Camtasia Relay®

Server Security Administrator Guide

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Contents

Introduction

The purpose of this guide is to help Camtasia Relay administrators securely deploy and manage Camtasia Relay within their organization's network environment. The target audience for this guide is Camtasia Relay administrators who *manage the server environment in which Camtasia Relay is hosted but also desire some* assistance in making these servers more secure.

This guide provides high-level guidance for hardening Windows Server, IIS, SQL Server, and Camtasia Relay so the environment hosting Camtasia Relay is more secure against attacks. In many cases, the default settings for these components will be appropriate for your organization but this guide should help those administrators who wish to put in the extra effort to further improve their security. Please note that this document is not an extensive guide for hardening your organization's servers against attacks, this guide is only intended to help you get started. Where possible, we provide links to resources to help you further secure the environment where Camtasia Relay is hosted.

Please note that network security is outside the scope of this guide. This document does not provide any guidance on network security issues such as designing a secure network architecture for Camtasia Relay Server(s) (and associated components), network monitoring, or the use of network security appliances such as firewalls, intrusion detection/prevention systems (IDS/IPS), web application firewalls (WAF), etc. This guide is not intended to supersede your organization's network security policies and procedures; it is meant to complement them.

Also note this guide does not discuss several areas of server security such as setting up appropriate access control to the physical machine, auditing policies/log monitoring, and maintaining server backups. Administrators are encouraged to seek out additional resources to accomplish these tasks.

Every organization's network, policies, and business needs are different. Administrators should take care that any configuration changes do not conflict with your organization's business needs, policies, and applicable standards and regulations.

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Reduce Attack Surface

The majority of recommendations in this guide deal with disabling (or not installing) services not needed by Camtasia Relay to reduce the attack surface of your Camtasia Relay deployment. Attack surface can be intuitively defined as the number of ways in which an attacker can enter the system and potentially cause damage. The rationale behind reducing attack surface is simple: if a service is not needed then it should be removed or disabled so that an attacker cannot target that service. Removing unneeded services also makes hardening components easier (for example, patch management is simplified as there are fewer services that require patching.)

There are usually multiple ways to adjust the settings for many of the components discussed in this guide. We typically only present one set of steps for changing these settings. Please use whatever method you feel is appropriate to manage configuration settings.

Segregation of Duties

Camtasia Relay should only be deployed on a dedicated server. Other services such as mail, DNS, or other web applications should not be hosted on the server hosting Camtasia Relay. This simplifies configuration and administration. Segregation of duties also helps to ensure that security weaknesses in one service do not lead to compromises of other services hosted on the same server (since those services are instead hosted on other servers.)

Keep Patches Up-to-Date for All Components

Update all components in your network with the most recent patches from their respective vendors, if possible. This includes Windows Server, IIS, SQL server, Camtasia Relay, LDAP server software, email server software, etc. Keeping all components up to date helps ensure that your network is protected against previously discovered-and-fixed vulnerabilities; detailed information and exploit code is widely available for many of these previously discovered-and-fixed vulnerabilities. For many components (for example, Windows Server, SQL Server), automatic updates are available so that the system automatically detects and installs new patches and updates.

Strong Passwords

Many of the components involved in hosting Camtasia Relay (including Windows Server accounts, SQL Server users, and Camtasia Relay accounts) rely on passwords for distinguishing authorized users from everyone else. Attackers commonly attempt to guess passwords to gain access to these systems as an authorized user. These attacks are typically executed using automated scripts that try thousands of passwords including common passwords, dictionary words, and random combinations of characters. One of the best defenses against password guessing attacks is the use strong, or hard-to-guess, passwords. Strong passwords should:

- Have 8 characters in length or more.
- Combine letters, numbers, and symbols.
- Not include words from the dictionary.
- Be different than your username or account name.
- Be different than passwords used for other systems.

For more suggestions and information on strong passwords, please see the article**: Strong Passwords and Password Security** at **http://www.microsoft.com/protect/yourself/password/create.mspx**.

Know Your Servers

Security is about risk management and trade-offs; in the case of server hardening, increasing security is about managing the risk of an attacker taking advantage of an enabled service with the trade-off of not being able to use that service if it is disabled. An important prerequisite for server hardening is the detailed knowledge of the purpose of the server, its services, and hosted applications and how these services and applications are used by your organization. With this information, you can make informed and intelligent decisions about how to manage your servers' configurations in order to increase security. In other words, we would like to reiterate that every organization's network, policies, and business needs are different. Server administrators should take care that any configuration changes made do not conflict with your organization's business needs, policies, and applicable standards and regulations.

Suggested Workflow for this Guide

We suggest the following workflow for installing Camtasia Relay and server hardening.

1. **Install Windows Server**. Start with a fresh install to reduce the number of installed services and therefore reduce the server's attack surface.
2. **Install Camtasia Relay Server**. To install the Camtasia Relay Server, you need to install a number of prerequisites. This guide contains suggestions for securely configuring several of these prerequisites.
    a. **Enable the Application Server Role**. If you are installing the Application Server Role prerequisite, see **Installing the Application Server Role** on page 13.
    b. **Acquire a Server SSL Certificate.** If you are installing the prerequisite SSL certificate see **Configure SSL** on page 18.
3. **Server Hardening.** After installing Camtasia Relay, follow the suggestions in this guide to further secure Camtasia Relay's hosting environment. If you are new to managing Camtasia Relay and server security see **Server Hardening Quick Start Guide** on page 8. Otherwise we suggest you follow this guide in the presented order, starting with **Firewall Rules** on page 9 through **Camtasia Relay Security Features** on page 25.

Server Hardening Quick Start Guide

There is a lot to do when hardening your network and servers against attacks and the amount of work required can be intimidating at first. There are many configuration changes suggested in this guide and many more possible improvements that can be found in other resources.

To help you get started quickly, this section lists the five things, at minimum, you should do to improve the security of Camtasia Relay's environment:

- **Patch Your Servers**.
  Update all components to the latest patch level, especially Windows Server and SQL Server and enable automatic updates if possible.
- **Use Restrictive Firewall Rules.**
  Set Firewall rules to "Deny All" and only open the ports specified in the section "Firewall Rules" for servers hosting Camtasia Relay.
- **Use and Enforce Strong Passwords.**
  Use strong passwords for the Windows Server administrator account, SQL Server users, and Camtasia Relay administrator accounts.
- **Enable Only the Application Server Role.**
- Enable only the Application Server role on any Windows Servers hosting Camtasia Relay. No other roles should be enabled. See **Installing the Application Server Role** on page 13.
- **Use a Valid Server SSL Certificate.**
  Obtain a valid server certificate for SSL from a well-known Certificate Authority. See **Configure SSL** on page 18.

These five items should help you quickly get started on improving the security of the servers hosting Camtasia Relay. Once you feel comfortable with these five items you can move on to other items in this guide and suggestions from other resources.

Firewall Rules

The following ports are always required for Camtasia Relay to work properly.

Component	Protocol	Ports	Direction
Camtasia Relay Web Application and Service	TCP	80, 443	Incoming
DNS	TCP/UDP	53	Outgoing
NTP	UDP	123	Outgoing

Additional ports may also be required by the operating system or other software (for example, port 1663 for Windows KMS activation.)

Ports Required by Publishing Destination

Depending upon the publishing destinations used by your Camtasia Relay profiles, you may need to open the following ports.

Publishing Destination	Protocol	Ports	Direction
Screencast.com	TCP	80, 443	Outgoing
FTP	TCP	Add the executables “w3wp.exe” and “RelayPublisher.exe” as exceptions. (See below for more details.)	Outgoing
File System	N/A	Check the “File and Printer Sharing” checkbox under Windows Firewall Exceptions.	N/A
File System (Microsoft File Sharing SMB)	TCP/UDP	135-139	Outgoing
File System (Direct-hosted SMB)	TCP/UDP	445	Outgoing
ITunes U	TCP	80,443	Outgoing

FTP Publishing

FTP Publishing requires you to add the following executables as outgoing exceptions to Windows Firewall:

- **w3wp.exe** (located at C:\WINDOWS\system32\inetsrv by default)
- **RelayPublisher.exe** (located at C:\Program Files\TechSmith\Relay Server\Manager by default)

If configuring a network firewall, the TCP port 21 outgoing and the ephemeral port range (TCP 1024 through 4999 outgoing) should be open for FTP publishing.

Add a Windows Firewall Exception

To access a program through the Windows firewall:

1. In the *Windows Firewall* dialog box, on the **Exceptions** tab, click **Add Program**.
2. Click **Browse**, and navigate to the program executable you wish to access through the firewall, and click **Open**.
3. Click **OK** twice to close the Windows firewall program.

Conditional Ports

Depending upon the configuration of Camtasia Relay and the features enabled, you may need to open the following ports.

Feature	Protocol	Ports	Direction
Email Notification / SMTP	TCP	25 (default SMTP port) or Specified SMTP port	Outgoing
LDAP Authentication	TCP	389 (default LDAP port) or 636 (default LDAP SSL) or Specified LDAP port	Outgoing
Blackboard Notification	TCP	80, 443	Outgoing

- If email notification is enabled, the SMTP port specified in the SMTP configuration must be open (outgoing) between all Camtasia Relay servers and the designated SMTP server.
- If LDAP authentication is enabled, the LDAP port specified in LDAP configuration must be open (outgoing) between all Camtasia Relay servers and the designated LDAP server.
- If Blackboard notification is enabled, then ports 80 and 443 must be open (outgoing) between all Camtasia Relay servers and the designated Blackboard server.

Local SQL Server

You do not need to open ports if Camtasia Relay uses an instance installed on the same machine. However, by default, Camtasia Relay will attempt to connect using TCP/IP and if the appropriate firewall ports are not open (see **Remote SQL Server Ports** on page 11**)** then this connection will fail.

To enable Camtasia Relay with restrictive firewall rules, change the Camtasia Relay Server's configuration files:

- **data.config** (located in the Manager directory of Camtasia Relay's installation directory, typically C:\Program Files\TechSmith\Camtasia Relay\Manager\)
- **web.config** (located in the Web directory of Camtasia Relay's installation directory, typically C:\Program Files\TechSmith\Camtasia Relay\Web\)

For each of these files, do the following:

1. Open .config in a text editor.
2. Find the connection string for the relay instance. For example:

```
<add name="RelayConnectionString" connectionString="Data Source=<servername>\RELAY;
Initial Catalog=Relay; User Id=relay; Password=<password>; Pooling=True;" />
```

3. Change the server name to "(local)" and save the file.

The Camtasia Relay Configuration Protection Tool can also be used to change the connection string in both the data.config and web.config file. Please see **Configuration Protection Tool** on page 37 in the **Camtasia Relay Security Features** section for more information.

Remote SQL Server Ports

If Camtasia Relay is deployed in a teaming configuration or is configured to use a remote SQL server you must choose to either:

- list the SQL server executable as an exception to blocked programs or
- configure the database engine to use a specific TCP/IP port and open this port on servers hosting Camtasia Relay and SQL server.

We recommend listing the SQL server executable as an exception for simplicity.

Use Dynamic Ports / List SQL Server as an Exception

By default, Camtasia Relay uses dynamic ports to access the named 'relay' instance. To continue to use dynamic ports you can list the SQL Server executable (Sqlservr.exe) and SQL Browser as exceptions to the blocked programs on the server hosting the database. Please note that only one instance of SQL Server can be accessed in this way. See **Add a Windows Firewall Exception** on page 10 to add SQL Server and SQL Browser as exceptions to Windows Firewall rules.

By default, SQL Server (Relay) is located at C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Binn\Sqlservr.exe and SQL Browser is located at C:\Program Files\Microsoft SQL Server\90\Shared\sqlbrowser.exe. Note that these file paths are dependent on the SQL installation but in most cases the directory structure should be similar. For example, SQL Server (Relay)'s location could change based on the instance identifier in the path (MSSQL.1 in the example above.)

Note that under the Scope tab of the firewall rule, access could be restricted to only allow access from Camtasia Relay servers for increased security.

On the application server hosting Camtasia Relay (not the SQL Server), it is easiest to create a rule that allows full access to the remote SQL server. When using a named instance, SQL Server binds multiple dynamic ports and it is difficult to create a set of firewall rules that will cover all of the possible ports in order to allow the Camtasia Relay server to communicate with the remote SQL Server. Therefore it is easiest to create a rule to allow the Camtasia Relay Server full outbound access to the remote SQL Server.

Use Static Ports

You may want to use static ports by configuring the database engine to use a specific TCP/IP port and then opening this port on servers hosting Camtasia Relay and SQL server. Please see the following resources for more information on configuring static ports.

- **How to Configure a Firewall for SQL Server Access:**
  http://msdn.microsoft.com/en-us/library/ms175043(SQL.90).aspx
- **How to Configure a Server to Listen on a Specific TCP Port (SQL Server Configuration Manager):**
  http://msdn.microsoft.com/en-us/library/ms177440(SQL.90).aspx

Firewall Rules Resources

- **Service overview and network port requirements for the Windows Server system**
  http://support.microsoft.com/kb/832017
- **Windows 2003 - Windows Firewall Technical Reference**
  http://technet.microsoft.com/en-us/library/cc779199.aspx
- **Windows Firewall Center**
  http://technet.microsoft.com/en-us/network/bb545423.aspx

Windows Server Hardening

Securing the Windows Server operating system is an important part of securing your network. A few steps can reduce the attack surface of Windows Server. After installing Camtasia Relay, you should:

- Delete or disable unused system accounts.
- Disable the Windows guest account.
- Rename the administrator account.
- Enforce a strong password policy for all accounts. For instructions on how to configure a password policy, please see the article **Enforcing Strong Password Usage throughout Your Organization** at **http://technet.microsoft.com/en-us/library/cc875814.aspx.**

In addition to simple steps, properly configuring the roles and services on the server can further help secure it.

