Host Access Management and Security Server

Administrator Guide

May 2018

Legal Notice

For information about legal notices, trademarks, disclaimers, warranties, export and other use restrictions, U.S. Government rights, patent policy, and FIPS compliance, see https://www.microfocus.com/about/legal/.

The only warranties for this product and any associated updates or services are those that may be described in express warranty statements accompanying the product or in an applicable license agreement you have entered into. Nothing in this document should be construed as creating any warranty for a product, updates, or services. The information contained in this document is subject to change without notice and is provided “AS IS” without any express or implied warranties or conditions. Micro Focus shall not be liable for any technical or other errors or omissions in this document. Please see the product’s applicable end user license agreement for details regarding the license terms and conditions, warranties, and limitations of liability.

Any links to third-party websites take you outside Micro Focus websites, and Micro Focus has no control over and is not responsible for information on third party sites.

Contents

Host Access Management and Security Server

Host Access Management and Security Server provides a browser-based central point of administration so you can quickly configure and deploy secure terminal sessions.

An administrator uses Management and Security Server to create host sessions for Micro Focus products including Reflection Desktop, InfoConnect, Reflection ZFE, Reflection for the Web, and Rumba. Then, the existing user and group directories can be leveraged to control access to the sessions

1 About Management and Security Server

Host Access Management and Security Server version 12.4.15 released with Reflection ZFE 2.2.3. See the Release Notes for details.

Open the **About** menu to view

- **Product Information**: the installed **Version** and **System Information** for Host Access Management and Security Server.
- **Activated Products**: the currently installed activation files (for add-on or other products), displayed on the **Configure Settings - Product Activation** panel.
- **Legal Information**: the license agreement and legal notices.

About Management and Security Server

Using the **Administrative Console**, the administrator can centrally secure, manage, and monitor users' access to configured sessions.

The product navigation has been redesigned with these menus:

- Manage Sessions
- Manage Packages
- Assign Access
- Configure Settings
- Run Reports

About Add-On Products

Add-on products can be used to enhance Management and Security Server's functionality with supplemental means of security. These products require separate licenses and can be installed along with Management and Security Server. Additional activation or configuration is required.

Add-on products include:

- Security Proxy Server
- Terminal ID Manager
- Automated Sign-On for Mainframe
- Micro Focus Advanced Authentication

2 Manage Sessions

Use **Manage Sessions** (known as *Session Manager* in previous versions) to create and configure terminal sessions. Use the column chooser to modify the summary view of your sessions.

- Add a session
- Product-specific settings
- Edit a session
- Copy a session
- Delete a session
- Export a Reflection for the Web session

Add a session

1. Click **Manage Sessions** > **Add**.
2. Select your **Product**.

   For **Reflection/InfoConnect Desktop**, **Reflection for Windows**, or Reflection for the Web select the **Session type**.
3. Enter a unique **Session name** that does not exceed 64 characters.

   Session names cannot include any of these characters: `\ / : * ? " < > ¦`
4. Enter a **Comment** that you want to display regarding this session. Comments are internal notes for the administrator and can display in the summary list.
5. Continue with the steps to configure a session for your product:
   - Reflection for the Web
   - Reflection ZFE
   - Rumba+ Desktop

   For all other products, continue with step 6.
6. Select your **File Storage** preferences.

   Saving settings files. When **Overwrite setting files** is selected, Management and Security Server compares the user's local settings with the web server version of the settings files. When they are different, the local file is overwritten. By overwriting existing settings files, you can easily distribute updates; however, the users' changes will be lost.

   The settings files can be saved as **Read-only** or **Hidden**. Hidden files do not appear in the user's Windows Explorer unless the user configures Windows to show hidden files.

   NOTE: If a user runs Windows 7 with Internet Explorer in protected mode, file virtualization may prevent Management and Security Server from finding a folder. To turn off protected mode on the machine, go to Tools > Internet Options > Security tab. Clear the Enable Protected Mode check box, click OK, and restart Internet Explorer.

   Storing settings files on the workstation. Windows-based settings files are stored on the end user's computer.

Choose where you want the settings files to be stored: the default location, **My Documents\<product folder>**, in **Temp**, or your specified **<User profile folder>**.

7 Click **Launch** to start the session in administrator mode in a separate window.

NOTE: To configure this session to connect through the Security Proxy (if you are entitled), see Setting Up the Security Proxy Server.

8 Configure and save the session. The settings are sent to Management and Security Server, and the saved session is added to the list on the **Manage Sessions** home page.

Note: Use the column chooser to show or hide session properties: Type, Name, Description, Direct Link, Comments, Security Status.

9 As a next step, you can

- Use Assign Access to make the session available to end users.
- Return to Manage Sessions to add or edit a session.

Related Topics

- Authentication & Authorization
- Assign Access
- Edit a session

Product-specific settings

If you are using one of these products, note the specific settings to configure a session.

Reflection for the Web
Reflection ZFE
Rumba+ Desktop

Configure a Reflection for the Web Session

You can use additional settings to customize the display and behavior of your Reflection for the Web session.

Options on this panel: Appearance | FTP | Advanced Settings | Applet Parameters

Appearance

- **Window title**. You can change the title bar for the session. The title can include these special characters:

Table 2-1

Character	Value
&&	a single ampersand
&c	Connection Status (whether you are connected and over what transport)
&d	Date

Character	Value
`&h`	Host name
`&s`	Session type
`&t`	Transport
`&v`	Terminal session identifier that uniquely identifies this terminal session from others. See specific types:
`&v` for IBM 3270 and IMB 3270 Printer sessions	LU name
`&v` for IBM 5250 and IBM 5250 Printer sessions	Device name
`&v` for ALC. UTS Terminal, T27, T27 Printer, and Airlines Printer sessions	Terminal ID

- Select **Display session in its own window** to launch a session in a frame outside of the browser page.
- Select **Display session embedded in a web browser window** to launch the session in a new browser window.

  Use this option to specify a custom page template, which allows you to format the HTML to add custom text, graphics, or JavaScript for the session. The template jsp must be stored in the `/mss/server/web/webapps/mss/templates` folder on the MSS server. You can copy one of the sample templates as a starting point for your own template.

  Templates must be stored in the templates folder directly or in a subfolder. If you leave the page template field empty, the embedded session will appear in a new browser window with a simple heading that shows the name of the session. When the specified template is not present, the default embedded page is used. For more information, see the Knowledgebase article: Using Templates in Reflection for the Web.

FTP

Select **Enable FTP within this session** when you want to include FTP as an option on the File menu for IBM 3270, IBM 5250, HP, VT, or UTS terminal emulation sessions. When enabled, users can open a window that allows them to easily transfer files using FTP.

FTP Window

When you configure a standalone FTP session, use these options to specify the appearance of the FTP window. When you select **Local/remote lists and console**, lists of local and server files and directories are displayed in the top portion of the FTP window, and an FTP console with a command line is displayed in the bottom portion.

Users can change this appearance after the session is started using buttons on the FTP button bar. When you select either of the other options here--**Lists only** or **Console only**--users will not be able to change the FTP window appearance.

Advanced Settings

Click **Advanced**, and use these settings to customize how the session is displayed, launched, and delivered.

- Window Size and Status Bar
- Session Auto Launch

Window Size and Status Bar

- **Use best dimensions for each user**

  Based upon the client machine's screen resolution, Management and Security Server is able to determine the best width and height for each user's session window. This setting applies only when the session is displayed in its own window.

- **Use maximized dimensions**

  The session will be in a full screen display. This setting applies only when the session is displayed in its own window.

- **Use these window dimensions**

  The **Width** and **Height** options determine the dimensions of the applet (in pixels).

- **Display status bar**

  This option controls whether the status bar appears in the terminal window. The status bar appears at the bottom of the window and includes information such as the cursor position, whether the connection is encrypted, and the type and status of the connection.

Session Auto Launch

Check **Auto Launch** to automatically launch the session when the Links List is displayed. Users cannot override this auto launch mechanism. If this setting is not enabled, users can choose to open a session automatically by configuring Session Attributes, available from the Action button on the Links List.

Applet Parameters

You can customize the properties of a Reflection for the Web session by adding applet parameters.

Applet parameters modify the behavior of the basic session. When you launch a session and change its settings, the new settings are saved in a configuration file. Applet parameters allow you to extend functionality beyond the configuration file.

Refer to **Applet Attributes and Parameters** in the Reflection for the Web Reference Guide for descriptions and valid values of the standard applet parameters

To add a parameter

1. Click **+Add**.
2. From the **Parameter** drop-down list, select a standard parameter, or click **<Custom>** to add a new one.
3. Enter a **Value**, if required.
4. Click **Add**. The parameter is added to the table.

NOTE: Not all parameters are valid for all session types. To be sure a parameter applies to your session, refer to the **Applet Attributes and Parameters**.

List of current parameters

The applet parameters that are currently assigned to this session are listed in the table. To remove a parameter, check it, and click **-Remove**.

Next steps

As a next step, you can

- Use Assign Access to make the session available to end users.
- Configure Authentication and LDAP authorization.
- Return to Manage Sessions to add or edit a session.
- Export a Reflection for the Web session

Export a Reflection for the Web session

Use the **Export** option to save a Reflection for the Web session as a Reflection ZFE session type. After the Reflection ZFE session is created, the original session remains unchanged in the **Manage Sessions** list.

On the **Manage Sessions** panel:

1. Locate the Reflection for the Web session you want to save as a Reflection ZFE session type.

   TIP: Reflection for the Web session types are identified by a globe icon (denoting a web-based session), followed by the terminal type, such as 3270: 

.
2. Right-click the session (or check the box) and click **Export**.
3. On the **Export session** panel, enter the name for the new Reflection ZFE session, and the address of the Reflection ZFE Session Server that will host the session.
4. Click **Create**. The new session is added to the **Manage Sessions** list and can be assigned to users or groups. Note that the icon changed to the Reflection ZFE session type: 

.

The original Reflection for the Web session is unchanged and remains available in the session list.

Related Topics

- Assign Access
- Authentication & Authorization
- Manage Sessions

Configure a Reflection ZFE Session

1. Note the session properties and the Session Server URL. Click **Launch**.
2. A browser opens to the web client **Settings** > **Connections** panel. Configure the settings for this session, and click **Save**.

3 When finished configuring, click **Exit** to save the session to the Management and Security Server.

4 As a next step, you can

- Use Assign Access to make the session available to end users.
- Return to Manage Sessions to add or edit a session.

Related Topics

- Assign Access
- Manage Sessions
- Authentication & Authorization

Configure a Rumba+ Desktop Session

You are able to add a Rumba session to be managed by Management and Security Server because you already

- configured a session in your Rumba application.
- saved the session profile.

Now, you must upload and attach your Rumba session profile to the session you are adding to Management and Security Server.

Rumba Session Profile

1 After you enter a Session name, click **Browse.** Select the Rumba session profile (saved by your Rumba application). The profile name displays on this page.

2 By default, **Overwrite settings files** is not selected, and users can set local preferences in their launched sessions.

Check this option if you want Management and Security Server to compare the local and web server versions of the settings file and overwrite the user's file if there are differences.

NOTE: After a Rumba session is created in the Administrative Console, users can open their Rumba sessions from the Windows Start menu, as usual. The settings file is downloaded from Management and Security Server to the client computer the first time the session is launched. Users can then launch the session using the local settings file. Sessions launched from the local settings file are not updated from the Management and Security Server settings file.

Overwrite settings files allows you to easily distribute updates to existing settings files; however, changes that users made to their settings will be lost.

---

3 If entitled to the **Security Proxy Add-On**, you can configure the Rumba session to connect through a Security Proxy server that has client authorization enabled.

The **Security Proxy Settings** require one setting in the Rumba session (configured separately using the Rumba client), and one setting on this Configure Session page.

3a In the Rumba session, set the host name and port to the address of the Security Proxy server.

3b On this page, check the **Use security proxy server** box, and enter the host name and port to which the Security Proxy will forward the connection.

4 Click **Save**. The profile is then uploaded and attached to the session.

To edit a configured Rumba session

1. Using your Rumba application, open the appropriate session profile, and make the changes. Save the profile.
2. In Management and Security Server, open **Manage Sessions**, and click the session name.
3. Click **Browse** and select the Rumba session profile that you just edited and saved.
4. Click **Save** to upload and attach the updated profile.

Edit a session

1. In **Manage Sessions**, click the session you want to edit. Or, check the box, and then click **Actions** > **Edit**.
2. Note the **Properties**, which are not editable.
3. Change the settings you wish to edit. (Details are described in either Add a session or Product-specific settings.)
   - Session Name
   - Window title
   - Display option -- in a separate window or embedded in a browser window
   - FTP option for this session
   - Advanced settings
4. Click **Save**, or **Launch** the session.

NOTE: If an administrator is editing a session, and a second administrator attempts to open the same session, a message displays to notify the second admin that the session is locked and changes cannot be saved.

Related Topics

- Configure Authentication
- Assign Access
- Add a session

Copy a session

To add a new session with the same properties:

1. In **Manage Sessions**, right-click the session you want to copy. (Or, check the box, and the click **Actions** > **Copy**.)
2. Enter a **Name** for the copied session. Click **OK**.

The session is saved with identical properties and added to the **Manage Sessions** list.

Delete a session

1. Right-click the session or session you want to delete. To delete multiple sessions, check the boxes and click **Actions** > **Delete**.

The deleted sessions are removed from the list.

3 Manage Packages

Use **Manage Packages** to deploy configuration data to specified users. You can manage the macros and settings installed on each user's machine by uploading .msi files. Packages are available only with Windows-based clients.

The available packages are listed on this panel.

- Configure a Package
- Upload or Update a Package

Configure a Package

To use this feature, you must first create an `.msi` file that packages the files you want to deploy.

For example, with Reflection Desktop or INFOConnect, use the **Installation Customization Tool** to package the files. Refer to the product documentation for information about which files you can include and how to use the tool.

Related Topics

- Upload or Update a Package

Upload or Update a Package

You can add a new package or update an existing one.

To upload a new package:

1. Click **+ Add**, and then **Browse** to the .msi file you want to upload.
2. Add a **Description** for your reference.

To update an existing package:

1. Check the package you want to update and click **Edit**.
2. **Browse** to the newer version of the file. The filename must be the same.

   The new configuration information is deployed to a user workstation when the user logs on.

To delete a package:

Check the package, and click **Delete**.

NOTE: Package management requires additional configuration on replicated administrative servers. See Replication > Copying Package Data.

Next steps:

After you upload a package, use **Assign Access** to associate the package with a user.

When a user logs on to the Links list or launches a Windows-based session from a direct URL, the .msi file contents will be installed on the user's machine.

Related Topics

- Search & Assign
- Manage Sessions

4 Assign Access

Use **Assign Access** (known as *Access Mapper* in previous versions) to provide user access to one or more sessions or packages.

The ability to assign sessions or packages to a specific user or group of users is dependent on whether LDAP authorization is enabled. To enable and configure your LDAP server, open Authentication & Authorization, and click **Use LDAP to restrict access to sessions**.

- Search & Assign
- Currently Assigned

Search & Assign

With LDAP authorization enabled, you can assign sessions and packages to an individual user, a group of users, or a specific folder in your LDAP directory.

When multiple LDAP servers are configured, search for users or groups within a domain.

- Search for Users or Groups/Folders
- Assign Sessions or Packages

Search for Users or Groups/Folders

Determine who should have access.

1. Verify or select the **Domain**.

   To assign sessions or packages to **All users within the selected domain**, keep that Search result selected, and skip to step 5.

2. When LDAP authorization is enabled, you can search for and assign access to specific **Users**, **Groups**, or **Folders** in that domain. When LDAP authorization is *not* enabled, access to sessions or packages can be assigned only to **All Users**.

   NOTE: The **Search by** options are based on the LDAP server configuration (Search Base and Groups/Folders). You will see either **Users | Groups** OR **Users | Folders**.

   To search, select a **Search by** option, enter a name, or enter the asterisk (*) wildcard or a combination of * and letters in the text box.

3. Click **Select attributes** to narrow your search using the available filters. Click **Search**.

4. In the **Search Results** find and click the name of the user, group, or folder.

   Click **Details** to see this user or group's attributes and the groups from which they can inherit access. A group's Details also includes the members of that group.

   Or, click **Search Again** to change the search attributes or to search for another user.

5. For the selected user or group of users, continue with Assign Sessions or Packages.

Related Topics

- Assign Sessions or Packages

Assign Sessions or Packages

Determine which sessions or packages this user or group is entitled to access.

1. Check the Sessions or Packages you want to make available to the selected user or group.

   Become familiar with these Notes to understand different means of assigning access.

   NOTE:

   - An asterisk (*****) next to the Session name denotes that a user has inherited access to that session by being a member in a group.

     For example, if you assign Session1 to Group A, of which JohnUser is a member, then JohnUser inherits access to Session1. When viewing JohnUser's assigned sessions, an asterisk appears next to Session1. To remove a user's access to an inherited session, click the User, and clear the **Allow user to inherit (*) access to sessions** check box (below the list).
   - Granting access to **All users** means granting access to the search base, and all users inherit that access. Such access is only extended to users when the **inherit * access** option is checked.
   - Sessions cannot be assigned to Active Directory primary groups (such as Domain users).

   ---

2. Select or clear the option to **Allow access to Administrative Console**.

   When checked, the selected user or group has access to the Administrative Console.

3. The **Edit** option is used for Automated Sign-On to a Mainframe. If you are configuring this add-on feature, and want to assign this session, click **Edit**. Then continue with Select method to obtain mainframe user name .
4. Click **Apply** to save your assigned sessions.
5. Repeat the steps to Search and Assign sessions to a different user or group.

Related Topics

- Search for Users or Groups/Folders
- Select method to obtain mainframe user name

Select method to obtain mainframe user name

The **Edit** option displays when **Automated Sign-On for Mainframe** is activated. Use the **Edit** button you to choose a method to derive the mainframe user name that will automatically log the selected user or group on to the selected mainframe session.

NOTE: To recap, the configuration of **Automated Sign-On for the Mainframe** requires:

- The Automated Sign-On for Mainframe Add-On product is installed and configured on the Host Access Management and Security Server.
- A session to the mainframe was created with a macro detailed in the Automated Sign-On for Mainframe Administrator Guide.
- The session is assigned to the appropriate user or group.

Note: The session cannot be inherited from a group to which the user belongs.

- The method for obtaining the mainframe user name is selected.

To select the method:

1. For the selected user or group, check the session you want them to automatically log on to.

   Click **Edit**, next to the session name.

2. On the **Method to obtain mainframe user name** panel, choose the option:

   - **Not set**

     The default must be changed for automated sign-on.

   - **Derive from UPN**

     Select this option to request a passticket from DCAS by deriving the mainframe username from the User Principal Name (UPN) of the user. The UPN is typically available from a smart card or client certificate, and is a standard attribute in Active Directory servers. A UPN is formatted as an Internet-style email address, such as userid@domain.com, and Management and Security Server derives the mainframe username as the short name preceding the '@' symbol.

   - **Get LDAP attribute value from authenticating directory**

     Select this option to perform a lookup in the LDAP directory (defined in Authentication & Authorization) and return the value of the entered attribute as the mainframe username.

     All LDAP attributes must meet these criteria:

     -must begin with an alpha character
     -no more than 50 characters
     -any alphanumeric character or a hyphen is permitted

   - **Get LDAP attribute value from secondary directory using search filter**

     Select this option to use the search filter to find the user object in the secondary LDAP directory; then return the value of the entered attribute as the mainframe username.

   - **Literal value**

     This option is available for sessions assigned to users, but not groups. Enter a value that meets these criteria:

     -up to eight alphanumeric characters
     -no spaces
     -no other characters

3. Click **OK**.

Related Topics

- Search & Assign
- Assign Sessions or Packages
- Currently Assigned

Currently Assigned

This view lists all of the users and groups who have been assigned one or more sessions or packages.

Click a user or group in the Search Results. Their assigned Sessions are checked.

Related Topics

- Search & Assign
- Manage Sessions
- Authentication & Authorization

5 Configure Settings

Use these settings to enable features in Management and Security Server.

