Installation and Deployment Guide

Reflection 2014

Attachmate Reflection®

Attachmate®

Installation and Deployment Guide

Attachmate

Contents

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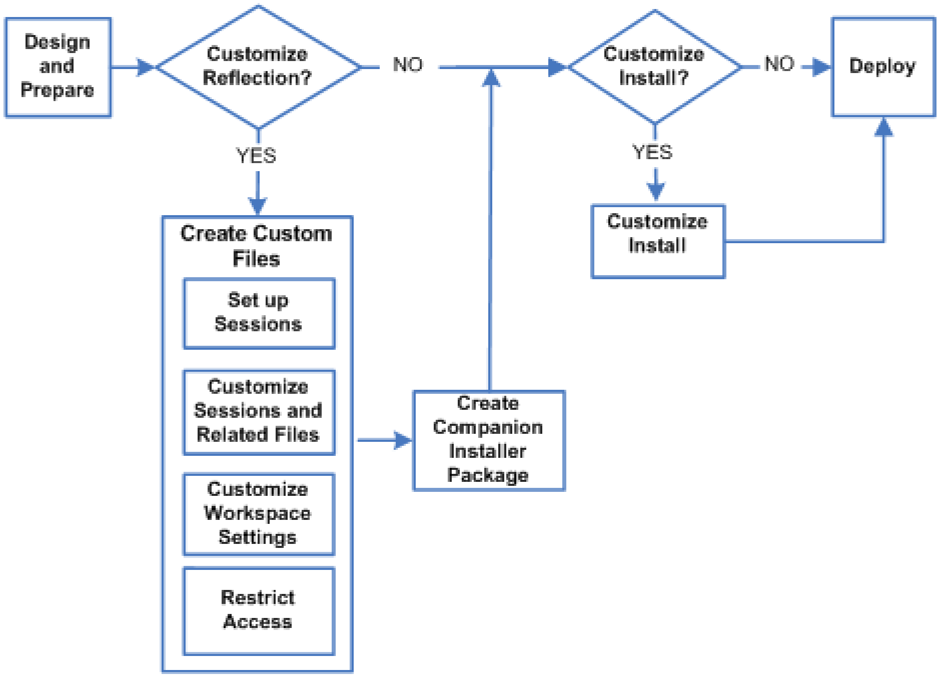
CHAPTER 1

Design and Prepare for Deployment

This guide can help you design and prepare your Attachmate Reflection 2014 deployment. Regardless of the approach you take, most deployments follow the same basic workflow.



Before you deploy Reflection, we recommend that you do the following:

- Review the hardware and operating system requirements (page 8).
- Set up an environment for customization, testing, and deployment (page 9).
- Familiarize yourself with Attachmate's customization tools (page 12).

System Requirements

Requirements for Attachmate Reflection 2014 can vary, depending on your hardware and other software components present. For complete information about deploying Reflection in virtualized environments and other supported platforms, see Technical Note 2698 (http://support.attachmate.com/techdocs/2698.html).

Processor	2 GHz, 32-bit or 64-bit (1.5 GHz or higher multi-core, 32-bit or 64-bit recommended)
System memory (RAM)	1 GB (2 GB recommended)
Operating system and platform	One of the following:
	Microsoft Windows 8.1 Pro 32-bit and 64-bit
	Microsoft Windows 7 Enterprise 32-bit and 64-bit
	Microsoft Windows 7 Ultimate 32-bit and 64-bit
	Microsoft Windows Vista Enterprise, SP1 32-bit and 64-bit
	Microsoft Windows Vista Ultimate, SP1 32-bit and 64-bit
	Microsoft Windows Server 2012 R1 or R2 with Remote Desktop Services (for multi-user environments)
	Microsoft Windows Server 2008 R1 or R2 with Windows Terminal Server (for multi-user environments) 32-bit and 64-bit for R1 (64-bit only for R2)
	Microsoft Windows Server 2003 R2 with Windows Terminal Server (for multi-user environments) 32-bit and 64-bit
Additional software requirements	To use the Office integration features in Reflection, Microsoft Office 2007 or later must be installed.

Prerequisite software — Microsoft .NET Framework

Reflection 2014 R1 requires .NET Framework 4.0 or later (4.5 is recommended). If the .NET Framework isn't installed, the Attachmate Setup Program will install version 4.0 on all systems except Microsoft Windows Server 2008 R1 and later.

Notes:

- **If you install Reflection directly with MSI** and the product features you install do not require .NET 4, you may add the SKIPDOTNET=1 property to the command line to bypass this test condition.
- **If you install with an MSI directly on Windows XP clients**, before you deploy make sure that these clients have the Microsoft Windows Installer 3.1. Although Windows Installer 3.1 is optional, you should update your version of Windows Installer to take full advantage of the features available in Windows Installer 3.1.

Microsoft Windows Installer 3.1

The Microsoft Windows Installer (MSI) version 3.1 is distributed with Reflection 2014. This is applicable to Windows XP only. If you run the Attachmate Setup Program on Windows XP, the wizard determines whether Windows Installer 3.1 is installed, and automatically updates it if necessary.

Microsoft Visual Basic for Applications (VBA)

Reflection 2014 supports Microsoft VBA 6.5. If you select to install this feature in the Attachmate Setup Program, it is automatically installed. If you install Reflection 2014 directly with MSI or with a deployment tool and you want to install this feature, you must install it directly, using the core VBA 6.5 MSI and an appropriate language specific MSI (these MSIs are in the Prerequisites folder, in the distribution media).

Create an Administrative Installation Point

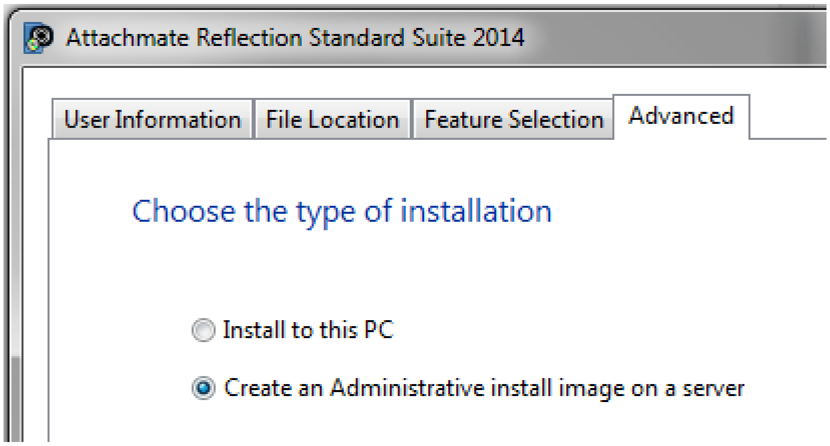
Use this procedure to create an administrative installation point on a networked file server. This places all of the administrative tools and installation files you need to customize and install Reflection to a single location.

To create an administrative install point

1. Download the Reflection installation files.
2. Create a network share on a network file server.
3. From the root directory of the installation files, double-click `setup.exe`.

   This starts the Attachmate Setup Program.
4. Click **Continue** and accept the license.

5 From the **Advanced** tab, click **Create an Administrative install image on a server**.



6 Click **Continue**.

The **File Location** tab is selected.

7 Browse to the network share you want to use for the administrative install image.

> Important! Be sure to specify a UNC path for the network share. For example:
> `\\share_name\administrative_install_point`

8 Click **Install Now**.

9 The next step in preparing a test environment is to install Reflection on a workstation (page 10).

Notes:

Administrative install images are typically created in a file server folder but you can create them in any folder on a local hard disk. This is useful for testing purposes.

If you prefer to use a command line instead of the Attachmate Setup Program graphical interface, you can create an administrative install point as follows:

```
path_to_setup_file\setup.exe /install /admin
TARGETDIR=UNC_path_to_administrative_installation_point
```

If you prefer to install Reflection on your workstation first, you cannot use the installation program graphical interface to create the administrative install image. Instead, you must install it from the command line as follows:

```
path_to_setup_file_on_your_workstation\setup.exe /install /admin
TARGETDIR=UNC_path_to_administrative_installation_point
```

Install Reflection on a Workstation

After you create an administrative installation point, you'll need to install Reflection on a workstation so that you can open and run Reflection. If you plan to customize Reflection, you will use this installation to create custom configuration files.

To install Reflection on a workstation

1 On the workstation, navigate to the network share where you have created the administrative installation point, and double-click `setup.exe`.

2 From the Attachmate Setup Program, click **Continue**, and then accept a license.

3 The following steps are optional:

a) To personalize the installation, click the **User Information** tab and enter the name, organization, and Volume Purchase Agreement (VPA) number, if you have one. (VPA numbers, which are issued by Attachmate, are used by customer support to expedite service requests.)

b) To change the default installation folder or the default user data directory, click the **File Location** tab and browse to the folder you want to use.

c) To select which features, components, or languages are installed, click the **Feature Selection** tab. The default installation does not include all feature and components.

4 Click **Install Now**.

Set up a Shortcut to the Attachmate Customization Tool

The Attachmate Customization Tool (ACT) is designed to be opened from a command line. However, you can create a desktop shortcut that opens this tool. This will save time when you are working with the tool.

To create a shortcut that opens ACT

1 On your administrative installation point, right-click the setup.exe file, and choose **Create Shortcut**.

2 Right-click the shortcut and choose **Properties**.

3 In the **Target** box, add the /admin option to the end of the command line. For example:

```
\\myServer\adminInstallPoint\setup.exe /admin
```

> CAUTION: Make sure that the path in the **Target** box conforms to the Uniform Naming Convention (UNC) format and does not include drive letters. Drive letters can cause problems if you try to use the shortcut on other workstations.

4 Rename the shortcut and save it on the desktops of your workstation and the server you use for your administrative installation point.

5 To start ACT, double-click the shortcut, and in the **Select Customization** dialog box, choose which mode you want to open.

To start ACT from a command line

1 On a command line, change to the administrative installation point and enter:

```
<path_to_setup>\setup.exe /admin
```

2 In the **Select Customization** dialog box, choose which mode you want to open (Transform or Custom installer).

Attachmate Installation Tools

Reflection uses the Microsoft Windows Installer application installation and configuration service. The Windows Installer gets installation information from a relational database, which is saved and deployed as a Microsoft MSI file. When you deploy an MSI file to a user workstation, the Windows Installer on the workstation accesses the information in the MSI file to perform the installation.

Use the following tools to customize and deploy Reflection. These tools are installed as part of the administrative install image.

Attachmate Setup Program

The Attachmate Setup Program (`setup.exe`) is the recommended tool for installing and deploying Reflection.

`Setup.exe` has a command-line interface that you can run from a command line, a batch file, or a deployment tool. You can type command-line options to set installation parameters and limit user interaction as Reflection is installing, or use command-line options to prepare Reflection for installation by users. Command-line installations may have additional system requirements (page 8).

To see a list of available command-line parameters, type:

```
setup.exe /?
```

Attachmate Customization Tool

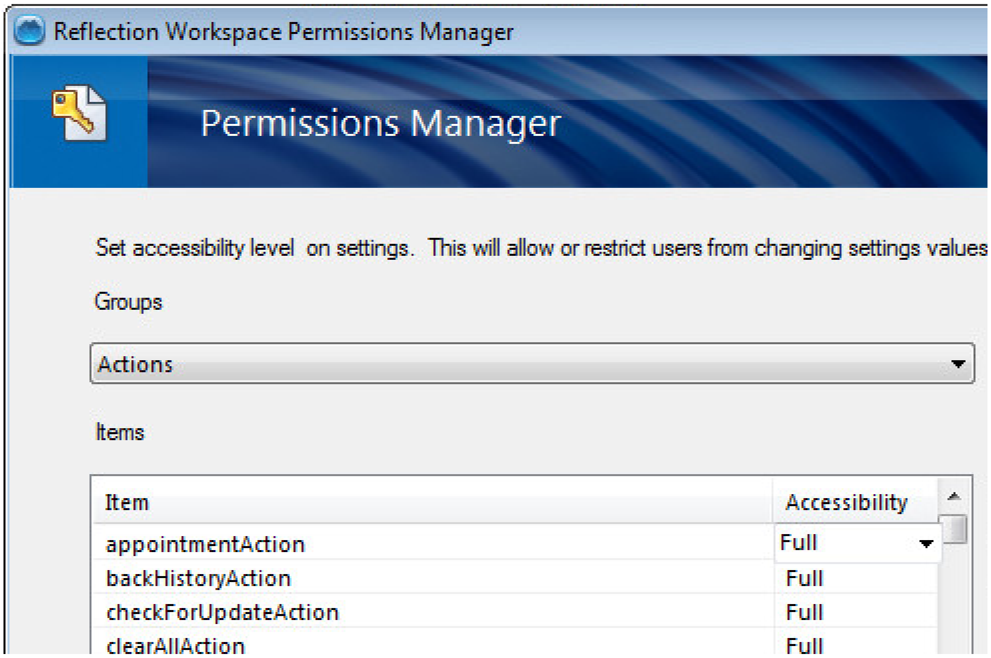
This tool is accessed by running `setup.exe` in administrator mode. The Attachmate Customization Tool lets you create the following files:

- **Transform file** (MST). This file modifies the default installation. This lets you customize Reflection for separate departments or groups. You can upgrade Reflection without removing these customized files.
- **Companion installer package** (MSI). This is a package containing the customized configuration settings and files that you choose to deploy with the installation (or independently). Companion packages show up as independent entries in the Windows list of installed applications. To customize Reflection, see Customize the Workspace (page 17).