Required Server Roles

When installed on Windows Server 2003/2008, Camtasia Relay requires that the Application Server role be enabled. No other roles are required.

Installing the Application Server Role

Windows Server 2008

Follow the directions for installing the application server role (**http://technet.microsoft.com/en-us/library/cc754684.aspx**) and install only the server role services specified in step number seven below.

To install the Application Server role:

1. Select **Start** > **Server Manager**.
2. If the *User Account Control* dialog box appears, confirm that the action it displays is what you want, and click **Continue**.
3. On the **Action** menu, select **Add Roles**.
4. The *Add Roles Wizard* appears. Click **Next**.
5. The *Select Server Roles* page appears. Select the **Application Server** check box and click **Next**. If the *Add Features Required for Application Server* dialog appears, click **Add Required Features**.
6. Information about the Application Server role appears. Familiarize yourself with the information, and click **Next**.
7. On the *Select Role Services* page, only install the Web Server (IIS) support service role. Other service roles are not required by Camtasia Relay. Select Web Server (IIS) support and click **Next**. If the Add Required Services dialog appears, verify the services to be added are appropriate and click **Next**.
8. Click **Install** to begin installing the Application Server role with the options that appear on the page. When the installation process is finished, the status of the installation appears on the *Installation Results* page.

Windows Server 2003

Use the following procedure to install the application server role:

To install the Application Server role:

1. Select **Start** > **Server Manager**.
2. Click **Add or remove a role**.
3. The *Configure Your Server Wizard* appears. Click **Next**.
4. Select **Application server (IIS, ASP.NET)** and click **Next.**
5. On the *Application Server Options* page, select the **Enable ASP.NET** checkbox. Click **Next**. (Do not check FrontPage Server Extensions.)
6. On the *Summary of Selections* page, click **Next.**
7. The *Windows Components Wizard* will appear. Insert your Windows Server Service Pack 2 CD when prompted.

Resources for Installing and Configuring the Application Server Role

- **Running IIS 6.0 as an Application Server on Windows Server 2003**
  http://technet.microsoft.com/en-us/library/cc756814.aspx
- **Installing and Configuring Application Server on Windows Server 2008**
  http://technet.microsoft.com/en-us/library/cc731311.aspx

Security Configuration Wizard

Disable Unnecessary Services

If you are installing Camtasia Relay on a new installation of Windows Server 2008 then the default services installed for the operating system and the application server role are most likely appropriate for your organization. If you install Camtasia Relay on Windows Server 2003, especially an older installation of Windows Server or alongside other applications (note this both violates the principle of segregation of duties and the Camtasia Relay specifications), then it may be appropriate to disable unneeded services in order to further harden your server.

Use the Security Configuration Wizard to disable unneeded services and further harden Windows Server 2003. Please see the articles (such as the SCW Quick Start Guide) under **Security Configuration Wizard for Windows Server 2003** at **http://www.microsoft.com/windowsserver2003/technologies/security/configwiz/default.mspx**.

The Security Configuration Wizard is also available for Windows Server 2008 and is very similar to the Security Configuration Wizard used for Windows Server 2003.

Windows Server Auditing

It may be useful to monitor successful/failed logons, policy changes, and resource access for the Windows Server hosting Camtasia Relay. You can use the Security Configuration Wizard to choose specific resources to audit. Alternatively, you can use Windows server's Administrative tools to edit the local security policy. Refer to the Windows Server documentation for help using the Security Configuration Wizard.

- **Security Configuration Wizard for Windows Server 2003**

  http://www.microsoft.com/windowsserver2003/technologies/security/configwiz/default.mspx
- **Security Configuration Wizard for Windows Server 2008**

  http://technet.microsoft.com/en-us/library/cc771492.aspx

IIS Hardening

To access IIS settings for the Camtasia Relay web site: Click **Start** and navigate through **Administrative Tools** and click **Internet information Services (IIS) Manager**.

Windows Server 2008 / IIS 8

Remove Unnecessary HTTP headers

Remove unneeded HTTP headers that may be configured in IIS such as “X-Powered by ASP.NET”.

1. In IIS Manager, select the server name on the left.
2. Double click on **HTTP Response Headers.**
3. Select any items listed in the table and click **Remove**.
4. The *HTTP Response Headers* removal confirmation dialog appears. Click **Yes**.

Remove Unnecessary Extensions

1. In IIS Manager, select the server name on the left.
2. Double-click on **Handler Mappings**.
3. Remove any entries in the table with a **Path** value of *.rem, *.asmx, trace.axd, and WebAdmin.axd as well as the OPTIONS Verb Handler.
   a. Select the entry you wish to remove.
   b. Click **Remove.**
   c. The *Confirm Remove* dialog appears. Click **Yes**.

Remove Unnecessary HTTP Methods

On Windows Server 2008, we consider it unnecessary to remove any HTTP verbs. The HTTP verbs enabled by default should be appropriate.

Windows Server 2003 / IIS 6

Remove Unnecessary HTTP Headers

Remove unneeded HTTP headers that may be configured in IIS such as “X-Powered by ASP.NET”.

1. In IIS Manager, right-click on **Web Sites** and click **Properties**.
2. Click the **HTTP Headers** tab.
3. Select any items in the *Custom HTTP headers* box and click **Remove.**
4. You may be prompted to also remove the custom header from child websites. Click **Yes**.

Remove Unnecessary Extensions

Camtasia Relay requires the following application extensions to be enabled: .ashx, .aspx, .axd, .config, .jrpc, .svc, and .merge. All other extensions can be safely removed.

1. In IIS Manager, click on the plus symbol next to **Web Sites**.
2. Click the plus symbol next to the website where Camtasia Relay will be installed ("Default Web Site" for Express installation).
3. Right-click **Relay** and select **Properties.**
4. The *Relay Properties* page appears. Click on the **Virtual Directory** tab.
5. Click on the **Configuration** button on the right side of the page.
6. Remove all extensions *except*: .**ashx**, **.aspx**, **.axd**, **.config**, **.jrpc**, **.svc**, and **.merge**.
   a. Select the application extension and click **Remove**.
   b. A confirmation dialog appears. Confirm that the action it displays is what you want, and click **Yes.**

Remove All HTTP Methods Except GET, POST, and HEAD

For all remaining extensions, remove all HTTP methods except GET, POST, and HEAD.

1. In IIS Manager, click on the plus symbol next to **Web Sites**.
2. Click the plus symbol next to the website where Camtasia Relay will be installed ("Default Web Site" for Express installation)**.**
3. Right-click on **Relay** and select **Properties.**
4. The *Relay Properties* page appears. Click on the **Virtual Directory** tab.
5. Click on the **Configuration** button on the right side of the page.
6. Remove all HTTP methods except GET, POST, and HEAD for the extensions: .ashx, .aspx, .axd, .config, .svc, and .merge.
   a. Select the application extension to change and click **Edit**.
   b. In the Limit to: text box, remove any words that are not GET, HEAD, POST.
7. Remove all HTTP methods except POST for the extensions: .jrpc.
   a. Select the application extension .jrpc and click **Edit**.
   b. In the **Limit to:** text box, remove any words that are not POST.

Restart IIS for changes to take effect

You must restart IIS for the changes you made (removing HTTP headers, removing unnecessary extensions, removing HTTP methods) to take effect.

1. Click **Start** and navigate through **Administrative Tools** and click on **Services.**
2. The *Services* window appears. Find **IIS Admin Service** in the list.
3. Right-click on **IIS Admin Services** and click **Restart**.
4. You are prompted to restart other services (World Wide Web Publishing Services and HTTP SSL). Click **Yes**.

Configure SSL

Camtasia Relay requires SSL in order to protect users' sensitive data in-transit and to provide assurance that users are communicating with the right server. With SSL, all data transmitted to the website is encrypted and integrity-protected. To enable SSL, a valid SSL server certificate is needed.

There are three ways to obtain a server certificate:

- Purchase a server certificate from a commercial Certificate Authority (CA).
- Request a server certificate from your organization's internal CA.
- Create a self-signed server certificate for test purposes. Self-signed certificates should not be used for any purpose other than testing.
  - Using a self-signed certificate will result in users' browsers warning them about visiting the Camtasia Relay web application and in some cases may block them from visiting Camtasia Relay altogether.
  - Using a self-signed certificate opens a web server up to certain network-level (man-in-the-middle or server spoofing) attacks which can result in an attacker gaining access to user data (passwords for example) as well as the ability to modify user requests.

We urge you to use a server certificate well-known Certificate Authority, if possible.

Request a Server Certificate in Windows Server 2008

1. Click **Start** and navigate through **Administrative Tools** and then click **Internet information Services (IIS) Manager**.
2. In the *Connections* pane**,** click on server name.
3. In *Features View* of the Relay site, double-click Server Certificates.See the Microsoft article Configuring Server Certificates in IIS 7.0 (**http://technet.microsoft.com/en-us/library/cc732230.aspx**) for further instructions on obtaining, installing, and managing server certificates.

Bind a Server Certificate to the Relay Web Site in Windows Server 2008

1. In IIS Manager, click on the plus symbol next to server name.
2. Click on the plus symbol next to **Sites**.
3. Click on **Default Web Site**.
4. Click on **Bindings…**
5. The *Site Bindings* page appears. Click **Add.**
6. The *Add Site Binding* page appears. Select **https** from the dropdown menu.
7. Select the server certificate to add to the Relay web site from the **SSL certificate** dropdown menu.
8. Click **View** to view the server certificate. Review the certificate information to ensure the certificate is valid and the information is correct. Click **OK** when you are finished reviewing the certificate.
9. Click **OK**.

Request a Server Certificate in Windows Server 2003

To request a certificate in the first two situations, use the Web Server Certificate Wizard**.**

1. Click **Start** and navigate through **Administrative Tools** and then click **Internet information Services (IIS) Manager**.
2. Click on the plus symbol next to **Web Sites**.
3. Right-click on **Default Web Site** and click **Properties**.
4. The *Default Web Site Properties* page appears. Click the **Directory Security** tab.

5. Click the **Server Certificate** button.
6. The *Web Server Certificate Wizard* appears. Using the Web Server Certificate Wizard you can request a server certificate from your organization's internal CA or from a commercial CA.

See Microsoft's article Certificates_IIS_SP1_Ops (**http://technet.microsoft.com/en-us/library/cc757474.aspx**) article for further instructions on obtaining, installing, and managing server certificates.

Bind a Server Certificate to the Relay Web Site in Windows Server 2003

1. In IIS Manager, click on the plus symbol next to the server name.
2. Click on the plus symbol next to **Web Sites**.
3. Right-click on **Default Web Site** and click **Properties**.
4. Click on the **Directory Security** tab.
5. Click on the **Server Certificate** button.
6. The *Web Server Certificate Wizard* appears. Click **Next**.
7. Select the **Assign an existing certificate** radio button. Click **Next**.
8. Select the server certificate to install and click **Next**.
9. Review the certificate information to ensure the certificate is valid and the information is correct. Click **Next** when you are finished reviewing the certificate.
10. Click **Finish**.

Disable Older Versions of SSL and Weak Ciphers

Older versions of the SSL protocol have well-known vulnerabilities and should no longer be used. Certain ciphers, used to perform encryption, are also no longer considered secure and should not be used.

On Windows Server 2008, both SSLv2 and PCT 1.0 are disabled by default. Furthermore the ciphers enabled by default on Windows Server 2008 are appropriate.

Windows Server 2008 SSL Ciphers: **http://technet.microsoft.com/en-us/library/cc766285.aspx**

On Windows Server 2003, both older versions of SSL and certain ciphers should be disabled by following the directions below.

Disable SSLv2 and PCT 1.0 on Windows Server 2003 / IIS 6

1. Click **Start**, click **Run**, type **regedt32**, and click **OK**.
2. In Registry Editor, locate the following registry keys:
   - HKey_Local_Machine\System\CurrentControlSet\Control\SecurityProviders \SCHANNEL\Protocols\PCT 1.0\Server
   - HKey_Local_Machine\System\CurrentControlSet\Control\SecurityProviders \SCHANNEL\Protocols\SSL 2.0\Server
3. For each key, do the following:
   a. On the **Edit** menu, select **New** > **DWORD Value**.
   b. In the *Value Name* box, type **Enabled**, and then press **Enter**.
   c. Double-click the value to edit its current value.
   d. Type **00000000** in Hexadecimal Editor to set the value of the new key equal to "0".
   e. Click **OK**. Restart the computer.

Resource: **http://support.microsoft.com/kb/187498/en-us**

Disable Weak Ciphers on Windows Server 2003 / IIS 6

1. Click **Start**, click **Run**, type **regedt32**, and click **OK**.
2. In Registry Editor, locate the following registry keys:
   - HKey_Local_Machine\System\CurrentControlSet\Control\SecurityProviders \SCHANNEL\Ciphers\RC2 40/128
   - HKey_Local_Machine\System\CurrentControlSet\Control\SecurityProviders \SCHANNEL\Ciphers\RC4 40/128
3. For each key, do the following:
   a. On the **Edit** menu, click **New** > **DWORD Value**.
   b. In the *Value Name* box, type **Enabled**, and then press **Enter**.
   c. Double-click the value to edit its current value.
   d. Type **00000000** in Hexadecimal Editor to set the value of the new key equal to "0".
   e. Click **OK**. Restart the computer.