- General Settings
- General Security
- Secure Shell
- Certificates
- Trusted Certificates
- Credential Store (Reflection for the Web)
- Security Proxy
- Authentication & Authorization
- Product Activation
- Automated Sign-On for Mainframe
- Metering
- Terminal ID Manager
- Replication
- Logging

General Settings

Configure these settings for using Management and Security Server.

- Set VPA number
- Set server name
- Custom login page
- Applet tag
- Links List

Set VPA number

The volume purchase agreement (VPA) number appears in the client's **About** box and is used by the Metering server. If the VPA is unspecified, it is reported as 00000 in the emulator and in metering reports.

If you did not enter your number during installation, you can add it here.

Set server name

You can enter up to 45 characters to identify this Administrative Server. This name is helpful for debugging in larger environments where more than one Administrative Server is behind a load balancer. In these cases, it can be difficult for the client to determine which Administrative Server is being accessed.

This string is printed in the Java console.

Custom login page

You can create your own login/links list page and store it separately from the installed default page. The page can have any custom content desired, including graphics, links, or JavaScript.

If you specify a custom login page here, the custom page jsp must be stored on the server in the templates folder directly or in a subfolder. A sample custom login page is available in the `MSS/server/web/webapps/mss/templates/samples` folder, along with some other samples for dynamic embedded sessions.

If the custom login page is not found under the templates folder, the default login page is displayed. If you are developing a custom login page and have trouble getting it to display properly, you may not be able to access the Administrative Console to change the custom page specification. Rename the custom page in the templates folder, and the default page will be used.

Applet tag

Oracle recommends the use of the **APPLET tag** as a consistent way to deploy Java applets across browsers on all platforms. The **OBJECT/EMBED tag** may be used to resolve issues for specific browsers. More specifically:

- Use the **APPLET tag** to deploy applets to a mixed-browser environment.
- Use the **OBJECT** tag to deploy applets that are to be used only with Internet Explorer.
- Use the **EMBED** tag to deploy applets that are to be used only with the Mozilla family of browsers.

When using the **OBJECT/EMBED tag**, you can specify the URL for the **OBJECT codebase** attribute and the **EMBED pluginspage** attribute, which is used to download the latest JRE when no JRE is present on the machine.

The default URLs point to the latest JRE available from Oracle. You can specify another location if you want to distribute the JRE from an alternate location.

For more information, see the Oracle Java documentation on applet, object, and embed tags.

Links List

A direct link is a URL that opens the specified session after the user authenticates. Check **Show links list for direct sessions** if you want users to see a list of links to their entitled sessions when you provide a direct link to a session.

This setting applies only to sessions that are configured to launch in a frame outside of the browser page.

NOTE: Java version detection is disabled by default to provide faster startup of sessions on the client. When Java detection is enabled, users are informed when their Java version is unsupported by the product.

The specific version of Java detected is also used to configure applet parameters that help manage the behavior of sessions when navigating away from and back to the web page.

To enable Java version detection, edit this configuration file:

1. Open `/mssdata/propertyDS.xml`.
2. Change the **enableJavaVersionDetection** value from `false` to `true`:

   ```
   <CORE_PROPERTY NAME="enableJavaVersionDetection">
    <BOOLEAN>true</BOOLEAN>
   </CORE_PROPERTY>
   ```
3. Save the file.

General Security

The General panel prompts you to set (or change) passwords, smart card settings, and other security options.

- Server access protocol
- Change administrator password
- Restrict administrator account
- Require new login
- Smart card settings
- Certificate chooser prompt
- Enable identity verification
- Change keystore password
- PKI Server
- Keychain

Server access protocol

By default, Management and Security Server allows browsers to use the HTTP protocol to communicate between the client computer and the Management and Security Server. Although HTTP is universally available, information exchanged using HTTP is sent in clear text and is vulnerable to unauthorized access.

To secure your passwords and other sensitive data, we recommend that you require browsers to connect to Management and Security Server using the HTTPS protocol, which provides TLS/SSL encryption. To require HTTPS:

- Check **Require HTTPS for connections to the Management and Security Server**.
- Make sure TLS/SSL is enabled on your web server.

  If you installed Management and Security Server with the automated installer, TLS/SSL is enabled with a self-signed server certificate.

NOTE: When users first request a session, they may see a warning that the certificate is not trusted by their browser. Generally, users can choose to permanently accept the certificate.

If your web server uses a certificate signed by a popular Certificate Authority most browsers are able to establish a TLS/SSL connection without going through the security warning.

Use the HTTPS Certificate Utility to manage the Administrative Server certificate.

Related Topics

- Smart card settings
- General Security

Change administrator password

The administrator password is used to log onto the Administrative Console,

`<hostname>/adminconsole`

If you are using LDAP authorization, you can also assign access directly to individuals or groups the same way you assign host sessions. The Administrative Console then appears as a link on the user's list of links.

Restrict administrator account

Use these settings to limit access to the Management and Security Server administrator account.

IP range

Enter a range of IP addresses -- either IPv4 or IPv6 -- for devices that are allowed to log in as administrator. IP addresses outside this range will be rejected even if the correct password is entered.

Note: If the designated machines have multiple IP addresses, enter all of the possible IP addresses that the client might send.

You can use an asterisk (*) as a wild card in any part of the IP address. Use a single * (the default) to allow anyone with the password to log in as administrator. To restrict access, you must include * or a number in each section of the address.

Use a hyphen (-) to indicate an inclusive range of addresses and a comma (,) to list individual addresses. Examples:

Table 5-1

This entry...	allows access from...
*	all IP addresses
123.*.*.*	all IP addresses that begin with 123
123.123.4.5 - 123.123.4.7	only 123.123.4.5, 123.123.4.6, and 123.123.4.7
123.*.*.*, 246.246.0.1	all IP addresses that begin with 123 and from 246.246.0.1
123.123.4.5	only the given IP address

Maximum allowed attempts before lockout

After a user has attempted to log into the administrator account the specified number of times without providing the correct password, the user is locked out. This feature helps to guard against brute force attacks.

A zero (0) here or in the following field disables the lockout feature. This is the default.

Lockout duration (seconds)

This field specifies the length of time a user remains locked out after the specified number of failed login attempts. This feature helps to guard against brute force attacks.

A zero (0) here or in the preceding field disables the lockout feature. This is the default.

Require new login

Set the time when the administrator must log in (again).

Require a new login to the server after an inactive period (minutes)

Management and Security Server times out when a user has not launched a session or otherwise interacted with the Administrative Server for the time specified. The user must log in again to open a new host session or access the Administrative Console. Host sessions that are already open are not affected.

Note: When you are configuring sessions and settings, you may want to lengthen the timeout period to avoid disruption.

Require new login for each host session launched by a user

When LDAP authentication is in effect, you can require users to log in to the Administrative Server each time they launch a session. This option does not apply when the user is logged in as administrator.

Smart card settings

Smart cards store digital certificates that can be used to validate (authenticate) a user’s identity to the network. Digital certificates are used in X.509 systems, and are part of an organization’s public key infrastructure (PKI). Smart card support is available only on Windows platforms.

From a user’s smart card, only one certificate is used to authenticate to Management and Security Server. By default, smart card support is available for sessions using PKCS #11 (Public-Key Cryptography Standard) smart card readers, such as ActivCard.

The default setting

Management and Security Server’s default smart card parameter specifies the provider, sunpkcs11, and the associated certificate attributes.

If you use a different provider, enter the smart card provider along with certificate attributes to identify valid certificates on the user's smart card. For details and examples, see About smart card parameters.

Smart card libraries

Smart card libraries are required when using `sunpkcs11` to access smart cards. (MSCAPI uses DLLs that ship with Windows, and the provider DLLs do not need to be specified in this field.)

SunPKCS11 requires one or more libraries, such as ActivClient. Noting the library examples provided in Management and Security Server, you could use `acpkcs211` instead of `acpkcs`, and `acpkcs211.dll` instead of `acpkcs201.dll`. Separate the library names with commas.

Note: When using ActivClient7 with Management and Security Server, you must include the full Windows short (MS-DOS) path to the dll. For example, the short path on a Windows x64 system would be `C:\PROGRA~2\ActivIdentity\ActivClient\acpkcs211.dll`

Paths on a Windows machine can use either forward slash (`/`) or backward slash (`\`) file designations.

About smart card parameters

Smart card parameters can be used as filters to identify valid certificates on a user's smart card.

The smart card setting in Management and Security Server includes the smart card provider and certificate attributes as a filter to select a valid identity certificate.

Smart Card Provider

The first part of the parameter identifies the software provider that Management and Security Server should use to access the smart card certificate reader on the client machine.

In the default parameter, sunpkcs11 (Public-Key Cryptography Standard) is the intended software provider. Another valid provider is MSCAPI (Microsoft CryptoAPI, native to Windows).

If you use a smart card provider other than sunpkcs11, enter the provider followed by the desired certificate attributes. A colon (:) is required to separate the provider from the filter when multiple masks are used (See Certificate Attributes).

Certificate Attributes

The next part of the default parameter is made up of two filters, separated by a semi-colon (;). Each filter consists of Object-ID (OID) masks that specify certificate attributes. The masks specify which certificate attributes (encoded tokens) MUST (+) or MUST NOT (-) be on the certificate before it can be used for login or client authentication.

The default parameter specifies these attributes:

```
KU+DIGSIG,KU-NONREP,EKU+CLIAUTH,EKU+SCLOGIN,EKU-EMLPROT;
KU+DIGSIG,KU+NONREP,EKU-NONE.
```

The first filter uses the following logic for each attribute to be TRUE. When all attributes are TRUE, the certificate is valid and can be used for authentication.

- `KU+DIGSIG`: Key Usage of Digital Signature OID MUST be present in the certificate.
- `KU-NONREP`: Key Usage of Nonrepudiation OID MUST NOT be present in the certificate.
- `EKU+CLIAUTH`: Extended Key Usage of Client Authentication OID MUST be present in the certificate.

- `EKU+SCLOGIN`: Extended Key Usage of Smart Card Login OID MUST be present in the certificate.
- `EKU-EMLPROT`: Extended Key Usage of Email Protection (called Secure Email) OID MUST NOT be present in the certificate.

If any attribute in the first filter is FALSE, the second filter is used. The second filter in the default parameter uses this logic for each attribute to be TRUE:

- `KU+DIGSIG`: Key Usage of Digital Signature OID MUST be present in the certificate.
- `KU+NONREP`: Key Usage of Nonrepudiation OID MUST be present in the certificate.
- `EKU-NONE`: Extended Key Usage MUST NOT be present in the certificate.

Certificate chooser prompt

After a user inserts a smart card and enters the Personal Identification Number (PIN), a list of certificates displays. Use this setting to select how the user is prompted to choose a certificate.

Show certificate prompt

This default option requires the user to choose the correct certificate each time they log on. In the displayed list, the **Type** column can help to identify the proper certificate.

Show certificate prompt and allow user to save selection

This option allows the user to save the certificate selection. When the user chooses to save the selection, the cached certificate is used for this connection and the user will not be prompted to choose the certificate on subsequent logons.

Enable identity verification

When a session is set to use TLS to connect to the host or the Security Proxy Server, the emulator applet authenticates the server to which it is connecting using the host or security proxy certificate. When **Enable server identity verification** is selected, the applet checks the common name on the certificate against the name of the host or server. You must ensure that the common name on the server certificate is the same as the name of the host or proxy server to which it has been issued.

If you clear the client verification option, the applet verifies that the server has a trusted certificate, but does not check that the server presenting the certificate is actually the one to which the certificate was issued.

If the connection uses TLS, the common name on the server certificate must always match the host or security proxy server name, regardless of whether server identity verification is selected.

You can override this setting on a per session basis with the `serverIdentityOverride` applet parameter.

Change keystore password

You can set a password to protect keystores and private keys that are stored on the Management and Security Server. This password protects the following:

- The Management and Security Server certificate and private key.

- The client certificate and private key.
- The imported certificates on the terminal emulator applet trusted certificate list. These are the certificates listed in the **Import Trusted Certificates** table on the **Certificates Trusted by the Emulator Applet** panel.

To change this password, enter the existing and new passwords and click **Apply**. If a keystore password has not been previously set, leave the **Existing password** field blank.

NOTE: This password does ***not*** protect these certificates:

- The trusted certificates from certificate authorities on the terminal emulator applet trusted certificate list. These are the certificates listed in the **Trusted Root Certificate Authorities** table on the **Certificates Trusted by the Emulator Applet** panel.
- The Management and Security Server trusted certificate list.

  To change the password that protects these certificates, see Keystore Password for the Trusted Certificates List.

Keystore Password for the Trusted Certificates List

The Administrative Server uses the Oracle JVM (java virtual machine) default password, `changeit`, to protect the Administrative Server's trusted certificate list. The keystore for the Administrative Server trusted certificate list is stored within the java.home directory for the JVM that is installed with the Administrative Server. The default location on a Windows platform is `C:\Program Files\Micro Focus\MSS\jre\lib\security`. The keystore is stored in the `cacerts` or `jssecacerts` file.

To change the password that protects the Administrative Server's trusted certificate list:

1. Open a **Command Prompt**. On a Windows platform, using the default installation, change to this directory: `C:\Program Files\MSS\_jvm\lib\security`. The file `cacerts` or `jssecacerts` will be in this directory.
2. Enter the following command:

   ```
   ..\..\keytool.exe -storepasswd -v -new new_pass -keystore cacerts
   ```

   Where `new_pass` is your new password, and `cacerts` is the file in which the keystore is stored. Replace `cacerts` with `jssecacerts` that is the file in your `security` directory.
3. When prompted to **Enter keystore password**, type the current password, which by default is `changeit`, and press **Enter**.

   The new password is saved to `cacerts` (or `jssecacerts`).
4. Use your new password (`new_pass` in this example) to import an untrusted certificate when configuring LDAP or to view and modify trusted certificates on the Certificates tab.

PKI Server

You can use PKI Services Manager to validate client certificates used to authenticate to Management and Security Server.

Two options can be set on this panel to use PKI Server:

- **when the authentication method is X.509 with LDAP failover**

  Check this box if you want PKI Services Manager to validate the certificates used to authenticate to Management and Security Server.

- **by the terminal emulation and file transfer clients**

  Check this box if you want PKI Services Manager to validate the certificates used to authenticate the clients.

The **PKI Services Manager** version 1.3 or higher is available as a separate download from the same product download page as Host Access Management and Security Server.

After the PKI Services Manager is installed and configured, enter:

- **PKI Server address**: the name or IP address of the computer running PKI Services Manager.
- **PKI Server port**: the PKI Services Manager port. (The default is 18081.)

Keychain

The keychain stores the passwords and passphrases (such as LDAP server passwords) used by the Management and Security Server. The keychain file is encrypted and is unlocked for use by the Management and Security Server at server startup. The keychain file is located in `MSSData/rweb.keychain`.

You can also set a password for the keychain, using these settings.

- **Use a keychain password file to allow unattended server startup**

  By default, this setting enables unattended startup of the Management and Security Server. The keychain password is written to the keychain password file `MSSData/rweb.pwd`. On subsequent server startup or restart, the keychain password is read from the keychain password file, and the keychain is unlocked without additional action by the administrator.

  Note: When this option is *not* checked, the keychain must be manually unlocked by the system administrator by running the **KeychainUtility** application.

- **Keychain port for submitting the unlock password**

  This setting defines the port number that the keychain service listens on. To change the default port (12797), enter a local port number from 1 to 65535. Or, enter 0 to allow a random port assignment.

  This port is accessed by the KeychainUtility when the keychain must be manually unlocked.

- **Existing password for unlocking the keychain file**

  The default password is `changeit`

- **New password** and **Confirm new password**

  Enter a case-sensitive password.

Note: The system administrator MUST restrict the filesystem permissions for the `rweb.keychain` and `rweb.pwd` files to only read/write access by root and the process that runs the Management and Security Server. All other access to these files must be denied.

Secure Shell

Use the **Secure Shell** panel to manage the public and private keys needed for secure shell (SSH) connections.

- Known Hosts List
- Shared User Key Pair

Known Hosts List

The known hosts list contains the public keys of hosts that the terminal emulator applet can connect to using secure shell. When an SSH connection is negotiated, the client authenticates the host against a list of known hosts.

The known hosts list on the Management and Security Server can be used by all clients, similar to the default user key pair. The table displays the hosts that are known.

To add a host to the list of known hosts, import a file that contains the host's public key.

1. In the `/etc/ssh` directory, locate the file that contains the public key, such as `ssh_host_<algorithm>_key.pub`.

   The format of the file can be OpenSSH, Base64 encoded.DER, or .PFX.

2. Add hostname,ip if the file does not already contain that information.

   That is, be sure the file contains `hostname,ip algorithm key`. For example:

   ```
   mySSHhost,10.10.1.1 ssh-rsa
   AAAAB3NzaB1yc2EAAAABIwAAAIEA0WR3aIRtilXquUmXtxw5oi3rMkhY9jw/lV03WvUNvSb/
   xQnIfoMeserY5DfU8+eqUPzLX0efJMik22VFAzFo+ZCOnlHbj39yNi2a1/
   7dAJYECaHo7pxhILHAZxXbwOpWSms3aaccWOOEA+Fyzv8DpppQ9WrpD/fWVvXWNGR22sU=
   ```

3. Copy the key file into this directory on Management and Security Server:

   Unix: `/var/opt/microfocus/mss/mssdata/certificates`

   Windows: `C:\ProgramData\Micro Focus\MSS\MSSData\Certificates`

4. On the **Secure Shell** panel, under **Known Hosts List**, click **+ Import**.

5. Enter the required information:

   - **File name**: the name of the file with the host's public key that you copied (step 2).
   - **Public key file password**: if required.
   - **Host name**: as specified in the public key file. The name you enter must *exactly match* the hostname in the public key. For example, if the hostname in the key is `hostname.example.com`, and you enter `hostname`, the import will not work.
   - **Host IP address**: as specified in the public key file, if present. If there is no IP address in the public key file, leave this field blank.

6. Click **Import**.

   This host now displays in the Known Hosts List.

Shared User Key Pair

A user key pair is a public and private key used to authenticate a web-based client to a secure shell host. Although each typically has unique keys, a key pair can be shared among users.

To share a user key pair, choose one of these methods:

- Generate
- Import
- Export
- Shared User Key Pair Details

Generate

The generated user key pair will be stored on the Management and Security Server and automatically deployed to Reflection for the Web clients.

To generate a key pair, enter the required information:

- **Key algorithm**: RSA (the default) or DSA
- **Encryption key length**: the size of the public and private keys. Longer keys are more secure but may take more time to generate.

When you click **Apply**, the key pair is created in the `MSSData/trustedcerts` folder as `sshclient.bcfks`, and the details are displayed in this panel.

Import

A public key and its associated private key pair can be imported from a local workstation.

To import a key pair to the Management and Security Server:

1. Copy the key pair file or files to the `certificates` directory on the Management and Security Server:

   UNIX: `/var/opt/microfocus/mss/mssdata/certificates`

   Windows: `C:\ProgramData\Micro Focus\MSS\MSSData\Certificates`
2. Enter the **File name**.
   - If the keys are in **OpenSSH** format files, enter the name of the private key file. The public key must be in a file with the same name and a `.pub` extension.
   - If the keys are in a **.PFX** format file, enter the file name.
3. Enter the **Password** that protects the private key. If the file is not protected, leave this field blank.
4. If the file contains multiple certificates, enter the **Friendly name** of the one associated with the desired key pair. Otherwise, leave this field blank.
5. Click **Import**. The key pair file is created in the `MSSData/trustedcerts` folder, and the details are displayed on this panel,

Export

You can export the shared user public key or key pair to an OpenSSH or secssh format file.

Specify a file name for export; for example, `id_rsa`. The public key is written to a file with this name and a `.pub` extension. When selected for export, the private key is written to this file.

The file or files are written to this folder on the Management and Security Server:

UNIX: `/var/opt/microfocus/mss/mssdata/certificates`

Windows: `C:\ProgramData\Micro Focus\MSS\MSSData\certificates`

Check or enter the required information.

- **Export the private key with the public key** - otherwise, only the public key is exported.
- **Overwrite existing file(s)** - if other key files exist with the name.
- **Key file name** - a name for the file that will be created by the export operation.