Permissions Manager

This is a feature of the Attachmate Customization Tool's custom installer mode that lets you restrict configuration settings and features in the workspace and in session documents. Your changes are saved to .access files which are automatically included in the companion installer package (`.msi`). There are different access files for mainframe, AS/400, UNIX/OpenVMS, and application-wide settings. Plus, there is a separate access file for actions (page 50), which affects the ability to create new session documents or show the UI Designer.

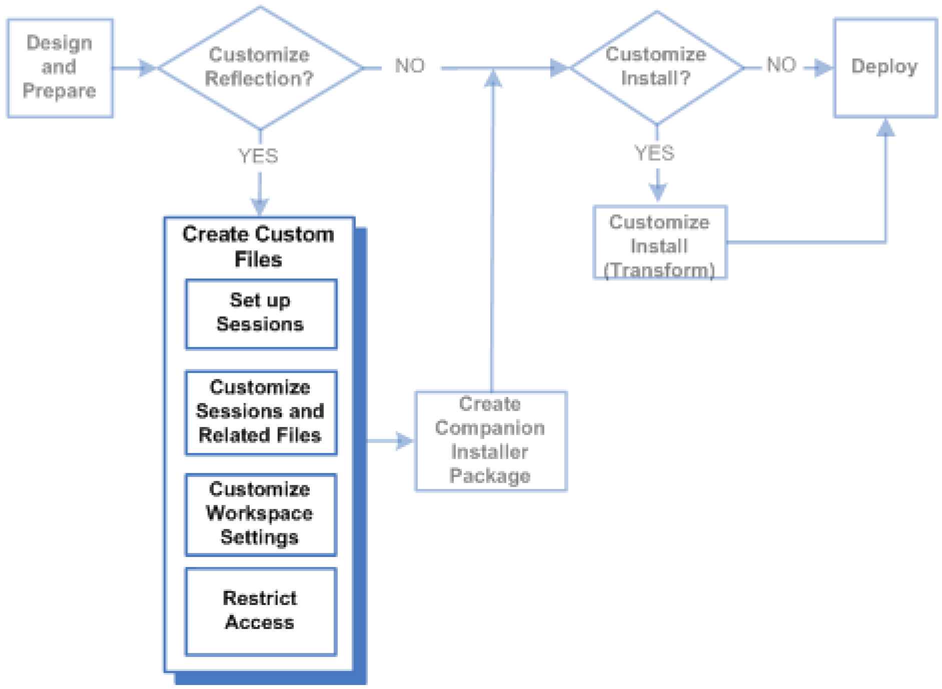
You can edit .access files by running Permissions Manager (page 49).


Reflection Workspace Permissions Manager
Permissions Manager
Set accessibility level on settings. This will allow or restrict users from changing settings values
Groups
Actions
Items
Item
Accessibility
appointmentAction
Full
backHistoryAction
Full
checkForUpdateAction
Full
clearAllAction
Full

CHAPTER 2

Customize Reflection

You can customize the Reflection workspace, sessions, and access privileges. Customized files can be bundled in a companion installer package (`.msi`) and deployed with the installation or later.



What do you want to do?

Customize a Session Document

Use this procedure to customize a session document file (that is, change its default settings for text input, appearance, macros, hotspots and other settings). Custom settings are saved to a separate file which must be deployed with the session document file.

To configure security settings for a session document file, see Create a Secure Session Document (page 21). Security settings are saved in the session document file.

To customize a session

1. Open a Reflection session (for example, `mySession.rd3x`).

2. From the **Quick Access** toolbar, click the **Document Settings** button and make the changes you want.

   The following steps (a through h) illustrate how to create a custom settings file — a keyboard map file that assigns the Ctrl+E key combination to the Erase EOF Send Key.

   a) In the **Settings** dialog box, under **Input Devices**, click **Manage Keyboard Map**.

   b) In the **Manage Keyboard Map** dialog box, click **Create a new keyboard map from an existing keyboard map file.**

   c) Select a keyboard map file to use as a template for your new file (for example, `Default 3270.xkb`).

   d) To configure the session to use the custom keyboard file, select the check box **Use the new file in the current session document**, and then click **OK**.

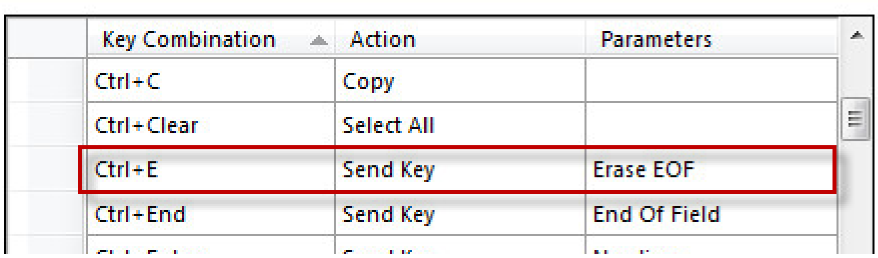
   e) In the **Keyboard Mapper** dialog box, hold down the Ctrl key and then press the E key to enter Ctrl+E in this box.

   f) Click the **Select Action** button, and from the **Action** list, scroll down and select **Send Key**.

   g) Under **Action** parameters, from the **Key** list, select **Erase EOF** and click **OK**. The Ctrl+E key combination appears in the Keyboard Mapper table.

   h) Click **OK** and save the new keyboard map to the Keyboard Maps folder as `myKeyboardMap.xkb`. If you are prompted that this is not a secure location, click **Yes**. (The file is saved in your `Documents\Attachmate\Reflection\Keyboard Maps` folder.)

Keyboard Mapper



You can "package" the keyboard map file and other settings file in a companion installer package for deployment (page 32).

Customize the Workspace

You can change the appearance and basic functionality of the main Reflection window in a variety of ways. For example, you can specify startup macros and actions, trusted locations, and privacy filters. You might change the appearance by opening Reflection in browser mode or with the Ribbon closed.

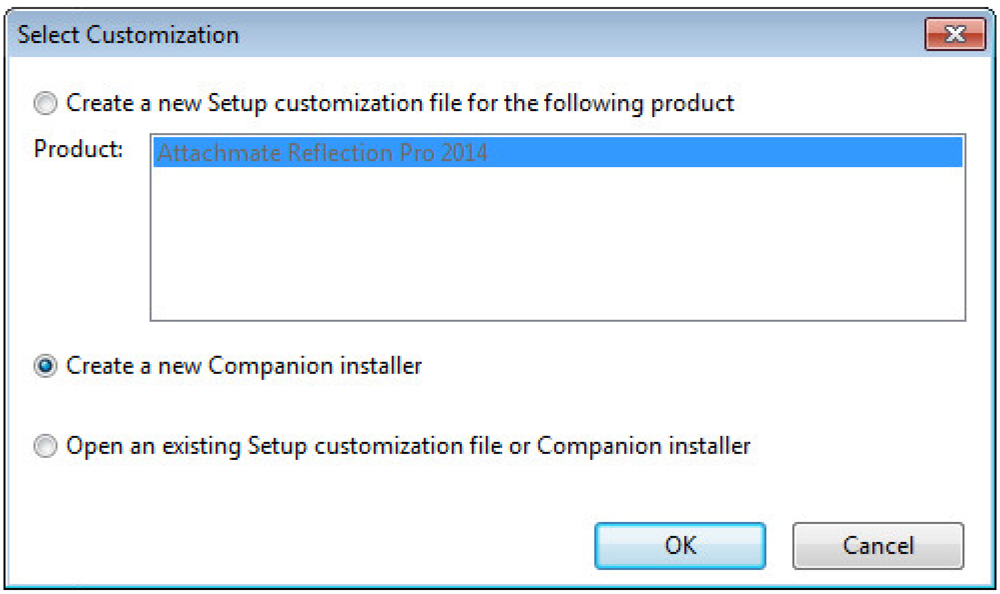
Use the Attachmate Customization Tool to configure most of the custom workspace settings.

To create a custom workspace

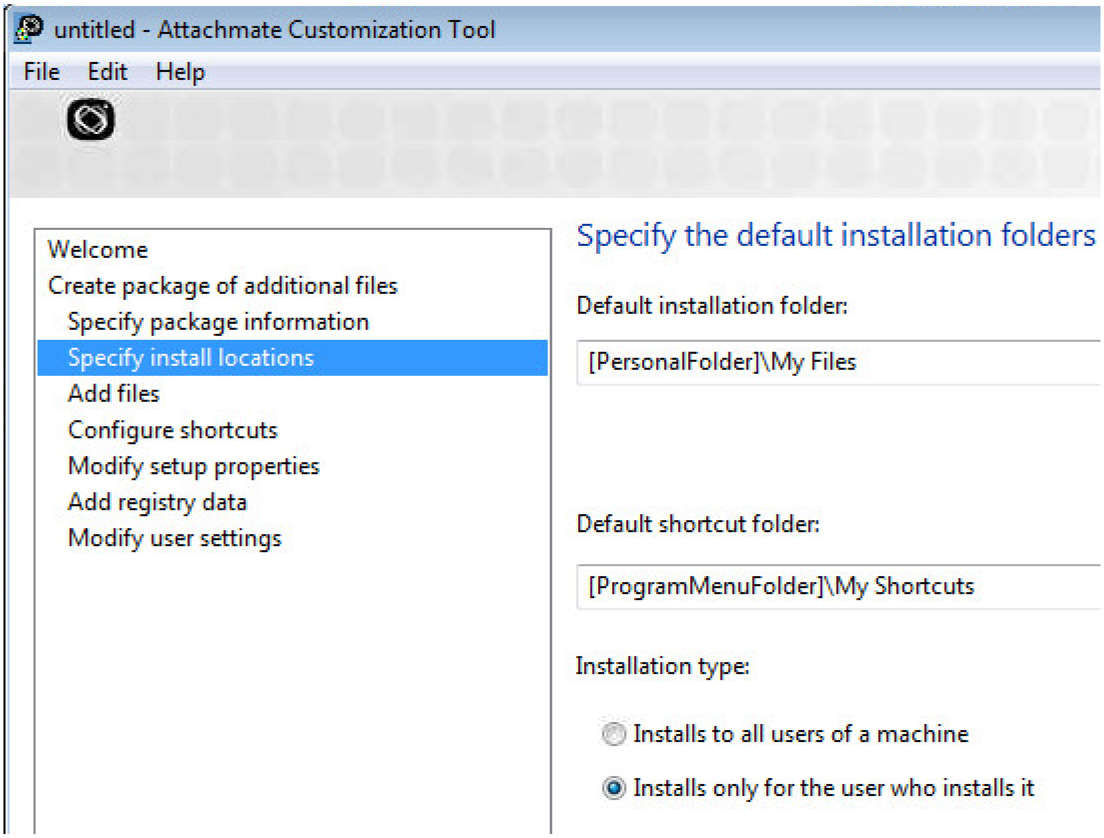
1. From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