Resource: **http://support.microsoft.com/kb/245030**

SSL Resources

- **Configuring Server Certificates in IIS 6.0**
  http://technet.microsoft.com/en-us/library/cc757474.aspx
- **Configuring Server Certificates in IIS 7.0**
  http://technet.microsoft.com/en-us/library/cc732230.aspx
- **TechSmith Support Center: How can I create a self signed SSL certificate for use with Relay?**
  http://techsmith.custhelp.com/cgi-bin/techsmith.cfg/php/enduser/std_adp.php?p_faqid=1999
- **SSLDigger**
  http://www.foundstone.com/us/resources/proddesc/ssldigger.htm
  You can use this freely available tool to check your server for weak SSL ciphers and to determine if you have older versions of SSL installed.
- **Microsoft SSLDiagnostics**
  http://www.microsoft.com/DownLoads/details.aspx?FamilyID=cabea1d0-5a10-41bc-83d4-06c814265282&displaylang=en
  You can use this freely available tool to help diagnose problems with your SSL configuration on Windows Server 2003.

SQL Server Hardening

Hardening the SQL database server helps ensure that your users' data is protected from attackers. Similar to securing Windows Server, several simple steps can help reduce the attack surface of SQL server. You should:

- Delete or disable unused system accounts.
- Disable the Windows guest account.
- Rename the administrator account.
- Enforce a strong password policy for all accounts.
- Ensure that SQL Server is using the most up to date Service Pack and patches. (Camtasia Relay expects SQL Server Express 2005 Service Pack 3 or later.)

Disable Unused SQL Services

The services **SQL Server (Relay)** and **SQL Server Browser** are needed. On a new install of SQL Server these should be the only services installed. If you configure Camtasia Relay to use a SQL Server that has other SQL services enabled and these services are no longer needed, then you may wish to disable them.

Restrict SQL Server Protocols

Restricting what protocols can be used to access SQL server reduces the attack surface the database.

1. Click **Start** and navigate to the **Microsoft SQL Server** program group, through **Configuration Tools** to click on **SQL Server Configuration Manager**.
2. Expand **SQL Server 2005 Network Configuration** and click on **Protocols for RELAY.**
3. Disable SQL Server Protocols for RELAY**:**
   a. **Remote SQL Server Deployment**: Make sure that TCP/IP and Shared Memory are the only SQL Server protocols that are enabled. Right click on the protocols you wish to enable and click **Enable**; right click on any protocols you wish to disable and click **Disable.**
   b. **Local SQL Server Deployment:** Make sure that Shared Memory is the only SQL Server protocol enabled.
4. Expand **SQL Native Client Configuration** and click on **Client Protocols.**
5. Disable Client Protocols:
   a. **Remote SQL Server Deployment**: Make sure that TCP/IP and Shared Memory are the only SQL Server protocols that are enabled.
   b. **Local SQL Server Deployment:** Make sure that Shared Memory is the only SQL Server protocol enabled.

Restrict Remote Access

Restrict Remote Logons

Use the Local Security Policy tool to remove the "Access this computer from the network" user right from the Everyone group to restrict who can log on to the server remotely.

1. Click **Start** and navigate through **Administrative Tools** and then click **Local Security Policy.**
2. Click on the plus symbol next to **Local Policies**.
3. Click on **User Rights Assignment.**
4. Double-click on the **Access this computer from the network** entry in the list.
5. The *Access this computer from the network Properties* page appears. Select **Everyone** from the list and click **Remove**.
6. Click **OK**.

Disable Null Sessions (Anonymous Logons)

Null sessions allow for anonymous access which can allow an attacker to connect to your server without authentication.

Restrict null sessions by setting RestrictAnonymous=1 in the registry at the following location.

```
HKLM\System\CurrentControlSet\Control\LSA\RestrictAnonymous=1
```

Secure Communication Between Relay and SQL

You may need to take steps to protect the communication between Camtasia Relay and a remote SQL server (such as when using Camtasia Relay's teaming features.) The communication should either be encrypted (for example, by using SSL or IPSec) or the remote SQL server should be deployed such that attackers cannot intercept traffic to and from the SQL server.

In the case of deploying the SQL server such that attackers cannot intercept traffic to and from the SQL server, the Camtasia Relay Server should be deployed in a demilitarized zone (DMZ) in your network and this DMZ should be physically or logically segmented from the internal network by a stateful packet inspection (SPI) firewall or other network security device. The point-to-point communication between any Camtasia Relay Servers and the remote SQL server should not be across any public network. The remote SQL server should be placed in a more secure portion of your network than the DMZ and should not be publicly accessible, if possible.

In the case of using SSL or IPSec to encrypt Camtasia Relay's communication with a remote SQL server, the following instructions should help you get started.

SSL

1. Obtain a valid SSL Certificate for SQL Server. See **Configure SSL** on page 18 for more information on how to obtain and configure a server certificate. In order for SQL server to use the SSL certificate it must meet certain requirements, which are listed here: **http://technet.microsoft.com/en-us/library/ms189067(SQL.90).aspx**.
2. **Configure SQL Server to use the SSL certificate**.
   a. Before SQL Server can be configured to use the SSL certificate, the account used to run the SQL Server service must be given permission to access the SSL certificate. This account is typically the 'NetworkService' account. Microsoft's freely available WinHttpCertCfg tool can be used to grant the NetworkService access to the certificate. Please note that this tool must be used with the same Windows account used to install the certificate. For information on using the WinHttpCertCfg tool see the following resources:
      i. **http://msdn.microsoft.com/en-us/library/aa384088(VS.85).aspx**
      ii. **http://blogs.technet.com/mscom/archive/2007/05/30/how-to-get-sql-to-accept-the-cert-or-a-day-or-two-in-the-life-of-an-mscom-debug-engineer-part-2.aspx**
   b. Once the certificate has been installed in server's certificate store and the SQL server service's account has access to the certificate, SQL can be configured to use this certificate. See the instructions here on how to configure SQL to SSL: **http://technet.microsoft.com/en-us/library/ms189067(SQL.90).aspx**. Alternatively:
      i. Click **Start**, in the Microsoft SQL Server 2005 program group, point to **Configuration Tools**, and then click **SQL Server Configuration Manager**.
      ii. Click the plus symbol next to **SQL Server 2005 Network Configuration.**
      iii. Right click on **Protocols for RELAY** and select **Properties**.
      iv. On the **Certificate** tab, select the appropriate SSL certificate.
      v. On the **Flags** tab, select **Force Encryption: Yes**.
      vi. Click **OK**.

IPSec

Alternatively, IPSec may be used to encrypt communication between Camtasia Relay and a remote SQL server. It should be noted though that configuring and deploying IPSec may be considered much more complicated and heavily dependent upon your organization's network architecture. The following resources may help you configure IPSec.

- **IPSec Overview:**
  http://technet.microsoft.com/en-us/network/bb531150.aspx
- **Data Access Security – Secure Communication:**
  http://msdn.microsoft.com/en-us/library/aa302392.aspx#secnetch12_securecommunication
- **How To: Use IPSec to Provide Secure Communication Between Two Servers:**
  http://msdn.microsoft.com/en-us/library/aa302413.aspx
- **Using IPsec for Network Protection**:
  http://technet.microsoft.com/en-us/library/cc512617.aspx

Server Auditing

It may be useful to monitor successful/failed logons, policy changes, and resource access for the Windows Server hosting your SQL server. See **Windows Server Auditing** on page 15 for instructions on setting up auditing.

SQL Server Security

You can change or verify many advanced settings to increase the security of SQL Server. The default settings created by the Camtasia Relay installer are appropriate in many cases. However, if you (1) are using a remote SQL database with Camtasia Relay and (2) the remote SQL Server used by Camtasia Relay has other database instances installed (in the past or currently), and (3) you are comfortable using SQL Server Manager to manage SQL server configuration settings, then it may be appropriate to further secure SQL server using these advanced settings. If so, see **Appendix A: SQL Server Security** on page 50 for suggestions on securely configuring SQL server.

Resources for SQL Server Hardening

Security Considerations for SQL Server: **http://msdn.microsoft.com/en-us/library/ms161948.aspx**

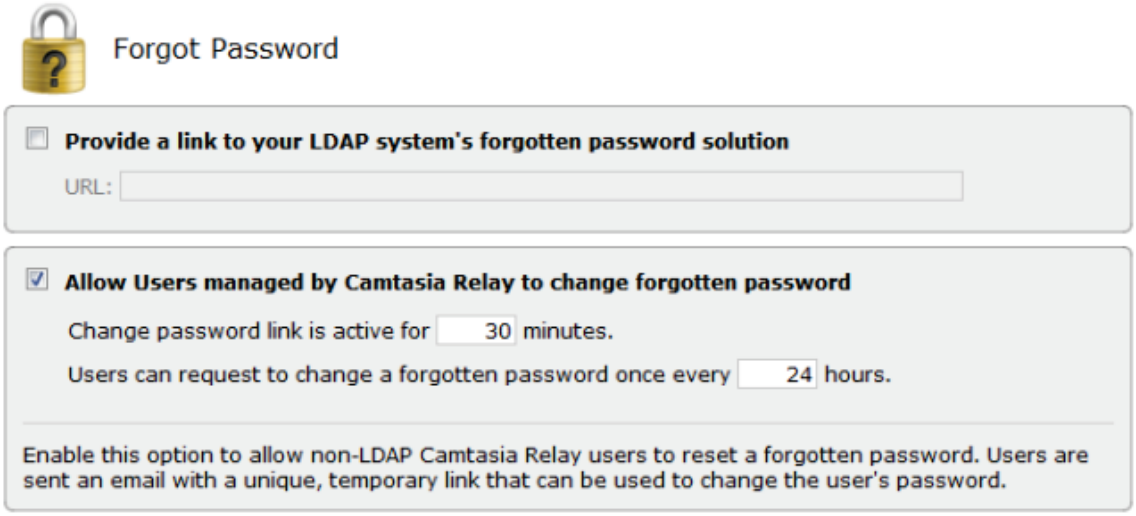
Camtasia Relay Security Features

Camtasia Relay includes several features you can configure to increase the security of Camtasia Relay user accounts.

Forgotten Password Policy

You can allow users managed by Camtasia Relay to change their password if they have forgotten their password.

When this feature is enabled, Camtasia Relay can provide a link to your organization's forgotten password solution and/or allow users managed by Camtasia Relay (not LDAP users) to change their forgotten password. You can configure Camtasia Relay's forgotten password policy on the Camtasia Relay website on the User Account Security Settings page (/Relay/SecuritySettings.aspx.)



The table below describes the behavior of the forgotten password feature for each possible configuration.

Configuration	User Type	Behavior
LDAP Forgotten Password Link Enabled Only	Users managed by LDAP	Users who follow the forgotten password link on the website will be redirected to the specified URL for your LDAP system's forgotten password solution. Users who follow the forgotten password link on the recorder will be redirected to ~/Relay/ContactAdmin.aspx which will include a link to the specified URL.
	Users managed by Relay	
Camtasia Relay Forgotten Password Enabled Only (*demonstrated in the image above*)	Users managed by LDAP	Users who follow the forgotten password link on the website and recorder will be sent to ~/Relay/ForgotPassword.aspx where the user can submit a CAPTCHA-protected form to request that a unique link be sent to the email address stored for their account. The email sent to users managed by LDAP will instruct them to contact their administrator.

	Users managed by Relay	Users who follow the forgotten password link on the website and recorder will be sent to ~/Relay/ForgotPassword.aspx where the user can submit a CAPTCHA-protected form to request that a unique link be sent to the email address stored for their account. The email sent to users managed by Camtasia Relay will contain a unique link that is active for a short amount of time. The forgotten-password link leads to a second CAPTCHA-protected form (~/Relay/NewPassword.aspx) that users can use to change their password.
Both Forgotten Password Features Enabled	Users managed by LDAP	Users who follow the forgotten password link on the website and recorder will be sent to ~/Relay/ForgotPassword.aspx where the user can submit a CAPTCHA-protected form to request that a unique link be sent to the email address stored for their account. The email sent to users managed by LDAP will include a link to the specified URL for your organization's LDAP forgotten password solution.
	Users managed by Relay	Users who follow the forgotten password link on the website and recorder will be sent to ~/Relay/ForgotPassword.aspx where the user can submit a CAPTCHA-protected form to request that a unique link be sent to the email address stored for their account. The email sent to users managed by Camtasia Relay will contain a unique link that is active for a short amount of time. The forgotten-password link leads to a second CAPTCHA-protected form (~/Relay/NewPassword.aspx) that users can use to change their password.
Neither Forgotten Password Feature Enabled	Users managed by LDAP	Users who follow the forgotten password link on the website and recorder will be sent to ~/Relay/ContactAdmin.aspx which will instruct the user to contact their administrator.
	Users managed by Relay	

About Forgotten Password for Users Managed by Relay

Enabling this feature increases the attack surface of Camtasia Relay.

When this feature is enabled, users managed by Camtasia Relay can submit a CAPTCHA-protected form to request that a unique link be sent to the email address stored for their account. This unique link is active for a short amount of time; this duration is configured by the Camtasia Relay administrator using the User Account Security Settings at ~/Relay/SecuritySettings.aspx. The forgotten-password link leads to a second CAPTCHA-protected form (~/Relay/NewPassword.aspx) that users can use to change their password.

An attacker may attack this feature by attempting to guess the unique link and if successful, changing a user's password. Therefore the form employs a number of defenses. CAPTCHA should help to prevent brute-force guessing. The link's short duration also limits the number of guesses an attacker can possibly try during the link's lifetime. Lastly, the password change form reports the same results for valid links and invalid links.

To help prevent an attacker from using Camtasia Relay to send unwanted email to users, the forgotten password feature restricts how often a forgotten password email will be sent to users. If a user (or attacker) requests a forgotten password email for a user and the link from this email is not successfully used to change the user's password then Camtasia Relay will not send the user another forgotten password email for an admin-specified time.

Account Lockout

To prevent an attacker from using a brute-force attack to guess users' passwords, you can enable account lockout. With account lockout enabled, both users managed by Camtasia Relay and users who authenticate via LDAP can be locked out of Camtasia Relay after a number of failed login attempts.