Enter the name for the private key (the file name with no extension) even if you are exporting only the public key.

- **Private key passphrase (optional)** - if you are exporting the private key, you can protect it with a password you enter here.

  Note: The password does not apply to the public key.

Shared User Key Pair Details

- **Public Key Algorithm** - the algorithm used to generate the host's key pair.
- **Public Key Fingerprint (SHA-1)** - A message digest of the public key made using the SHA-1 algorithm. The fingerprint can be used by a client to validate the public key.
- **Public Key Fingerprint (MD5)** - A message digest of the public key made using the MD-5 algorithm.

Related Topics

- General Settings

Certificates

Certificates in Management and Security Server generally identify a client or server. (Client certificates can identify individuals.) During authentication, Entity A presents a certificate to Entity B, which checks the signature against its store of trusted certificates. If the certificate or its root is trusted, the transaction proceeds. If not, Entity B may either reject the transaction or present Entity A's user with a warning.

Server certificates. The need for server certificates depends on the security settings that are used for your terminal sessions:

- If you use **TLS/SSL** security, the Host needs server certificates.
- If you use the **Security Proxy Server**, both the **Management and Security Server** and the **Security Proxy** need server certificates.

Use the **Certificates** panel to generate and apply a self-signed certificate for Management and Security Server or to import a signed client certificate to share.

- Administer the Management and Security Server Certificate
- Administer Shared Client Certificate
- Other certificates

Administer the Management and Security Server Certificate

Management and Security Server requires a certificate to connect to the Security Proxy. You can generate a self-signed certificate or import a CA-signed certificate and private key.

Generate a self-signed certificate

This form generates a self-signed Management and Security Server certificate that can be used to connect to the Security Proxy. If a self-signed server certificate already exists, the certificate generated here will replace it.

To **Generate** the certificate:

1. Enter the **Common name** of the site on which the certificate will be installed, such as `hostname.company.com` (for an external site) or **hostname** (for an internal site).
2. Enter the required information.
3. Open **Advanced Settings**, and confirm or change the settings, as desired.
4. Click **Generate** and **View Details** to verify your entries.

Import a key pair

If a server certificate and private key already exist, the imported key pair will overwrite them.

To **Import** the key pair:

1. Copy the file containing the certificate and the private key into this folder on the Management and Security Server:

   UNIX: `/var/opt/microfocus/mss/mssdata/certificates`

   Windows: `C:\ProgramData\Micro Focus\MSS\MSSData\Certificates`
2. Enter the required information.

   Keystore file name: the file that contains the certificate

   Keystore password: that protects the file that contains the certificate

   Friendly name: so you can easily identify the certificate
3. Click **Import**.

Administer Shared Client Certificate

A client certificate is used to identify users connecting to the Security Proxy or to a TLS/SSL host when client authentication is required. If all users share the same client certificate, the Administrative Server can automatically distribute it to the emulator clients when needed.

If a server certificate and private key already exist, the imported key pair will overwrite them.

To **Import** the key pair:

1. Copy the file containing the certificate and the private key into this folder on the Management and Security Server:

   UNIX: `/var/opt/microfocus/mss/mssdata/certificates`

   Windows: `C:\ProgramData\Micro Focus\MSS\MSSData\Certificates`
2. Enter the required information.

   Keystore file name: the file that contains the certificate

   Keystore password: that protects the file that contains the certificate

   Friendly name: so you can easily identify the certificate
3. Click **Import**.

Other certificates

Certificates that are needed for other functions are managed differently.

- To generate other self-signed certificates or to import signed certificates to the Security Proxy, clients, or host systems, use the certificate features in those components.
- Use the **Security Proxy Wizard** to manage the Security Proxy certificate.
- Use the **HTTPS Certificate Utility** to administer web certificates (for use with Tomcat) or to generate a Certificate Signing Request (CSR)

HTTPS Certificate Utility

This utility installs or updates a certificate for the HTTP server functionality that is included with Management and Security Server (from the Start menu). This certificate enables clients to establish secure connections (HTTPS) to the services provided by the Management and Security Server.

The HTTPS Certificate Utility also provides the option to create a private key and a Certificate Signing Request (CSR).

How to Generate a Certificate Signing Request (CSR)

A Certificate Signing Request or CSR is a block of encoded text that is given to a Certificate Authority (CA) when applying for an SSL Certificate. The CSR includes identity information and a public key. A CA verifies the identity of the server's domain name and its owner and then adds a signature to the certificate to verify the server's authenticity to other computers.

The Certificate Authority uses a CSR to create your SSL certificate, but it does not need your private key. Keep your private key secret.

Choose a method to generate a CSR and obtain a CA-signed certificate:

- Use the HTTPS Certificate Utility
- Use a Certificate Authority’s Instructions
- Use Commands for Keytool or Openssl Tool

Use the HTTPS Certificate Utility

To generate a CSR and a new private key:

1. Open the **HTTPS Certificate Utility** from the **Start** menu. (It installs with Management and Security Server.)
2. Proceed through the utility, and review your previous actions, if pertinent.
3. On the **Select a certificate action** screen, select **Generate a new key pair and Certificate Signing Request**.
4. Proceed through the screens to specify information for the certificate:
   - a Friendly Name
   - a Common Name
   - the certificate's organization and locality
   - the certificate's validity and key length

- the directory that will store the private key and the CSR
- the certificate store's File name, File type, and Password that will be used to store the private key and the CSR

5 Note the **Next steps** and Quit the HTTPS Certificate Utility.

.....

6 Send the `*.csr` file from the directory you specified to the Certificate Authority (CA) of your choice. Do not send your private key.

.....

7 When the signed SSL certificate is received from the CA (response time varies), return to the **HTTPS Certificate Utility** to import the certificate together with the private key that was generated in the previous steps.

8 Proceed to the **Select a certificate action screen**, and select **Import a certificate a private key**.

9 Enter the certificate store file name that you previously specified.

10 Enter the keystore's password.

11 Click **Next** to apply the configuration changes. Click **Done** to close the utility.

Use a Certificate Authority's Instructions

To generate a CSR and obtain a CA-signed certificate, choose a CA, follow their instructions, and use the tools they provide. Here are some examples, with links to the CSR generation instructions:

- Comodo
- DigiCert
- GeoTrust
- Thawte
- Symantec

CAs provide detailed instructions for common tools such as keytool and openssl. Some have their own tools that you can download. Creating a CSR can also be done completely online. For example, see SSL Tools

Use Commands for Keytool or Openssl Tool

If you are unable to use the HTTPS Certificate Utility or follow the instructions from a CA, you can use the manual keytool commands for CSR to perform the three steps: generate a key, generate a CSR, import the response from the CA.

1 `keytool -genkey -alias server -keyalg RSA -keysize 2048 -keystore keystore.jks`

2 `keytool -certreq -alias server -keyalg RSA -file server.csr -keystore keystore.jks`

3 `keytool -importcert -trustcacerts -file careply -keystore keystore.jks`

Or, you can use the openssl tool to generate CSRs and keys in two steps: generate a key and a CSR, and import the response from the CA.

1 `openssl req -new -newkey rsa:2048 -nodes -keyout server.key -out server.csr`

2 `openssl pkcs12 -export -out keystore.p12 -in careply -inkey server.key`

Trusted Certificates

The Certificate Store contains the certificates that are trusted by the terminal emulator client and the Management and Security Server.

Select **Terminal Emulator Clients** or **Management and Security Server** to filter the view of trusted certificates.

- Terminal Emulator Clients - Trusted Certificate list
- Trusted Root Certificate Authorities
- Management and Security Server - Trusted Certificate list

Terminal Emulator Clients - Trusted Certificate list

Clients that make a TLS/SSL connection to a host or Security Proxy must trust the host or proxy certificate. This panel presents a list of root certificates trusted by the terminal emulator applet.

The table shows the certificates that have been imported to the terminal emulator applet's trusted list. To view details about the certificate, click the certificate's Friendly name.

To add a certificate to the list, click **+ Import**, enter the required information, and click **Import**.

Trusted Root Certificate Authorities

This table lists the set of commonly used root certificates in Management and Security Server. To view details about a root certificate, click the root's Friendly name.

If a trusted CA root certificate expires or is compromised, you may need an update.

NOTE: If your certificate changes are needed by Windows-based clients to perform X.509 authentication, you must restart the Management and Security Server for the changes to take effect.

Management and Security Server - Trusted Certificate list

This collection of certificates includes CA certificates used to authenticate X.509 clients and to establish other servers as known and trusted to the Management and Security Server.

View or modify certificates trusted by the Management and Security Server.

This collection is used for the following features:

- **X.509 with LDAP failover authentication:** Add CA certificate(s) needed to authenticate end-user certificates, such as a certificate stored on a smart card.

  For these features, certificates are added to establish the other server as known and trusted:
- **Automated Sign-On for Mainframe:** Add a certificate(s) to establish trust of a Mainframe host.
- **Replication:** Add certificate(s) to trust other MSS servers used in Replication.
- **Micro Focus Advanced Authentication (MFAA):** Add certificate(s) to trust the MFAA host.

Server certificates from other servers should be included in this certificate collection.

IMPORTANT: When using **X.509 with LDAP failover** authentication in conjunction with other Management and Security Server features that also use the certificates in this collection, such as Automated Sign-On for Mainframe, special consideration should be given to ensure that trust is not inadvertently broadened and granted to unintended end-user clients.

See Trusted Root Certificate Authorities.

Credential Store (Reflection for the Web)

The credential store is a database of usernames and passwords that have been used to log on to a host. Reflection for the Web uses these credentials in conjunction with login macros to automatically log on to host sessions. The Credential Store requires Windows on the client machine.

Enable credential store

Check **Enable credential store** to save new credentials or read existing ones.

Select form of identity

By default, users are represented in the credential store depending on how they authenticate, such as with a Windows domain and username.

Check **Use LDAP distinguished name** to represent users by their LDAP Distinguished Name. This option requires LDAP authorization to be enabled in **Configure Authentication**.

Regenerate encryption key

When you enable the credential store, you should back up the key used to encrypt usernames and passwords in the credential store.

To back up the key, copy `[MSSData]/PropertyDS.xml` to a secure location. Make a new backup of `PropertyDS.xml` whenever you change settings in the Administrative Console so that these settings will not be overwritten when you restore the file. **Note:** You need administrator privileges to open or edit `PropertyDS.xml`.

When you click Regenerate Key:

A new key is generated to either replace an existing key or to add a key when the credential store is empty. When replacing an existing key, the data is decrypted using the old key and re-encrypted using the new key. Subsequent encryption uses the new key.

NOTE: Re-encrypting the credential store with a new key could take quite a bit of time. During the re-encryption, nothing can be written to or read from the credential store.

You *cannot* regenerate a key if the existing key is corrupted or maliciously altered. You must first recover the old key from a backup or delete all credentials before generating a new key.

Recovering an encryption key

To recover the old encryption key from the backup, edit `PropertyDS.xml` (requires administrator privileges):

1. Open the current `PropertyDS.xml` file and the backup copy in an editor.
2. Copy the values for the following properties from the backup to the current version of `PropertyDS.xml`:

   ```
   CS.EncKey
   CS.EncAlgorithm
   CS.EncKeyLength
   CS.EncIV
   ```

3. Save `PropertyDS.xml`.
4. Restart the Management and Security Server.

Delete selected credentials

When the credential store is enabled, new credentials are added when users run sessions configured with single sign-on macros. As time goes by, you may wish to remove older credentials. Use this option to delete stored user credentials based on the last-used date.

Note: Once credentials are deleted, they cannot be recovered.

To delete credentials:

1. Select one or more **Users**.
2. Sort by **Credential Last Used**.
3. Check the credentials you want to delete, and click **– Delete**.

Security Proxy

Use this panel to import the settings from the Security Proxy Server to the Management and Security Server after the Preliminary steps are completed.

- Preliminary steps - Install and Configure
- Import Security Proxy settings
- Create and assign secure sessions

Preliminary steps - Install and Configure

Before you can import the settings, you must install the Security Proxy and configure some initial settings.

For detailed steps, refer to Using the Security Proxy Server.

Next Step: Import Security Proxy settings

Import Security Proxy settings

After the Security Proxy is installed, configured, and started, import the Security Proxy settings to the Administrative Server.

1. In the Administrative Console, open **Configure Settings** > **Security Proxy**.
2. Click **+ Import**.
3. Enter the **Server name** of the computer on which you installed the Security Proxy Server.

NOTE:

- The Security Proxy Server must be running when you import the settings.
- The name you enter must match the common name on the security proxy certificate if client verification of server identity is enabled (the default setting).

  The Administrative Server verifies the proxy server identity by comparing the common name on the proxy certificate to the name of the server itself. If the names do not match--for instance, if the server certificate common name is `servername.example.com` and you enter `servername`--you may be able to import the certificate, but session connections through the proxy will fail when the client attempts to verify the server identity.
- The Security Proxy server must trust the Administrative Server certificate. (See Preliminary Steps.)

---

4. Enter the **Monitor port**. You can check the Security Proxy Monitor port number in the Security Proxy Wizard (**Advanced Settings**).
5. Enter a name that clients would recognize. If a single proxy server name is always used, leave this field blank.

   In some cases, clients may need to access the security proxy using a different name than the one used to import the proxy settings. For example, as administrator, your computer may access the Security Proxy through an internal network, but your end users may access the Security Proxy from outside the firewall and use a different proxy name. In this case, enter the name that the clients use in this field.

   When both names are entered, the Administrative Server uses the first name to contact the Security Proxy and import its settings and certificate, and then displays the second name in the table on the **Security Proxy** panel and in the Terminal Session tool. Emulator sessions use the second name to contact the proxy.

   If any end users contact the Security Proxy using both proxy names, import the Security Proxy settings twice, and define separate sessions for each proxy name.
6. Click **Import**. After the Security Proxy settings are imported, the Security Proxy server is listed in the table with its details:

   Server name: The name of the server on which the security proxy is installed.

   Authorization: The status of client authorization on this server. Authorization is enabled by default.

   Monitor Port: The port on which the Security Proxy listens for incoming communication. Used when the Administrative Server contacts the proxy to get report information or to import the security settings. Usually 8080.

   Proxy Port: The port the emulator uses to open a secure connection to the Security Proxy.

Supported Protocols: The protocols that are available on the Security Proxy. Each proxy can support emulation and/or FTP. or the Passthrough proxy (no TLS handshake, client/server authentication, or encryption).

Destination: When client authorization is turned off, each Security Proxy port connects to one host. Set the destination host for this proxy port in the Security Proxy Wizard. When client authorization is on, one port can connect to multiple hosts.

Friendly Name: The name of the server certificate used for this Security Proxy setting.

Cipher Suite: The encryption algorithm used for this proxy port.

7 **Accept settings exported from Security Proxy Servers.**

When you use the **Security Proxy Wizard** to set up or change a Security Proxy, you can export information and certificates directly to the Administrative Server over an HTTP connection. This information is not encrypted.

To use the automatic export in the Security Proxy Wizard, you must check this box.

IMPORTANT

- **If you change settings on the Security Proxy**, you must re-import them to the Management and Security Server.
- **When you upgrade**, open the **Security Proxy Wizard**, review the status of your Security Proxy servers, and click **Save**. This action synchronizes the Security Proxy server with the Management and Security Server.

Next step: Create and assign secure sessions

Create and assign secure sessions

After the trust between the Administrative Server and the Security Proxy is set, use **Manage Sessions** and **Assign Access** to create and assign secure sessions to authorized users.

For detailed steps, refer to Using the Security Proxy Server:

- Create Secure Sessions
- Assign Secure Sessions

Related Topics

- Preliminary steps - Install and Configure
- Import Security Proxy settings

Authentication & Authorization

Choose a method to validate a user's identity (authentication). Then you can assign sessions to specific users or groups (authorization).

- Choose Authentication Method
- Choose Authorization Method
- LDAP Server Configuration

- Single Sign-on through IIS
- Single Sign-on through Windows Authentication
- X.509 Configuration
- SiteMinder Configuration
- Micro Focus Advanced Authentication

Choose Authentication Method

Authentication validates the user's identity based on some credentials, such as a username/password combination or a client certificate. Select a method to authenticate users:

- **None** - Management and Security Server does not present a login screen. Any user can access their assigned sessions without being prompted for credentials. Session authorization is not available.

  NOTE: If you set the authorization method to None, be aware that all users are logged in as Guest. During session configuration, it is best not to allow users to modify their session settings (User Preference Rules), as they can overwrite each other’s choices.

- **LDAP** - Management and Security Server makes a read-only connection to your existing LDAP (Lightweight Directory Access Protocol) server to verify usernames and passwords. You can also use LDAP to authorize session access. LDAP is an industry standard application protocol for accessing and maintaining distributed directory information services over a network.

  Note: You can enable more than one LDAP server.

- **Single sign-on through IIS** - This option uses Microsoft IIS web server. This option requires no additional setup as long as you used the automated installer and chose to integrate with IIS during the installation process. You can find more information on install configurations in the Management and Security Server Installation Guide.
- **Single sign-on through Windows authentication** - This option uses the NT LAN Manager version 2 (NTLM v2) protocol to authenticate users. When a user logs into the Windows domain and requests a session using a web browser that supports integrated authentication though NTLM v2, a secure hash of the user's credentials is sent to a domain controller for verification. Once verified, the Administrative Server establishes an authenticated HTTP session with the user's browser.

  NOTE: NTLM v1 is no longer supported. Any settings saved for Single sign-on through Windows are exclusively for NTML v2 and will overwrite any existing NTLM v1 settings.

  Microsoft Internet Explorer, as well as other web browsers, support integrated authentication through NTLM, but other browsers may require additional configuration to enable this functionality. The computer running the Administrative Server does not need to be a member of the Windows domain.

- **X.509** - X.509 is a standard for managing digital certificates and public key encryption. When you use certificate-based authentication, you can specify the certificate source and setting for LDAP failover if certificate-based authentication fails.
- **SiteMinder** - To enable this option on a Windows system, install both the Administrative Server and a SiteMinder web agent on the same machine as IIS, and set up the server to use your IIS web server.

The setup options vary based on your selection.

Related Topics

- LDAP Server Configuration
- Enabling Multiple LDAP Servers
- Single Sign-on through IIS
- Single Sign-on through Windows Authentication
- X.509 Configuration
- SiteMinder Configuration

Choose Authorization Method

The authorization method determines who can access your terminal emulation sessions.

- **Allow authenticated users to access all published sessions**

  When this option is selected, the **Assign Users & Groups** panel presents the list of sessions that you can to publish to *all* end users. Users see the list of sessions when they log in.

- **Use LDAP to restrict access to sessions**

  When this option is selected, the **Assign Users& Groups** panel allows you to assign specific sessions to specific LDAP users or groups. Logon userids must match those in the LDAP directory. After the sessions are assigned, the authorized users see their list of sessions when they log in.

Related Topics

- LDAP Server Configuration
- Enabling Multiple LDAP Servers
- Choose Authentication Method
- Assign Access

LDAP Server Configuration

When you use LDAP to authenticate or authorize users, Management and Security Server makes a read-only connection to the LDAP server. Use these settings to configure that connection.

- LDAP Servers
- Enabling Multiple LDAP Servers
- LDAP Configuration
- Search Base and Groups/Folders
- Validate LDAP Connection
- Authentication of End Users
- Advanced Settings

LDAP Servers

You can **Add**, **Edit**, **Test**, or **Delete** the connection for each LDAP server. Check with your organization's LDAP administrator for more information, if needed to configure these options.

To use more than one LDAP server to authenticate or authorize users, you must first set a property. See Enabling Multiple LDAP Servers, and then proceed with the LDAP Configuration for each server.

Enabling Multiple LDAP Servers

More than one LDAP server can be configured to authenticate and authorize users. A property must be set, and then the servers can be added and configured.

To enable multiple LDAP servers:

1. Open `PropertyDS.xml`. (Administrative privileges are required.)

   On Windows: `C:\ProgramData\Micro Focus\MSS\MSSData\`
2. Locate this property, and set the value to `true`:

   ```
   <CORE_PROPERTY NAME="AC.DirAllowMultiLdap">
   <BOOLEAN>true</BOOLEAN>
   </CORE_PROPERTY>
   ```
3. Save the file.
4. Restart the MSS server.
5. Return to the **Administrative Console** and enter the LDAP Configuration information for each LDAP Server.