   <path_to_setup>\setup.exe /admin

2. From the **Select Customization** dialog box, select **Create a new Companion installer**, and then click **OK**.



3 From the navigation pane, click **Specify install locations**.

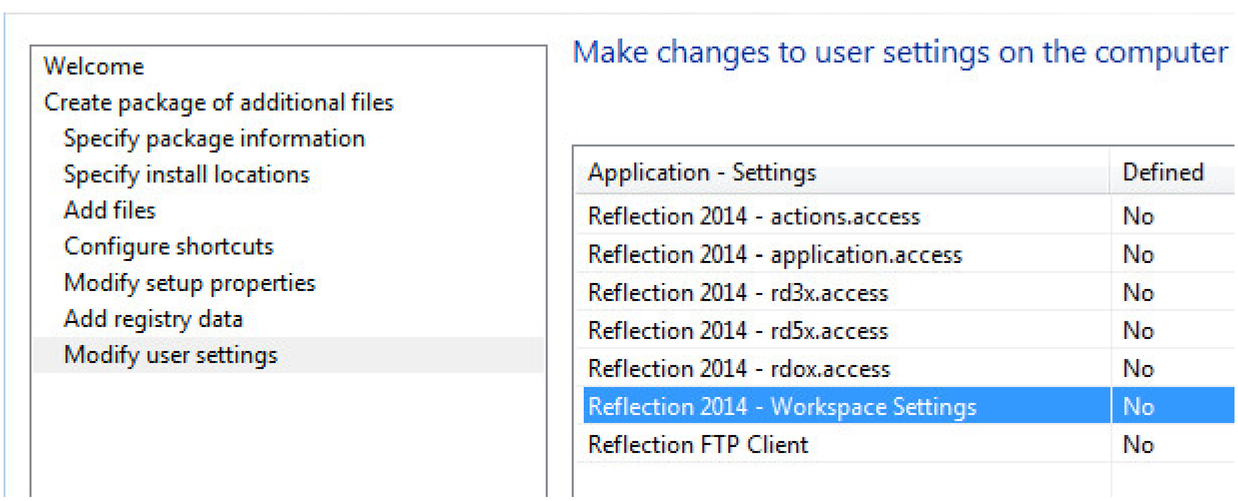


4 Under **Installation type**, select **Installs only for the user who installs it**.

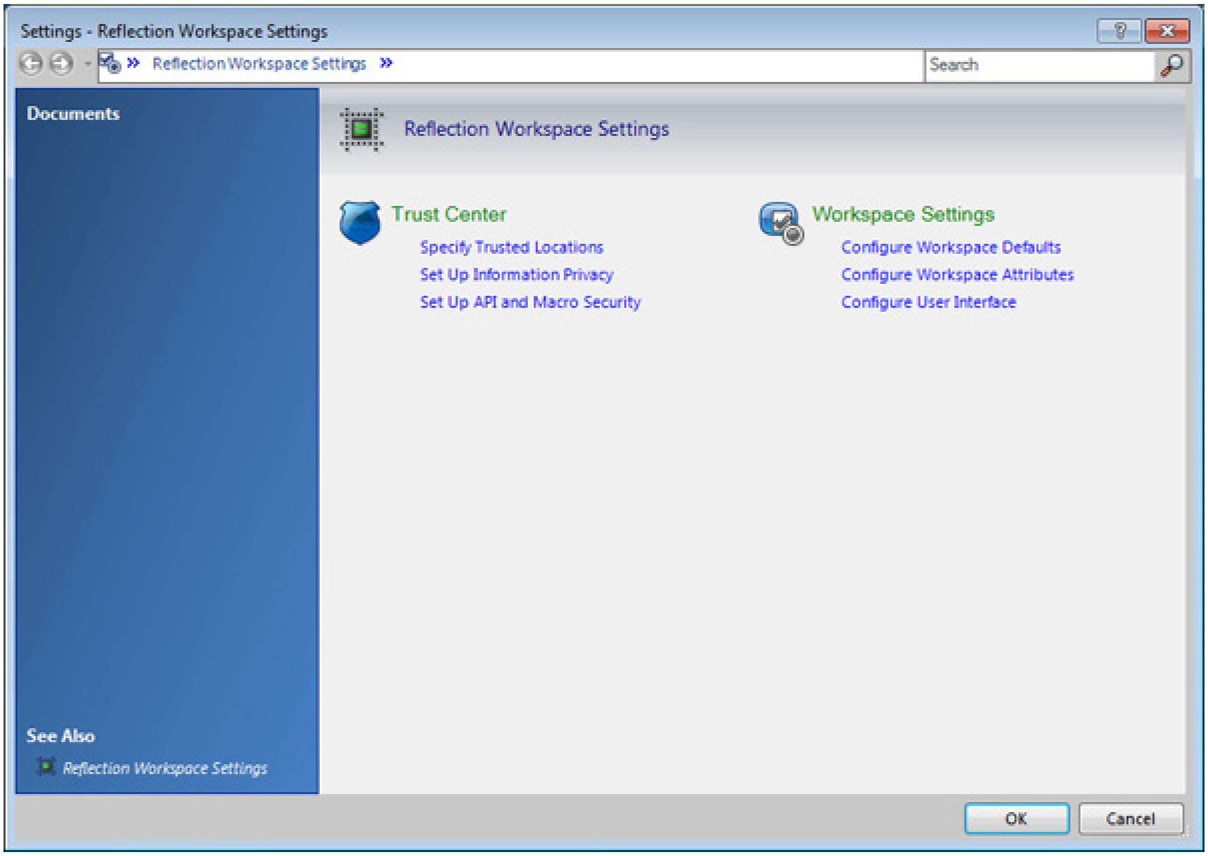
5 On the navigation pane, click **Modify user settings**.

6 From the list of **Application - Settings**, select **Reflection 2014 - Workspace Settings** and then click **Define**.

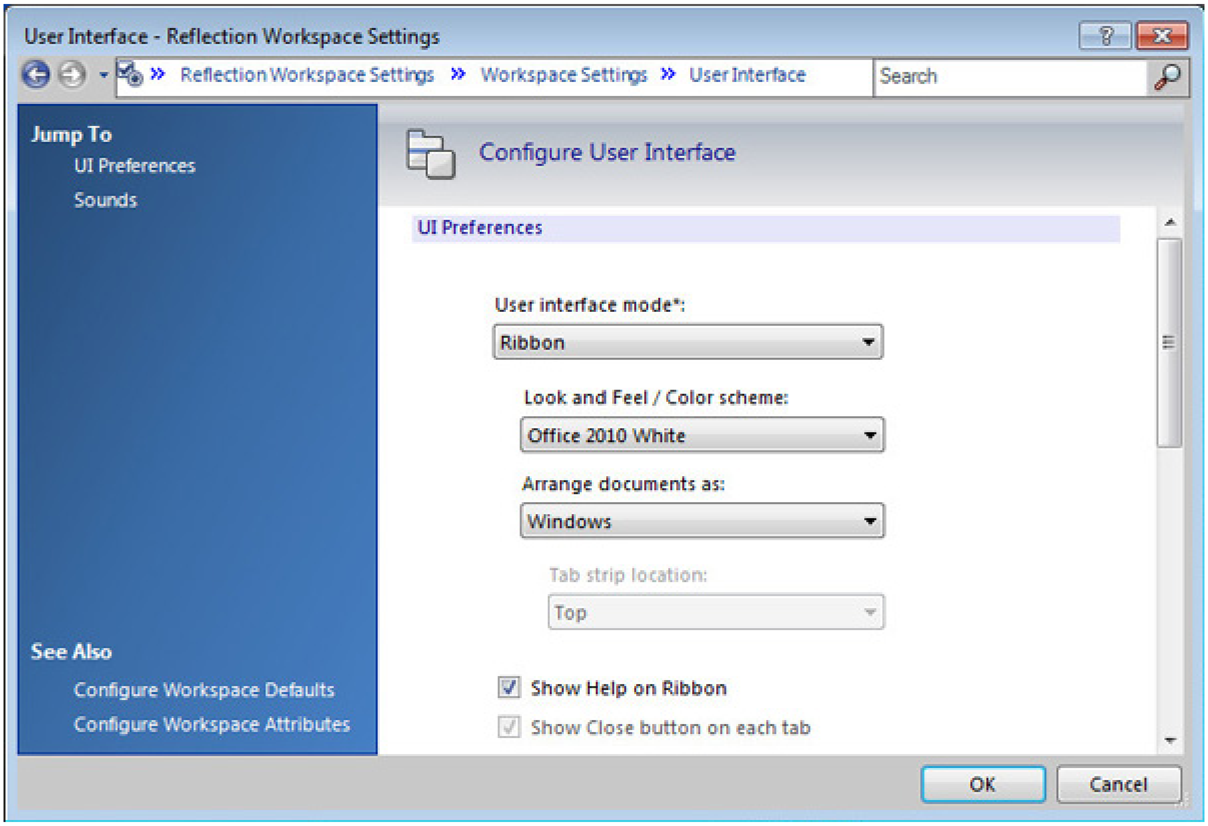
The **Reflection Workspace Settings** open in a separate window.



7 Under **Workspace Settings**, click **Configure Workspace Settings**.



8 In the **Configure Workspace Settings** dialog box, under **UI Preferences**, for **Arrange documents as**, select **Windows** and click **OK**.



9 To set the product Help to open from the local drive, select **Configure Workspace Attributes** and under **Help System**, select **Use installed help system**.

10 Save the companion package file (`.msi`) and close the Attachmate Customization Tool. You can deploy the companion file as it is, or you can edit it to add additional files.

Custom settings are automatically saved in the `Application.settings` file. The companion installer file is automatically configured to deploy this file to `[AppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`* (for a single user) or to `[CommonAppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`* (for all users)

where *`data_folder`* is specific to the version of Reflection. For example, for Reflection 2014 R1, this folder is `R2014_R1`.

Important: Workspace files can be deployed only to individual users. If you deploy Reflection to a computer that has more than one user, a separate deployment is required for each user.

Create a Secure Session Document

When you create a Reflection session document, configure it to use the security protocols your organization requires. Security settings are saved in the session document file.

This connection type	Supports these protocols
3270 terminal or printer	SSL/TLS, SOCKS
5250 terminal or printer	
6530 terminal*	SSL/TLS, Secure Shell
VT terminal or FTP Client	SSL/TLS, Secure Shell, Kerberos, SOCKS, HTTP

* Requires a separate add-on (page 29).

Topics in this section:

Connect Using SSL/TLS

The Secure Sockets Layer protocol (SSL) and its compatible successor, the Transport Layer Security protocol (TLS), enable a client and server to establish a secure, encrypted connection over a public network. When you connect using SSL/TLS, the client authenticates the server before making a connection, and all data passed between Reflection and the server is encrypted. Depending on the server configuration, the server may also authenticate the client.

Attachmate Reflection 2014 supports SSL/TLS connections for IBM 3270, IBM 5250, and VT terminals.

Note: SSL/TLS connections use digital certificates for authentication. Depending on how your certificate was issued and the way your host is configured, you may need to install a host and/or personal certificate before you can connect using SSL/TLS.

Before you start

Make sure your system has an SSL/TLS host (server or servers) and that you know how certificates are handled for your server.

The following instructions show how to configure a connection for a host that requires server authentication (but not client authentication) and uses a certificate from a trusted certification authority (CA).

This procedure shows how to import the certificate into the Reflection certificate store. To set up this connection, you need:

- The SSL/TLS host name
- A user name and password
- The port used by the SSL/TLS server
- Access to a CA certificate for the server

To configure a secure terminal session using SSL/TLS

1 Open the **Create New Document** dialog box.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon or Reflection Browser	From the Quick Access Toolbar, click the **New Document** button.
Mobile UI	Tap the Folder icon and then under **File**, select **New**.

2 From the **Create New Document** dialog box, select a session template and click **Create**.

3 For **Host Name/IP Address**, enter the fully qualified host name.

> Note: By default, the host name you enter must exactly match one of the host names entered in either the **CommonName** or the **SubjectAltName** field of the host's certificate. The setting **Certificate host name must match host being contacted** is configured from the **PKI Configuration** dialog box. Leave this setting selected for maximum security.

4 In the **Port** box, set the port your host uses for SSL/TLS connections. In most cases you will have to change the default port value. Contact the host system administrator for this information. (For connections to an AS/400, the SSL/TLS port will typically be 992.)

5 Select **Configure additional settings,** and then click **OK**.

6 Do one of the following:

- If you are setting up a 3270 and 5250 terminal session, under **Host Connection**, click **Set Up Connection Security**. Then, in the Configure Advanced Connection Settings dialog box, click **Security Settings**.
- If you are setting up a VT terminal session, click **Configure Connection Settings**, confirm Network Connection Type is set to **Telnet**, and click the Back arrow. Then, under **Host Connection**, click **Set Up Connection Security**.

7 From the **Security Properties** dialog box, select the **SSL/TLS** tab, and select **Use SSL/TLS security**.

8 (Optional) To specify the minimum allowable level of encryption for SSL/TLS connections, select a level in the **Encryption strength** list. The connection fails if this level cannot be provided.

Note: If you select Default, any encryption level is permitted, and Reflection negotiates with the host system to choose the strongest encryption level supported by both the host and the PC.

9 (Optional) Click **Configure PKI**.

The **PKI Configuration** dialog box opens, from which you can manage the digital certificates used for authentication.

a) Click **Reflection Certificate Manager**.

b) In the Reflection Certificate Manager dialog box, select the **Trusted Certificate Authorities** tab.

c) Click **Import** and browse to select the CA certificate for the server.

d) Modify default settings as required. (For example, to use only the Reflection store, you might choose to clear **Use System Certificate Store for SSL/TLS connections**. When this option is selected, Reflection looks for certificates in both the Reflection store and the Windows certificate store.)

When you customize any of the default PKI settings, the `pki_config` file is created.

e) Close the Certificate Manager dialog box and click **OK** to close the other open dialog boxes.

The imported certificate is saved in the `trust_store.p12` file.

f) After a connection is established, click the Save button on the Quick Access toolbar and save the session document.

Connect using Secure Shell (SSH)

You can configure Secure Shell connections when you need secure, encrypted communications between a trusted host and your PC over an insecure network. Secure Shell connections ensure that both the client user and the host computer are authenticated; and that all data is encrypted. Passwords are never sent over the network in a clear text format as they are when you use Telnet, FTP, or rlogin. You can use this procedure to connect securely to UNIX and Linux hosts.