Note that account lockout applies equally to presenters and administrators, including the "relayadmin" account. If your organization intends to use account lockout then additional Camtasia Relay administrator accounts should be created to help prevent a denial-of-service attack against administrators. In a denial-of-service lockout attack, an attacker would use a script to continually attempt to login as an administrator account with bad passwords, causing the account to be locked out so that Camtasia Relay administrators could never log in to that account.

Also note there is not currently a way for administrators to unlock user accounts using the web application. Users must either wait for admin-specified duration for their account to be unlocked or if the "Enable CAPTCHA to unlock" option is enabled, the user can unlock their account and login if they successfully complete the CAPTCHA challenge and provide the correct username and password.

There are a number of settings that must be configured for account lockout.

Setting	Description
Lock account after _____ failed login attempts	Determines how many times a user can attempt to login within a short time period (also specified by the administrator) before their account is locked.
Lock account for _____ minutes	Determines how long a user's account will be locked. After this time period has passed the user will be able to log-in (by providing the correct password) assuming that the user does not fail to log-in again (by providing an incorrect password) within the short time period which may result in the user's account being locked again. If the forgotten password feature is enabled, a user's account will be unlocked when a user changes their forgotten password using the feature.
Reset login attempts after _____ minutes	Determines the short time period in which a number of login attempts will lock out a user.
Enable CAPTCHA to unlock	If a user attempts to log-in to the website using a locked out account, they will be redirected to a CAPTCHA-protected log-in form. If a user provides the correct username, password, and solution to the CAPTCHA challenge, their account will be unlocked and the user will be logged in.

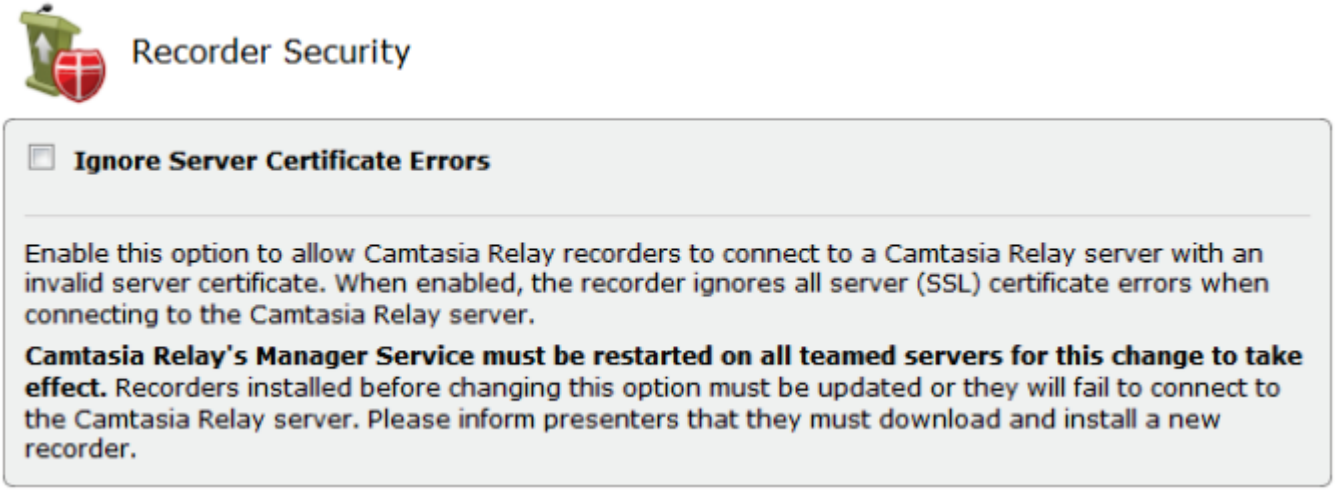
Password Complexity Rules

If password complexity rules are enabled then users managed by Camtasia Relay will be required to provide strong passwords. It is very important to enable this feature to help protect Camtasia Relay users against password guessing attacks. If this feature is not enabled then user passwords are not subjected to any standard of quality.

Please note that users who have set their password prior to enabling this feature may have passwords that do not meet the password complexity rules. Camtasia Relay currently does not warn users or force a password change if their current password does not meet the standard of the password complexity rules. Also note that passwords set for users by an administrator are not subject to password complexity rules. It is the administrator's responsibility to ensure that any administrator-set user passwords are strong passwords.

Password complexity rules are enforced when a logged-in presenter changes their password using the Camtasia Relay web application. If the forgotten password feature is enabled then password complexity rules are also enforced when a user changes their forgotten password using the unique link.

Recorders Ignore SSL Certificate Errors



The Recorder Security tab of the User Account Security Settings page (~ /Relay/SecuritySettings.aspx) includes the option having Camtasia Relay recorders ignore server certificate errors. By default, Camtasia Relay recorders will not connect to a Camtasia Relay server with an invalid server certificate. When "Ignore Server Certificate Errors" is enabled, the Camtasia Relay recorder will ignore all server certificate errors when connecting to a Camtasia Relay server.

After the "Ignore Server Certificate Errors" has changed, the Camtasia Relay recorders willbe unavailable for several minutes until they are rebuilt to reflect the security change. All Recorders installed before changing this option must be updated or they may fail to connect to the Camtasia Relay server. Presenters must download and install the new recorder.

Alternatively, for presenters using the PC Recorder, a change can be made to the Recorder's UploaderService.config file rather than having presenters download and install the new recorder. Follow these instructions to edit the UploaderService.config file on a machine where the PC Recorder is installed:

1. Navigate to the Uploader directory of the PC Recorder's installation directory (C:\Program Files\TechSmith\Camtasia Relay\Uploader\ by default.)
2. Open the UploaderService.config file in a text editor.

3. Change the value of the following line in the file:
   True indicates that the Recorder should ignore certificate errors when connecting to the Camtasia Relay server. **False** indicates that the Recorder will fail to connect if the Camtasia Relay server has an invalid server certificate.

   ```
   <IgnoreSslCertificateErrors>True</IgnoreSslCertificateErrors>
   ```

4. Restart the Uploader Service by executing (double-click) the "RestartUploader.cmd" command (in the Uploader directory). This command requires Administrative privileges on the machine.

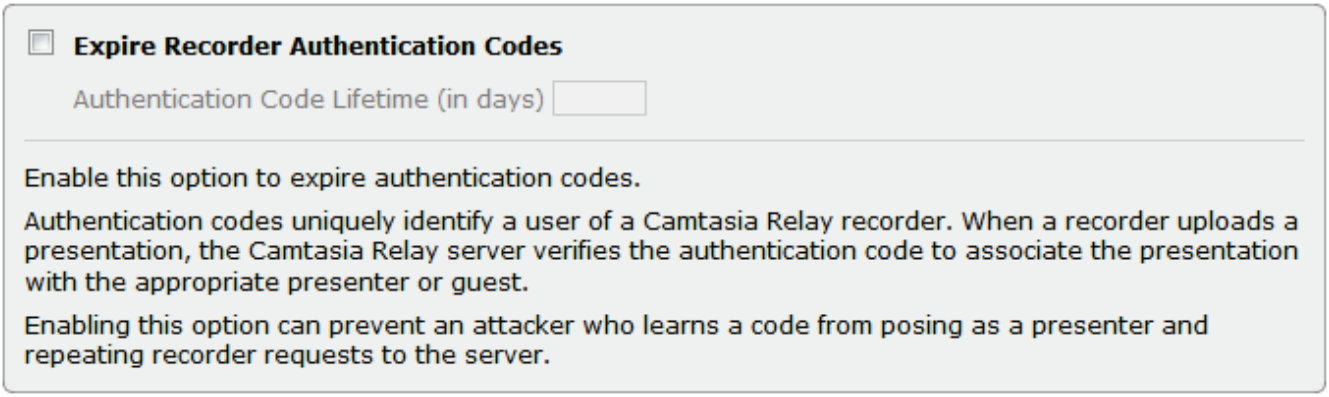
For presenters using the Mac recorder a change can be made to the Mac Recorder's Uploader.plist file rather than having presenters download and install a new recorder. Follow these instructions to edit the Uploader.plist file:

1. Navigate to the Content\Resources directory of the Mac Recorder's installation directory. The Uploader.plist file should be found under Contents\Resources\Uploader.plist.
2. Open the Uploader.plist file in a text editor.
3. Change the value of IgnoreSslCertificateErrors to true or false accordingly.
4. Restart the Uploader service.

The Camtasia Relay Recorder's "Ignore Certificate Errors" feature should only be used for testing purposes (for example, when using a self-signed server certificate when you are unable to or do not wish to add the self-signed certificate to the trusted certificate store.) If possible a valid server certificate should be obtained from a well-known Certificate Authority.

Please note that using an invalid server certificate makes certain network-level (man-in-the-middle or server spoofing) attacks which can result in an attacker learning user passwords or modifying user requests before they reach the Camtasia Relay server. We urge you to use a server certificate from a well-known Certificate Authority, if possible.

Expire Recorder Authentication Codes



The Recorder Security tab of the User Account Security Settings page (~ /Relay/SecuritySettings.aspx) includes the option having the authentication codes used by Camtasia Relay recorders expire. By default, authentication codes never expire. Authentication codes uniquely identify presenters. When a presenter authenticates using the Camtasia Relay recorder, the Camtasia Relay server assigns that presenter an authentication code. The Camtasia Relay recorder uses this authentication code when communicating with the server to associate presentations with the authenticated presenter; the Camtasia Relay server verifies this authentication code before allowing a Recorder to upload a presentation.

If an attacker were able to learn a presenter's authentication code, that attacker could potentially upload presentations as that presenter. By specifying a lifetime for authentication codes, administrators can limit the window when an attacker (who has learned a presenter's authentication code) can upload presentations as that presenter.

Note that presenters using the "Remember Me" functionality on the PC Recorder will need to log out and log in again once their authentication code has expired. Otherwise their presentations will upload as a guest presentation.

Presenters using the Mac Recorder's "Remember Me" feature do not have to log out and log in again; the Mac Recorder securely stores the presenter's password using Keychain and uses the stored password to obtain a fresh authentication code whenever the Recorder is started.

Using a Self-Signed Server Certificate with Camtasia Relay Recorders

The Camtasia Relay Recorders will fail to connect to a Camtasia Relay Server with an invalid server certificate by default. If your organization is using a self-signed server certificate on the Camtasia Relay server then you have several options to allow recorders to connect to the server.

- Add the self-signed server certificate to clients' trusted certificate stores, or
- Modify the recorder's configuration to ignore ***all*** server certificate errors.

Please note that if the self-signed server certificate is added to a client's trusted certificate store then users on that client machine should be able to use a web browser to connect to the Camtasia Relay server website without having to click through a server certificate warning.

PC - Adding Self-Signed Certificate to Trusted Store

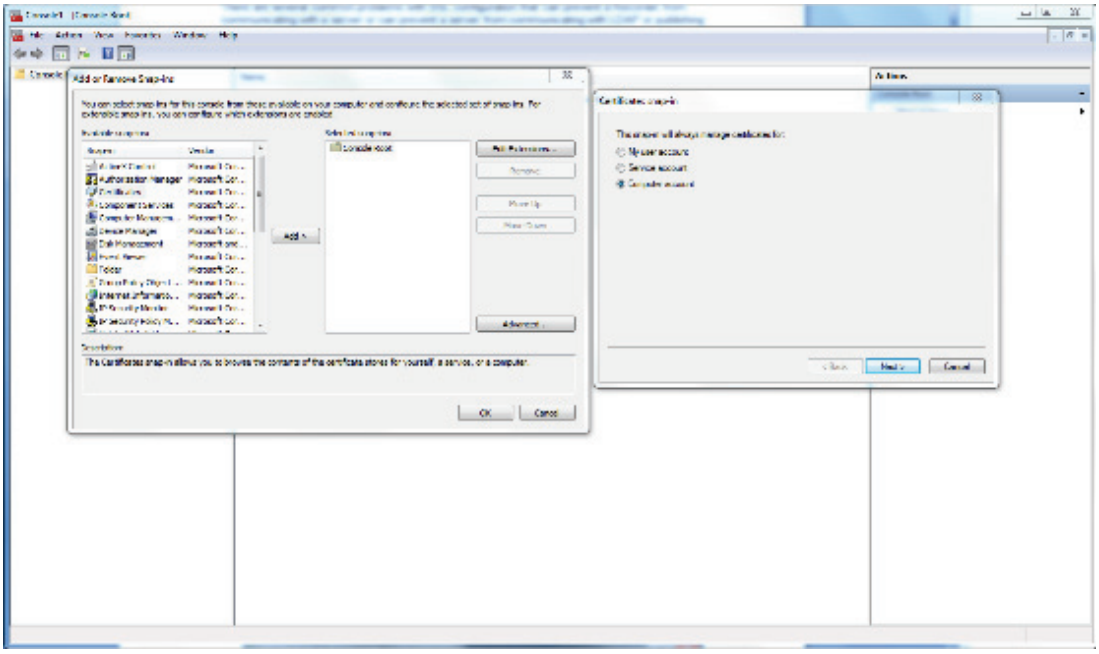
On individual client machines, the "Certificate Manager" snap-in for the Microsoft Management Console (MMC) can be used to install the certificate to the client machine's trusted certificate store.

Alternatively, Windows features such as Active Directory Group Policy (see **http://technet.microsoft.com/en-us/library/cc725911%28WS.10%29.aspx** for more information) can be used manage certificate settings on client machines. Using Group Policy, the self-signed server certificate could be pushed to the certificate stores of clients on the domain, allowing Recorders installed on those client machines to connect to the Camtasia Relay server. (Of course, if your organization is capable of using Group Policy to manage certificate settings it is likely you are also capable of setting up an internal Certificate Authority and obtaining a server certificate for Camtasia Relay from this internal CA; this scenario is preferable to using a self-signed certificate.)