   Or, if you are configuring **Single sign-on through Windows authentication**, return to Adding Another Server for Single Sign-on Through Windows.

NOTE: To revert to a single LDAP server, set the property in step 2 to `false`, save the file, and restart the MSS server.

LDAP Configuration

Click **Add** to open the LDAP Configuration page, or select a server and click **Edit**.

Enter or edit the **LDAP Server** information.

- **Server type**

  Select the type of LDAP server you are using from the list. The options on this page change depending on the LDAP server type you select. If you do not see your specific LDAP server in the list, select **Generic LDAP Compliant Directory Server (RFC 2256)**.
- **Security options**

  Data can be passed between the Administrative Server and the LDAP server in clear text or encrypted. The type of encryption used depends on your LDAP server. Kerberos v5 is available for Windows Active Directory, and TLS/SSL for all other servers.

  By default, Management and Security Server transmits data between the Administrative Server and the LDAP server in clear text. If you choose this option, you should prevent users from accessing the network link between these two servers.

Encryption type	Description
TLS/SSL	When using TLS/SSL as the security option for an LDAP server, you must import the server's trusted certificate. If you are presented with multiple certificates to import, it is best to choose the CA certificate.
Kerberos v.5	When you select Windows Active Directory with Kerberos, you must enter the name of the Kerberos key distribution centers. Multiple key distribution centers, delimited by commas or spaces, can be used. If you do not know the name of the Kerberos key distribution center, enter the fully-qualified DNS name of the Active Directory server. The option under the key distribution center name field allows you to encrypt all data transmitted over the Kerberos connection. By default, only user names and passwords are passed securely between the Administrative and LDAP servers using Kerberos. Encrypting all data is more secure, but may increase performance overhead.

- **Server name**

  Enter the LDAP server name as either a name or a full IP address. If you selected TLS/SSL above, this LDAP server name must exactly match the Common Name on the LDAP server's certificate. Multiple server names, delimited by commas or spaces, can be used for failover support. If an LDAP server is down, the next server on the list will be contacted. In this case, all fields specified on this page that are used for LDAP connections should be available on all the LDAP servers, and should have identical configurations.

- **DNS domain**

  Use this option to enter a DNS domain instead of a specific domain controller. No further configuration is required.

  When selected, you do not need to specify a domain controller address or the corresponding NetBIOS name because Management and Security Server provides the Domain Controller Locator Service. This service can be used ***only*** when the administrative server is running on **Windows**.

  For example, when you enter a domain name, such as `mycompany.com`, Management and Security Server automatically finds an available **domain server** and the **domain name**, which can be different from the dns domain.

- **Server port**

  Enter the port used by your LDAP server. The default is 389 for plain text or 636 for TLS/SSL. If you are using Active Directory, you may wish to set the server port to the global catalog port, which is 3268 (or 3269 over TLS/SSL). Global catalog searches can be faster than referral-based cross-domain searches.

- **Username** and **Password**

  Provide the username and password for an LDAP server account that can be used to access the directory in read-only mode. Generally, the account does not require any special directory privileges but must be able to search the directory based on the most common directory attributes (such as cn, ou, member and memberOf). Type in the password again in the Password confirmation box.

If this account password changes and the Administrative Server's configuration is not updated to use the new password, your users will get error messages when trying to authenticate. To resolve the problem, update the account password here and save your new settings. To avoid this problem, you may wish to set up an account that is not subject to automatic password aging policies, or that will not have the password changed by other administrators without notice.

NOTE: The user name must uniquely identify the user in the directory. The syntax depends on the type of LDAP server you are using.

- If you selected Windows Active Directory and Kerberos, enter the userPrincipalName (for example, `username@exampledomain.com`). The userPrincipalName is case sensitive. Case sensitivity does not apply to end user logins.
- If you selected Windows Active Directory with Plain Text, enter the NetBIOS domain\samAccountName (for example, `exampledomain\username`), userPrincipalName (for example, `username@exampledomain.com`), or distinguished name (for example, `uid=examplename,DC=examplecorp,DC=com`).
- If you selected any other LDAP server type, enter the distinguished name (for example, `uid=examplename,DC=examplecorp,DC=com`).

Search Base and Groups/Folders

- **Directory search base**

  Enter the distinguished name of the node in the directory tree you want to use as the base for Administrative Server search operations. Examples: `DC=my_corp,DC=com` or `o=my_corp.com`. For more information about how to describe the search base, see the LDAP administrator for your organization.

- **Groups or folders**

  While you can assign sessions to specific users in the directory, you can also assign sessions to either **Logical groups** or **Folders**. Choose the option that reflects the way the data is organized in your directory -- and the way you want to Assign Access. For instance if you want to assign access to a folder, then **Folders** must be selected here.

  In Management and Security Server, the term **folder** is used to describe both organizational units and containers. Most directories have an organizational structure that uses logical groups; for example, `groupOfNames` and `groupOfUniqueNames`.

Validate LDAP Connection

At this point, you can test the LDAP connection between Management and Security Server and this LDAP server. If the **Test Connection** result is **Success**, continue with the configuration.

If **Test Connection** fails, check the logs and resolve the issue before continuing.

Authentication of End Users

LDAP attribute for identifier

The default LDAP attribute to use as an identifier is available when you select an LDAP server type.

Table 5-2 *Default LDAP identifiers*

Server type	Default user identifier
OpenLDAP Directory Server	cn
Generic LDAP Compliant Directory Server (RFC 2256)	cn
RACF Directory Server	racfid
Oracle LDAP Directory Server	uid
IBM Tivoli Directory Server	cn
Windows Active Directory	List of domains**
NetIQ eDirectory	cn
Windows Active Directory with LDAP login form	cn

**When you select Active Directory as your LDAP server and the Kerberos security option, you must enter a list of Kerberos realms (e.g., domain@example.com). If you are using Active Directory with plain text, enter a list of NT domains (e.g., MYCOMPANY, SALES).

When an end user requests the list of sessions, the login page prompts for a username and password and displays available domains or realms in a drop-down list. If you have more than one domain or realm, separate the entries with commas (for example, 1stDomain, 2ndDomain, 3rdDomain).

Advanced Settings

Maximum nested level for groups

This number determines how assigned sessions are inherited. If Group A contains Group B of which JohnUser is a member, and you assign a session to Group A, JohnUser will also have access to that assigned session. If users do not inherit sessions as you expect, increase this number. Do not raise this level more than necessary because too high a number can impair performance if you have a large number of users. The default is 5.

After the LDAP servers are configured, use **Assign Users & Groups** to assign users to sessions.

Related Topics

- Manage Sessions
- Assign Access

Single Sign-on through IIS

This method assumes that Management and Security Server is set up to use your IIS web server (Windows only).

If you installed using the automated installer and integrated with IIS during installation, setup is complete. If you used an alternative installation method, see the Management and Security Server Installation Guide for more information.

Users who have logged in to Windows do not need to log in again to access sessions. You must administer usernames and passwords through the identity system used by IIS, typically Active Directory.

Credential Prompts When Using Single Sign-on

When Management and Security Server is configured to use Single Sign-On through IIS or through Windows, a user will be prompted for credentials under certain circumstances:

- The browser's process owner is not a valid Windows user or a member of the Active Directory domain. Typically the browser's process owner performs the interactive login to the operating system. However, an exception to this occurs when the **Run As** command launches the browser as a different user.
- The browser does not support single sign-on using Kerberos.

  - In Internet Explorer, this option is enabled by selecting **Enable Integrated Windows Authentication**. While this option is enabled by default, it can be overridden through Group Policies and practices.
  - In Mozilla Firefox, you must configure support for Kerberos authentication. Refer to Firefox documentation for instructions.
- When using Internet Explorer, if the `management.server.iis.url` property contains periods (such as http://www.microsoft.com or http://10.0.0.1), the requested address is assumed to exist on the Internet. Credentials are not passed automatically, and a credentials prompt will appear. However, Internet Explorer can be configured to automatically pass credentials for such an address by adding it to the Trusted Sites list. Alternatively, you can configure a Custom security level in Internet Explorer to perform an **Automatic logon with current username and password**.

Related Topics

- Assign Access

Single Sign-on through Windows Authentication

Use this configuration to set up Management and Security Server in a Windows environment that uses Active Directory authentication (NTLM v2) with or without LDAP authorization.

NOTE: NTLM v1 is no longer supported. Any settings saved for **Single sign-on through Windows authentication** are exclusively for NTML v2 and will overwrite any existing NTLM v1 settings.

If you cannot upgrade to NTLM v2, you can manually edit your NTLM v1 settings. Contact Support for details.

1. In **Configure Settings - Authentication & Authorization**, click **Single sign-on through Windows authentication**.
2. Select your authorization method:
   - **Allow all authenticated users to access all sessions**
   - **Use LDAP to restrict access**

     NOTE: The same server will be used for Windows (Active Directory) authentication and LDAP authorization.
3. Under LDAP Servers, click **Add**.
4. Follow the steps for the type of authentication selected in step 2:
   - Allowing all authenticated users access to all sessions
   - Using LDAP to restrict sessions

You can add one or more servers to use this authentication method. See Adding Another Server for Single Sign-on Through Windows.

Allowing all authenticated users access to all sessions

1 Enter the settings for Single Sign-on through Windows (Active Directory) authentication:

- **Domain Controller DNS name of IP address**

  IP address or DNS name of the Active Directory Domain Controller.

- **NetBIOS hostname of domain controller**

  The first 15 characters of the domain controller's host name, for example, `myComputer`.

  NOTE: The term **NetBIOS** is called *pre-Windows 2000* in some Windows utilities.

- **NetBIOS domain name**

  The first 15 characters of the left-most label in the DNS domain name.

  Example: For the DNS domain name `mydomain.mycompany.com`, enter the NetBIOS domain value `mydomain`.

  For information on how to obtain the NetBIOS name, see:

  Finding your domains' DNS and NetBIOS names

  Finding the NetBIOS Name of a Domain

- **Computer account (for servicing)**

  A computer account in the Active Directory domain.

  A computer account is different than a user account. The computer account should not be associated with an actual physical or virtual computer. For information on how to create a new computer account, see the Microsoft article, Create a New Computer Account. For background on this setting, see the **Notes** below.

  To specify the Computer account for servicing

  A computer account's syntax is the pre-Windows 2000 computer name, followed by a $ sign, followed by the @ symbol, then the DNS domain name.

  Syntax: `<Computer name (pre-Windows 2000)>$@<DNS domain name>`

  For example, if the Computer name is `ReflServiceAccount`, the pre-Windows 2000 Computer name is `REFLSERVICEACCO` and the **computer account** is: `REFLSERVICEACCO$@mydomain.com`

- **Computer account password**

  The password of the Computer account.

  If this value is not already known, it must be explicitly reset in Active Directory. You can reset a computer account's password using a simple VBScript, or the ADSI Edit tool.

  For more information, see:

  Reset a computer account's password using VBScript

  ADSI Edit Tool

2 Click **Test Connection**.

This action checks the NTLMv2 connection to be sure the server is listening and is in fact a domain controller. The test attempts to authenticate to the server using the IP address or alias for the domain controller, the NetBIOS hostname, computer account, and password.

Note: The Domain is not tested and could still be a cause for error later in the authentication process.

If the result is **Success**, click **OK**.

If **Test Connection** fails, check the logs and resolve the issue before continuing.

3 To add another server, see Adding Another Server for Single Sign-on Through Windows.

Notes

1. **Background on Computer account (for servicing)**. By default, a computer running Windows automatically changes its own password in Active Directory every 30 days. This means that if you create a computer account in the usual way (by adding a computer to the domain), then every 30 days, the password value stored in the Administrative Server's configuration will no longer be in sync with the value in Active Directory. In addition, Windows does not provide a method for you to learn what password Windows is using for the computer account.

   For this reason, you should create a computer account in the Active Directory domain, where the account is not associated with an actual computer. Such a configuration will prevent a computer from changing the account's password to an unknown value that is not synchronized with the password value stored in the Administrative Server's configuration for NTLM v2.

   There are exceptions to the automated password change (such as when the computer is turned off for more than 30 days, or when automatic password changes are disabled for the computer). These exceptions are not the recommended solution.

2. **Credential prompts.** A user will be prompted for credentials under certain circumstances. See Credential Prompts When Using Single Sign-on

Using LDAP to restrict sessions

1 Enter the **LDAP Server** information: Server type, Security options, Server name, Server port, Username, Password.

2 Enter the **Directory search base**, and choose **Logical groups** or **Folders**.

3 Enter the **Domain** used to authenticate end users.

4 Enter the settings needed for **Single sign-on through Windows authentication**:

- **NetBIOS hostname of domain controller**
- **Computer account (for servicing)**
- **Computer account password**

5 Click **Test Connection**.

This action checks the NTLMv2 connection to be sure the server is listening and is in fact a domain controller. The test attempts to authenticate to the server using the IP address or alias for the domain controller, the NetBIOS hostname, computer account, and password.

Then, the LDAP connection is tested.

Note: The Domain is not tested and could still be a cause for error later in the authentication process.If the result is Success, click OK.

If the result is **Success**, continue with your setup.

If **Test Connection** fails, the message specifies whether check the NTLM or the LDAP server connection failed. Check the logs and resolve the issue before continuing.

6 For the **Maximum nested level for groups**, accept the default (5), or change the number.

7 Click **OK**.

8 To add another server, see Adding Another Server for Single Sign-on Through Windows.

Adding Another Server for Single Sign-on Through Windows

You can add one or more Active Directory servers to use Windows authentication with or without LDAP authorization.

1 **Prerequisite:** The property must be set to enable multiple LDAP servers (*even if you do not use LDAP to restrict sessions*). See Enabling Multiple LDAP Servers.

2 On the **Configure Authentication** panel, verify that this method is selected:

- Single sign-on through Windows authentication

3 Select the Authorization method for this server:

- **Allow all authenticated users to access all sessions**
- **Use LDAP to restrict access**

4 Click **Add u**nder **Servers** (or **NTLM Servers**).

5 Continue with the steps for the selected type of authorization:

- Allowing all authenticated users access to all sessions
- Using LDAP to restrict sessions

Related Topics

- Manage Sessions
- Assign Access
- LDAP Configuration

X.509 Configuration

Use this configuration to enable users to authenticate with X.509 client certificates, and then automatically connect to a host session. Optionally, you can specify settings to fall back to LDAP authentication if certificate-based authentication fails.

NOTE: X.509 is supported through the HTTPS port. Users should disable HTTP ports when running X.509.

- Pre-requisites
- Authentication Settings
- Certificate Revocation Checking

Pre-requisites

See X.509 Certificates - Setup Requirements to be sure the requirements for this authentication scheme are met.

Authentication Settings

LDAP options for authentication

- **Fallback to LDAP authentication**

  Use this option to prompt the user for LDAP credentials when certificate-based authentication fails.

- **Validate LDAP User Account**

  Account validation is always enabled and causes authentication to fail when an LDAP search fails to resolve a Distinguished Name (DN) for the name value obtained from the user's certificate. If you are using Microsoft Active Directory as your LDAP server type, additional validation is performed. User authentication will fail when the user's Active Directory account is either disabled or expired.

- **Distinguished Name Resolution Order**

  The values in this property can be re-ordered, added, or removed. Items are listed in order of preference. For example, to locate the **User Principal Name** of the certificate before checking other values, enter `upn`, `email`, `cn_val`, `cn`.

- **UPN Attribute Name**

  This property is used only when **upn** is present in the **Distinguished Name Resolution Order** field; otherwise this property is ignored. The User Principal Name (UPN) is an Internet -style login name and generally takes the form `auser@domain.com`.

  The **UPN** value is retrieved from the **Subject Alternative Name** field in the user's certificate. The Administrative Server then performs a search for an LDAP user object, based on the UPN attribute name and value, to validate that the user object exists in the LDAP database. The LDAP search filter takes the form of (`upn-attribute-name=upn-value-from-certificate`). For example: `userPrincipalName=auser@domain.com`.

  Enter the name of the **LDAP attribute** used in the LDAP directory where the UPN-style name is stored. If the LDAP Server type is Microsoft Active Directory, use the default UPN attribute name: `userPrincipalName`. Other LDAP implementations may use a different attribute name, such as `email` or a custom name.

Client options

- **Login Timeout (optional)**

  Enter any available single value LDAP attribute, such as `wWWHomePage` (if using Microsoft Active Directory), or enter a custom single value LDAP attribute created by the LDAP administrator.

- **Custom Message when Authentication Fails (optional)**

  When authentication fails, the user sees the default message, "The attempt to authenticate using a certificate or smart card has failed."

  You can append the general message with customized text. To do so, use `\n` to begin a new line. For example, to add a Help Desk number, enter

  ```
  \n\nFor further assistance:\n 1. Click OK to log on with User name and Password.\n 2. Call the Help Desk at 411-555-1212.
  ```

- **Custom PIN Prompt (optional)**

  Use this field to add custom text to the **Enter PIN** dialog prompt. For example, `Enter your smart card PIN.`

Allowed source of certificates for Reflection for the Web clients

Note: If you do not use Reflection for the Web, the Hard and Soft certificate settings do not apply.

- Select **Hard certificates** to use smart cards as an alternative to permanently installing client certificates on local hard drives. This option simplifies user authentication and prevents the unauthorized capture of passwords over networks. For more information, see
- Select **Soft certificates** to use certificates stored on the client's computer for X.509 authentication. The user's certificate must be included in a keystore named `usercert.pfx`.

  The admin must copy `usercert.pfx` to the preference files directory on a client workstation, typically in `C:\Users\<username>\AppData\Roaming\mfmss`.

  When soft certificates are enabled, X.509 authentication proceeds as follows:

  1. The browser on the client is used to browse to the Administrative Server (`http://<servername>:<port>/rweb`).
  2. During X.509alt authentication, the launcher checks for the `usercert.pfx` file before checking for a smart card.
  3. When the `usercert.pfx` file is found in the preference files location on the client, either

     X.509alt authentication completes and the links list displays

     – or –

     an **Enter Passphrase** dialog box opens, if required for `usercert.pfx`. Once the user enters the correct passphrase, X.509alt authentication completes and the links list displays.

Certificate Revocation Checking

Changes to the certificate revocation checking settings below do not take effect until the server is restarted.

NOTE: If you enable both OCSP and CRL checking, then OCSP will always be tried first. If the revocation status cannot be determined using OCSP, the validation will fall back to using CRL.

Enable Online Certificate Status Protocol (OCSP)

The **Online Certificate Status Protocol (OCSP)** is an Internet protocol used for obtaining the revocation status of an X.509 digital certificate.

Use this option to specify Online Certificate Status Protocol (OCSP) settings that verify the TLS/SSL client certificate chain. OCSP is an Internet protocol used to obtain the revocation status of an X.509 digital certificate. OCSP is an alternative to Certificate Revocation Lists (CRLs), and is often implemented in a Public Key Infrastructure (PKI).

An OCSP server, also called a responder, may return a signed response signifying that the certificate specified in the request is good, revoked, or unknown. If it cannot process the request, it may return an error code.

Enable OCSP

Check this box to enable and configure OCSP options. The OCSP responder's signing certificate is checked using the same settings as the rest of the certificate validation.

Use Authority Information Access (AIA) Extension

The Authority Information Access (AIA) extension indicates how to access Certificate Authority information and services for the issuer of the certificate in which the extension appears. When enabled, the OCSP server URL specified in the Authority Information Access extension of a certificate is used to check the certificate revocation status using the Online Certificate Status Protocol.

Additional OCSP Responders

In addition to the URLs from the AIA extension, you can specify the URLs (separated by a space) of other OCSP responders. If you clear the **Use AIA Extension** checkbox, or if the certificate does not contain an AIA extension, only the URLs in this text box will be used. HTTP URLs are supported.

Example: `http://ocsp.example.com`

Enable Certificate Revocation List (CRL)

Use this option when the revocation status cannot be determined using OCSP.