Note: Secure Shell connections are available for VT terminal sessions.

Before you start

By default, Secure Shell connections use public key authentication for the host and username/password authentication for the user. To configure a connection using these defaults, you need to make sure your system has a Secure Shell server or servers and that you know the following information:

- The host name.
- The User name and password.
- The port used by the Secure Shell server (the default is 22).

To configure a secure terminal session using Secure Shell (SSH)

1 Open the **Create New Document** dialog box.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon or Reflection Browser	From the Quick Access Toolbar, click the **New Document** button.
Mobile UI	Tap the Folder icon and then under **File**, select **New**.

2 From the **Create New Document** dialog box, select the **VT Terminal** template and click **Create**.

3 In the **Create New** dialog box, under **Connection**:

- Select **Secure Shell**.

  The Port value changes to 22, which is the standard port for Secure Shell connections. If you need to connect to a different port, select **Configure additional settings**, or use the procedure below to change the default Secure Shell settings.

- (Optional) Enter the **Host name/IP address.** If you omit this, you will be prompted for a host name when you connect.

- (Optional) Enter your **User name**. If you omit this, you will be prompted for a host name when you connect.

4 Click **OK**.

5 The first time you connect, you are prompted to verify the host hey authenticity. Verify the host key fingerprint and select **Always**.

Note: Host authentication (performed with public key authentication) enables the Secure Shell client to reliably confirm the identity of the Secure Shell server. If the host public key is not installed on the client, the host fingerprint is displayed and users are prompted to contact the system administrator to verify the fingerprint. This confirmation prevents risk of a "man-in-the-middle" attack, in which another server poses as the host. After the host key is added to the client, Attachmate Reflection 2014 can authenticate the server without requiring user confirmation, and the unknown host prompt does not appear again. The key is saved in a file called `known_hosts`, which is created in the folder `personal_documents_folder\Attachmate\Reflection\.ssh`.

6 When prompted, enter your password.

7 Click the **Save** button on the **Quick Access** toolbar and save the session document.

The file is saved in `[PersonalFolder]\Attachmate\Reflection`.

To configure username and password prompts to appear in the terminal window

1 Open a session that you have configured to use Secure Shell. Disconnect if you are connected.

2 Open the **Document Settings** dialog box.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon or Reflection Browser	With a session open in Reflection, from the Quick Access Toolbar, click .
Mobile UI	Tap the Gear icon and then select Document Settings.

3 Under **Host Connection**, click **Configure Connection Settings**.

4 Under **Connection Options**, select **Handle SSH user authentication in terminal window**.

To configure non-default Secure Shell settings

1 Open a session that you have configured to use Secure Shell. Disconnect if you are connected.

2 Open the **Document Settings** dialog box.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon or Reflection Browser	With a session open in Reflection, from the Quick Access Toolbar, click .
Mobile UI	Tap the Gear icon and then select Document Settings.

3 Under **Host Connection**, click **Set up Connection Security**.

4 In the **Reflection Secure Shell Settings** dialog box, configure any non-default settings and then click **OK**.

Notes:

- When you click OK, changes to the default settings are saved in the Secure Shell `config` file in `[PersonalFolder]\Attachmate\Reflection\.ssh`
- If you want to deploy the session to all users of a computer, first rename the `config` file to `ssh_config` and the `known_hosts` file to `ssh_known_hosts`.

Connect Using Kerberos

Kerberos is a protocol that uses a trusted third party to enable secure communications over a TCP/IP network. The protocol uses encrypted tickets rather than plain-text passwords for secure network authentication and also supports encryption of the data stream.

After you configure a session using Kerberos, you can export these settings to an XML file in order to deploy them. The first time a user opens a Reflection Kerberos session, these settings are imported into the registry.

Note: Kerberos connections are available for VT terminal sessions.

Before you start

Make sure you know the following information:

If you are configuring Kerberos using Windows credentials:

- You must be logged into a Windows domain.
- You must know the fully qualified name of a host that is running a kerberized server application (such as `telnetd` or `ftpd`) and that has been joined to the Windows domain.

If you are configuring Kerberos using a KDC, Make sure your system has a KDC server and that you know:

- The fully-qualified name of a host that is properly configured and running a kerberized server application (such as `telnetd` or `ftpd`).
- The fully qualified KDC host name.
- The Kerberos principal (and password) with which you will be authenticating.
- The Kerberos realm.

To configure a secure terminal session using Kerberos

1 Open the Create New Document dialog box.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon or Reflection Browser	From the Quick Access Toolbar, click the **New Document** button.
Mobile UI	Tap the Folder icon and then under **File**, select **New**.

2 From the **Create New Document** dialog box, select a session template and click **Create**.

3 For **Host Name/IP Address**, enter the fully qualified host name.

4 Select **Configure additional settings,** and then click **OK**.

5 Under **Host Connection**, click **Set Up Connection Security**.

6 From the **Security Properties** dialog box, click the **Kerberos** tab, and select **Reflection Kerberos**.

Note: Unless your PC has a Kerberos Manager configuration file installed, the **Reflection Kerberos Initial Configuration** dialog box is displayed the first time you use Reflection Kerberos. You must specify default Kerberos settings in this dialog box before you can make a connection.

---

7 Do one of the following:

- Select Use Windows logon values.

  -OR-

- Enter values for **Default Principal**, **Default Realm**, and **KDC host name**.

1 Click **OK** to close the **Reflection Kerberos Initial Configuration** dialog box.

2 Configure any additional Kerberos options that you want to use for this connection and click **OK** to close the **Security Properties** dialog box.

3 Click **OK** to close the **Settings for VT** dialog box and initiate the connection. When prompted, enter your password.

4 After a connection is established, click the Save button on the Quick Access toolbar and save the session document.

5 Click **OK** to close the open dialog boxes and return to the workspace.

Set up a SOCKS or HTTP Proxy Server Session

You can configure sessions to connect through a SOCKS proxy server or an HTTP server.

Notes:

- SOCKS is supported for VT, 3270, and 5250 terminals.
- HTTP is supported only for VT terminals.

Before you start

Make sure your system has a proxy server or servers and that you know the following information:

- If you are setting up a connection to a SOCKS server, know the proxy server address and protocol version.
- If you are setting up a connection to an HTTP server, know the proxy server address and port.

To set up a session to connect through a SOCKS proxy server or an SSL/TLS server

1 Open the **Create New Document** dialog box.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon or Reflection Browser	From the Quick Access Toolbar, click the **New Document** button.
Mobile UI	Tap the Folder icon and then under **File**, select **New**.

2 From the **Create New Document dialog** box, select a document template and click **Create**.

3 In the **Create New Terminal Document** dialog box, under **Connection**, enter the Host name/IP address.

4 Click **Configure additional settings** and then click **OK**.

5 In the Settings dialog box, under **Host Connection**, click **Setup Connection Security**.

6 If you are configuring a 3270 or 5250 terminal session, in the Configure Advanced Connection Settings dialog box, Under **Security**, click **Security Settings**.

7 On the Security Properties dialog box **Proxy** tab, select **Use proxy serve**r and then select the proxy type:

- SOCKS (supported for VT, 3270, and 5250 terminals).
- HTTP (supported only for VT).

8 Click **Configure**.

9 If you want to designate only one HTTP proxy server, configure the session for the proxy server as follows:

To configure…	Do this
SOCKS	Enter the **Server address** and the **Protocol version**.
HTTP	Enter the server **Address** and **Port**. If you want to use authentication that requires a user name and password, select **Basic authentication** and enter the user name for the proxy server. (If this is not selected, no authentication is used.)

10 If you want to configure more than one proxy server or configure specific destination routes, leave the fields in the **HTTP** (or **SOCKS**) **proxy** group blank and click **Advanced**.

Connect to an HP NonStop/Tandem Host

Use the procedures in this topic to configure Reflection 2014 to connect to an HP NonStop Tandem host. To connect to this host, the Reflection for NonStop 2014 Add-On must be deployed with the Reflection 2014 base product.

During installation of the base product, Reflection 2014 will remove EXTRA! 6530 Client Option 7.x – 9.x and the Reflection for 2008 or 2011 NonStop Add-On, if detected.

Note: The Reflection for NonStop 2014 Add-On does not support the conversion of user settings, like session files and macros, created with EXTRA! 6530 Client Option.

Obtaining and Installing the Product

Maintained customers are eligible to download the latest product releases from the Attachmate Download Library web site: `https://download.attachmate.com/Upgrades/`

Important! The Reflection for NonStop 2014 Add-On must be installed *after* Reflection is installed. The Add-On installer does not currently support an automated administrative installation. For more details about the Add-On, see Technical Note 2707 (http://support.attachmate.com/techdocs/2707.html).

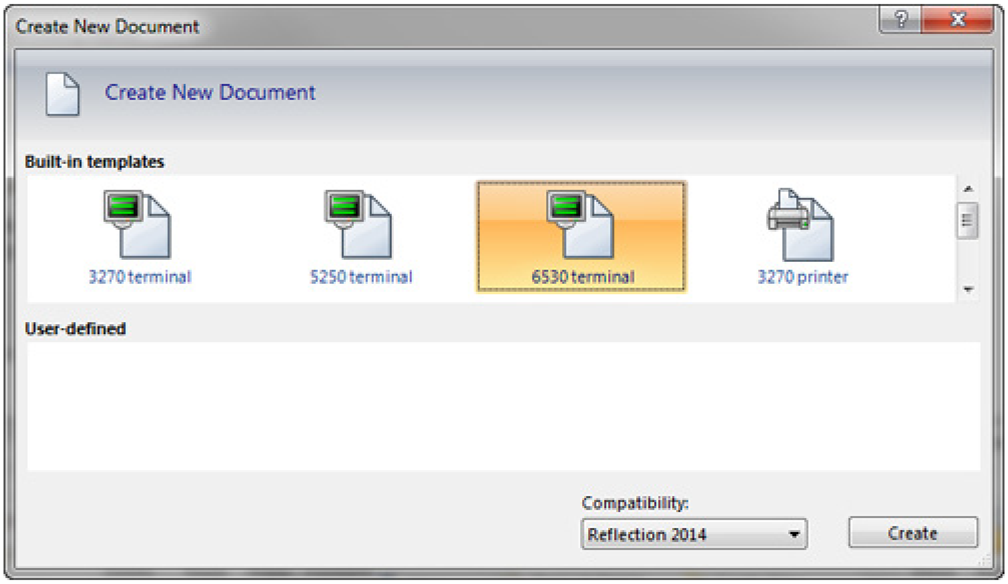
To create a 6530 session

1 From the Reflection Workspace, open the **Create New Document** dialog box.

The steps depend on your user interface mode.

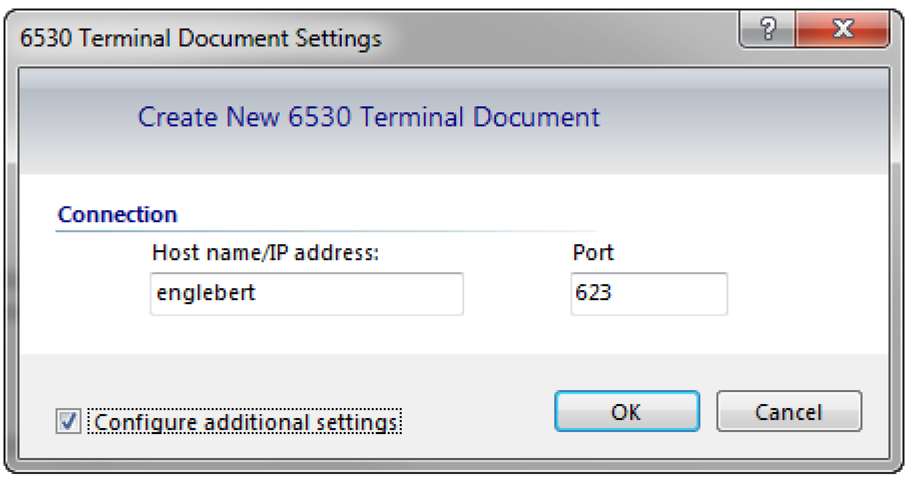
User Interface Mode	Steps
Ribbon or Reflection Browser	From the Quick Access Toolbar, click the New Document button.
Mobile UI	Tap the Folder icon and then under File, select New.