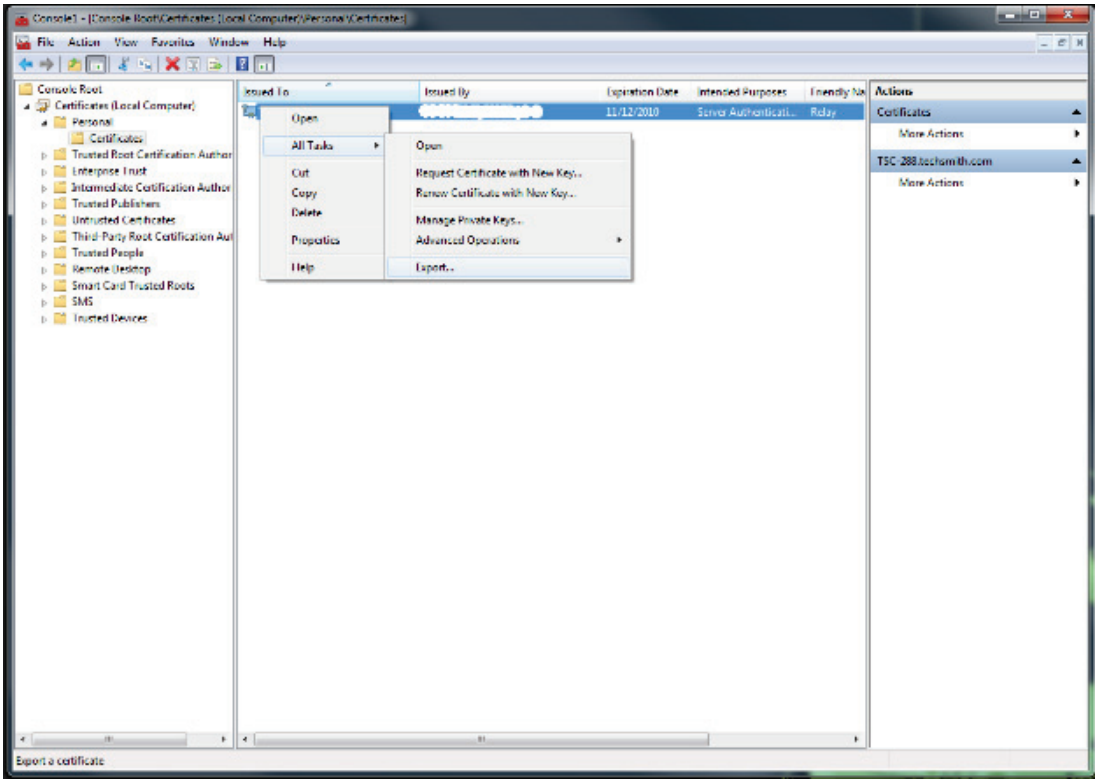
Using MMC Certificate Manager Snap-in to Export a Server Certificate from Server

Follow these instructions to export the server's certificate to a file which can then be copied to PC client machines and imported in order to allow the Camtasia Relay recorder installed on these clients to connect to a server with a self-signed certificate.

1. Launch MMC. Windows Start > Run and type in mmc.
2. In MMC, under the File menu select Add / Remove Snap-in.
3. In the left hand pane, select Certificates and click Add. When prompted, select 'Computer Account' and click Next.



4. When prompted to select a computer, make sure that Local Computer is selected and click Finish.
5. Click OK.
6. Expand the Certificates. Several different types of certificate stores should be displayed (Personal, Trusted Root Certificates, etc.)
7. Expand the Personal certificate store.
8. Click “Certificates”
9. Right click on the self-signed certificate used by the Camtasia Relay server. Select **All Tasks** and click on **Export.** The Certificate Export Wizard appears.



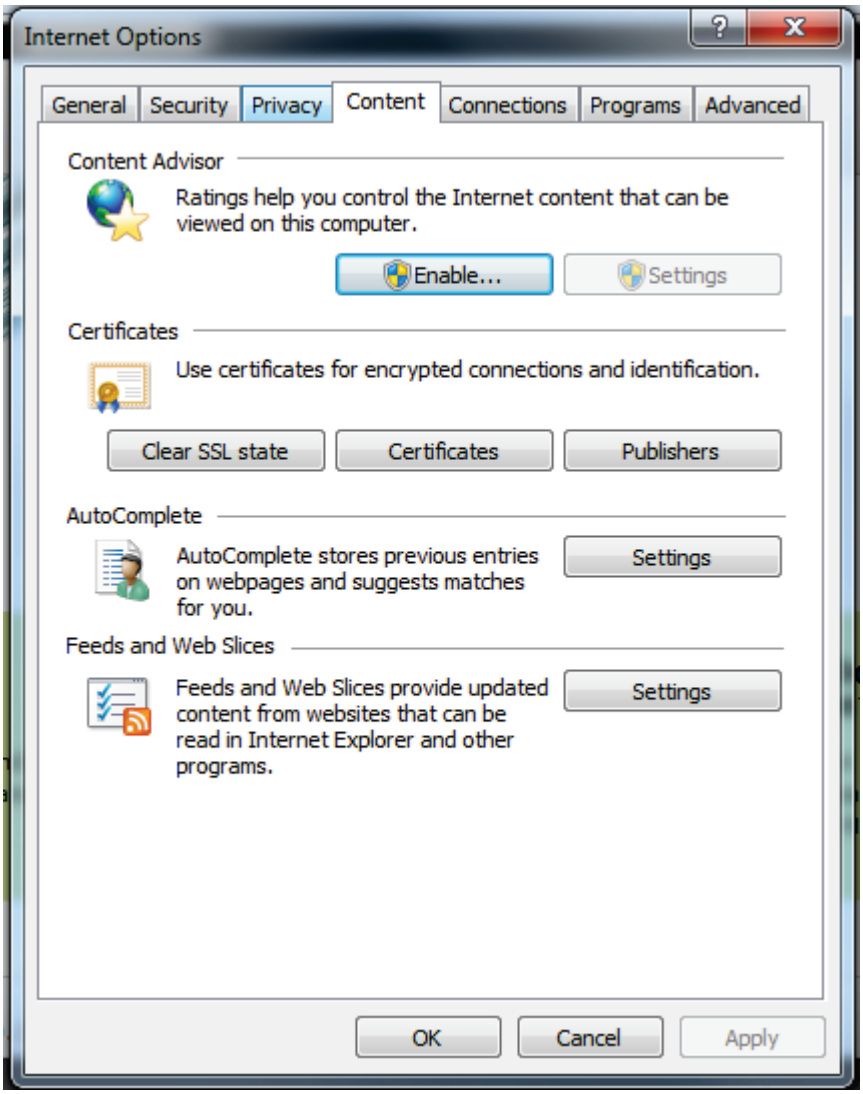
10. Click Next.
11. Select “No, do not export the private key.” Click Next.
12. Select the format you wish export the certificate in (DER encoded binary X.509 should be selected by default and should be suitable.)
13. Provide a location and name for the certificate export file to be saved to. Click Next.
14. Click Finish.
15. Copy the exported certificate file to clients.

Using MMC Certificate Manager Snap-in to Import a Server Certificate to a Client

Follow these instructions to import a server certificate to a PC client’s certificate store.

1. Copy the exported certificate file to the client machine.
2. Launch MMC. Windows Start > Run and type in mmc.
3. In MMC, under the File menu select Add / Remove Snap-in.
4. In the left hand pane, select Certificates and click Add. When prompted, select ‘Computer Account’ and click Next.
5. When prompted to select a computer, make sure that Local Computer is selected and click Finish.
6. Click OK.
7. Expand the Certificates. Several different types of certificate stores should be displayed (Personal, Trusted Root Certificates, etc.)
8. Expand the Personal certificate store.
9. Right click on “Certificates”. Select **All Tasks** and click on **Import.** The Certificate Import Wizard appears.

10. Click Next.
11. Browse to the certificate file to be imported (from step 1.) Click Next.
12. Verify that the Personal certificate store is selected for “Place all certificates in the following store” option and click Next.
13. Click Finish.
14. In Internet Explorer, open the Tools > Internet Options menu. Click on the Content tab. Click ‘Clear SSL state’.



15. The Recorder should now be able to connect to the server. If the Recorder is unable to connect, close the Recorder, restart the Uploader service and open the Recorder again.

Mac – Adding Self-Signed Certificate to Trusted Store

Follow these instructions to add a server certificate to a Mac client's certificate store.

1. Copy the exported certificate file to the client machine.
2. If using OSX 10.6, open the certificate file. Expand the **Trust** node and set **Secure Socket Layer (SSL)** to **Always Trust**.
3. Launch Keychain.
4. On Keychain's **File** menu, select **Import Items**. A file browse dialog appears.
5. Select the exported certificate file (from step 1.)
6. On the **Destination Keychain** dropdown, select the option appropriate for your operating system version:
   - OSX 10.5, 10.6: Select **System**.
   - OSX 10.4: Select **X509Anchors**.
7. Click **Open**. A confirmation dialog appears.
8. Review the details of the certificate and verify they are correct for the Camtasia Relay server. Click **Always Trust**. An administrator username/password dialog appears.
9. Type an administrator's name and password and click **OK**.
10. Select the **System** Keychain and verify that the imported certificate appears in the list.
11. The Recorder should now be able to connect to the server. If the Recorder is unable to connect, restart the Recorder and it should be able to connect.

Modifying Uploader Configuration to Ignore Server Certificate Errors

The configuration file for both Mac and PC Recorder's Uploader service can be modified to

Follow these instructions to edit the UploaderService.config file on a machine where the PC Recorder is installed:

1. Navigate to the Uploader directory of the PC Recorder's installation directory (C:\Program Files\TechSmith\Camtasia Relay\Uploader\ by default.)
2. Open the UploaderService.config file in a text editor.
3. Change the value of the following line in the file:
   True indicates that the Recorder should ignore certificate errors when connecting to the Camtasia Relay server. False indicates that the Recorder will fail to connect if the Camtasia Relay server has an invalid server certificate.
   <IgnoreSslCertificateErrors>True</IgnoreSslCertificateErrors>
4. Restart the Uploader Service by executing (double-click) the "RestartUploader.cmd" command (in the Uploader directory). This command requires Administrative privileges on the machine.

For presenters using the Mac recorder a change can be made to the Mac Recorder's Uploader.plist file. Follow these instructions to edit the Uploader.plist file:

1. Navigate to the Content\Resources directory of the Mac Recorder's installation directory. The Uploader.plist file should be found under Contents\Resources\Uploader.plist.
2. Open the Uploader.plist file in a text editor.
3. Change the value of IgnoreSslCertificateErrors to true or false accordingly.
4. Restart the Uploader service.

This option can also be enabled for clients downloaded from the server in the future using the Recorder Security tab of the User Account Security Settings page (~/Relay/SecuritySettings.aspx) of the Camtasia Relay website. See the **Recorders Ignore SSL Certificate Errors** on page 28

LDAP over SSL

If your organization's LDAP server is deployed in such a way that an attacker may intercept the traffic between Camtasia Relay and the LDAP server then SSL should be used to protect LDAP communications. In this case, SSL is needed to protect the master LDAP user credentials stored and used by Camtasia Relay, as well as the credentials of users that authenticate using LDAP, as they are transmitted to the LDAP server.

1. During LDAP configuration, check the **Use secure authentication (SSL)** option.
2. For convenience and LDAP over SSL testing purposes, Camtasia Relay's LDAP integration feature also offers the ability to "Trust all certificates". Only select this option for testing purposes (for example, when using a self-signed server certificate when you are unable to or do not wish to add the self-signed certificate to the trusted certificate store.) If possible a valid server certificate should be obtained from a well-known Certificate Authority.

   Please note that using a self-signed certificate makes certain network-level (man-in-the-middle or server spoofing) attacks which can result in an attacker learning LDAP passwords or modifying user requests before they reach the LDAP server. We urge you to use a server certificate from a well-known Certificate Authority, if possible.

WebDAV Publishing over SSL

If your deployment of Camtasia Relay uses WebDAV publishing and network architecture is such that an attacker may be able to intercept traffic between Camtasia Relay and the WebDAV server then SSL should be used for WebDAV publishing.

1. When adding or configuring a WebDAV publishing destination, begin the URL of the server with https://
2. For convenience and testing purposes, Camtasia Relay's WebDAV publishing feature also offers the ability to "Trust all certificates". Only select this option for testing purposes (for example, when using a self-signed server certificate when you are unable to or do not wish to add the self-signed certificate to the trusted certificate store.) If possible a valid server certificate should be obtained from a well-known Certificate Authority.

   Please note that using a self-signed certificate makes certain network-level (man-in-the-middle or server spoofing) attacks which can result in an attacker learning the password used for WebDAV server publishing. We urge you to use a server certificate from a well-known Certificate Authority, if possible.

Cryptography Used by Camtasia Relay

Camtasia Relay uses several forms of cryptography to protect your data while it is in transition and at rest.

SSL

SSL is used to protect communications between the recorder or browser and the Camtasia Relay server. In this case SSL helps protect against an attacker learning usernames and passwords when an administrator or presenters logs in (as well as other sensitive information when communicating with the Camtasia Relay website.) Please see the SSL section below for more information.

SSL can also be used to encrypt traffic between the Camtasia Relay and LDAP server as well as between Camtasia Relay and some types of publishing destination servers (sFTP, WebDAV over SSL, Screencast.com, and iTunesU.)

Cryptography used by the Recorder

The SHA1 hash algorithm is used by the Camtasia Relay Recorder in the following cases:

- On the PC client, to store a hash of a presenter's password when the presenter chooses to use the "Remember Me" feature. (The Mac client uses the Keychain for the "Remember Me" feature.)
- On both clients, to calculate a message digest of requests that will be sent to the server. This message digest helps prevent message tampering and to ensure that only authorized clients use the server's web service to authenticate, retrieve profile information, and upload presentations.