Enable CRL

Check this box and enter the URLs of Certificate Revocation List issuers to be used for certificate verification. These are the URLs that your Security Proxy server is set to use when checking the user's client certificate. Enter each URL, separated by a space. LDAP and HTTP URLs are supported.

Use CRL Distribution Point (CRLDP) Extension

The CRL Distribution Point (CRLDP) extension indicates how to access Certificate Authority information and services for the issuer of the certificate in which the extension appears. When enabled, the CLR server URL (specified in the CRLDP extension of a certificate) is used to retrieve the Certificate Revocation List.

Additional CRL Issuers

In addition to the URLs from the CRLDP extension, you can specify the URLs (separated by a space) of other CRL issuers. If you clear the Use CRL Distribution Point checkbox, or if the certificate does not contain a CRLDP extension, only the URLs in this text box will be used.

Examples:

```
ldap://myCAServer.example.com/CA/certificaterevocationlist

http://server1.example.com/CertEnroll/server1.example.com.crl
```

SiteMinder Configuration

Management and Security Server uses Microsoft IIS to integrate with SiteMinder. For instructions on how to integrate IIS with MSS and if needed, Reflection ZFE, see Technical Note 2859 - Using the IIS Reverse Proxy with Reflection ZFE

If you have selected SiteMinder as your authentication method, complete the configuration:

- **Agent version**

  Some configurations vary depending on the version you select.
- **Agent name**

The name of the SiteMinder agent that is used by IIS. This is the **Name** of the agent configured to work with IIS that is integrated with the Management and Security Server.

- **Configuration file (version 5+)**

  Provide a full path to the SiteMinder host configuration file. This is typically `SmHost.conf` and resides in the `config` directory in the SiteMinder web agent installation directory.

- **Shared secret (version 4)**

  The secret used by the policy server to verify the agent. This is the Shared secret that was created in the SiteMinder Administration tool under System Configuration > Agents.

- **Policy server host (version 4)**

  The IP address (preferred) or DNS name of the host on which the SiteMinder policy server is installed.

- **Authentication port (version 4)**

  The SiteMinder policy server's authentication port. The default for this port is 44442. To check the port number, open the SiteMinder Policy Server Management Console, click the Settings tab, and look for the Authentication port number under Access Control. If other SiteMinder port numbers were changed from their defaults, you must reset the corresponding port numbers in the Management and Security Server PropertyDS.xml file, located in the MSSData folder.

- **User identity**

  Determines which SiteMinder user attribute is displayed in the list of sessions and used for LDAP authorization.

- **User identity LDAP search attribute (optional)**

  When the Administrative Server is configured to use authorization, use this field to specify the LDAP attribute used by the Administrative Server to perform an LDAP search request for the user's distinguished name (DN). During authorization, the Administrative Server issues an LDAP search request to obtain the user's LDAP DN. The LDAP search request's filter uses the attribute specified in this field.

  For example, if you enter the value "uid" into this field, then the LDAP search filter will look like: (uid=<SiteMinder username>) where <SiteMinder username> is the value of the SiteMinder user's name, obtained from the SiteMinder session token, using the ATTR_USERNAME key. Example: (uid=johns)

  NOTE: When the Administrative Server is not configured for authorization, any value entered in this field is ignored.

SiteMinder and 64-bit systems

If you're using a 64-bit operating system, check to be sure that the SiteMinder installer placed the path to the 64-bit libraries before the path to the 32-bit libraries in the PATH variable. To confirm the order, open a command window and type: `echo %PATH%`.

If the 64-bit libraries are not first in the path, then edit the PATH variable so that the path to the 64-bit libraries comes before the path to the 32-bit libraries.

Related Topics

- Assign Access
- Manage Sessions

Micro Focus Advanced Authentication

Advanced Authentication is a separate Micro Focus product that offers biometric and multi-factor authentication for several Micro Focus products, including Management and Security Server.

A separate Add-On license is required to use **Micro Focus Advanced Authentication** with **Management and Security Server**. See the Preliminary Tasks for details.

Configuring Advanced Authentication

To activate and set up Advanced Authentication, complete the preliminary tasks prior to configuring the Advanced Authentication server to trust the Management and Security Server.

- Preliminary Tasks
- Configuring Advanced Authentication in the Administrative Console

Preliminary Tasks

1. Install Micro Focus Advanced Authentication Server, and note the
   - server name (or IP address)
   - server's port number
2. After you obtain the separate license for **Host Access Management and Security Server - Advanced Authentication Add-On**, download the activation file, named `activation.advanced_authentication-<version>.jaw`, from the product download page.
3. Upload the activation file.
   - **3a** Log in to **Management and Security Server**.
   - **3b** Open the Administrative Console to **Configure Settings - Product Activation**.
   - **3c** Click **Activate New**.
   - **3d** Browse to and click the activation file you downloaded in step 2.

     The file is installed and added to the list of Currently Installed products.
4. Continue with the steps for Configuring Advanced Authentication in the Administrative Console to establish trust between the Advanced Authentication server and Management and Security Server.

Configuring Advanced Authentication in the Administrative Console

Follow these steps to establish trust between the Advanced Authentication server and the Management and Security Server.

1. In Management and Security Server, open **Configure Settings - Authentication & Authorization**.
2. Select **Micro Focus Advanced Authentication** as the authentication method.

   Select LDAP as the **Authorization** method, if desired.
3. Import the Advanced Authentication server's certificate:
   - **3a** Enter the **Server** name or IP address of the Advanced Authentication server (noted in Preliminary Tasks - step 1) ***without*** a prefix, such as `https://`.

     For example, enter `<myserver>.<mycompany>.com`.
   - **3b** Enter the server's **Port** number (also noted in Preliminary Tasks - step1).
   - **3c** Click **Import Certificate**. A message displays to confirm whether the server is trusted.

NOTE: If you are presented with multiple certificates to import, it is best to choose the CA certificate.

If this error appears, **Failed to retrieve the certificate chain for the server**, be sure the server name is entered correctly. The host name must match the name in the server certificate.

4 By default, the **Verify server identity** option checks to make sure the host name is matched with the certificate from the Advanced Authentication server.

Note: When present, the SANs (Subject Alternative Names) in the Advanced Authentication server certificate is used, not the common name.

CAUTION: Clearing the **Verify server identity** check box is a security risk. Do not disable this feature unless you understand the risk.

5 Click the **Test Connection, w**ith **Verify server identity** checked.

The test is successful when the entry for the Advanced Authentication server is valid, and the server address is in the certificate.

If the test connection is *not* successful, troubleshoot the error as follows:

- **Advanced Authentication Failure - The hostname you entered does not match the server certificate.**

  Check the certificate in the Configure Settings - Trusted Certificates list. Then, correct the server name to match the SAN in the certificate.

  For instance, a mismatch occurs when you enter the IP address, and the IP address is not in the certificate.

- For more information, see `trace.0.log`. By default, `trace.0.log` is located in `\ProgramData\Micro Focus\MSS\MSSData\log`. To view the trace log file, use the **LogViewer** utility. For more information, see Using Log Viewer.

Configuring Advanced Authentication Methods

Refer to the Advanced Authentication documentation to configure Advanced Authentication methods, such as Fingerprint or Voice.

Product Activation

View the list of activation files for currently installed components, clients, and other products managed by Management and Security Server.

Use this panel to upload additional activation files.

- Install an additional product
- Complete the activation

NOTE: If this message appears, “Activation files installed on the Management and Security Server do not match those available to emulator client sessions,” resolve the conflict by either

- manually copying the activation files installed in the `WEB-INF/lib/modules` folder of the administrative server to the `ex/modules` folder of the emulator client so the contents of both locations match
- or, reinstalling the file using **Activate New** on the **Configure Settings - Product Activation** panel.

Install an additional product

1. After purchasing an add-on product or another emulator, you will receive information about downloading the product as an activation file, which has this format:

   ```
   activation.<product_name>.jaw
   ```

2. Download the activation file and note the download destination.
3. In the **Administrative Console**, click **Configure Settings - Product Activation**.
4. Click **Activate New** and browse to the activation file for the product you want to install: `activation.<product_name>.jaw`
5. Click the file. The new product is added to the Product list.

   If you uploaded a product evaluation file, open the column chooser to view the Expiration date.
6. Restart your browser to ensure that the Administrative Console is fully updated with the new set of activation files. You do not need to restart the MSS server.

   Management and Security Server displays the required configuration settings.
7. Be sure to Complete the activation.

Complete the activation

After the activation files are uploaded, further configuration may be required to complete the installation. Follow the steps below if you are adding one of these products:

- Security Proxy Server
- Terminal ID Manager
- Automated Sign-On for Mainframe
- Micro Focus Advanced Authentication

Security Proxy Server

1. Copy the activation file, `activation.security_proxy-<12.4.n>.jaw`, into the

   `/securityproxy/lib/modules` folder on each machine where Security Proxy Server is installed.
2. Start the **Security Proxy Server**.
3. Refer to the Management and Security Server Installation Guide to configure the Security Proxy Server.

Terminal ID Manager

1. Copy the activation file, `activation.terminal_id_manager-<12.4.n>.jaw`, into the `Micro Focus/MSS/server/web//webapps/tidm/WEB-INF/lib/modules` folder on each machine where Terminal ID Manager is installed.
2. Restart the Terminal ID Manager servlet.

   If the Terminal ID Manager servlet is running under Tomcat, then restart the Tomcat server.

   If the Terminal ID Manager is running under a different application server, follow the procedures for that application server to restart the Terminal ID Manager servlet.

   If the Terminal ID Manager does not start, you may need to edit the `rweb.properties` file in the MSSData directory:

   1. Open **About** > **Product Information**. Find the **MSS Data Path**.
   2. In the MSSData directory, open `rweb.properties`, and look for this line: `idmanagement.enabled=false`
   3. If the enabled value is `false`, change the value to `true`.
   4. Save the file, and then restart the Terminal ID Manager servlet as described above.

Automated Sign-On for Mainframe

1. In the **Administrative Console**, open **Configure Settings** - **Automated Sign-on**.
2. Check **Enable automated sign-on to mainframe sessions**, and enter the required information See Help for assistance.
3. See the Automated Sign-On for Mainframe Administrative Guide for the required mainframe configuration.

Micro Focus Advanced Authentication

1. In the **Administrative Console**, open Authentication & Authorization.
2. Click **Micro Focus Advanced Authentication**, and enter the required information. See Help for assistance.

Automated Sign-On for Mainframe

The settings on this page are used to generate a per-session passticket for automated sign-on to mainframe sessions. Details are required for

- the Digital Certificate Access Server (DCAS) on the mainframe.
- the server or location where your users' mainframe usernames are stored.

You may need to consult with your mainframe host administrator before proceeding.

- Enable automated sign-on for mainframe sessions
- DCAS server
- Settings for secondary LDAP directory
- Source for User Principal Name (UPN)
- Search filter used with secondary LDAP directory

Enable automated sign-on for mainframe sessions

Check **Enable automated sign-on to mainframe sessions** when you are ready to implement this feature. When checked, the required configuration fields display.

DCAS server

The DCAS server information is used to obtain a passticket from the mainframe. Ask your mainframe host administrator to configure the DCAS server to accept client connections from the Administrative Server. Several keystores must be correctly configured for client authentication.

For details, see the Automated Sign-On for Mainframe Administrator Guide.

DCAS server name

Enter the name of the DCAS server.

DCAS server port

The default port is 8990; however, the DCAS server can be configured to use any port.

Client certificate used to authenticate to DCAS server

Choose which certificate to use for client authentication of the Administrative Server (Management and Security Server) to the DCAS server.

- **Use Management and Security Server certificate**

  This option uses the Administrative Server's certificate and private key (configured on the **Configure Settings - Certificates** panel).

- **Use custom keystore**

  This option uses a separate keystore that contains a certificate and private key.

  1. Enter the **Keystore filename** with the correct extension. The keystore can be one of these formats:
     - Java keystore: `.jks`
     - PKCS#12 keystore: `.p12` or `.pfx`
     - Bouncy Castle BCFKS keystore: `.bcfks`
  2. Enter the (case-sensitive) **password** used to read the keystore.

     The password for the keystore and the private key **must be the same**.
  3. The keystore must be placed in the `MSSData\trustedcerts` folder.

     The default Windows location is

     `C:\ProgramData\Micro Focus\MSS\MSSData\trustedcerts`

Verify server identity

Check this box to verify the hostname [entered in the *Server name* field] against the certificate received from the DCAS server when a secure connection is made from the Administrative Server to DCAS.

Test Connection

Click this button to test the connection between the Administrative Server and the DCAS server.

Settings for secondary LDAP directory

Mainframe usernames may be stored in a secondary LDAP directory, which can be different from the directory used for authentication. The settings in this section identify the secondary LDAP directory.

Secondary LDAP server

Select **Enable** if you plan to search a secondary LDAP server to obtain your users' mainframe usernames. When enabled, the search filter on a secondary LDAP directory (defined below) can be used in **Assign Access**, where you can authorize users or groups to access specific sessions. When this checkbox is cleared, the search filter option in the Assign Access is unavailable.

Server type

Select the type of LDAP server that is used to store your mainframe usernames. The options on this panel change depending on the selected LDAP server type. If you do not see your specific LDAP server in the list, select **Generic LDAP Compliant Directory Server (RFC 2256)**.

Security options

Data can be passed between the Administrative Server and the LDAP server as clear text or encrypted. The type of encryption used depends on your LDAP server. Kerberos v5 is available for Windows Active Directory, and TLS/SSL for all other servers.

By default, Management and Security Server transmits data between the Administrative Server and the LDAP server in clear text. If you choose this option, you should prevent users from accessing the network link between these two servers.

Kerberos: When you select **Windows Active Directory** with **Kerberos v5**, you must enter the name of the Kerberos **key distribution center(s)**. Multiple key distribution centers, delimited by commas or spaces, can be used. If you do not know the name of the Kerberos key distribution center, enter the fully-qualified DNS name of the Active Directory server.

The option under the key distribution center name field allows you to encrypt all data transmitted over the Kerberos connection. By default, only user names and passwords are passed securely between the Administrative Server and the LDAP servers using Kerberos. Encrypting all data is more secure, but may increase performance overhead.

TLS/SSL: When you select **TLS/SSL** security, Administrative Server negotiates a TLS or SSL v3 protocol version for the connection with the LDAP server. The protocol version negotiated with the LDAP server depends in part on the TLS and SSL protocol versions allowed by that server. Administrative Server supports SSL v3 for backwards compatibility with older LDAP servers;

however, use of SSL v3 is not recommended. If there are some TLS or SSL protocol versions that you do not want used for LDAP connections, it is recommended that you disable those protocol versions on the LDAP server.

To configure security for TLS/SSL connections, you must first import the server's trusted certificate(s) into the JRE's default trusted keystore, as follows.

1. Import the certificate to the JRE's keystore file named `cacerts`, located in `[Management and Security Server Install Dir]\jre\lib\security`.

   Example: `C:\Program Files\Micro Focus\MSS\jre\bin>keytool -import -trustcacerts -alias myHost -file myHost.cer -keystore ..\lib\security\cacerts`

   For more information, see the Java SE documentation for the **keytool security tool**.
2. Enter the Java keystore's default password: `changeit`
3. Restart the Management and Security Server.

Server name

Enter the LDAP server name as either a name or a full IP address. If you selected TLS/SSL above, this LDAP server name must exactly match the Common Name on the LDAP server's certificate.

Multiple server names, delimited by commas or spaces, can be used for failover support. If an LDAP server is down, the next server on the list will be contacted. In this case, all fields specified on this panel that are used for LDAP connections should be available on all the LDAP servers, and should have identical configurations.

Server port

Enter the port used by your LDAP server. The default is **389** for plain text or **636** for TLS/SSL.

If you are using Active Directory, you may wish to set the server port to the global catalog port, which is **3268** (or **3269** over TLS/SSL). Global catalog searches can be faster than referral-based cross-domain searches.

Username and Password

Provide the username and password for an LDAP server account that can be used to access the directory in Read-only mode. Generally, the account does not require any special directory privileges but must be able to search the directory based on the most common directory attributes (such as `cn`, `ou`, `member` and `memberOf`). Enter the password again in the **Password confirmation** box.

NOTE: The **username** must uniquely identify the user in the directory. The syntax depends on the type of LDAP server you are using.

- For **Windows Active Directory** and **Kerberos**, enter the **userPrincipalName** (such as `username@exampledomain.com`). The userPrincipalName is case sensitive. Case sensitivity does not apply to end-user logins.
- For **Windows Active Directory** with **Plain Text**, enter the **NetBIOS domain\samAccountName** (such as `exampledomain\username`), **userPrincipalName** (such as `username@exampledomain.com`), or **distinguished name** (such as, `uid=examplename,DC=examplecorp,DC=com`).
- For any **other LDAP** server type, enter the **distinguished name** (such as, `uid=examplename,DC=examplecorp,DC=com`).

If this account password changes and the Administrative Server's configuration is not updated to use the new password, your users will get error messages when trying to authenticate. To resolve the problem, update the account password here and saving your new settings.

To avoid this problem, you may wish to set up an account that is not subject to automatic password aging policies, or that will not have the password changed by other administrators without notice.

Directory search base

Enter the distinguished name of the node in the directory tree you want to use as the base for Administrative Server search operations.

Examples: `DC=my_corp,DC=com` or `o=my_corp.com`. For more information about how to describe the search base, see the LDAP administrator for your organization.

Source for User Principal Name (UPN)

The User Principal Name (UPN) is an Internet-style login name based on Internet standard RFC 822. The UPN generally has the form `auser@domain.com`. When mapping access to terminal sessions that use automated sign-on, a UPN or search filter can be used as the source of the mainframe username.

Management and Security Server can use the recipient portion of the UPN directly as the mainframe username (for example, the `auser` portion of the value `auser@domain.com`), or it can use the recipient portion of the UPN as the key in an LDAP search filter, as defined in the section below.

If a smart card is used for authentication to the Administrative server, the UPN is often available from the card. Otherwise, its value can be acquired from the authenticating LDAP directory. Windows Active Directory objects typically include a UPN attribute named `userPrincipalName`. When using other LDAP directories, you can use this field to specify the name of the attribute containing the UPN-style user name.

Enter the LDAP attribute used in the authenticating directory where the UPN-style name is stored.

Search filter used with secondary LDAP directory

Choose the method for obtaining mainframe usernames from your secondary LDAP directory.

- A value derived from the User Principal Name can be used in an LDAP search filter to find the object in the secondary directory containing the user's mainframe username.
- Alternatively, the value of another attribute from the authenticating directory can be used as the value in the search filter to find the object in the secondary LDAP directory containing the user's mainframe username.

Metering

Use the options on the **Configure Settings - Metering** panel to set the location of the usage metering server. The options set here are used as defaults for displaying connection activity in the usage reports.

- Add a Metering Server
- Current Metering Servers

Add a Metering Server

1 Click **+Add Server** to identify your Metering Server and add it to the list of servers.

- **Use HTTPS**: Select this option to enable a secure connection using the HTTPS protocol.
- **Metering web server name**: Identifies the web server on which the metering server resides. Enter a full server name or the full IP address.
- **Port**: Specifies the port on which the metering server resides. The default is 80 for HTTP, and 443 for HTTPS.
- **Metering servlet context**: Specifies the web application context for the metering server.

  This entry is used in the URL for this metering server, and is specified when the metering component is installed. The default, `meter`, is the correct value if you used the automated installer and have only one metering server.

2 Click **Add** to add the metering server to the list of available metering servers.

The Metering Server is listed as a URL. For example, if the web application context name for your metering server is `metering`, the URL added to the list is

`http://<servername:port>/metering/AdminStart.html`.

3 Click the URL to log in to the **Metering** console for that metering server.

NOTE: About multiple metering servers

In most deployments, only one metering server is needed to support all clients. If more than one metering server is run, the metering report numbers must be manually added together.

The metering service does not support load balancing. Each emulation client must report directly to a single metering server.

Current Metering Servers

The default display lists the **Metering Server Setup** URL for each metering server.

When you click the URL, you are prompted for your Metering administrator login.Then, you can configure settings and license pools for that metering server. Open **Help** for more information.

