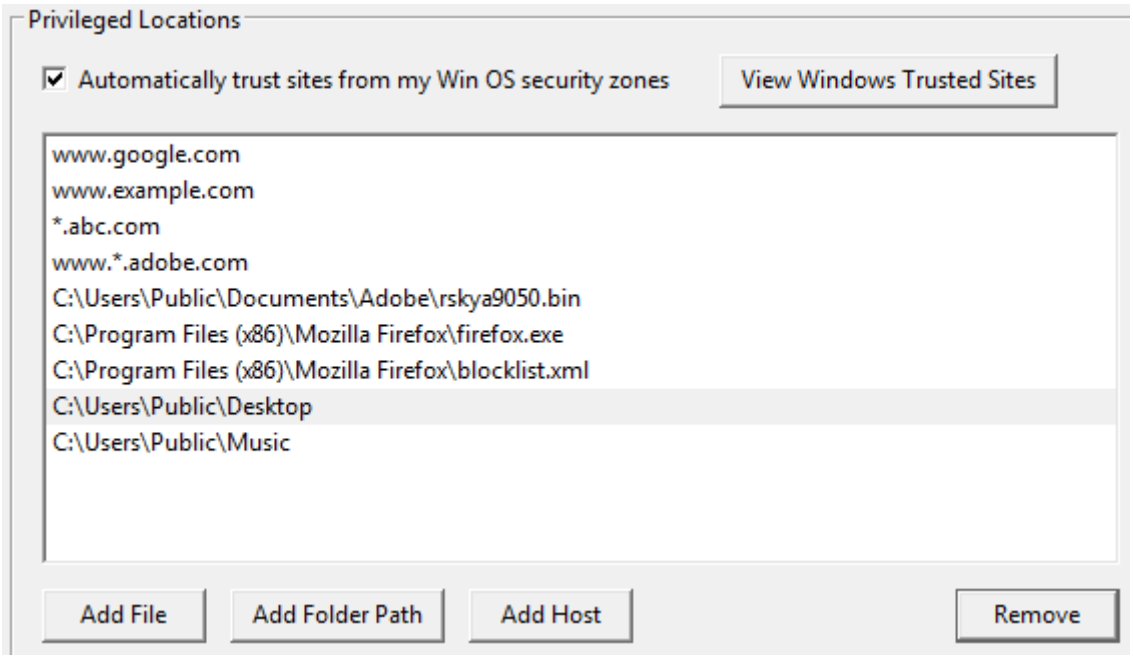
9.1.2 UI configuration

To specify a privileged location through the user interface:

1. Go to **Preferences > Security (Enhanced)**.
2. Set a privileged location by selecting one of the following buttons:

    - **Add File**: A file is defined by a path, so its security settings will be invalid if that file is moved.
    - **Add Folder Path**: Prior to 10.1, trust is not recursive. With 10.1 and later, trust is recursive but can be disabled via a registry preference.
    - **Add Host**: Enter the complete name of the root URL only with no wildcards. For example, www.adobe.com but not www.adobe.com/lc. To specify HTTPS, select **Secure Connections Only**.
3. Choose **OK**.

Privileged locations

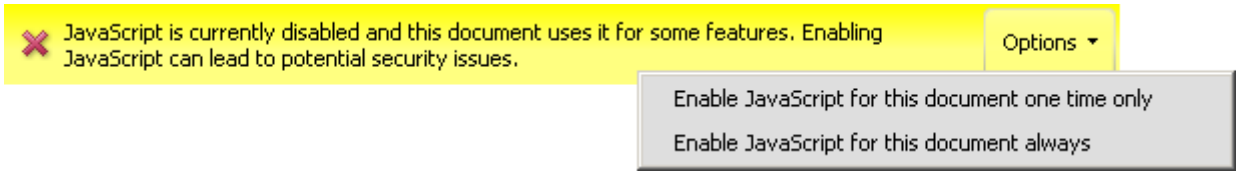


9.1.3 UI (on-the-fly) config.

Whenever a PDF opens that contains content which is blocked by a security feature, a Yellow Message Bar (YMB) appears. If the feature has not been disabled by the administrator, users can trust the document on-the-fly as follows:

- When the YMB appears, choose **Options**.
- Choose from one of the available trust options which vary by feature. Choosing **Trust Always** adds the current item to privileged locations.