Cryptography used by the Server

The SHA1 hash algorithm is used by the Camtasia Relay server in the following cases:

- For the server's web service, to calculate and verify the message digest for web service requests.

The SHA384 hash algorithm is used by the Camtasia Relay server in the following cases:

- For users managed by Camtasia Relay, users' passwords are salted and hashed multiple times and the resulting hash value is stored in the database.

The Rijndael symmetric (private key) encryption algorithm is used in the following cases:

- To encrypt the master LDAP password, if provided during LDAP configuration. The encrypted password is stored in the database and is decrypted by the server when the master LDAP password is required for LDAP authentication (such as when Camtasia Relay must resynchronize a user managed by LDAP.)
- To encrypt publishing destination passwords (as well as iTunesU shared secrets), if provided for a publishing destination. The encrypted password is stored in the database and is decrypted by the server when publishing.

About the Private Key Used for Symmetric Encryption

The private key used to encrypt the master LDAP password and publishing destination passwords is stored in the Windows registry under HKEY_LOCAL_MACHINE/SOFTWARE/TechSmith/Camtasia Relay Server/Key. The private key is generated at random during installation of the first Camtasia Relay team member unless an encryption key is already present in the registry.

The encryption key is not stored in plaintext form; it is protected using Windows Data Protection API (DPAPI, see **http://msdn.microsoft.com/en-us/library/ms995355.aspx** for more information.) The Camtasia Relay server uses the DPAPI to have the Windows Local Security Authority encrypt the encryption key. Only applications running on the same Windows Server will be able to decrypt the value stored in the registry. Therefore when adding a new Camtasia Relay server to an existing team, administrators must first export the private key from an existing team member; the configuration protection tool (see below) can be used to export the private key to an XML file. The installer will prompt for this XML file when adding a new server to a Camtasia Relay server.

Please note that the encryption key is strongly tied to the data stored in the database. If the encryption key is lost, Camtasia Relay will be unable to decrypt the master LDAP password or publishing destination passwords. When Camtasia Relay fails to decrypt a publishing destination password, that publishing destination will be put into an error state (as well as any profiles that use that publishing destination.)

In order to determine whether or not a Camtasia Relay server has the same encryption key as other team members, a salted SHA-384 hash of each server's plaintext encryption key is stored the database as well as a hash of the team's correct key. If a server's hash does not match the correct key's hash, the server will be put into an "Encryption Key Error" state. The configuration protection tool can be used to repair this error.

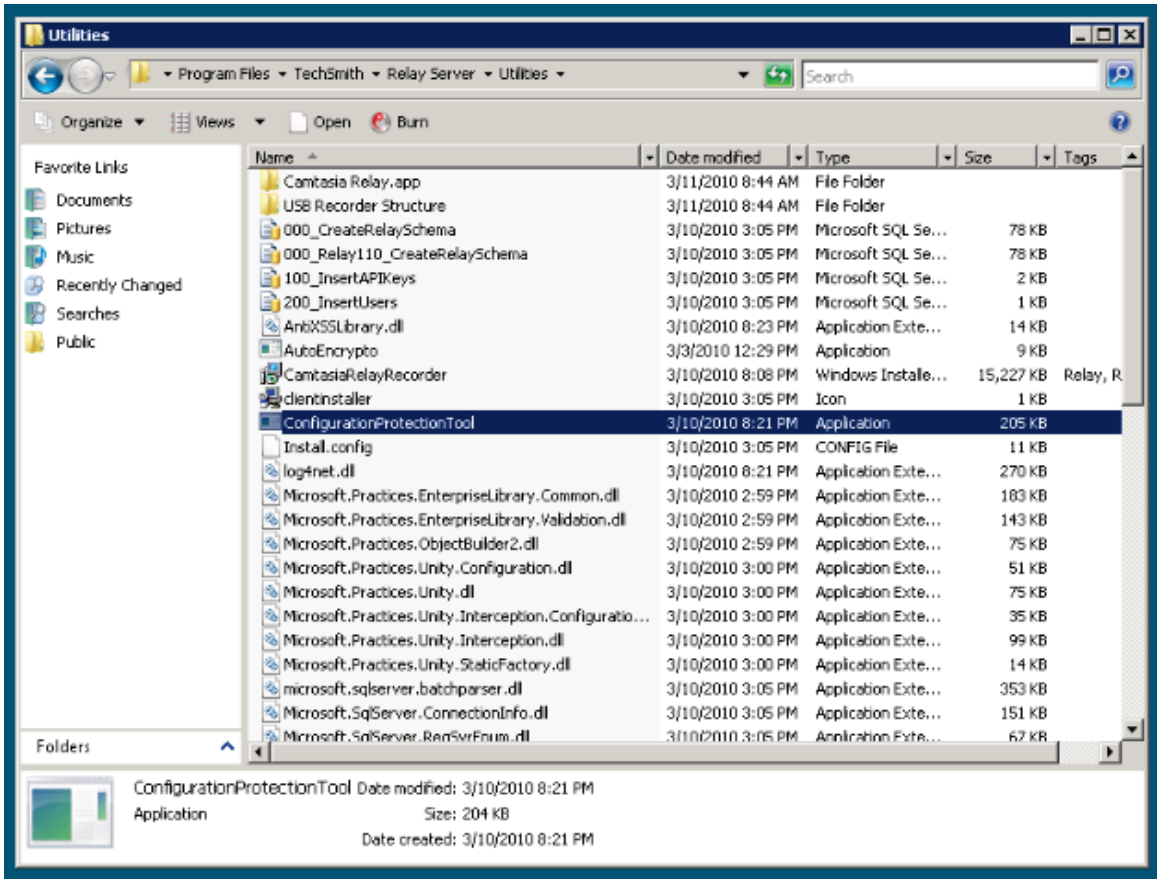
Configuration Protection Tool

The Camtasia Relay Configuration Protection Tool can be used to:

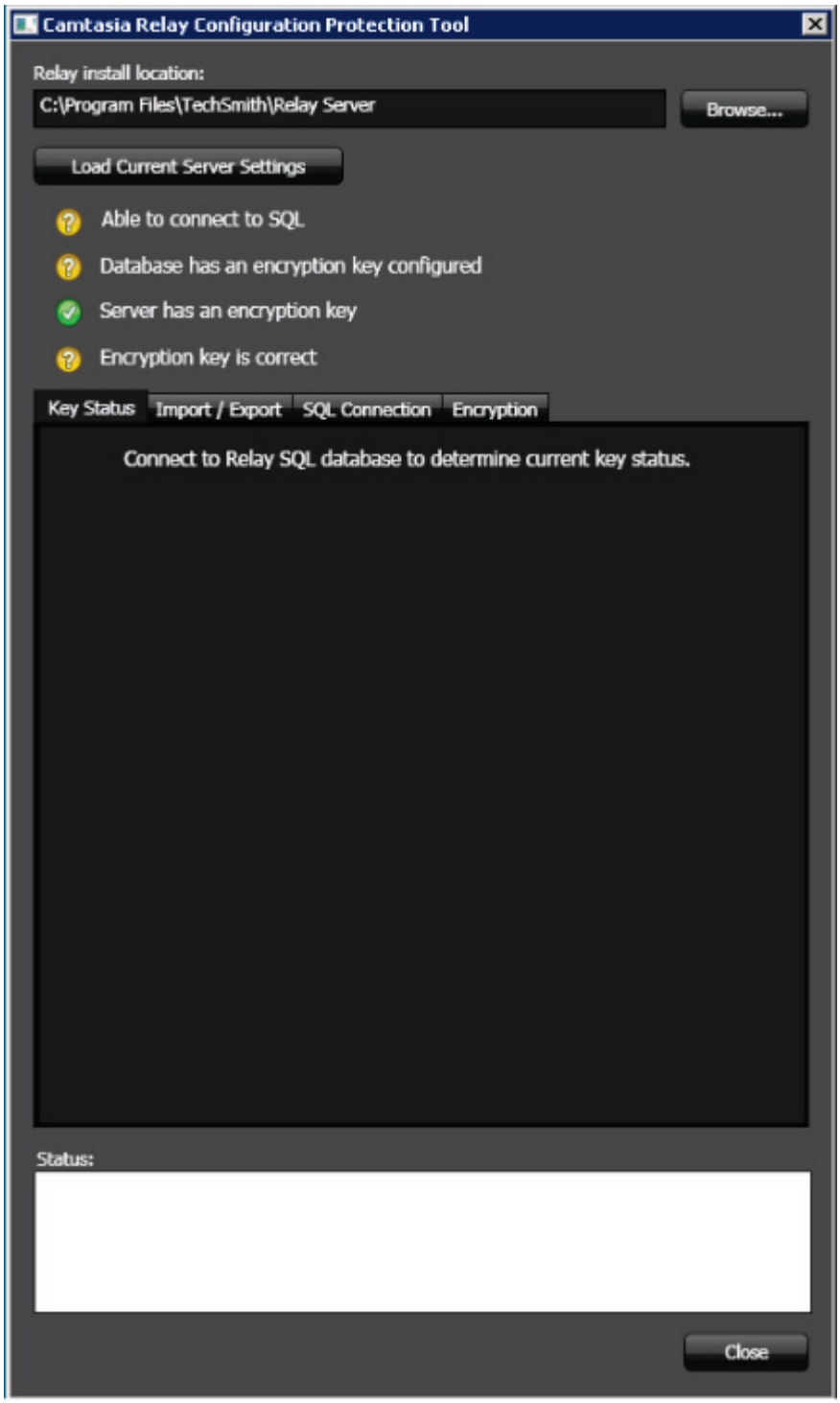
- Export the private key used to encrypt publishing destination credentials to an XML file. This XML file is required when adding a new server to a Camtasia Relay team.
- Manage the private key
  - Install a new private key on a server
  - Change the key used by a team
  - Override (reset) the key used by a team
- Manage the connection string used by Camtasia Relay
  - Change the connection string in Camtasia Relay's .config files in one place
  - Encrypt the connection string in Camtasia Relay's .config files.

The configuration protection tool (ConfigurationProtectionTool.exe) is located in the Utilities directory of the Camtasia Relay installation directory (C:\Program Files\TechSmith\Camtasia Relay\Utilities by default.)

Launch the configuration protection tool by double-clicking on the ConfigurationProtectionTool.exe.

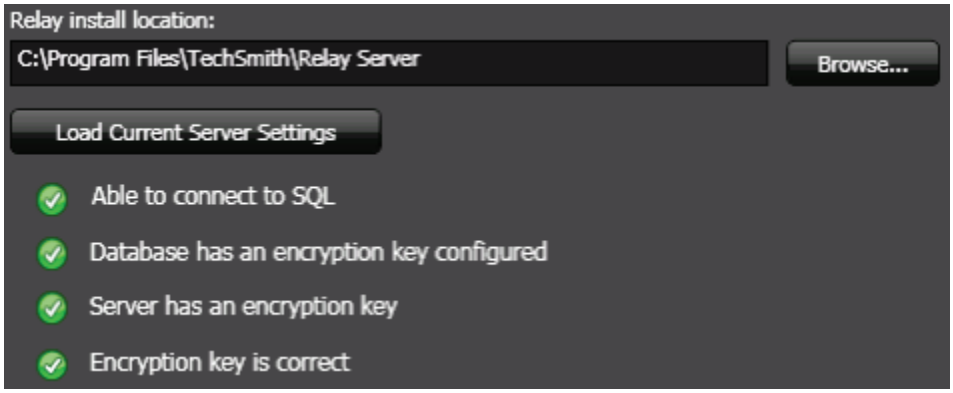


When starting, the configuration protection tool (CPT) attempts to find Camtasia Relay's .config files in the specified installation directory (initially based on where the tool was launched from.) The status window will be updated with an error message if CPT is unable to find the .config files. The installation directory must be corrected before any other action can be taken. If the installation directory is correct, the "Load Current Server Settings" button will check the registry and several database values to determine whether or not the server has the correct encryption key.



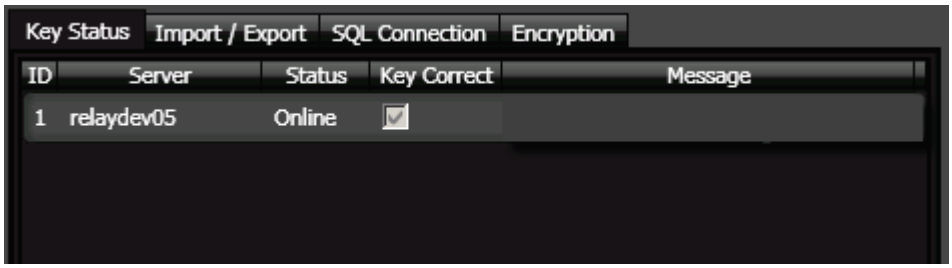
Initial State of the Configuration Protection Tool

The status icons (below the “Load Current Server Settings” button) will be updated.



Icon	Description
Able to Connect to SQL	Indicates whether or not CPT can connect to the Relay database, using the connection string in the SQL Connection tab. “Load Current Server Settings” initializes the connection string using the connection string stored in the web.config file.
Database has an encryption key configured	A yellow question mark (unknown) is shown when CPT is unable to connect to SQL. A red X indicates that there is no record in the database for the hash of the team’s correct encryption key (see the *About the Private Key Used for Symmetric Encryption* section above.) A green checkmark indicates that there is a hash of the team’s correct encryption key in the database.
Server has an encryption key	A red X indicates that there is no value for the encryption key in the registry. A green checkmark indicates that the server has an encryption key stored in the registry under HKEY_LOCAL_MACHINE/SOFTWARE/TechSmith/Camtasia Relay Server/Key.
Encryption key is correct	A yellow question mark (unknown) is shown when CPT is unable to connect to SQL. A red X indicates that the hash of the server’s encryption key stored in the database does NOT match the team’s correct encryption key. A red X can also indicate that there is no record in the database for the hash of the server’s encryption key (see the *About the Private Key Used for Symmetric Encryption* section above.) A green checkmark indicates that the hash of the server’s encryption key stored in the database matches the team’s correct encryption key

After connecting to the Camtasia Relay database, the configuration protection tool retrieves the status of each endpoint in the team and determines whether or not each endpoint has the correct encryption key.