Click the column chooser ◫ to view more server details, such as

- **Protocol**: Specifies the protocol, either http or https, used to access the metering server. The default is `http`.
- **Server**: Shows the name or IP address of the metering server that you entered in the Metering web server name box above.
- **Port**: Specifies the port used by the metering server. The default is 80 when the protocol is http, and 443 when the protocol is https.
- **Servlet Context**: Specifies the web application context used by the metering server. The default is `meter`.

Note: Deleting a server from the list does not uninstall the metering server, but prevents it from appearing in the list of available metering servers when you launch a session from **Manage Sessions**.

Use LDAP ID

Check **Use LDAP ID** if you want metering to be based on the LDAP IDs at your site.

Terminal ID Manager

Use the options on this panel to set the location of the Terminal ID Manager server. Set other settings in the Terminal ID Manager console, available from the Start menu.

- Add Terminal ID Manager Server
- Current Terminal ID Manager Servers

Add Terminal ID Manager Server

- **Server name:** Identifies the web server on which the Terminal ID Manager server resides. You can use a full server name or its full IP address.
- **Server port:** Specifies the port on which the Terminal ID Manager server resides. The default is 80 if the protocol is HTTP, and 443 if the protocol is HTTPS.
- **Servlet context:** Specifies the web application context for the Terminal ID Manager server. This entry is used in the URL that accesses the Terminal ID Manager server. The default is `tidm`.
- **Use HTTPS:** Enables a secure connection using HTTPS.

Current Terminal ID Manager Servers

- This list displays the settings for the installed Terminal ID Manager server.
- The Protocol (HTTP or HTTPS), Server, and Servlet Context, are listed.
- Click the **Terminal ID Manager Server Setup** URL to open the configuration page for the Terminal ID Manager. *Note:* The **Terminal ID Management Administration** panel is also available from the Start menu.

Replication

Use the options on the Replication panel to set up a **Master** Administrative Server that will replicate its configuration, including the sessions you created, to one or more **Slave** Administrative Servers.

Server replication makes it easier to configure and maintain multiple Administrative Servers, provide load balancing, and have more flexibility when spanning geographically distant server installations.

Note: If you plan to set up a load-balancing environment, configure Replication *first*.

- About Replication
- Standalone Server Role
- Master Server Role
- Slave Server Role
- Replication Guidelines for Secure Connections
- Copying Package Data
- Upgrading Replication Servers

About Replication

Replication allows you to synchronize multiple administrative servers by propagating configuration and session changes made on one server to all of the servers in a replication group.

An administrator sets up Replication with one **Master** server and one or more **Slave** servers. The servers in the replication group are synchronized because the Master replicates the changes to all of the Slaves.

Secure Connections

When configuring replication, you may choose to use HTTP or HTTPS as your server-to-server communication transport. If you choose HTTP (not secure), you do not need to manage certificates.

If you choose HTTPS, you must establish trust between the Master and the Slaves. See Replication Guidelines for Secure Connections

Configuration Overview

To implement server replication, configure one Master server and one or more Slave servers.

Slave servers are configured according to the settings on this Master server. Any subsequent changes to the Master server will be automatically replicated to the Slave servers. Only one Master server can be configured, but multiple Slave servers can be associated with that Master server.

You can modify the configuration on the Master server and push those updates to the Slaves. You can also modify the configuration on a Slave server and submit the changes, but they will not be applied until the requested change is implemented on the Master server.

All configuration elements of the Master Administrative Server are replicated to a Slave server -- ***except***:

- log files
- Credential Store settings
- some Certificates settings
- the Web Agent name, when *SiteMinder* is used for authentication. (The Web Agent name must be set separately for each replicated machine.)

NOTE: The **Concurrency Lock Timeout**, included in the former *Administrative WebStation* interface, applies to managing sessions. See the Note in Edit a session.

Related Topics

- Standalone Server Role
- Master Server Role
- Slave Server Role
- Replication Guidelines for Secure Connections
- Copying Package Data
- Upgrading Replication Servers

Standalone Server Role

This is the default role, and applies to Administrative Servers that are not configured for replication.

To set up Replication, configure a Master server, and add Slave servers.

- Master Server Role
- Slave Server Role

Master Server Role

Use the **Master server role** to set the configuration of this Administrative Server as the one that will be replicated to the specified Slave Administrative Servers.

- Configure master server
- Slave server list
- Add a slave server
- Test Connection

Configure master server

On the MASTER server that you want to replicate:

1. Click **Master**.
2. Choose whether to **Use HTTPS for server to server communication** (between the Master and Slave servers). HTTPS is the default.

   When you use HTTPS, verify that a certificate for the Slave server is in the Master server's trusted store before proceeding with replication setup. See Replication Guidelines for Secure Connections for more information.

   You cannot change the transport and retain previously configured Slave servers. You must delete existing Slave servers before changing the protocol from HTTP to HTTPS (or vice versa).
3. Change the default **Passphrase**, if desired.

   The Master server and all associated Slave servers must share the same passphrase. Use these fields to change the default passphrase.

   If you make no changes to the passphrase on any of the Administrative Servers in the cluster, the passphrase is automatically the same on all servers. A changed passphrase is in effect for all replication implementations, whether or not HTTPS is used.
4. Next step: Add a slave server.

Slave server list

The Administrative servers that have been replicated with this Master server's configuration are in the list of Slave servers.

Add a slave server

Before you add a replication server, remember:

- When you set up a Master server and then specify Slave servers, *any existing configuration* for the Slave server will be *overwritten*, and existing sessions on the Slave server will be deleted.
- Any security certificates that are required for an HTTPS transport or for a Security Proxy must be in place *before* the Slave server is added here. For more information, see Replication Guidelines for Secure Connections.

To add a **Slave Server**:

1. Click **+ Add**, which expands the dialog.
2. Enter the **Slave server host name**.

   Add the fully qualified name of a Slave server that is to communicate with the Master server. This name is used to identify where changes are sent and also validates the requests coming in from the Slave server. Enter the name of each Slave server here.
3. Enter the **Slave port**.

   The default host port is 443 for HTTPS and 80 for HTTP. Use the ports that you specified for HTTP and HTTPS during Management and Security Server setup.
4. Enter the **Servlet context**.

   This entry specifies the web application context for the Slave server. The servlet context is used in the URL that accesses the Slave server, and is specified when the Administrative Server is installed.

   The default, `mss`, is the correct value if you used the automated installer and did not change the default context as part of setup.
5. Click **Save**. The server is added to the list of Slave servers.
6. Click **Apply** to save the Master configuration.

Test Connection

To confirm that your Master server can locate a Slave server, select the Slave server in the list, and click **Test Connection**. This is a one-way test; it does not confirm that the Slave server is correctly configured to reach the Master server.

A message displays the result. *Note: The test fail*s if you are using HTTPS and the required certificates are missing. For more information, see Replication Guidelines for Secure Connections.

Related Topics

- Slave Server Role

Slave Server Role

Use the Slave server role to replicate the configuration of the Master Administrative Server.

- Configure slave server
- Add the master server
- Test Connection

Configure slave server

Before you add a replication server, remember:

- When you set up a Master server and then specify Slave servers, *any existing configuration* for the Slave server will be *overwritten*, and existing sessions on the Slave server will be deleted.
- Any security certificates required for an HTTPS transport or for a Security Proxy must be in place *before* the Slave server is added. For more information, see Replication Guidelines for Secure Connections.

On the SLAVE server that will replicate the Master:

1. Click **Slave**.
2. Choose whether to **Use HTTPS for server to server communication** (between the Master and Slave servers). HTTPS is the default.

   When you use HTTPS, verify that a certificate for the Slave server is in the Master server's trusted store before proceeding with replication setup. See Replication Guidelines for Secure Connections for more information.

   You cannot change the transport and retain previously configured Slave servers. You must delete existing Slave servers before changing the protocol from HTTP to HTTPS (or vice versa).
3. Change the default **Passphrase**, if desired.

   The Master server and all associated Slave servers must share the same passphrase. Use these fields to change the default passphrase. A changed passphrase is in effect for all replication implementations, whether or not HTTPS is used.
4. Next step: Add the master server.

Add the master server

A Slave serve can be associated with only one Master Administrative server. When configured, the Master is listed on this panel. To change the Master, delete the one in the list and click **+ Add**.

To add a **Master Server**:

1. Click **+ Add**, which expands the dialog.
2. Enter the **Master server host name**.

   Add the fully qualified name of a Slave server that is to communicate with the Master server. This name is used to identify where changes are sent and also validates the requests coming in from the Slave server. Enter the name of each Slave server here.
3. Enter the **Master port**.

   The default host port is 443 for HTTPS and 80 for HTTP. Use the ports that you specified for HTTP and HTTPS during Management and Security Server setup.
4. Enter the **Servlet context**.

   This entry specifies the web application context for the Master server. The servlet context is used in the URL that accesses the Master server, and is specified when the Administrative Server is installed.

   The default, `mss`, is the correct value if you used the automated installer and did not change the default context as part of setup.
5. Click **Save**. to add the Master server to the list .
6. Click **Apply** to save the Slave configuration.
7. Then, return to the Master server to be sure each Slave is added to the list.

Test Connection

To confirm that your Slave server can locate the Master server, click **Test Connection**. This is a one-way test; it does not confirm that the Master server is correctly configured to reach the Slave server.

A message displays the result. *Note: The test fail*s if you are using HTTPS and the required certificates are missing. For more information, see Replication Guidelines for Secure Connections.

Related Topics

- Master Server Role

Replication Guidelines for Secure Connections

The notes below provide an overview of certificate requirements for replication.

- **If you are using HTTPS** as the transport between Master and Slave servers, perform these steps before adding the Master or Slave servers to the list.

  Setting up replication using HTTPS requires that certificates for the Administrative Servers be trusted. In the case of self-signed or other certificates that are not well known, the certificates must be imported to all Administrative Servers in the cluster.

  The certificate of the current Administrative Server must be included in the list along with the certificates of the remote Administrative Servers. This step is required for all servers, Master or Slave, in the management cluster.

  To confirm that a trusted certificate is already present or to import a certificate:

  1. Open **Administrative Console** > **Configure Settings - Trusted Certificates**.
  2. Under **Certificate Store**, click **Management and Security Server**.
  3. View the list of certificates trusted by the Management and Security Server.
  4. Click **+ Import** to add a certificate.
- If you are using a **Security Proxy** server, you must also import the certificates for all the remote Administrative Servers to each Security Proxy server. Use the **Security Proxy Wizard** to import these certificates.

  When you create a secure session that connects to a Security Proxy server, the session is thereafter linked to this specific Security Proxy. When this session is replicated to other servers in the cluster, the session is then initiated from a different Administrative Server, but the session itself will still connect to the original Security Proxy for which it was configured.

  If client authorization is enabled on the Security Proxy Server, then the Security Proxy Server will only accept connections from sessions initiated from Administrative Servers it trusts (that is, their certificates are in the **Security Proxy Trusted Certificate** list).

  In order for connections from replicated servers to succeed in this environment, the certificates from every Administrative Server in the cluster need to be imported to the Security Proxy server. If there are multiple Security Proxy Servers in the cluster, then this operation needs to be done on each of these Security Proxy Servers.

Copying Package Data

If you are replicating a server that contains packages for Windows-based sessions, the assignments and settings are replicated automatically. However, the package data must be manually copied to each Slave server.

Package data needs to be manually copied from the Master server to each Slave server when:

- new packages are uploaded to the Master server.
- existing packages are updated or deleted from the Master server.

To copy the package data:

1. Upload, update, or delete packages on the Master server.
2. Delete all `.zip` files from the `/MSSData/deploy/packages/` directory from each Slave server.
3. Manually copy all of the `.zip` files from the `/MSSData/deploy/packages/` directory on the Master server to the analogous location on each Slave server.
4. To confirm success: Log in to Management and Security Server on a Slave server as a user who is authorized to receive the package. Verify that the package downloaded and installed successfully.

NOTE: If your client already has the package, first uninstall it from the client, and delete it from `C:\Users\<username>\AppData\Local\Temp\MicroFocusPkgs` before performing this verification.

Upgrading Replication Servers

If server replication is enabled, you must disable it on every server with replication before you upgrade. Follow these steps:

1. In the Administrative Console, click **Configure Settings - Replication**. Select the **Standalone** option. Click **Apply**.
2. Repeat this step for the **Master** server and all the **Slave** servers.
3. Upgrade all the servers.
4. Configure the **Master** server from **Standalone** back to the **Master** server role, and add the Slave servers.
5. Configure the **Slave** servers from **Standalone** back to the **Slave** server role, and add the Master server.

Logging

Use the options on this page to configure the Management and Security Server logs. These logs show information about users' session activity, system configuration activity, and basic trace logging.

The **Log Viewer** utility provides detailed records and enables you to set filters, search message text, and change defaults. On Windows, the **Log Viewer** is available from the Start menu.

For more information, see Using Log Viewer.

- Administrative server
- trace.log
- Write client debug output to Java console

- Mark Log
- Credential store

Administrative server

Set the level of logging for users' session activity and system configuration activity. You can configure the logs to keep a record of errors and informational messages or to log only errors; you can also disable the log altogether.

To view the information in the Administrative Server log, open **Run Reports - Log File Viewer** in the Administrative Console.

trace.log

Set the level of logging for the trace log. When analyzing server problems, Technical Support may request that this setting be changed to include debug information. You cannot disable this logging option.

The trace log file is located in the log folder within the MSSData folder.

NOTE: About Filenames

Since Management and Security Server 12.1, the log filename uses the naming convention `logfile.<number>.log`, where **logfile.0.log** is the current file and previous log files are rolled over to names with numbers greater than zero, such as `logfile.1.log`.

Upgrades from earlier versions will retain the same log filename with the addition of version numbers appended to the end of the filename; for example, `logfile.txt.0`.

To specify where the sequence number appears in the filename, edit the `log.properties` file by adding the `%g` token in the filename, such as `logfile.%g.log`. For more information, see Using Log Viewer.

Write client debug output to Java console

Do not enable this setting unless requested to do so by Technical Support.

When enabled, all subsequent launches of Management and Security Server will send debug information to the Java console.

Mark Log

Each time the **Mark Log** button is clicked, a searchable (LOG_MARK) message is written to the trace log files on all administrative servers. To locate the lines in the LogViewer, search for `LOG_MARK`.

Credential store

Set the level of logging for Credential Store activity. You can configure the logs to keep a record of errors and informational messages or to log only errors; you can also disable the log altogether.

To view the information in the credential store log, open **Run Reports - Credential Store** in the Administrative Console.

6 Run Reports

Reports provide information about Management and Security Server components and products. View the activity for the features you are using.

Log File Viewer Reports

To view a Log File Viewer Report, make your selections, and click **Show Report**. The Log File Viewer Report includes information about users' session activity and administrators' configuration activity.

You can change the level of information to be logged on the Logging tab in the Settings tool.

Filters

Choose the type of report and the type of information you want to view.

Report type

- **Management server - User activity:** information about all users' session activities.
- **Management server - System configuration activity:** information about administrators' configuration activities.
- **Credential store activity:** information on the credential store, including who has attempted to access the credential store.

Message type

At least one of these options must be selected for a report to appear.

- **Info:** includes Informational messages
- **Error:** includes all Error messages

Sort field

Select **Date** or **User** to determine how the information in the report will be sorted.

Show Report

Click **Show Report** to view the activity for the criteria you specified.

In the Log File Viewer Report:

- **Date:** The date of the activity
- **Type:** Informational or Error
- **User:** The login ID of the user or administrator
- **Message:** A detailed description of the event.

  Events described in these reports include logging on and off, logon failure messages, terminal session requests, terminal sessions created, settings changed, and reports requested.

Usage Metering Reports

When you click **Run Reports - Usage Metering** > **Show Report Menu**, you will first be prompted for your Metering administrator password. Then you can generate reports from the metering logs.

Reports are organized by license pools. A metering license pool is created automatically when a user first logs on using the associated license. Usage numbers identify the number of licenses checked out when the report was run. Usage and host connection data can differ. For example, a user who opens Reflection Workspace (Windows-based) but does not connect to a host is shown in usage reports but not in host connection reports.

Each report provides a summary view of the metering data gathered by the Metering Server After the Initial Setup is completed, you can choose a report type, filter the information you want to see, and click **Show Report**.

Initial Setup

To view a Usage Metering report, the data must first be made available to Management and Security Server. Be sure to

1. Install a metering server. (The automated installer provides this option.)
2. Use the **Configure Settings** - **Metering** panel to make the metering server available to the Management and Security Server
3. Enable metering in the sessions you want to meter.

   From **Manage Sessions**, launch a session, and enable metering. For example, in Reflection, click **Administration** > **Metering Setup...** > **Enable usage metering**.

Once metering is enabled and your users begin to access sessions, you can view activity in the following reports:

- Current Activity
- Concurrent Usage
- Usage by Attribute
- Usage by User or Machine
- All Usage Activity
- Host Connections

Current Activity

This report may be of most interest under concurrent licensing. For each product being metered, view:

- **Current Usage:** the number of users currently logged on.
- **Peak usage since last checkpoint:** the highest number of licenses in use at one time during the current checkpoint period.
- **Time of Peak Usage:** when the peak usage occurred.

Concurrent Usage

Concurrent usage data is aggregated into checkpoint periods. By default, a checkpoint is sent to the metering log every 60 minutes. You can change the frequency of checkpoints in the metering server configuration tool.

For each product being metered, view:

- **Overall Peak Usage:** the highest number of licenses being used currently during the report period.
- **Checkpoint:** the time when the usage data was aggregated.
- **Peak Usage:** the number of licenses being used concurrently at that time.
- **Time of Peak Usage:** when the peak usage occurred.
- **Highest Product Version:** highest version of the product being run during the report period.

Usage by Attribute

Usage data is shown for one or more of five workstation attributes **Username**, **IP address**, **Machine name**, **MAC address**, and **NetBIOS name**. (MAC address and NetBios name are available only for Windows-based sessions.)

For example, when **Username** is selected, the **Product Usage Count** shows the number of unique usernames that used the product at least once during the report time period. When **Include details on where metered products are used** is checked, the **Usage Details** section shows the specific instances of the selected attributes for each product.

If users A, B, and C used Reflection during the report period, the summary report would show a Username count of 3, and the details would show separate lines for user A, user B, and user C.

Usage by User or Machine

This report shows the usage data for one specific username or machine.

You can use the `*` symbol as a wild card in IP addresses to limit results to a particular subnet. The `*` must be placed at the end of the address. For example, these entries are valid:

```
192.168.123.*
92.168.*.*
192.*.*.*
```

But `192.168.*.123` is not valid.

All Usage Activity

Data is shown for each instance of a product being run during the report period. The report shows the name of the metering server (with VPA number) and the data for each license pool used during the report period.

Enter the desired reporting period, and use the column chooser to select the data you want to view.

- **Date:** The day and time the product was requested.
- **Elapsed Time:** The amount of time the product was in use. If the session had not been closed, the field shows "Unavailable."
- **Begin Status:** Shows whether the client successfully ran the product. When the attempt to run the product fails because the license number has been exceeded and the session has enforcement turned on, the table shows "Veto."

  Note: if a connection can't be made for some reason other than license enforcement, the metering server reports a successful session checkout followed immediately by a session release. The table shows a Begin Status of "Success," and End Status of "Success," and a very short elapsed time.
- **End Status:** Shows whether the session was successfully closed or timed out. If the session has not been closed, the field shows "Unavailable."
- **Version:** Product version number for which the license was issued.
- **Username:** Username to which the license was issued.
- **IP Address:** IP address to which the license was issued.
- **Machine Name:** Workstation name to which the license was issued.
- **MAC Address:** MAC address to which the license was issued. Available only for Windows-based sessions.
- **NetBIOS Name:** NetBIOS name to which the license was issued. Available only for Windows-based sessions.

Host Connections

The connection reports show actual connections to hosts. The reports for host connections by **attribute**, **by specific user or machine**, and **connections to a specific host** show only sessions that have been opened and closed.

The **All host connection activity** report shows all opened connections whether they have been closed or not.

- **Host connection by attribute**

  Specify an attribute to show the users or machines that completed connections to any host.