YMB with trust options



9.1.4 Registry configuration

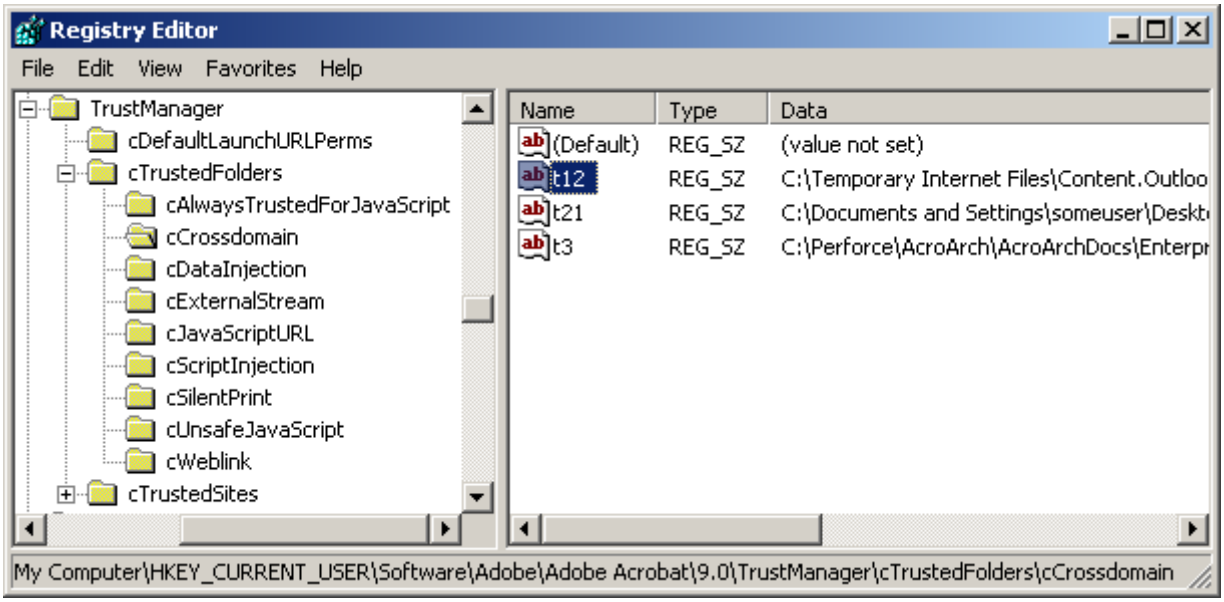
The application stores information about privileged location trust in the registry and plist. Once a file is trusted via the UI or YMB, a `t<unique id>` is added to each of the cabs under `cTrustedFolders|cTrustedSites`. The container cab determines which restriction the document can bypass. For example, a tID under `cCrossDomain` allows cross domain access. For a complete list of available preferences see the Preference Reference.

While you can create PLs manually at the registry level, it's easier to use the UI and then propagate those settings across your organization with the Wizard or post deployment via GPO or some other method. If you do decide to manually edit the registry, note the following:

- `TrustManager\cTrustedFolders` contains cabs for trusted folders AND files.
- `TrustManager\cTrustedSites` contains cabs for trusted http and https hosts.
- Each t(ID) must be unique. In the example below, t3 could reside in each of the cabs, but there could not be more than one t3 in each cab.

```
[HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager\cTrustedFolders\cCrossdomain]
"t3"="C:\\Documents and Settings\\username\\My Documents\\acrobat_logo16.png"
```

Protected View: trust set in the registry



9.1.5 Recursive directory trust

Recursivity is on by default with 10.1. Prior to 10.1, if you make a folder a privileged location its subdirectories are not automatically included. To make trust recursive, do the following:

1. Go to `HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager\cTrustedFolders\`.
2. For each subkey (e.g. cCrossdomain) where trust should be recursive, go to the subkey.
3. For each folder ID that should be recursive, modify the name by appending *_recursive* to it.