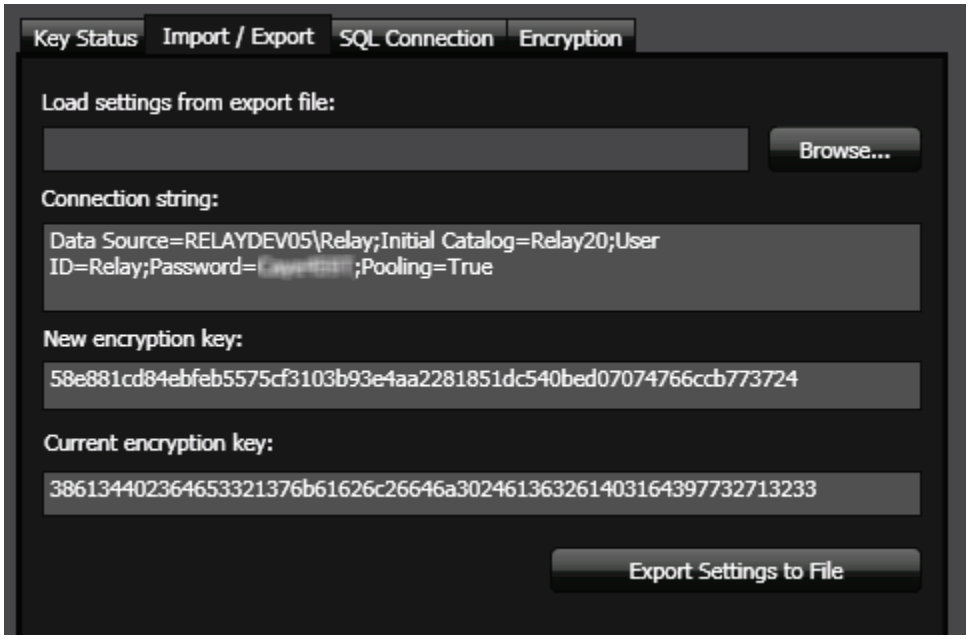
The key status tab shows the condition of each server: the server's status (Online, Offline, Error, Encryption Key Error, etc.), whether the server has the correct key (a check indicates that the server does have the correct key), and the last error message saved for that endpoint. You can use CPT's key status tab to quickly determine which endpoints have the correct encryption key; this can be useful when changing a team's encryption key or when troubleshooting encryption key errors.

Exporting Camtasia Relay's Private Key

The configuration protection tool can be used to export a server's encryption key and connection string to an XML file. The configuration protection tool can also import these settings from the XML file, which can then be installed to the server using the SQL Connection and Encryption tabs.

There are a number of scenarios in which you will need to export a server's encryption key:

- Adding a new server to a Camtasia Relay team
- Backing up the database
- Changing the encryption key for a team of servers
- Repairing an encryption key error for a team of servers



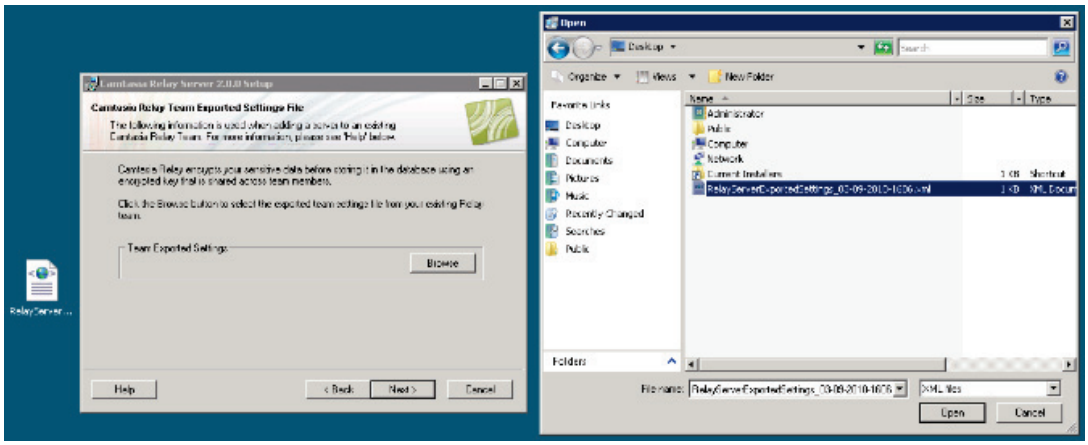
How to Create a Relay Team Exported Settings XML File

1. Access a Camtasia Relay server that has the correct encryption key installed.
2. Launch the configuration protection tool (in the Utilities directory of the Camtasia Relay installation directory)
3. Browse to the correct installation directory of Camtasia Relay, if necessary.
4. Click the “Load Current Server Settings” button. All status icons should be green for the existing server.
5. On the Import / Export tab, click the “Export Settings to File” button. Choose a location and filename for the file.
6. Move the XML file to the server that needs to use it. Be sure to delete the XML file from all Camtasia Relay servers when you are finished using the XML file.

Add a New Server to a Camtasia Relay Team

When installing a new server that will be added to an existing team of Camtasia Relay servers, the installer will prompt for a “Relay Team Exported Settings” XML file. This XML can be created using the configuration protection tool:

1. Create a Relay Team Exported Settings XML File using the directions above.
2. Copy the XML file produced by CPT to the local file system of the new server.
3. Browse to the XML file when prompted during the install process.
   The installer will set the encryption key in the registry so the Camtasia Relay server can encrypt and decrypt publishing credentials.
4. Once the installer has finished, delete the XML file.



Backing up Camtasia Relay’s Database

Since some records in Camtasia Relay’s database are encrypted using the private key if a database is going to be backed up and later restored on a machine that does not have the encryption key installed in the registry (or the same key installed in the registry) then a “Relay Team Exported Settings” file is necessary.

1. Create a Relay Team Exported Settings XML File using the directions above.
2. Store the XML file with the database backup.

If restoring the database to a server that does not have the encryption key installed in the registry (or the same key installed in the registry) then you will need to use the configuration protection tool to install the encryption key to that server. See “Install a New Private Key” below.

Changing the encryption key for a Team of Servers

After you've changed a team's private key on one server (See "Changing a Team's Private Key" below), you'll need to export the encryption key to the XML file, copy the XML file to other team members, and use the configuration protection to install the encryption key on those servers (See "Install a New Private Key" below.)

Repairing an Encryption Key Error for a Team of Servers

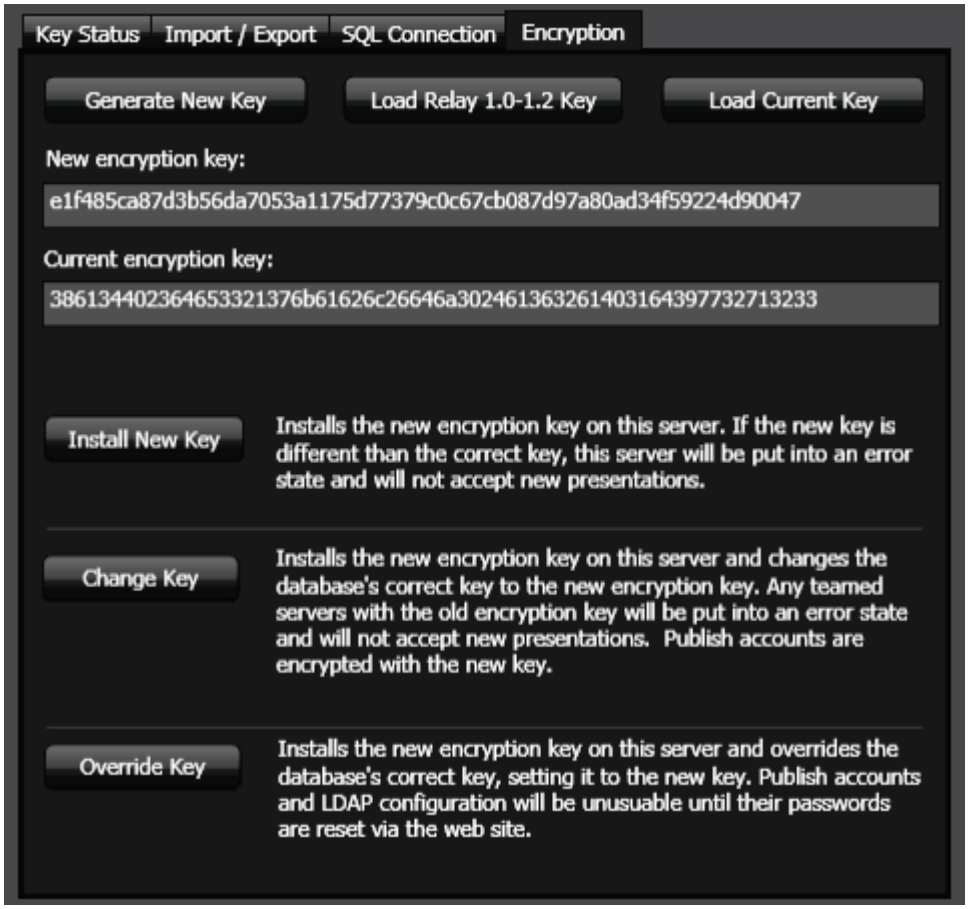
If you need to override (reset) a team's private key (see "Overriding a Team's Private Key" below), you'll need to export the encryption key to each other server on the team. Once you've overridden the team's private key on one server, you'll need to export the encryption key to the XML file, copy the XML file to other team members, and use the configuration protection to install the encryption key on those servers (See "Install a New Private Key" below.)

Managing Camtasia Relay's Private Key

The Camtasia Relay Configuration Protection Tool can be used to manage the private key for a single server or a team of servers. You may wish to use the configuration protection tool's key management features when:

- Changing the encryption key for a team of servers
- Importing an encryption key from a teamed server
- Repairing an encryption key error for a team of servers

After pressing the "Load Current Server Settings" or The "Load Current Key" button, your server's current encryption key will appear in the "Current encryption key:" text field if an encryption key is installed in the expected location of the registry.



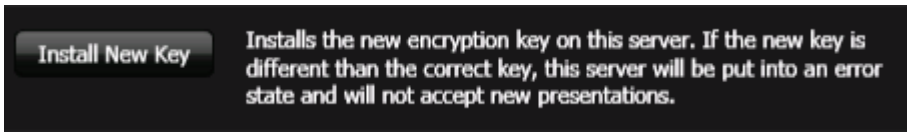
The “Generate New Key” button generates a new encryption key that can be to either install, change, or override Camtasia Relay’s encryption key. The generated key appears in the “New encryption key” text field.

The “Load Relay 1.0-1.2 Key” button loads the encryption key that was used for all Camtasia Relay 1.0, 1.1, and 1.2 installations.

All installations of Camtasia Relay 1.0, 1.1, and 1.2 used the same encryption key. If you installed Camtasia Relay 2.0 as an upgrade to Camtasia Relay version 1.0, 1.1, or 1.2 then your server/team uses this same key. Press the “Load Relay 1.0-1.2 Key” button and compare the version of the “New encryption key” and “Current encryption key” fields, if they match then your team is using the same encryption used by any deployment of Camtasia Relay versions 1.0, 1.1, or 1.2.

For security reasons, if your server/team is using the 1.0/1.1/1.2 encryption key, you may wish to change your server/team to using a random encryption. Please see “Changing a Team’s Private Key” below.

Install a New Private Key

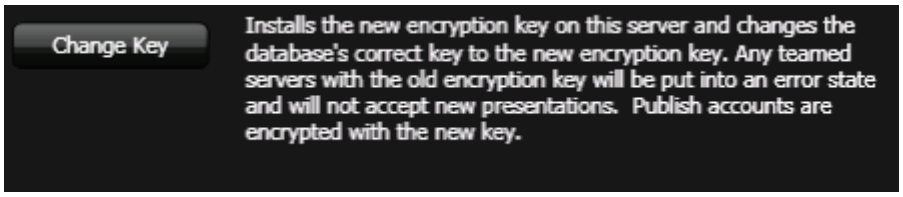


The “Install New Key” button takes the value in the “New encryption key” text field and installs it as the encryption key for the server where the configuration protection tool is running.

The value of the “New encryption key” text field is encrypted using Windows Data Protection API and then stored in the registry under HKEY_LOCAL_MACHINE/SOFTWARE/TechSmith/Camtasia Relay Server/Key. A salted SHA-384 hash of the encryption key is also stored in the database.

- Installing a new private encryption key on server using “Install New Key” does not change the encryption key on other servers in a team and does not change the encryption key used to encrypt publishing destination credentials.
- If the hash of the server’s encryption key does not match the hash of team’s correct encryption key, the server will be put into an “Encryption Key Error” state and will not accept uploads of any new presentations. This encryption key error can be repaired by installing the team’s correct encryption key to the server (see “Importing a Private Key from a Teamed Server” below.)

Changing a Team’s Private Key



The “Change Key” button can only be used if the server has correct encryption key installed. “Change Key” takes the value in the “New encryption key” text field and installs it as the encryption key for the server where the configuration protection tool is running.

The value of the “New encryption key” text field is encrypted using Windows Data Protection API and then stored in the registry under HKEY_LOCAL_MACHINE/SOFTWARE/TechSmith/Camtasia Relay Server/Key. A salted SHA-384 hash of the encryption key is also stored in the database for both the server and as the team’s correct encryption key.