  Data can be shown by **Username**, or by the machine attribute -- **IP address**, **Machine name**, **MAC address**, or **NetBIOS name**. (The MAC address and NetBios name are available only for Windows-based sessions.)
- **Host connections by specific user or machine**

  Specify a user or machine to limit the data in the previous report.

  You can use the * symbol as a wild card in IP addresses to limit results to a particular subnet. See the example in Usage by User or Machine.

When **Include details on where metered products are used** is checked, the report shows each separate connection the specified user or machine made to the host.

- Host connections to specific host

  Specify a host, and select the type of connections you want to view -- by Username or machine attribute.

  You can use the * symbol as a wild card in IP addresses to limit results to a particular subnet. See the example in Usage by User or Machine.

  When **Include details on where metered products are used** is checked, the report shows each separate connection made to the specified host.

- **All host connection activity**

  This report shows all host connections that were opened during the report period.

Credential Store Reports

You can filter by User, date, and host.

- Credential Store Users
- Credential Store Usage History

Credential Store Users

Click **Users** to see a count of credential store users. You can also request a list of credential store users. In this case, the report output includes both the number of users and a list of every user who has credentials stored in the credential store.

When you request the Users report, the resulting report displays the count of Credential Store users. If you select **Show list of users**, the report will include the identity of every user in the credential store.

Credential Store Usage History

Select a date and time range for the usage history report. You can specify day, month, year, and hour for both the From and To portion of the range. Credential store usage can be based on **Access by user** or **Access by host**.

NOTE: Credential store usage reports will be empty when credential store logging is disabled. To enable logging for the **Credential store**, go to **Configure Settings** > **Logging**.

Usage History

In the **Filter string** box, provide a user or host name for the query; then click **Access by user** or **Access by host**. All appropriate names containing that string will be included in the report.

Access by user

When you request the **Access by user** Usage History report, the resulting report displays access by users that match the string specified. The resulting report includes the date of access, the user's identity, the message, and the access category.

If the report is empty, be sure to enable logging for **Credential store** on the **Configure Settings** > **Logging** panel.

Access by Host

When you request a Usage History report for a **host name**, you can also filter by any other string that appears in the message field of the credential store log.

The resulting report displays access to hosts that match the specified string. The resulting report includes the date of access, the user's identity, the message, and the access category.

If the report is empty, be sure to enable logging for **Credential store** on the **Configure Settings** > **Logging** panel.

Security Proxy Server Reports

To view a Security Proxy Server Report, you must first install and configure at least one Security Proxy server -- and be sure the activation file is installed (as described in the Management and Security Server Installation Guide).

After you install the Security Proxy server, refer to Using the Security Proxy Server to configure sessions to use the Security Proxy.

To view a report of the Security Proxy server activity, select a **Report Type**, a **Security proxy server**, and click **Show Report**. ***Note:*** To add servers to the drop-down list, use the **Configure Settings - Security Proxy** panel to import a Security Proxy server.

Report types:

- Current user activity
- Security Proxy server logs
- Connections per proxy server

Current user activity

This report shows the date and time the report was created and the total number of current connections. The default view shows these results:

- **Start Time:** The time the session connected.
- **Accepted At:** The proxy IP address and port number on which the connection was accepted.
- **Source:** If **Resolve client machine DNS name** is off (the default), this column shows the client's IP address and port number. If client name resolution is on, the client's DNS name and port are displayed.
- **Destination:** If **Resolve remote host DNS name** is on (the default), this column shows the destination host's DNS name and port number. If **host name resolution** is off, the host's IP address and port are displayed.
- **Authorization:** The user or group ID under which the connection was authorized and the web server which authorized the user or group. The format is `<distinguished name>/<web server name>`.

  For example, if the access control model is **None** (end users log on as guest) and the server name is "hostname.example," the Authorization column displays `rwebgroup=guest/hostname.example.com`.

Use the Column Chooser to view more results:

- **ID:** The connection identification code. A code is assigned to each active connection at the time the connection is made. The code is constructed from the proxy instance number (p), the thread number (t), the connection number (c), and for FTP connections the session number (s). For example, a code for an FTP connection might be p1t52c8s8: proxy instance 1, thread 52, connection 8, session 8.
- **Client In:** The total number of bytes read from the host during this connection.
- **Server Out:** The total number of bytes written to the host during this connection.
- **Security:** The TLS version and the cipher suite.
- **Protocol:** The protocol (Emulation, FTP, or Pass Through) used in the connection. For FTP connections, the column also shows whether the control channel or active data transfer was involved.

Security Proxy server logs

For the selected Security Proxy server, this report shows each event that occurred from the time the first entry was written in the active log file to the time the report was requested.

Note that by default, the log file has a maximum size of 500 KB; when that size is reached, a new active log is started and this report shows activity from that time. You can change the maximum file size in the **Security Proxy Wizard** > **Logging** tab.

- **Time:** The time at which the log entry was written.
- **Accepted At:** The proxy IP address and port number on which the connection was accepted.
- **Source:** If **Resolve client machine DNS name** is off (the default), this column shows the client's IP address and port number. If client name resolution is on, the client's DNS name and port are displayed.
- **Destination:** If **Resolve remote host DNS name** is on (the default), this column shows the destination host's DNS name and port number. If **host name resolution** is off, the host's IP address and port are displayed.
- **Authorization:** The user or group ID under which the connection was authorized and the web server which authorized the user or group. The format is <distinguished name>/<web server name>. For example, if the access control model is None (end users log on as guest) and the server name is "hostname.example," the Authorization column displays rwebgroup=guest/hostname.example.com.

Use the Column Chooser to view more results:

- **Priority:** The priority of the log entry: Info (information), Error, Debug, Audit, or Warn.
- **Protocol:** The protocol (Emulation, FTP, or Pass Through) used in the connection.
- **Security:** The TLS version and the cipher suite.
- **Message:** A short description of the event. The code in brackets at the beginning of each message identifies the action taking place on the proxy server and uses the same format as the ID shown in the Current Activity report.

Connections per proxy server

This report shows the total current connections of all security proxy servers.

- **Security proxy address:** The security proxy server and its associated port.
- **Security proxy current connections:** Tthe count of current connections for that server.

Note: A single FTP session connecting through a security proxy server produces a count of three separate connections.

Assigned Access Reports

Use this report to view your assigned sessions. You can filter by **Users and Groups** or by **Sessions**.

Users and Groups

This report lists all users and groups and the sessions that are assigned to them. The report also indicates whether a user or group has access to the Administrative Console.

Enter a **Search field** string to limit the report to all users and groups that include the search string. The search is not case-sensitive.

Click **Show Report**.

Sessions

This report lists the sessions and the users and groups that are assigned to that session. Individual members of a group are not listed.

Enter a **Search field** string to limit the report to all sessions that include the search string. The search is not case-sensitive.

Click **Show Report**.

7 Technical References

Technical References supplement the product Help with overviews and detailed articles.

- Using the Security Proxy Server
- Security Overview
- X.509 Certificates - Setup Requirements
- Using Log Viewer

Using the Security Proxy Server

This article walks through the steps required to configure and deploy secure sessions using the Security Proxy Server.

Steps at a glance:

1. Install the Security Proxy Server
2. Configure and Start the Security Proxy Server
3. Import the Security Proxy certificates
4. Create Secure Sessions
5. Assign Secure Sessions
6. Run Reports

Notes about Upgrading

Resources

1. Install the Security Proxy Server

The automated installer provides the easiest way to install and configure the Security Proxy Server. If you cannot use the automated installer, other installation methods are available. The Security Proxy can be installed on a different machine

Refer to the Management and Security Server Installation Guide for detailed steps.

Be sure to check the Security Proxy Server's System Requirements and the Performance and Scaling Requirements.

Next step: Configure and Start the Security Proxy Server.

2. Configure and Start the Security Proxy Server

The Security Proxy Server must be configured to establish trust with the Management and Security Server (MSS). Use the **Security Proxy Wizard** to manage your Security Proxy settings and certificates.

About the Security Proxy Wizard

If you installed Management and Security Server and the Security Proxy *manually*, you must run the Security Proxy Wizard before you can use the Security Proxy server for encrypted sessions.

After the initial configuration, use the Security Proxy Wizard to change your Security Proxy settings and manage certificates.

The Security Proxy Wizard:

- generates or imports the certificate used to authenticate the Security Proxy Server.
- sets up a `server.properties` file that contains information about each security proxy connection.
- imports the certificate from the Administrative Server -- if you are using authorization to determine access levels.

NOTE: If you installed the Security Proxy using the **automated installer**, the Security Proxy Server is configured and started, and you can skip to Import the Security Proxy certificates.

Run the Security Proxy Wizard later to change settings or manage certificates.

Using the Security Proxy Wizard

1. Start the Security Proxy Wizard, according to where you installed the product.

   On Windows: run `[MssServerInstall]\securityproxy\bin\SecurityProxyServerWizard.exe`

   On Linux or UNIX:

   - The Security Proxy Wizard requires an X11 window to display its graphical interface. Use the console of an X window or an X session, and open a terminal window.
   - Run the executable:

     `[MssServerInstall]/securityproxy/bin/SecurityProxyServerWizard`

2. The wizard opens with the **Status** tab in focus. Choose whether to open an existing `server.properties` file or to create a new one for this Security Proxy server.

   Refer to the **Help** on each tab for more information.

3. On the **Trusted Certificates** tab, **Import** the Management and Security Server certificate.
4. On the **Proxies** tab, **Add** or **Modify** a proxy.
5. On the **Security Proxy Certificates)** tab, **Generate** or **Import** a security proxy certificate.

6 Return to the **Proxies** tab and click **Export Settings** to export the settings to the Administrative Server.

   Specify or accept the default Administrative Server, Port, and Context. Click **Export**.

7 To verify that the `server.properties` is configured, return to the **Status** tab.

8 Click **Exit** to close the wizard and save your settings. You may need to restart the Security Proxy service.

To make changes to the Security Proxy settings later, simply re-run the Security Proxy Wizard.

Next step: Start the Security Proxy Server.

Start the Security Proxy Server

If the automated installer was used to install the Security Proxy on the same machine as the Administrative Server, the Security Proxy Server has been started. Continue with 3. Import the Security Proxy certificates.

If a non-automated installation method was used, you must start the Security Proxy Server.

After a `server.properties` file is configured for the Security Proxy Server, start the Security Proxy Server:

- **On Windows**

  Or, run: `[MssServerInstall]\securityproxy\bin\MssSecurityProxy.exe`

  To start or stop the service, open Windows Control Panel > Administrative Tools > Services, and select **Security Proxy**.

  Note: When the automated installter is used, you can choose to install the servlet runner as a Windows service, in which case the servlet runner starts automatically.

- **On UNIX and Linux**

  For UNIX and Linux platforms, you can start and stop the service at run level changes using the method that is appropriate to your platform. Use `-start` and `-stop` parameters for the security proxy.

  Or, run: `[MssServerInstall]/securityproxy/bin/MssSecurityProxy`

  Note: When the automated installer is used, a link to the services is created in

  `/etc/init.d`

- **Command line options**

  You can use these commands on all platforms to start and stop the Security Proxy:

  ```
  securityproxy -start
  securityproxy -stop
  securityproxy -status
  ```

To install as a service:

1 Change to your MSS install directory.

2 Then use a parameter.

- **On Windows:**

  ```
  MssSecurityProxy.exe install
  MssSecurityProxy.exe start
  ```

- **On Linux or UNIX:**

  Use the daemon appropriate to your platform for installing or uninstalling the servlet runner as a service.

  ```
  MssSecurityProxy start
  ```

  Note: The administrator must configure `init` scripts to start the Security Proxy server on startup.

Next step: Import the Security Proxy certificates.

Using FIPS-Approved Mode

When the Security Proxy and terminal sessions are configured to run in FIPS-approved mode, all connections are made using security protocols and algorithms that meet FIPS 140-2 standards.

The updated cryptomodules in Management and Security Server 12.4 SP1 require a new setting for FIPS-approved mode. You must manually edit the Security Proxy properties file to run in FIPS-approved mode.

If you are upgrading from a version that used `fipsMode=approved`, the new property is *not* automatically enabled and must be manually configured.

To configure the Security Proxy to run in FIPS-approved mode:

1. Open `mss\securityproxy\conf\server.properties`.
2. In the `FIPS 140-2 Mode` section, add or set the `fipsApprovedMode=` setting to `on`:

   ```
   fipsApprovedMode=on
   ```
3. Restart the Security Proxy server.

3. Import the Security Proxy certificates

Once the Security Proxy is installed and configured, open Management and Security Server to import the Security Proxy settings.

1. Open the **Administrative Console** > **Configure Settings - Security Proxy** panel.
2. Click **+Import** and enter the required information. See **Help** for assistance.
3. To delete a Security Proxy server, check its box, and click **Action** > **Delete**.

Next step: Create Secure Sessions.

4. Create Secure Sessions

After the trust relationship is set between the Management and Security Server and Security Proxy, you can create secure sessions for your users.

1. In Administrative Console, open **Manage Sessions**, and click **+ Add**.
2. Select your **Product** (and **Session type**, if needed), and enter a **Session name**.
3. **Launch** the session.
4. As administrator, open the **Connection Setup (or Connection Settings)** dialog. You may need to Disconnect first.

NOTE: The dialog labels vary, depending on your emulator product. Refer to the product documentation for details.

4a Click the option to **Use TLS/SSL security**.

4b Choose **TLS v1.2, TLSv1.1,** or **TLS v1**. (If you upgraded from a version that used TLS 1.0-1.2, all three are checked.)

(The versions may be listed as **TLS 1.2, TLS 1.0**.)

4c Check **Use Security proxy**.

4d Select a **Security proxy server** and a **Proxy port** for this session.

4e Enter the **Destination host** and the **Destination port**.

4f If you check **End-to-end encryption**, the connection between the Security Proxy and the host will use TLS. Otherwise, that connection is not encrypted.

4g Click **OK**. Close the session, and click **Save/Exit** to send the settings to the Management and Security Server.

Next step: Assign Secure Sessions.

5. Assign Secure Sessions

Now you can enable user access to the secure sessions.

1. In the Administrative Console, open **Assign Access**.
2. **Search** for and click the user or group who should have access to the secure session.
3. Check the **Session** that is configured to use the Security Proxy.
4. Click **Apply**.
5. Deploy sessions to users.

Next step: After the sessions have been opened and used, you can Run Reports to view the activity.

6. Run Reports

In the Administrative Console, open **Run Reports - Security Proxy** to view the activity from your Security Proxy servers. See the Run Reports - Security Proxy Server Reports **Help** for more information.

Notes about Upgrading

When you upgrade Management and Security Server, note these requirements for the Security Proxy.

- Match the version
- Synchronize the upgrade

Match the version

The <major>.<minor> version of the Security Proxy must be the same as Management and Security Server.

Be sure to download the upgraded Security Proxy activation file and run it with the automated installer. Or, install the activation file and activate the server. Refer to the Management and Security Server Installation Guide.

Synchronize the upgrade

If Security Proxy is installed when you upgrade from Management and Security Server 12.4 to a later version (including updates and service packs), complete these steps to be sure the Security Proxy server is synchronized with the MSS administrative server.

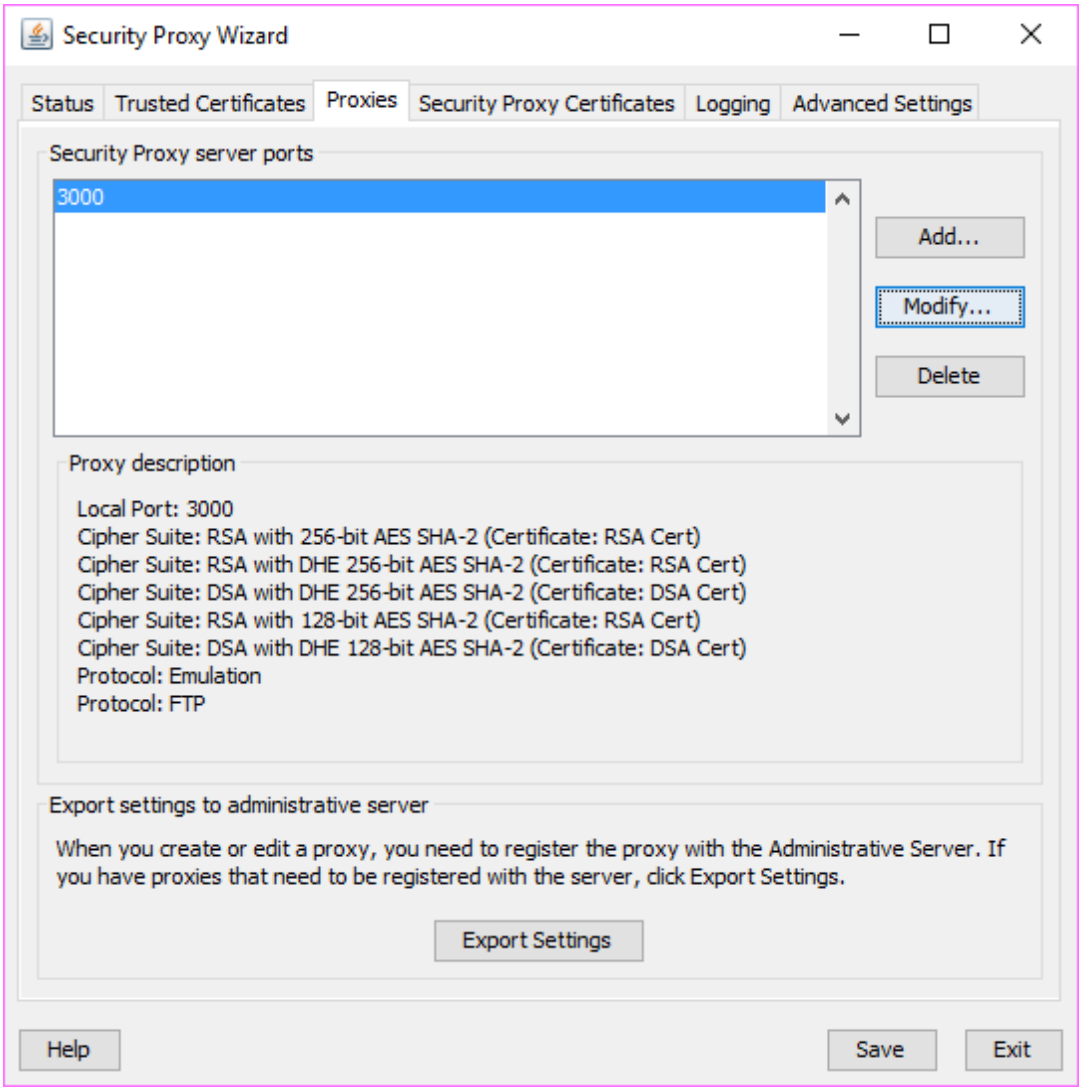
After you upgrade:

1. Open the **Security Proxy Wizard** (from the Start menu).
2. On the **Proxies** tab, review the configuration for each port, and click **Save**.

   Note the **Cipher Suites and Certificates**:

   - Multiple cipher suites of the same key type can use the same certificate.

- Management and Security Server automatically selects the certificate to use with the associated cipher suite. The selection is based on longest expiration date and other properties. For example:



3 To select a different certificate for a particular port:

3a Click the **Proxies** tab > **Modify**.

3b Note (or change) the selected cipher suites.

3c Select an RSA certificate or DSA certificate for that type of cipher suite. Click **OK**.

3d On the **Proxies** tab, click **Save**.

3e Click **Export Settings** > **Export** to send the settings to the MSS administrative server.

Resources

Management and Security Server Technical Resources

Management and Security Server Installation Guide

Security Proxy Wizard (Open from the Start menu)

Management and Security Server Administrative Console - Help:

- Security Proxy
- Manage Sessions
- Assign Access

Security Overview

With Management and Security Server, you can provide secure host access to all your users, whether they are around the corner or around the world.

In addition to using HTTPS connections and a variety of authentication and authorization methods, you can configure specific sessions to use the Security Proxy Server to shield the host from direct access by clients. (A separate license is required for the Security Proxy Add-On product.)