2 From the **Create New Document** dialog box, select the **6530 terminal** template and click **Create**.

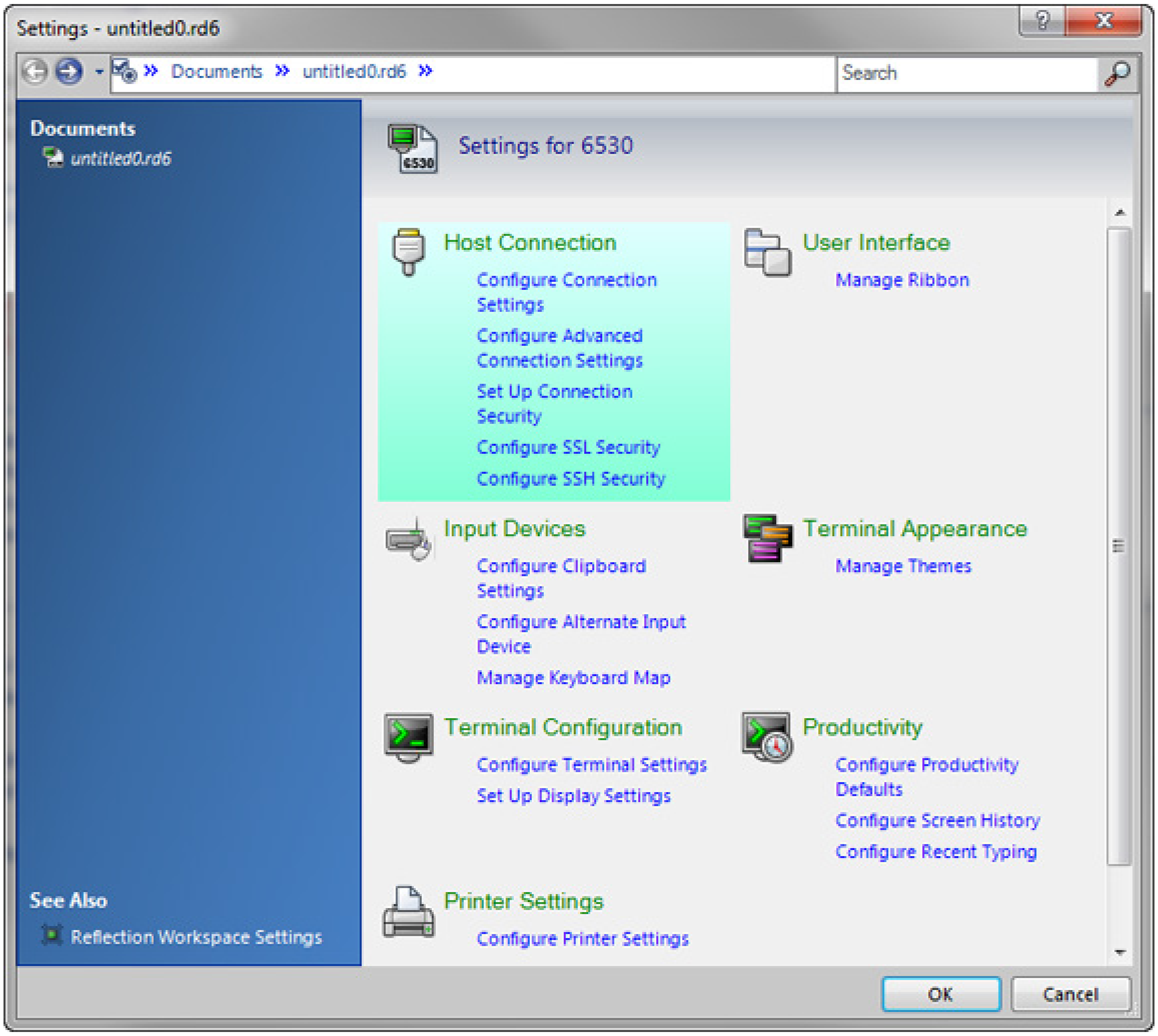


3 In the **6530 Terminal Document Settings**, enter the fully-qualified host name and port number for your host.

4 Select the check box for **Configure additional settings** and click **OK**.



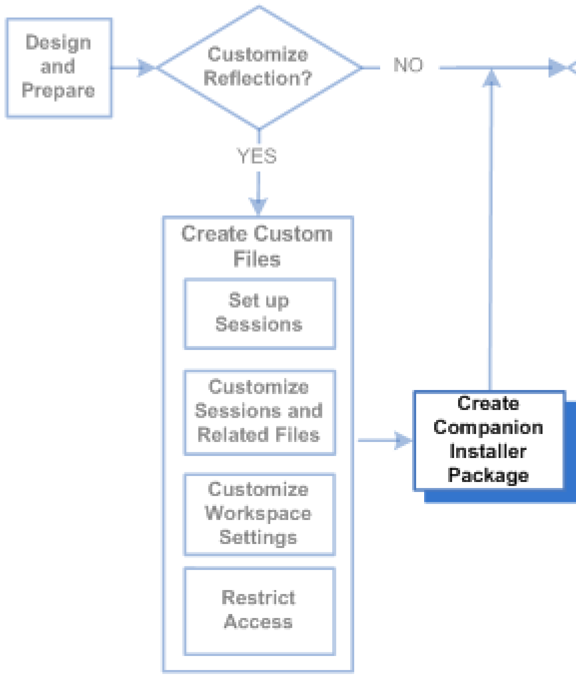
5 In the **6530 Settings** dialog box, configure the appropriate settings for your host.



6 Save the session document file (.rd6).

Package Sessions and Custom Settings Files

After you customize Reflection, bundle the customized session and settings files into a deployable companion installer package (.msi).



You can deploy companion installer packages separately or you can add them to a customized installation. You can also create and install packages at any time after the initial installation. Companion installer packages are displayed as independent entries in the Windows Add\Remove Programs list and can be installed or uninstalled independently of Reflection. If you support several business units that require their own customized configuration files, you can create a companion installer package for each business unit.

Companion installer packages have no built-in user interface except a standard progress bar.You can also create and Deploy MSI Packages from Reflection Security Gateway (page 86).

To create a companion installer package

1 Note the locations of custom configuration files you've created.

From your administrative installation point, open the Attachmate Customization Tool from a shortcut or by typing the following command line:

```
<path_to_setup>\setup.exe /admin
```

2 In the **Select Customization** dialog box, open the companion installer view:

- If you created a companion installer package earlier, select **Open an existing Setup file or Companion installer**, click **OK**, and then browse to select the file.
- If you have not created a companion installer package, select **Create a new Companion installer**.

3 On the left, click **Specify install locations**, and specify the **Installation type**. This setting will affect the list of available folder locations on the **Add files** panel.

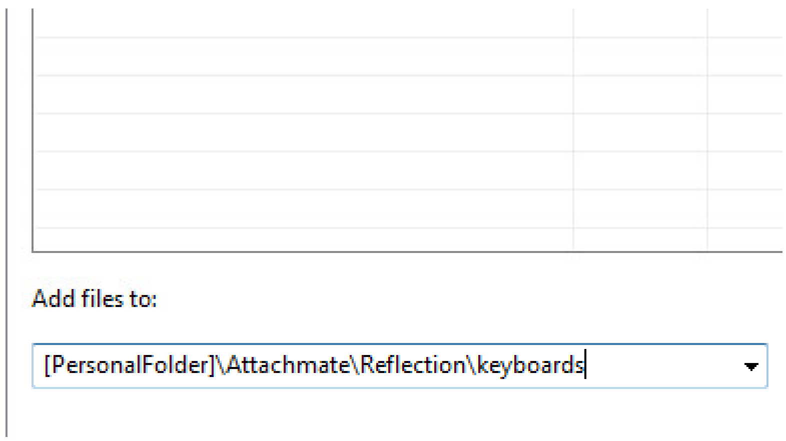
Note: In Reflection 2011 R1, all installations are user-specific.

4 On the left, click **Add files**.

5 At the bottom of the panel, from the **Add files to** menu, select the appropriate system folder (page 68) for the file you're adding. The available locations are determined by the installation type you chose in step 4. For the list of locations where Reflection expects to find configuration files, see Table 1.

6 Click in the **Add files to** box and type the rest of the path. The final entry should be one of the following:

- `[PersonalFolder]\Attachmate\Reflection\keyboards`
- `[ProgramFilesFolder]\Attachmate\Reflection\keyboards`



Important! The folder location you add must already exist on all target computers.

7 Click the **Add** button, browse to `Users\<username>\Documents\Attachmate\Reflection\keyboards` to select `myKeyboardMap.xkb`, and click **Open**.

8 Repeat step 8 to add any other files to this folder location.

9 Repeat steps 6-8, as needed, to add files to other folder locations.

10 From the navigation pane, click **Specify package information**.

- In the **Add/Remove** name box, type the package name that will appear in the Windows **Programs and Features** control panel.
- In the **Organization** name box, enter the name of your department.

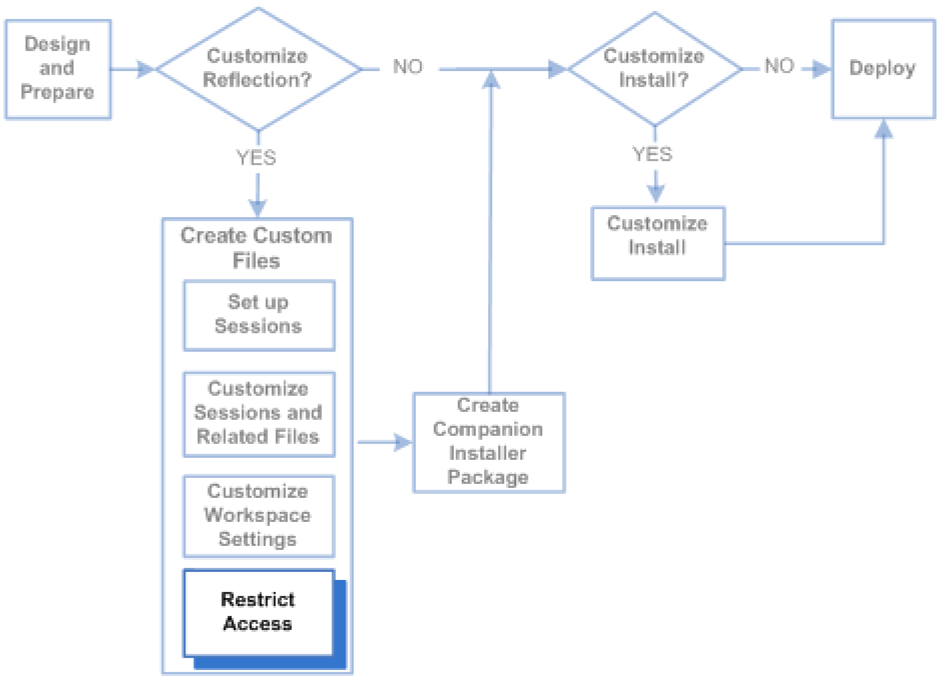
11 From the **File** menu, save the file as *myConfigFiles*.msi on the administrative installation point.

CHAPTER 3

Lock Down Features and Controls

You can restrict user access to almost any of the Reflection settings or controls. For example, you can prevent users from changing the host address that a session connects to, or from running a macro. Individual permissions are merged in the following order (from highest to lowest):

- Group Policy – user
- Group Policy – machine
- Local permissions file (.access)



What do you want to do?	See
Restrict features from specific users.	Attachmate Customization Tool (page 36)
Set privileges for all users.	Microsoft Windows Group Policy (page 37)
Hide sensitive data on screen.	Configure Information Privacy (page 43)
Set up secure directories for opening and saving files.	Add Trusted Locations (page 42)
Restrict users from opening Help online.	Customize the Workspace (page 17)

Customize Access to Settings

Use this procedure to configure user access to certain features in Reflection.

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

`<path_to_setup>\setup.exe /admin`

2 From the ACT navigation pane, click **Specify install locations**.

3 Under **Installation type**, select **Installs only for the user who installs it**.

4 From the navigation pane, click **Modify user settings**.

5 Under **Application – Settings**, select **Reflection 2014 – actions.access** and then click **Define**.

Permissions Manager opens in a separate window. This tool displays all of the controls (actions) and settings that can be restricted, organized into groups.

6 In the Items list, scroll down to **showAutoCompleteSettingsAction**. Then, under **Accessibility**, on the drop-down menu, choose **Restricted**.

7 Click **Next**, accept the default values, and then click **Finish**.

The settings are automatically saved in the actions.access file. The companion installer file is automatically configured to deploy this file to `[AppDataFolder]\Attachmate\Reflection\Workspace\<data_folder>`.

Note: The *<data_folder>* name is specific to the version of Reflection.

8 From the **File** menu, choose **Save As** and save the companion installer file on the administrative installation point as `myConfigFiles.msi`. Then, from the **File** menu, choose **Exit**.

Using Microsoft Group Policy

As an administrator, you can limit users' ability to modify their workspace or session documents by setting permissions from the Microsoft Group Policy Management Console using group policy templates.

Note: To use this feature, you must be running Windows 8, Windows 7, Windows Vista, Windows XP SP1, or Windows Server 2003 R2 or later on an administrative machine. For more information about managing group policy, see *Managing Group Policy ADMX Files Step-by-Step Guide* (*http://technet.microsoft.com/en-us/library/cc709647(v=ws.10).aspx*).

Reflection installs a set of group policy templates (ADM and ADMX files) to the following directory:

```
\Program Files\Attachmate\Reflection\Configuration\GroupPolicy
```

ADMX files

ADMX files are divided into language-neutral files (.admx) and language-specific resource files (.adml), available to all Group Policy administrators. These factors allow Group Policy tools to adjust their UI according to the administrator's configured language. (In Reflection 2014 Release 2, only US English files are included.)