Registry Configuration: Recursive trust

```
[HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager\cTrustedFolders\cScriptInjection]
t5_recursive"="C:\\Aardvark"
```

9.1.6 Disabling Priv. Locations

You can disable and lock the ability to add privileged locations by setting the preferences as shown in the example below. This feature allows administrators to control what users can trust. Simply lock the feature and provide your own trust list to user machines. To do so, set the following:

> **Note**
>
> 11.0 introduces support for locking on Macintosh.

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown]
"bDisableTrustedFolders"=dword:00000001
"bDisableTrustedSites"=dword:00000001
```

9.1.7 Wildcard and host trust

10.x products support the use of wildcard matching of subdomain components for trusted host URLs. For example, for a basic URL of a.b.c.adobe.com, you can wildcard on all of a, b, or c. It is required that at least the first subdomain is specified (adobe in this case). So `*.corp.adobe.com` or 11lcforms.*.adobe.com`` works, but `*.forms.corp.adobe.com` or `lcforms.corp.*.com` will not.

Wild cards also work with IP addresses. For example, when http:// 153.39.154.100 or its wildcard combinations such as 153.39.154.* or 153.39.*.100 or 153.*.154.* are added to OS trusted locations, then the File opens outside PV.

9.1.8 Trusting IE trusted sites

You can also elevate Trusted Win OS zones to privileged locations since these are already under IT control. Prior to 10.1.2/9.5, `bTrustOSTrustedSites` provided trust for Trusted Sites. Beginning with 10.1.2 and 9.5, trust is also extended to Local Intranet Zones.

> **Note**
>
> Choosing **Trust sites from my Win OS security zones** extends trust to files when PV is set to **Potentially unsafe locations**. When set to **All Files**, then OS trusted sites does allow PDFs to open outside of PV.

To make Internet Explorer's trusted sites and zones behave as PLs:

1. Go to **Preferences > Security (Enhanced)**.
2. Check **Automatically trust sites from my Win OS security zones**.
3. Choose **OK**. This options sets:

```
[HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager]
"bTrustOSTrustedSites"=dword:00000001
```

9.1.8.1 Locking IE trusted sites

Windows OS trust can be locked so that users can't change the setting via the UI as follows by setting `bDisableOSTrustedSites` as follows:

- **0**: Disables trusting sites from IE and locks the feature.
- **1**: Enables trusting sites from IE and locks the feature.

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Adobe\<product name>\<version>\FeatureLockDown]
"bDisableOSTrustedSites"=dword:00000000
```

9.2 Internet access

URLs can be blocked or allowed globally, or URL-specific settings can be created. See *8.1 Internet access* for details.

9.3 Certified document trust

11.0 introduces the ability to elevate any certified document to a privileged location for the Windows and Macintosh versions of Reader and Acrobat. When set, certified documents become trusted for exemption from the same security restrictions from which other privileged locations are exempt. Note the following:

- The PDF's certification signature must be valid and chain to a trusted root.
- The setting is off by default.
- The one exception to such trusted PDF's parity with privileged locations is that this level of trust does not apply when the PDF is viewed in Protected View.

To enable this feature:

1. Choose **Edit > Preferences** (Windows) or **(application name) > Preferences** (Macintosh).
2. Select **Security (Enhanced)** in the Categories panel.
3. Check **Automatically trust documents with valid certification**. This sets:

```
[HKEY_CURRENT_USER\Software\Adobe\<product>\<version>\TrustManager]
"bTrustCertifiedDocuments"=dword:00000001
```

To lock the setting, set the following:

```
[HKLM\SOFTWARE\Policies\Adobe\<product>\<version>\FeatureLockDown\
 "bEnableCertificateBasedTrust"=dword:00000001
```