- TLS/SSL Data Encryption
- FIPS-Approved Mode

TLS/SSL Data Encryption

Use the TLS/SSL data encryption options to secure the client-server data exchanges.

TLS/SSL Encryption between the Client Browser and the Management and Security Server

By default, Management and Security Server allows browsers to use the HTTP protocol to communicate between the client computer and the Management and Security Server. Although HTTP is universally available to web browsers, it is *not* a secure protocol. Information exchanged using HTTP is sent in clear text and is vulnerable to unauthorized access.

To secure your passwords and other sensitive data, you should require browsers to use the HTTPS protocol, which provides TLS/SSL encryption, when connecting to the Management and Security Server. To require HTTPS:

1. Make sure TLS/SSL is enabled on your web server. If you installed Management and Security Server with the automated installer, TLS/SSL is enabled by default.
2. Then, go to **Configure Settings - General Security** and check **Require HTTPS**.

NOTE: The **Require HTTPS** setting also forces any Java applets deployed by Management and Security Server to connect with the Management and Security Server using HTTPS. These applets are used when

- launching desktop sessions from the Java-based links list
- launching Reflection for the Web sessions
- configuring Reflection for the Web and desktop sessions from **Manage Sessions**.

When an HTTPS connection is made to the web server, the web server authenticates itself to the client browser using a server certificate. The client checks the server certificate against its trusted certificate store. If the certificate or its root is in the trusted store, the connection proceeds. If the certificate is not trusted, the browser warns the user and requires the user to agree to the connection.

If you use a self-signed certificate or one from a certificate authority (CA) that is not trusted by a user's browser, the browser will present a warning each time the user attempts to access the Management and Security Server. Many browsers permit the user to add the unknown certificate to a trusted certificate list, eliminating the warning. Another option is to use a Management and Security Server certificate from a CA whose root certificate is already trusted by the browser.

TLS/SSL Encryption between Client Session and Host

You can provide a level of security by using the TLS protocol to protect data sent between the client terminal (or printer) session and the host. (The host must be TLS-enabled.)

The option to require a TLS/SSL connection between the client and the host is available when you launch the session from **Manage Sessions**. In the launched session, go to the Connection Setup or Security Properties options to set a TLS connection.

TLS Encryption and Authorization between the Client Session and the Security Proxy Server

Greater security is provided by adding the Security Proxy Server, which requires a separate license. When you use the Security Proxy Server, data sent between the client session and the Security Proxy is TLS-encrypted and the host is protected from direct user contact. (The Security Proxy no longer support SSL encryption.)

In addition, when Security Proxy authorization is enabled, only users who have been authenticated and authorized by the Administrative Server are able to access the host. Others are denied access.

NOTE: To use the Security Proxy Server, the Administrative Server certificate must be trusted by the Security Proxy. The automated installer generates a self-signed certificate that must be imported to the Security Proxy's list of trusted certificates. If you installed a CA-signed certificate on the Administrative Server, you do not need to import the certificate to the Security Proxy.

End to end Encryption: Tunneled TLS Direct Connection to the Host

When you use the Security Proxy, data sent between the emulator and the proxy is TLS-encrypted. You can also tunnel a TLS direct connection to the host through the Security Proxy Server. This form of end-to-end encryption can be set up for a host that supports TLS connections.

To set up this type of connection, open the session’s Security (TLS/SSLSettings) dialog to configure a session to use the Security Proxy. Check the optionfor **End to end encryption**.

As part of the TLS protocol, the client checks the server or host name against the name on the server certificate. Therefore, TLS connections require the common name on the server certificate to match the host or Security Proxy server name. When end-to-end encryption through the Security Proxy is enabled, the client will receive a server certificate from both the Security Proxy and the host. It is recommended that the host certificate have the Security Proxy server name identified as a subject alternate name (SAN).

FIPS-Approved Mode

The United States government's Federal Information Processing Standards (FIPS) are sets of standards developed by the National Institute of Standards and Technology (NIST) that describe the handling and processing of information within governmental agencies.

Specifically, FIPS 140-2 sets standards for cryptographic modules. The cryptographic modules are validated against the specific set of requirements and tested in 11 categories by independent US government-certified testing laboratories. NIST and Canada's Communications Security Establishment (CSE) jointly administer the process by which modules are validated against FIPS 140-2.

When you configure the Security Proxy Server and secure terminal sessions to run in FIPS-approved mode, all connections are made using security protocols and algorithms that meet FIPS 140-2 standards.

Related Topic:

- Using the Security Proxy Server

X.509 Certificates - Setup Requirements

To authenticate users with X.509 client certificates, such as a certificate stored on a smart card, several elements must be in place.

Be sure the requirements for All clients are met in addition to those for your specific Reflection ZFE clients or Windows-based clients.

- All clients
- Reflection ZFE clients
- Windows-based clients

All clients

These settings are required for any client using X.509 certificates.

- **X.509** must be enabled in the **Administrative Console**: **Configure Settings** > **Authentication & Authorization** > **X.509**.
- Each client that is authorized to use Management and Security Server resources must have a client certificate, such as a certificate stored on a smart card, and a valid user account in LDAP.
- The issuer of the client certificates must be trusted by the Administrative Server. For more information, refer to Trusted Certificates.

Reflection ZFE clients

In addition to the requirement for All clients, these settings must be in place.

- A port configured for TLS client authentication must be enabled on the Management and Security Server. This secure port listens for and authenticates communications between MSS and the Reflection ZFE Session Server. This port is automatically configured when using the MSS automated installer or an MSS configuration utility.
- A certificate to trust the Reflection ZFE Session Sever is configured by the automated installer. No further action is needed.

However, if you need to manually add a certificate to the trust store, (such as a CA-signed certificate), follow these steps:

1. Use the **Java keytool** application to import the certificate into the file named `system.bcfks`, located in `MSS\server\etc`.

   Example:

   ```
   C:\Program Files\Micro Focus\MSS\jre\bin>keytool -importcert -alias alias -
   file certificate.cer -storetype bcfks -storepass changeit -providerpath
   ..\..\server\lib\bc-fips-*.jar -providername BCFIPS -providerclass
   org.bouncycastle.jcajce.provider.BouncyCastleFipsProvider -keystore
   ..\..\server\etc\system.bcfks
   ```

2. Restart the Administrative Server.

Replicated servers

If you are using Reflection ZFE with X.509 authentication **and Replication**, you must manually move your CA certificates for X.509 authentication, along with the `system.bcfks,` to the same location on *each* MSS Slave server in the replication cluster.

On *each* Slave server:

1. Locate the **MSSData** directory. This path is displayed in the Administrative Console: **About** > **Product Information**.
2. Copy the CA certificates to the `MSSData\certificates` directory.
3. Use the Administrative Console (**Configure Settings** > **Trusted Certificates**) to import the certificates into the Management and Security Server **Trusted Certificate List.** See **Help** for assistance.
4. Copy the `system.bcfks` from the Master to the same location on the MSS Slave: `MSS\server\etc`
5. Restart the MSS Service on the Slave server (required for the changes to take effect).
6. Repeat these steps for ***each*** Slave server in the replication cluster.

Windows-based clients

In addition to the requirement for All clients, these actions must take place.

- A port configured for TLS client authentication must be enabled on the Management and Security Server. This secure port authenticates end-user certificates presented by Windows-based clients (such as Reflection or Rumba).

  Note: When using the MSS automated installer or an MSS configuration utility, this port is automatically configured.

- The Administrative Server must be restarted after adding a CA-signed certificate.

Using Log Viewer

The Log Viewer application works with the XML log files written by all Host Access Management and Security Servers, including the Security Proxy Server.

Using the Log Viewer, you can:

- Filter log messages by severity.
- Search for message text to quickly find the records you need.
- Filter logs at view time, which enables you to find an interesting record, and then expand your view to see the context from all log sources without having to correlate multiple logs manually.

Notes about viewing information

- Log message details are displayed in a separate split window below the log message summary window and update automatically as messages are scrolled through.
- Open log files are listed in the vertical pane on the left side of the Log Viewer with the fully-qualified path and filename of the currently open log file displayed in the status line at the bottom of the Log Viewer window.
- Records in the XML logs contain rich information, including millisecond-accurate event times and sequence numbers that guarantee that messages are seen as atomic units in the order they were logged.
- Records in the XML logs are language-independent and can be viewed in any supported language, regardless of where they were originally written. Two different users can view the exact same log file in two different languages, with no loss of information.

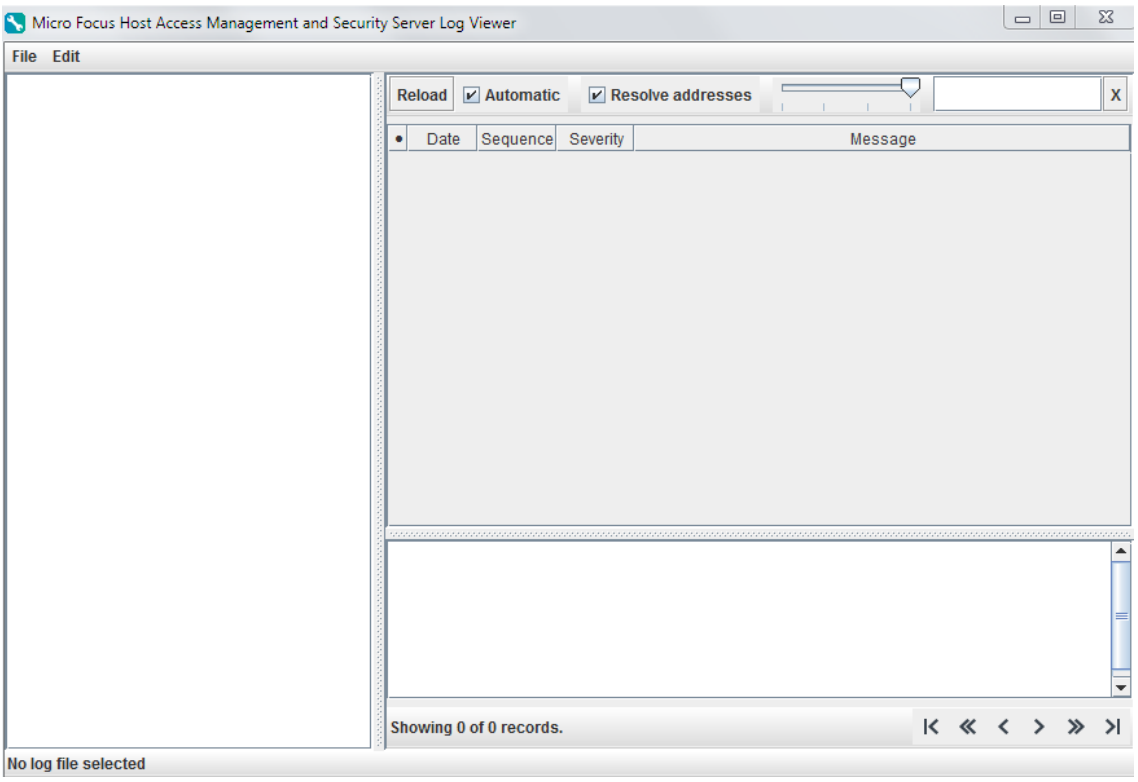
To use the Log Viewer

1. Open the Log Viewer.

   On Windows: Open from the **Start** menu, or double-click the executable:

   `C:\Program Files\Micro Focus\MSS\utilities\bin\LogViewer.exe`

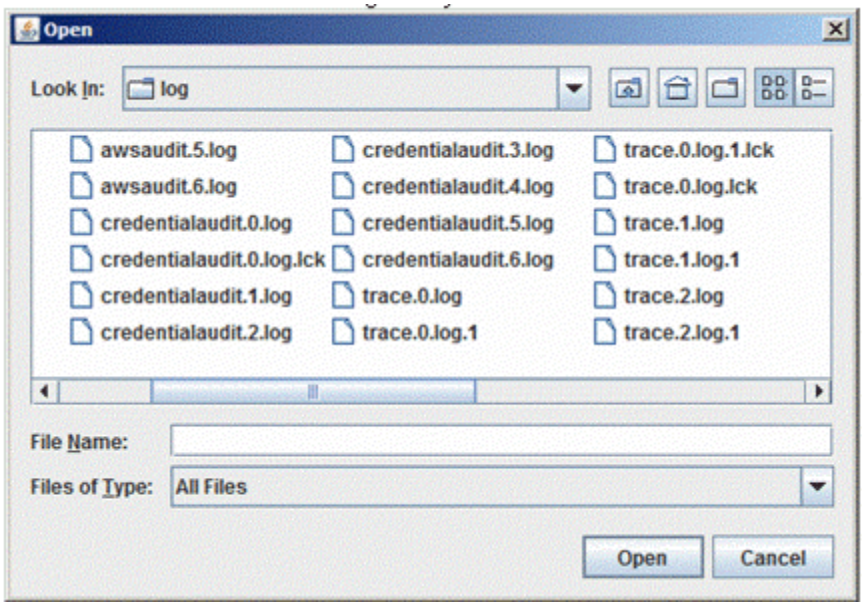
   On Linux: `/usr/local/microfocus/mss/utilities/bin/LogViewer`



2 In the Log Viewer, click **File** > **Load**. (Shortcuts: **Ctrl+L** to Load, and **Ctrl+O** to Close.)

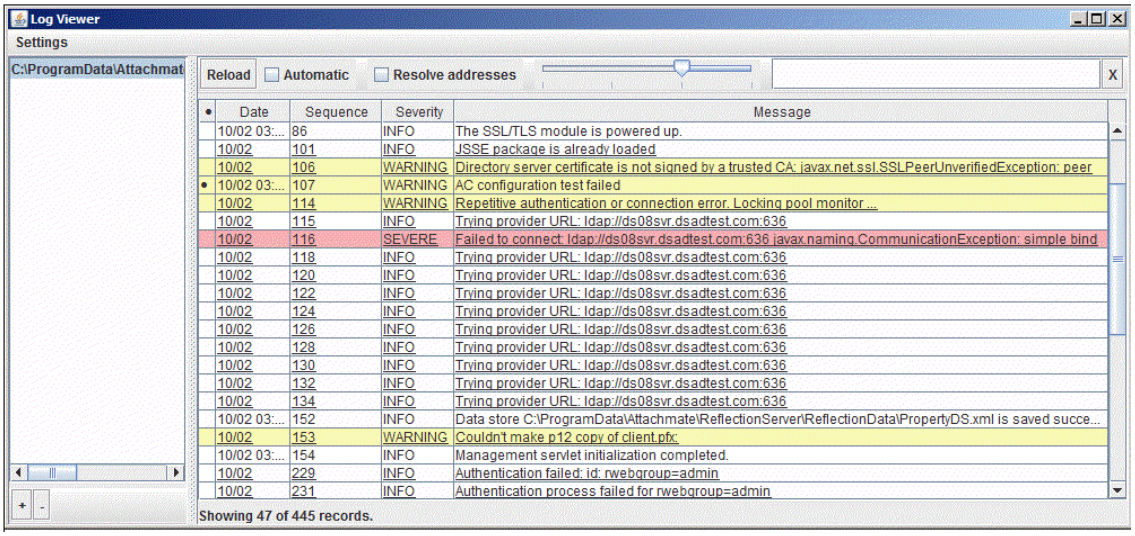
2a Browse to the directory containing the log files you want to view.

2b Select a log file and click **Open.**



Server log files are located in the **MSSData** directory. To locate the MSSData path, click **About** > **Product Information** in the Administrative Console.

3 Click the file in the left pane of the Log Viewer to view the details.



Other Features

Log Viewer provides these options from the top of the right pane.

- **Reload**—Refreshes the log. You can view logs while they are open for writing.
- **Automatic**—Refreshes the log about every 6 seconds, automatically.
- **Resolve addresses**—Displays DNS names instead of numeric IP addresses.

  Note: Address resolution may be slow, since it can require multiple DNS requests per address. Results are cached until you close the Log Viewer.
- **Slider** for Message Level Control—Filters the messages by Severity level.

  Severe messages are highlighted in red. Warnings are highlighted in yellow.
- **Search**—Type a partial search string into the text box to search the message field for matching strings. Log Viewer displays only the results with that string.

  Click the `X` to clear the text field and view all messages for selected level control.

Changing Logging Options

You can change certain default logging options for the product you have installed by editing the `log.properties` file.

Enable debug messages.
Change the default log file size.
Change the number of saved log files.
Change default log file directory.

The `log.properties` file is located in the `MSSData\properties` directory.

An example using `template_log.properties`

To customize logging properties:

1 In the `MSSData\properties` directory, open the `template_log.properties` file.

The template shows examples of the options that can be changed in `log.properties`.

2. Use the template file as a reference. (See the commented section.) Or, copy and paste its contents into the `log.properties` file and modify as needed.
3. When the changes are complete, save the file as `log.properties`.
4. Restart the MSS Server service for the changes to take effect.

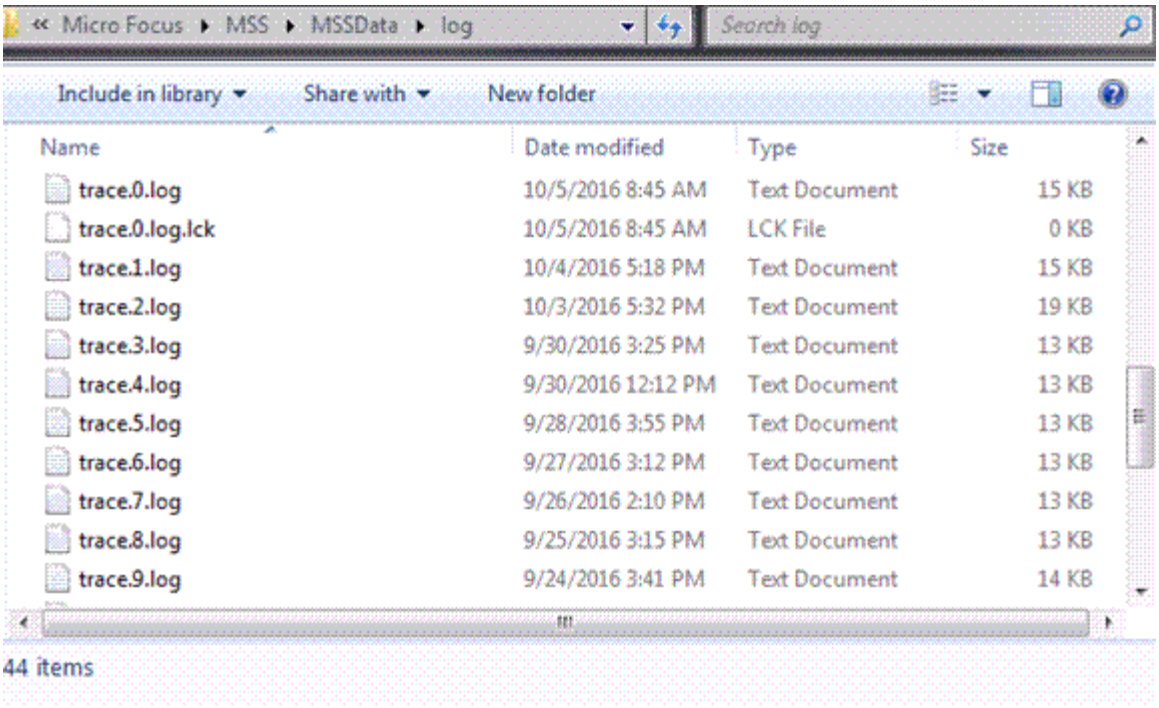
Gathering Log Files to View on another Server or to Send to Technical Support

Copy the following files from the `MSSData\log` directory. You do not need to stop the MSS server.

```
trace.<n>.log
awsaudit.<n>.log
credentialaudit.<n>.log
useraudit.<n>.log
```

After you gather the files, copy them to another server for viewing or if requested, send them to Technical Support.

NOTE: The log files are generated such that the lowest generation number (.0) is the current one, and higher numbers are successively older. For example, `trace.0.log` is more recent than `trace.7.log`.



If the (.0) log file covers the period where the event occurred, then gathering (.0) is sufficient. Otherwise, gather additional log files. The file count limit for each log file is 10. The files with `.lck` extensions are not needed for viewing.