Reflection `setup.exe` installs ADMX files to:

`...\`*`install_dir`*`\Configuration\GroupPolicy\ADMX`

It installs ADML files to the following directory:

`...\`*`install_dir`*`\Configuration\GroupPolicy\ADMX\en-us`

Reflection provides the following ADMX Group Policy files. Each of these files has a corresponding ADML language file.

This file	Controls access to
`ACTIONS.admx`	Actions
`APPLICATION.admx`	Reflection Workspace
`RD3X.admx`	Mainframe terminal
`RD5X.admx`	AS/400 terminal
`RDOX.admx`	UNIX/OpenVMS terminal
`ReflectionWorkspace.admx`	Root-level ADMX file

Note: This directory also includes the `ReflectionPCIDSS.admx` file. This file is used to configure information privacy through Group Policy and is not used to control access.

ADM files

ADM files contain the Group Policy definitions and resource strings in the same file.

Reflection `setup.exe` installs ADM files to:

`...\install_dir\Configuration\GroupPolicy\ADM\`

ADM Group Policy files:

This file	Controls access to
ACTIONS.adm	Actions
APPLICATION.adm	Reflection Workspace
RD3X.adm	Mainframe terminal
RD5X.adm	AS/400 terminal
RDOX.adm	UNIX/OpenVMS terminal

Install Group Policy Templates

Before you deploy group policy definitions, set and test them on a local test machine.

To deploy ADMX & ADML files on a local test machine

1 Copy the `.admx` files from …`\install_dir\Configuration\GroupPolicy\ADMX` to the central store (`%systemroot%\PolicyDefinitions`)

2 Copy all required locale `.adml` files to: `%systemroot%\PolicyDefinitions\<locale>`

3 Open the Group Policy Object Editor (`gpedit.msc`)

4 Under either **Computer Configuration** or **User Configuration**, browse to **Administrative Templates** | **Reflection Workspace**.

5 In the Group Policy Management Editor, navigate to the setting or feature you want to configure.

6 Enable the Group Policy settings you want to restrict access to.

Note: For more about using ADMX files to set group policy, see *Managing Group Policy ADMX Files Step-by-Step Guide (http://technet.microsoft.com/en-us/library/cc709647(v=ws.10).aspx).*

To install ADM files on a local test machine

1 Copy all .adm files

From:

`...\install_dir\Configuration\GroupPolicy\ADM\`

to:

`C:\Windows\inf`

2 Open Group Policy Object Editor (`gpedit.msc`)

3 Under either **User Configuration** or **Computer Configuration**, Right-click on **Administrative Templates** and select **Add/Remove Templates**.

4 Click **Add**, select the Reflection ADM files you need to add, and then click **Open**.

The Reflection ADM files are listed in the Add/Remove Templates dialog box, in the **Current Policy Templates** list.

5 Under either **Computer Configuration** or **User Configuration**, browse to **Administrative Templates** | **Classic Administrative Templates (ADM)** | **Reflection Workspace**.

6 In the Group Policy Management Editor, navigate to the setting or feature you want to configure.

7 Enable the Group Policy settings to which you want to restrict access.

Notes:
Registry keys are added when policy settings are **Enabled**. **When Not Configured** or **Disabled**, no key is present.

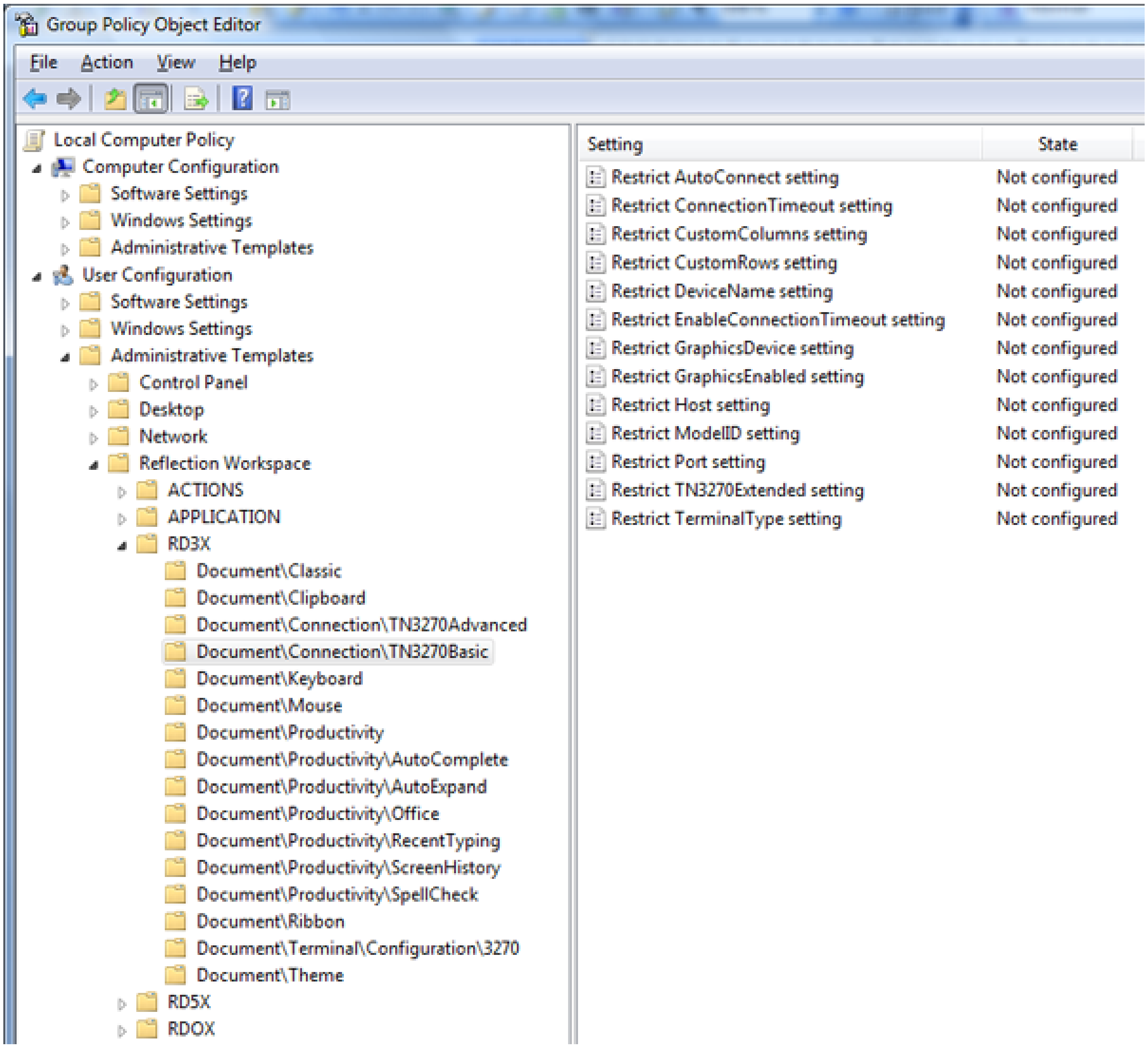
For more about using ADM files to set group policy, see *Add or remove an Administrative Template (.adm file) http://technet.microsoft.com/en-us/library/cc739134.aspx*.

Set Access with Group Policy

To set access with Group Policy Object Editor

1 In the Group Policy Management Editor, navigate to the setting or feature you want to configure.

The following example shows all shipping ADMX files loaded into the GPO Editor under User Configuration. Group Policies can be set at the machine (Computer Configuration) or user (User Configuration) levels.

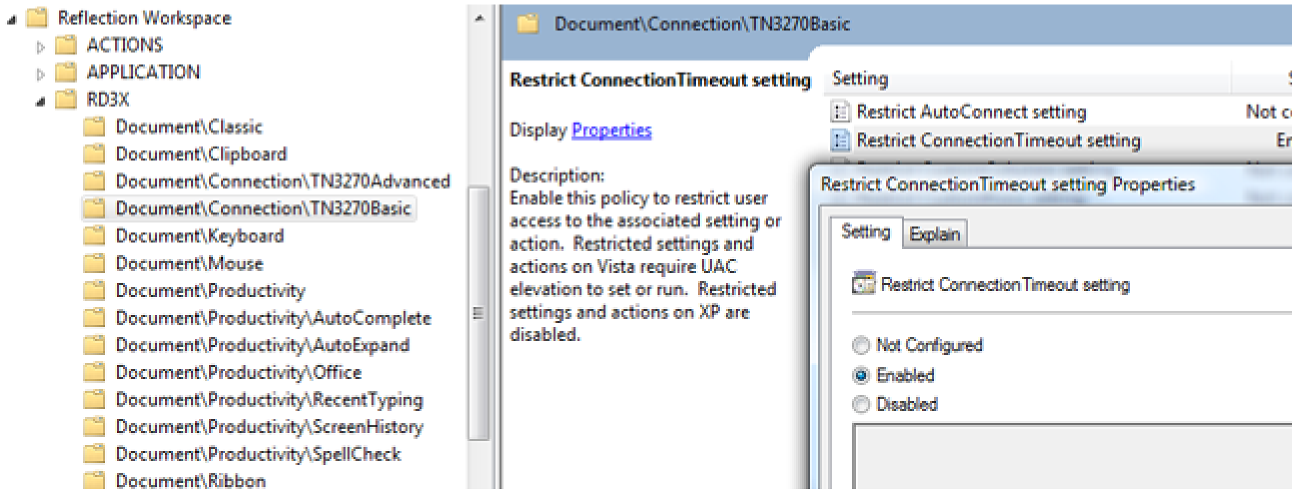


2 Enable the Group Policy settings you want to use.

The following example shows the following:

- The current node is the RD3X Document\Connection\TN3270Basic group.
- All the settings for this group are listed in the right-hand panel.

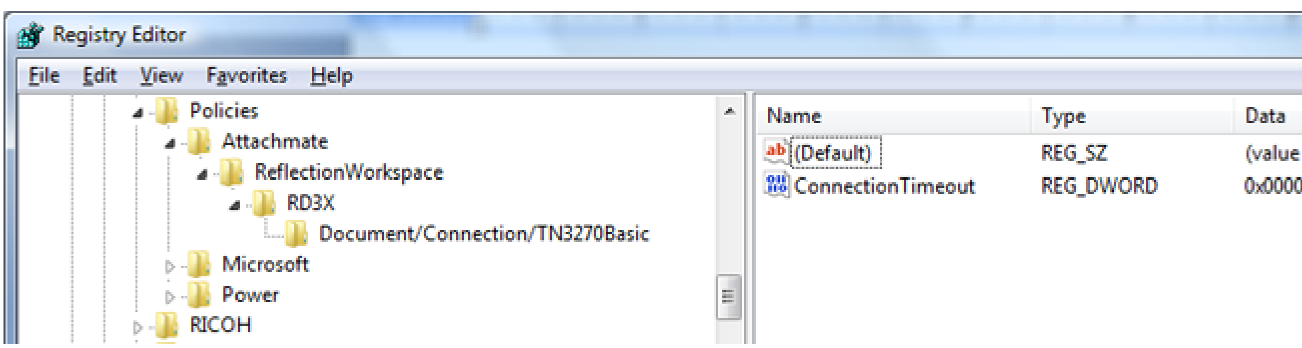
- The Restrict ConnectionTimeout setting policy is **Enabled**. This setting for 3270 display sessions is restricted (it requires UAC elevation on Windows 8, Windows 7, and Vista computers and is disabled on Windows XP computers).



Registry keys are added when policy settings are **Enabled**. These keys remain in the registry when policy settings are **Disabled**. No key is present when policy settings are **Not Configured**.

The following example shows the registry corresponding to the example above, with the Restrict ConnectionTimeout setting policy setting enabled.

HKEY_CURRENT_USER\Software\Policies



Protect Data and Privacy

Use the Trust Center to protect your working environment from information theft, and your data from potential damage caused by opening documents from non-trusted sources.

What do you want to do?	See
Define locations from which you can safely open (and store) documents.	Add Trusted Locations (page 43)
Mask sensitive data (such as credit card numbers) with privacy filters.	Configure Information Privacy (page 43)

Control access to the Reflection API and control the execution of actions invoked by a macro or API call.	Configure API and Macro Security (page 44)

Add Trusted Locations

A trusted location is a directory that is designated as a secure source for opening files. By default, Reflection Attachmate Reflection 2014 allows users to open documents only in directories specified as trusted locations in the Reflection settings. Attachmate Reflection 2014 specifies three trusted locations in the workspace `Application.settings` file in the program directory.

When you add other locations, these locations are saved in the `Application.settings` file in the user data directory folder. If you add trusted locations, you will need to deploy this file.