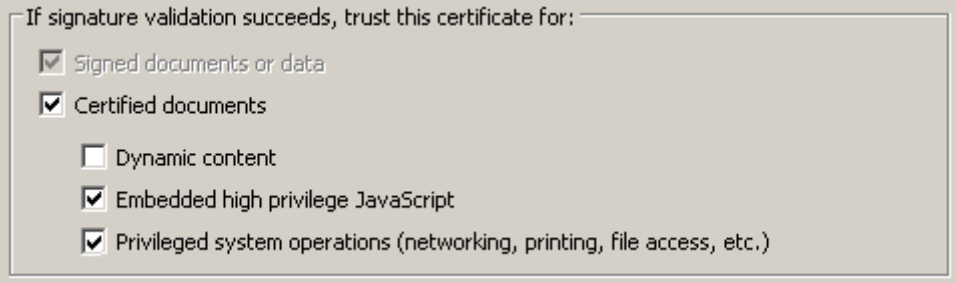
9.4 Per-certificate trust

Trust can be configured on a per-certificate basis so that certified documents signed with a specific certificate can be made exempt from some security restrictions. For the certification signature, the signature must be valid and the certificate must chain to a valid and trusted root certificate.

To set certificate trust:

1. Open Acrobat.
2. Do one of the following to open the Trusted Identities List:
    - 9.x: Choose **Security > Manage Trusted Identities** and from the **Display** drop down list, choose **Certificates**.
    - 10.x: Choose **Tools > Sign and Certify > More Sign and Certify > Manage Trusted Identities** and From the **Display** drop down list, choose **Certificates**.
    - 11.x: Choose **Edit > Preferences > Signatures > Identities and Trusted Certificates > More** and select **Trusted Certificates**.
3. Select a certificate.
4. Choose **Edit Trust**.
5. Check one or more of the following.
    - **Dynamic content**: Enables multimedia. See *8.2 Multimedia (legacy)*.
    - **High privileged JavaScript**: Enables HP JS execution. See *5.8 High privileged JavaScript*.
    - **Privileged network operations**: Enables those operations which are blocked when Enhanced Security is enabled. See *4 Enhanced Security*.
6. Choose **Ok**.

Certificate trust options



9.5 Cross domain trust

For details about setting up trust for cross domain access other than via privileged locations, see *7 Cross Domain Configuration*.

9.6 XObject (stream) access

Preference configuration can be a mystery if you don't take to time to understand related features and how they interact. For example, enhanced security settings interact with certificate trust settings and Trust Manager settings. The following provides just one use case where two settings must be configured to get one feature to work as expected.

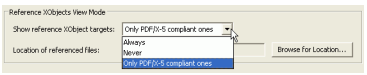
Since reference XObjects access external content, security is a concern. Therefore, XObject (external stream) access requires that such access be granted though the user interface (or registry) and that the referencing document is specified as trust-worthy when cross domain access is involved.

To configure XObject access:

To configure external content access:

1. Choose **Edit > Preferences > Page Display** (Windows) or **Acrobat > Preferences Page Display** (Macintosh).
2. Configure the Reference XObjects View Mode panel by setting **Show reference XObject targets**.
3. Set the location of referenced files (if any).
4. Choose **OK**.

Resource access



To configure trust via the registry:

1. Open the registry editor.

. Go to
`HKEY_CURRENT_USER\Software\Adobe\<product>\<version>\TrustManager\cTrustedFolders\cExternalStream`.

3. Right click and choose **New String**.
4. Enter a document ID in the form of t(some integer).
5. Right click on the new ID and choose **Modify**.
6. Enter the path to the trusted document in the Value Data field.

Go to
`HKEY_CURRENT_USER\Software\Adobe\<product name>\<version>\TrustManager\cTrustedFolders\cCrossdomain`
and repeat the same steps. Use the same ID and value.

Note

Other XObject settings can be configured via the UI or in the registry as described in the Preference Reference for Acrobat and Adobe Reader.

10 Content security

Application security is all about hardening the application against malicious attacks. Content security is designed to protect workflows and content within the application's secured environment. The product's application security options as well as its content security features such as digital signatures, encryption, and permissions provide unparallelled control over PDF-based workflows. These two are not always functionally distinct, and both are critical components of information assurance. For example, signing certificates in certified documents can be used to assign trust for operations that would otherwise be restricted by enhanced security.

This guide focuses solely on application security--configuring the application to enable, disable, or restrict features and PDF functionality that may pose a security risk. In all cases, configuration may occur before or after deploying clients. For details about content security features, refer to the digital signatures and document security documentation.

Information assurance components