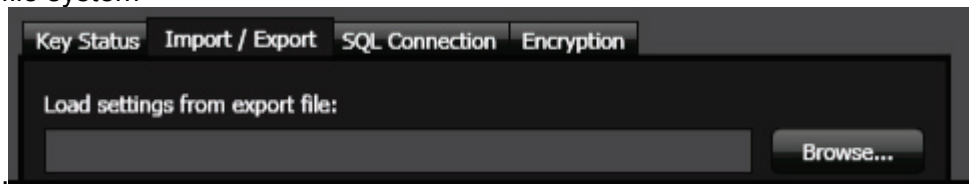
The previous correct encryption key is used to decrypt all publishing destination with passwords (and the master LDAP password) and then the new correct encryption key is used to encrypt these credentials again before they are updated in the database. If the configuration protection tool fails to decrypt and re-encrypt all publishing destinations you will be given the choice of committing or reverting the changes; if the changes are committed any publishing destinations (and corresponding profiles) where the password was not decrypted and re-encrypted successfully will be put into an error state. This error state can be repaired by accessing the publishing destination on the Camtasia Relay website, entering the correct password, and saving the publishing destination.

“Change Key” only installs the new encryption key to the server on which the configuration protection tool is running. All other team members will be put into an “Encryption Key Error” state and will not accept uploads of any new presentation. This encryption key error can be repaired by creating a Relay Team Exported Settings XML File using the directions above (under “How to Create a Relay Team Exported Settings XML File”), copying this file to each teamed server, importing the private key (follow the direction under Importing a Private Key from a Teamed Server below.)

Importing a Private Key from a Teamed Server

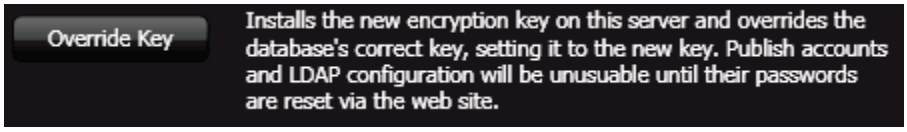
When changing or overriding a team's encryption key, it is necessary to export the new encryption key to other teamed servers.

1. On the server where the key was changed or overridden (and the server's encryption key is now the correct key), create a Relay Team Exported Settings XML File using the directions above.
2. For each teamed servers that does not have the correct encryption key installed (or is in the "Encryption Key Error" state.)
   a. Copy the XML file (from step 1) to the local file system.
   b. Launch the configuration protection tool.
   c. Browse to the correct installation directory of Camtasia Relay, if necessary.
   d. Click "Load Current Server Settings".
   e. On the Import/Export tab, click "Browse" and select the XML file (from step a) on the local file system



   f. On the Encryption tab, click the "Install New Key" button. The server should now have the correct encryption key and no longer be in the Encryption Key Error state.
   g. Delete the XML file from the local file system.

Overriding a Team's Private Key



When working with a Camtasia Relay database that has publishing destinations that have been encrypted with an encryption key that has been lost (that is, no servers have the same encryption key installed and there are no Relay Team Exported Settings XML files that contain the same encryption key as the database), the team's encryption key will need to be overridden. Overriding a team's encryption key is intended to be a last resort, when there is no other way to repair an encryption key error.

The value of the "New encryption key" text field is encrypted using Windows Data Protection API and then stored in the registry under HKEY_LOCAL_MACHINE/SOFTWARE/TechSmith/Camtasia Relay Server/Key. A salted SHA-384 hash of the encryption key is also stored in the database for both the server and as the team's correct encryption key.

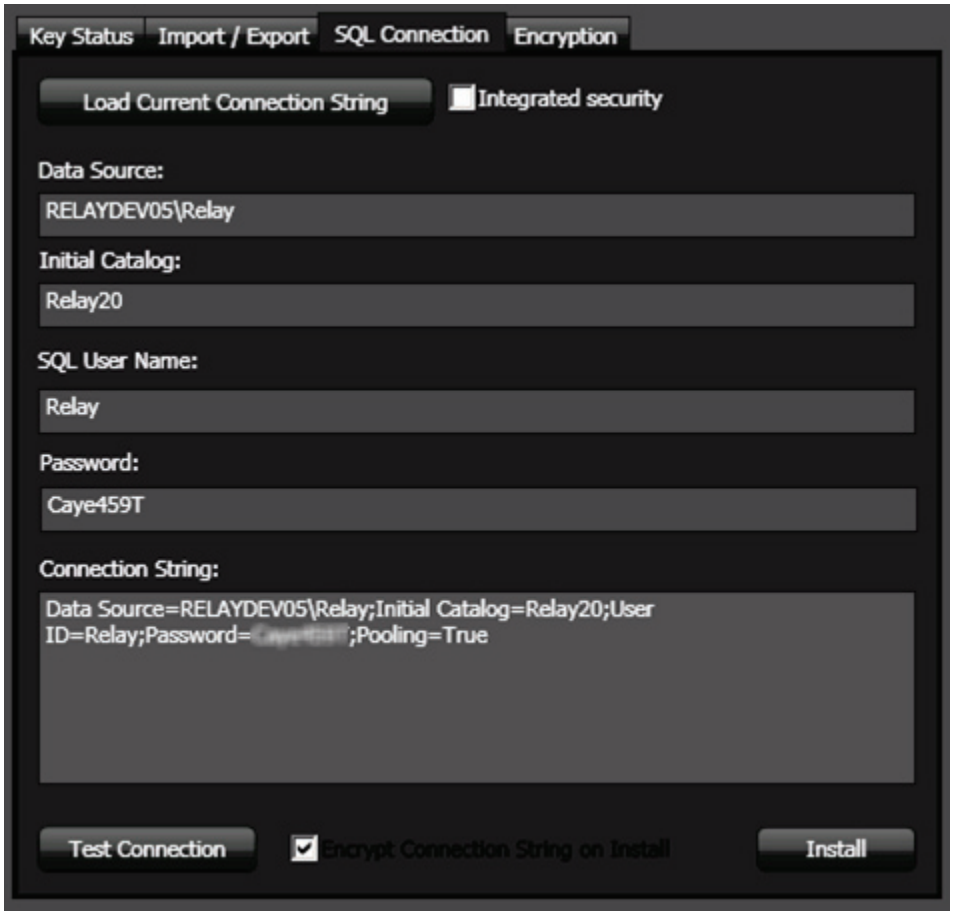
After overriding a team's encryption key, all servers in the team will be unable to decrypt existing publishing destinations' passwords for since these credentials were encrypted using a different encryption key. When Camtasia Relay processes a presentation and attempts to publish to one of these publishing destinations, the publishing will fail and the publishing destination (and corresponding profiles) will be put into an error state. This error state can be prevented (or repaired) by accessing the publishing destination on the Camtasia Relay website (on a server with the correct encryption key), entering the correct password, and saving the publishing destination.

Managing Camtasia Relay's Connection String

The connection string used to connect to Relay's SQL database is stored in two different .config files located within Camtasia Relay's installation directory:

- **data.config** (located in the Manager directory of Camtasia Relay's installation directory, typically C:\Program Files\TechSmith\Camtasia Relay\Manager\)
- **web.config** (located in the Web directory of Camtasia Relay's installation directory, typically C:\Program Files\TechSmith\Camtasia Relay\Web\)

The configuration protection tool can be used to update the connection string in both files, allowing the admin to edit the connection string in one place. The configuration protection tool can also be used to easily encrypt the connection string information in each .config file.



The "Load Current Connection String" button (and "Load Current Server Settings") initializes the connection string fields using the connection string stored in the web.config file.

The "Test Connection" button uses the connection string in the "Connection String:" text field to connect to Camtasia Relay's SQL database. The configuration protection tool's status icons will be updated appropriately depending on the result of the connection test.

Changing a Server's Connection String

After loading the server's current connection string, make changes using the "Integrated Security" checkbox and Data Source, Initial Catalog, SQL User Name, and Password fields.

After changing and testing the connection string, use the "Install" button to update Camtasia Relay's .config files with the new connection string.

Encrypting the Connection String in .config Files

If the "Encrypt Connection String on Install" checkbox is checked when the "Install" button is pressed, the connection string will be encrypted using the Windows Data Protection API. An example of a encrypted connection string appears below:

```
<connectionStrings
configProtectionProvider="DataProtectionConfigurationProvider">
<EncryptedData>
   <CipherData>

<CipherValue>AQAAANCMnd8BFdERjHoAwE/Cl+sBAAAAMmjWWyn5RE+a5cEL5aJt3QQAAAACAAAA
AAADZgAAw
AAAABAAAADIc5eCCQn5GDI78nq6fZOuAAAAAASAAACgAAAAEAAAABw/c0XaxibkDLrdwBAb+ZVwAQ
AAaOeuPfy5m5p
dr3HLeKpBG/+XFe/5YcM3vwg72kZueevwJ+/FB+04Qwc17FHYnYphLYIcvIJnulMQAstRNbRNxDn+
QdGVn6m7LYwSI
A/W+rLtdi/DCWD21heYG2kB3yPQ3TFnB8JUjn3avl7Pfmzn49DToksYfXZbS3jaN3aD/2FdtSZO94
7c5mqlCCl6Yri
NcEbCs+8tv36YKF1Dt9QZ/O67duWMaQkSggu7RP7mX8FV3+gKX5VOzHRMGwpNSYUWxdaYrQHhfsEF
902xHdNssgalZ
FVIJ3NqEIUZaIW4yuEl3NWuOiSr/zonizAvW2TKqmkMnokHOjoVz+3PZ3rCXRcpReO8ujB4TGQXrf
pmJGqtRu2qq1O
vwJtzopDaWQkyeYDMXWc1GmZL4xToS0Ft1T/cCnOPy8bsCzSFVQ94479yo0bIqeYKG+xOUidH0UZf
J0nCk062Qf1BC
jiQaAur2g//Bkm2haLcYomvjYjo8KUUAAAA95vU+wanIWur+udyeFnb/2ZSdHs=</CipherValue>
   </CipherData>
  </EncryptedData>
 </connectionStrings>
```

The .NET framework will automatically decrypt the connection string for use by Camtasia Relay but if an attacker was able to somehow read the web.config file over the Internet, they would not be able to read the connection string information.

Tools

Network/Server Security Assessment

Administrators should regularly run network security assessment tools such as Nessus, Nikto, and Nmap against their servers to identify known vulnerabilities. These tools aren't perfect but they are freely available (and attackers **will** be running them against your server.) Because these vulnerabilities are publicly known and can be easily identified using these tools, it is especially important to patch your servers and protect against these vulnerabilities. Of course, these tools cannot replace the security assessment of a network security specialist but they should help administrators identify and eliminate *some* well-known vulnerabilities.

- **http://www.nessus.org/download/**
- **http://www.cirt.net/nikto2**
- **http://nmap.org/**

General Server Security Resources

- **Windows Server 2003**
  http://technet.microsoft.com/en-us/library/cc706993.aspx
- **Windows Server 2008**
  http://technet.microsoft.com/en-us/library/dd349801.aspx
- **Windows Server 2003 Security Guide**
  http://www.microsoft.com/downloads/details.aspx?FamilyID=8a2643c1-0685-4d89-b655-521ea6c7b4db&DisplayLang=en
- **Windows Server 2008 Security Guide**
  - http://technet.microsoft.com/en-us/library/cc264463.aspx
  - http://www.microsoft.com/downloads/details.aspx?familyid=FB8B981F-227C-4AF6-A44B-B115696A80AC&displaylang=en
- **Windows Server 2003 Security Compliance Management Toolkit**
  http://technet.microsoft.com/en-us/library/cc163140.aspx
- **Windows Server 2008 Security Compliance Management Toolkit**
  http://technet.microsoft.com/en-us/library/cc514539.aspx

Appendix A: SQL Server Security

You can change or very many advanced settings to increase the security of SQL Server. The default settings created by the Camtasia Relay installer are appropriate in many cases. However, if you (1) are using a remote SQL database with Camtasia Relay and (2) the remote SQL Server used by Camtasia Relay has had other databases installed in the past or currently, and (3) you are comfortable using SQL Server Manager to manage SQL server configuration settings, then it may be appropriate to further secure SQL server using these advanced settings.

The settings below are typically accessed using SQL Server Manager.

SQL Authentication

Camtasia Relay requires SQL authentication be enabled in order to connect to a remote SQL server. Many resources on securing SQL server may advise you to disable SQL authentication; do **not** disable SQL authentication as Camtasia Relay will no longer be able to connect to the remote SQL server.

Delete or Disabled Unused SQL Users

Unused accounts should be deleted to prevent an attacker using them and their privileges in the event that the attacker gains access to the server.

Relay uses the SQL users “relay”. All other SQL Users should be deleted or disabled from the Relay instance with the exception of the following default required users: “dbo”, “guest”, “sys”, and “INFORMATION_SCHEMA”.

Least Privilege SQL User

The Camtasia Relay SQL user “relay” requires the following SQL service privileges: **datareader** and **datawriter**. No other permissions should be granted. The Camtasia Relay installer should configure the SQL server with least privilege but you should verify that the SQL user has only the privileges listed above and no other.

Use a Strong sa (System Administrator) password

The default system administrator (sa) account has been the subject of countless attacks. It is the default member of the SQL Server administration fixed server role **sysadmin**. Make sure you use a strong password for this account.

Do not grant permissions for the public role

All databases contain a public database role. Every other user, group, and role is a member of the public role. You cannot remove members of the public role. Instead, do not grant the permissions for the public role that grant access to your application's database tables, stored procedures, and other objects. Otherwise, you cannot get the authorization that you want using user-defined database roles because the public role grants default permissions for users in a database.

Remove the sample databases

Any sample databases, if present, (for example, Pubs and Northwind) should be removed using SQL Server Manager.