To set up a trusted location

1. On a workstation on which you have installed Reflection, open the Attachmate Customization Tool from a desktop shortcut (if you set up a shortcut) or from a command line as follows:

   `<path_to_setup>\setup.exe /admin`

2. In the Select Customization dialog box, select **Create a new Companion installer**, and then click **OK**.
3. On the navigation pane, click **Specify install locations**.
4. Under Installation type, select **Installs only for the user who installs it**.
5. On the navigation pane, click **Modify User Settings**.
6. In the **Make changes to user settings** panel, under **Application - Settings**, select **Reflection 2014 Workspace Settings** and then click **Define**.
7. Under Trust Center, click **Specify Trusted Locations** and then click **Add new location**.
8. Under **Path**, browse to the location you want to add.
9. To trust all folders within the trusted location, click **Subfolders**.
10. Click **OK** to close the Reflection Workspace dialog box.
11. Save the companion file on your administrative installation point.

Custom settings are automatically saved in the `Application.settings` file. The companion installer file is automatically configured to deploy this file to `[AppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`* (for a single user) or to `[CommonAppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`* (for all users)

where *`data_folder`* is specific to the version of Reflection. For example, for Reflection 2014 R1, this folder is `R2014_R1`.

Configure Information Privacy

With Reflection Information Privacy, you can protect sensitive data such as credit card Primary Account Numbers (PANs), phone numbers, and US Social Security numbers. Information Privacy allows you to configure Reflection so that the sensitive data is not displayed on the screen or in productivity features, such as Screen History. It also allows you to require secure connections.

You can configure Information Privacy with the Attachmate Customization Tool or with Group Policy.

To set up Information Privacy with the Attachmate Customization Tool

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

```
<path_to_setup>\setup.exe /admin
```

2 In the **Select Customization** dialog box, select **Create a new Companion installer**, and then click **OK**.

3 On the navigation pane, click **Specify install locations**.

4 Under Installation type, select **Installs only for the user who installs it**.

5 On the navigation pane, click **Modify User Settings**.

6 In the **Make changes to user settings** panel, under **Application - Settings**, select **Reflection 2014 Workspace Settings** and then click **Define**.

7 Under Trust Center, click **Set Up Information Privacy**.

8 Follow the instructions in Set Up Information Privacy Dialog Box and in the Setting up Information Privacy (http://support.attachmate.com/manuals/reflection2014.html) pdf.

If you need to...	Do this...
Redact certain patterns of data that are outside the realm of credit card formats (e.g., US Social Security numbers).	Set up Privacy Filter Redaction Rules and Privacy Filters.
Redact credit card Primary Account Numbers (PANs) to meet PCI DSS requirements. PCI DSS (Payment Card Industry Data Security Standard) is a worldwide standard comprising technology requirements and process requirements designed to prevent fraud and is published by PCI Security Standards Council, LLC (`https://www.pcisecuritystandards.org/`). All companies who handle credit cards are likely to be subject to this standard.	Set up Primary Account Number (PAN) Redaction Rules and Primary Account Number (PAN) Detection Rules.
Require secure connections (as may be required for PCI DSS compliance).	Set up PCI DSS Rules.

9 When you have finished configuring Information Privacy, click **OK**.

Custom settings are automatically saved in the `Application.settings` file. The companion installer file is automatically configured to deploy this file to `[AppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`* (for a single user) or to `[CommonAppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`* (for all users)

where *`data_folder`* is specific to the version of Reflection. For example, for Reflection 2014 R1, this folder is `R2014_R1`.

To set up Information Privacy with Group Policy

1. Copy the following files to the central store as follows:

Copy these files	To

`ReflectionPCIDSS.admx and ReflectionWorkspace.admx in:`
 	
`…\install_dir\Configuration\GroupPolicy\`
`ADMX`
	`%systemroot%\PolicyDefinitions`

`ReflectionPCIDSS.adml and ReflectionWorkspace.adml in:`
 	
`…\install_dir\Configuration\GroupPolicy\`
`ADMX\en-us`
	`%systemroot%\PolicyDefinitions\<locale>`

2. Open the Group Policy Object Editor (`gpedit.msc`).
3. Under either the Computer Configuration or User Configuration branch, browse to **Administrative Templates** | **Reflection Workspace** | **Information Privacy**.
4. In the **Information Privacy** panel, select and edit the policy settings.

Note: If you want to include the default regular expressions used for Custom Detection Rules and Custom Exception Expressions, you must add these expressions through the Group Policy editor. For detailed instructions, see Technical Note 2576 (http://support.attachmate.com/techdocs/2576.html): Adding Regular Expressions for Custom Detection Rules and Custom Exception Expressions to Group Policy.

Configure API and Macro Security

You can enable the Attachmate Reflection 2014 .NET API, and specify corresponding settings.

To set up API and macro and security

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

`<path_to_setup>``\setup.exe /admin`

2 In the **Select Customization** dialog box, select **Create a new Companion installer**, and then click **OK**.

3 On the navigation pane, click **Specify install locations**.

4 Under Installation type, select **Installs only for the user who installs it**.

5 On the navigation pane, click **Modify User Settings**.

6 In the **Make changes to user settings** panel, under **Application - Settings**, select **Reflection 2014 Workspace Settings** and then click **Define**.

7 Under **Trust Center**, click **Set Up API and Macro Security**.

8 Configure the API settings as follows:

To	Select
Prevent custom applications from accessing this installation.	Disable .Net API
Determine if Reflection legacy macros are supported, and to determine which legacy API has preference for the GetObject() method used to retrieve API COM objects. (Reflection supports multiple APIs, but can accept GetObject() calls for only one type of legacy API object at a time.)	Legacy API preference

9 Under **Action Permissions**, specify what you want to happen if an action that has been restricted through Group Policy or the Permissions Manager is initiated through a macro or API call.

To	Select
On a computer running Windows 8 or Windows 7, select to control restricted actions with User Account Control (UAC). -or- On a computer running Windows XP, select to prevent restricted actions from running.	Require elevated rights; do not execute on XP
Select to run restricted actions that are initiated through a macro or API call as expected. The same actions won't run if they are initiated through the user interface.	Execute the action

Customize User and Group Access

You can use the Attachmate Customization Tool (ACT) to lock down access when you create your companion installer package. The resulting `.access` files are automatically saved to the correct directory and included in the companion installer package. If you need to make changes, you can modify these .access files by opening the existing Companion installer in ACT or by using Permissions Manager (page 49).

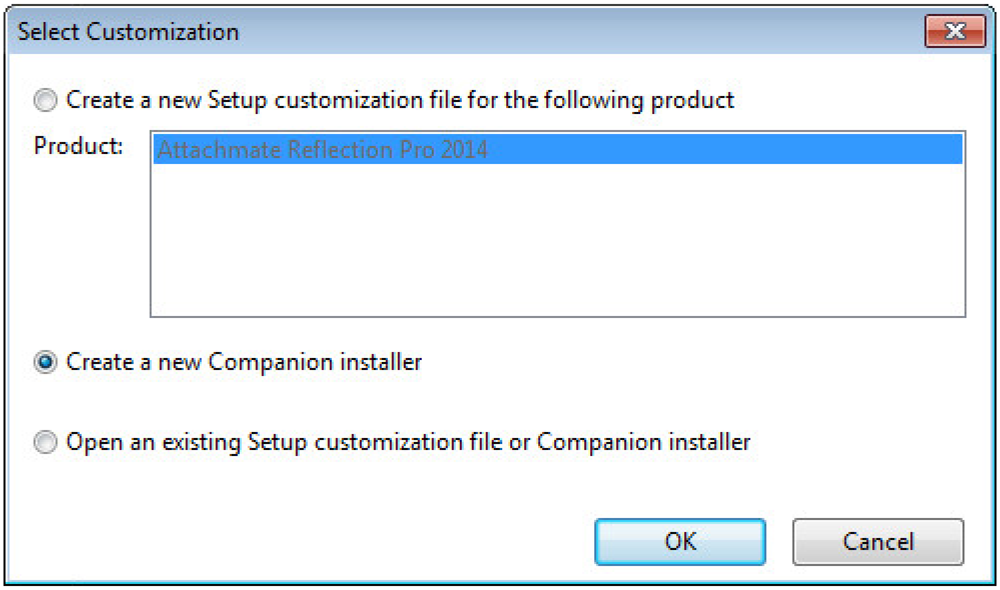
You can also lock down features using Microsoft Group Policy. For more information, see Lock Down Features and Controls (page 35).

To set user and group access in ACT

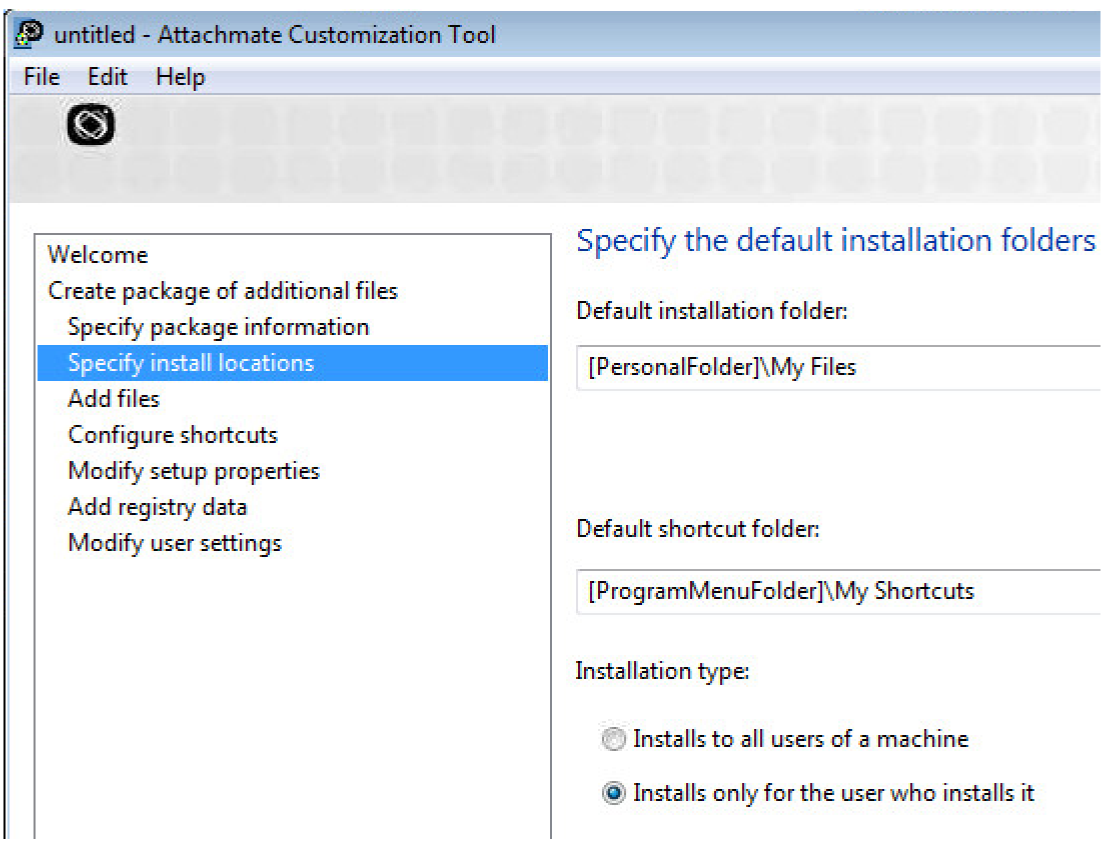
1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

```
<path_to_setup>\setup.exe /admin
```

2 In the **Select Customization** dialog box, select **Create a new Companion installer**.

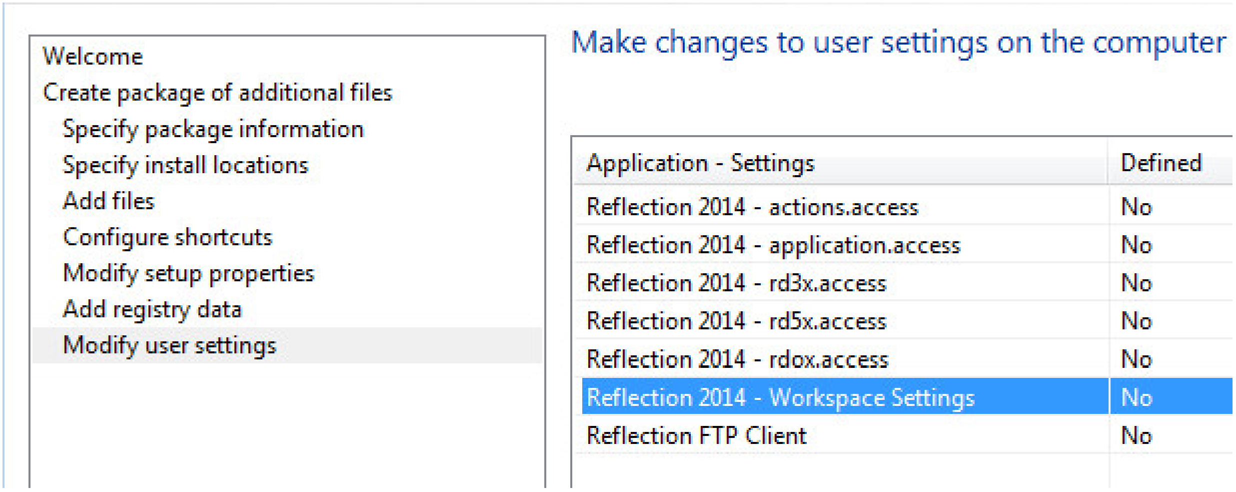


3 On the left pane, select **Specify install locations**.



4 Under **Installation type**, select **Installs only for the user who installs it**.

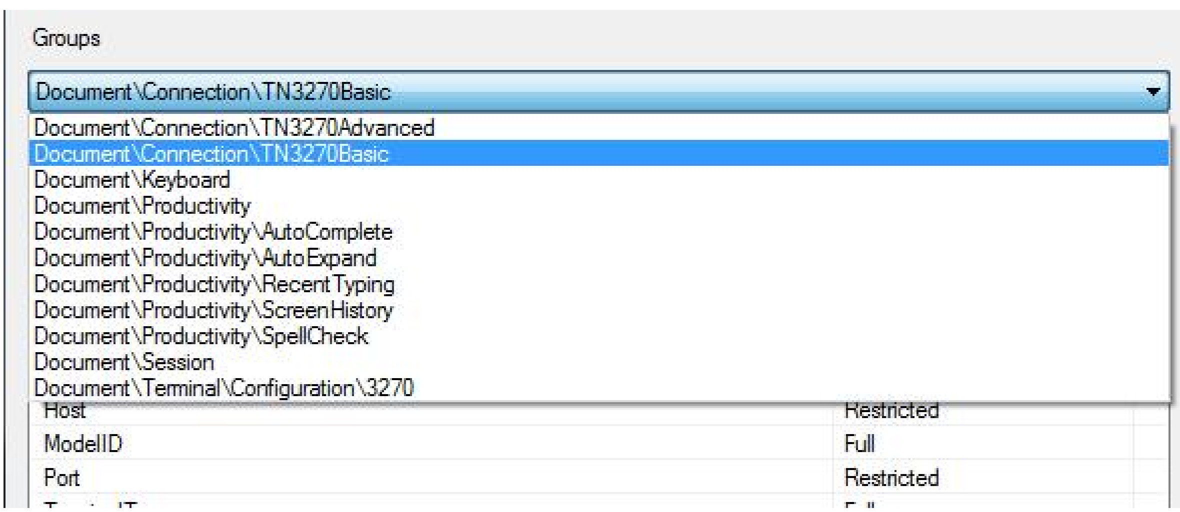
5 In the left pane, select **Modify user settings**.



Under **Application - Settings**, the Permissions Manager displays groups of configurable items. These configurable items are listed by their internal names, which may not exactly match the user interface item. The item's **Accessibility** indicates whether the user can configure the item (**Full**) or if administrator assistance is required to configure the item (**Restricted**).

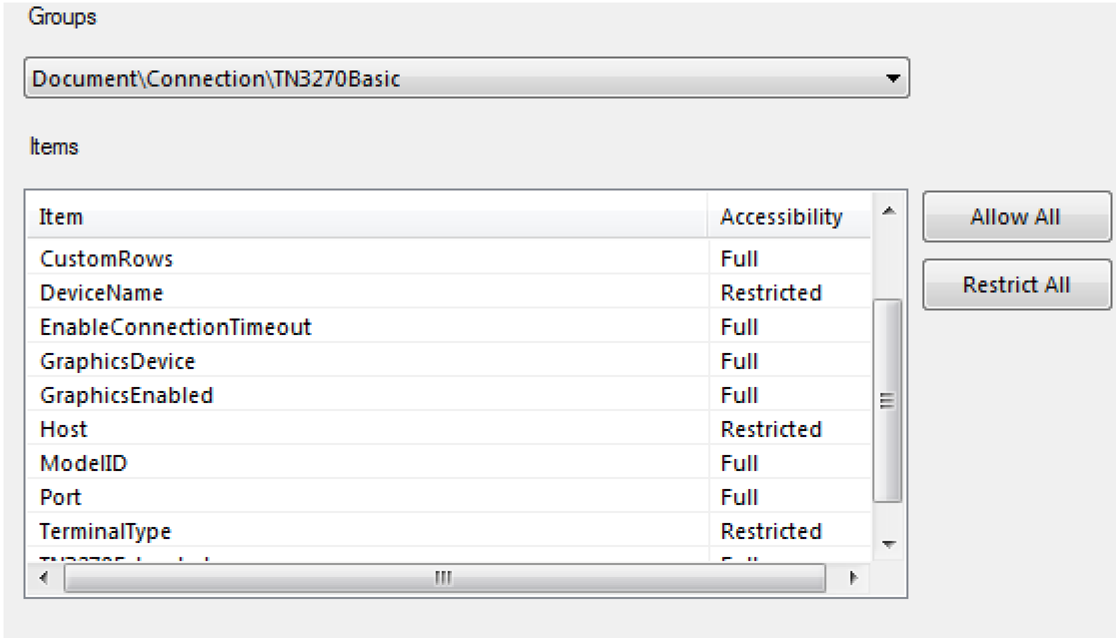
6 In the **Make changes to user settings** pane, select one of the .access options and click **Define**.

7 In Permissions Manager, under **Groups**, select the group of settings you want to control access to (for example, Document\Connection\TN3270Basic).



8 In the **Items** box, in the **Accessibility** column for the item (or items) you want to restrict, click **Full** and then select **Restricted** from the drop down menu.

In the following example, the Accessibility level for DeviceName, Host, and Port is **Restricted**. The resulting `rd3x.access` file limits access to these three settings.



9 Under **Additional security options**, select how to control session file encryption:

To do this	Select
Configure all sessions so that users can open only encrypted display session files.	**User can open only encrypted session files**
Configure all sessions so that users can save a display session only if it is encrypted.	**User can save only encrypted session files**

10 From the **File** menu, choose **Save As** and save the companion installer package.

The companion installer package automatically specifies to deploy this `.access` file to `[AppDataFolder]\Attachmate\Reflection\Workspace\`*`data_folder`*.

Note: The name of the *`data_folder`* is `R2014_`*`versionName`*. (For example, the *`data_folder`* name in Reflection 2014 R1 is `R2014_R1`.)

By default, `[AppDataFolder]` is defined as:

(Windows 8, 7 and Vista) `Users\<`*`yourUserName`*`>\AppData\Roaming\`

(Windows XP) `Documents and Settings\<`*`yourUserName`*`>\Application Data\`

Notes:

- Make sure to set file access rights on `.access` files to prevent users from deleting, replacing, or editing them.
- To deploy files to this folder, you will need to use a deployment tool that allows you to install the companion installer package as the user.

- When accessing a setting via an API, such as executing a macro, a setting with restricted access cannot be modified. (When attempting to set a restricted setting via an API, an error is logged.)

Edit Access Files in Permissions Manager

You can lock down access by editing `.access` files outside of the Attachmate Customization Tool. This requires that you manually package and install the customized .access files.

this is one way of locking down files but that also Group Policy can be used and then provide a link to Lock Down Features and Controls (the Group Policy section). The Lock Down Features and Controls section references and recommends using .access files so something similar in Edit Access File in Permission Manager.

The following access file templates are distributed with Attachmate Reflection 2014:

This File	Controls access to…
`actions.access`	Attachmate Reflection 2014 actions (for example, Auto Complete)
`application.access`	Attachmate Reflection 2014 workspace settings
`rd3x.access`	Attachmate Reflection 2014 3270 terminal settings
`rd5x.access`	Attachmate Reflection 2014 5250 terminal settings
`rdox.access`	Attachmate Reflection 2014 VT terminal settings

Important: Be sure to set file access rights on `.access` files that you deploy to prevent users from deleting, replacing, or editing them.

To set access with Permissions Manager

1. On a workstation to which you have installed Reflection, log on as administrator and in the Attachmate Reflection 2014 install folder, run `AccessConfig.exe`.
2. When prompted to create a new permission file, or edit an existing one, choose **Create new permission file**.
3. When prompted with a list of access file templates, choose the type of permission file to create.
4. Under **Groups**, select the type of setting to control access to (for example, the **Document\Connection\TN3270Basic** group).
5. In the **Items** box, in the **Accessibility** field for the item (or items) you want to restrict, click **Full** and then select **Restricted** from the drop down menu.
6. If you are configuring `rd3x.access`, `rd5x.access`, or `rdox.access` files, under **Additional security options**, select how to control session file encryption:

To do this	Select
Configure all sessions so that users can open only encrypted display session files.	**User can open only encrypted session files**
Configure all sessions so that users can save a display session only if it is encrypted.	**User can save only encrypted session files**

7 Make sure to deploy the `.access` files to `[AppDataFolder]\Attachmate\Reflection\Workspace\R2014_`*`version`*.

Important!

- To deploy files to the `R2014_`*`version`* folder, your deployment tool must allow you to install the companion installer package as the user.
- Setting session encryption options in an `.access` file affects only the associated session type. For example, limiting users to opening only encrypted session files in `rd3x.access` only affects 3270 terminal session files, and not 5250 session files..
- When accessing a setting via an API, such as executing a macro, a setting with restricted access cannot be modified. (When attempting to set a restricted setting via an API, an error is logged.)

Restrict Actions (actions.access)

In many cases, an action can be accessed multiple ways. For example, you can restrict access to the Clipboard Settings action (clipboardSettingsAction). However, if the user has access to the Document Settings action (settingsAction), Clipboard settings will still be accessible.

Item Name	UI Description
appointmentAction	Create an Outlook appointment that includes the selected host data in the message field.
backHistoryAction	View the previous host screen in ready-only mode.
clearAllAction	Remove all text from the display memory, including what's on the screen.
clearDisplayAction	Remove all text from the screen. By default, Reflection saves this text to the display memory.
clearSelectionAction	Clear the selection by clicking somewhere.
clipboardSettingsAction	Open the **Clipboard Settings** dialog box to configure settings that control how the Cut, Copy, and Paste functions work.
closeAction	Close the current document.
codePageSettingsAction	Open the **Select Host Code Page** dialog box to specify

	the host code page for your display session.
connectAction	Connect to the host for the current session document.
connectDisconnectAction	Connect to the host for the current session document, and then invoke again to disconnect.
contactAction	Create a new contact in Outlook that includes the selected host data in the Notes field.
contextMenuEditorAction	Open the Context Menu Editor.
copyAction	Copy the selected text to the Clipboard.
copyAppendAction	Add the selected text to the Clipboard.
cutAction	Delete the selected text and copy it to the Clipboard.
cutAppendAction	Delete the selected text and add it to the Clipboard.
disconnectAction	Disconnect from the host for the current session document.
emailMessageAction	Create an Outlook e-mail message that includes the selected host data.
exitAction	Quit the application.
fileTransferAction	Open the **Transfer** dialog box.
forwardHistoryAction	View the next screen in your screen history sequence.
ftpFileTransferAction	Open Reflection FTP Client.
fullScreenViewAction	Hide the Ribbon, and expand the workspace to fill your computer screen.
globalSettingsAction	Open the Reflection workspace configuration settings. Workspace configuration settings affect all terminal session and Web page documents opened in Reflection. Workspace configuration settings include security, file locations, and other settings related to Reflection.
helpAction	Open Help from the main workspace **Help** button.
hostConnectionSettingsAction	Configure the host connection for the current session document.
hotspotsSettingsAction	Open the **Set Up Hotspot Display Settings** dialog box.
keyboardExtendSelection	Extend the screen selection using the keyboard.
keyboardMapperAction	Display the keyboard map.
launchApplicationAction	Launch an external application from the Reflection workspace using a customized UI element.
launchSupportWebsiteAction	Open the Attachmate Support site from the **Help** menu.
launchVbaAction	Open the Visual Basic editor to create a VBA macro based on objects defined by the active session.

layoutCascadeAction	Arrange all open document windows in a cascade. The title bar of each window remains visible.
layoutHorizontalAction	Arrange all open document windows horizontally.
layoutSettingsAction	Open the **Layout Settings** dialog box.
layoutVerticalAction	Arrange all open document windows vertically.
lightPenAction	Simulate a light pen selection with your mouse or keyboard.
macroSecurityAction	Set macro security options to protect a macro from accidental changes.
mainframeTransferChunkAction	Open the **Transfer Settings** dialog box.
manualCaptureAction	Manually capture the current screen.
mapKeystrokeAction	Open the **Keyboard Mapper** to associate a keystroke with a host terminal key or to create a keyboard shortcut.
modelSettingsAction	Open the basic host connection settings page to specify the terminal model you want to emulate.
moveCursorAction	Move the cursor with a mouse click.
moveHostCursorAction	Move the cursor by sending the correct arrow keys to the host so that it moves the cursor relative to its current position.
newDocumentAction	Create a new document of any kind from the Workspace menu or the **Quick Access** toolbar.
nextWindowAction	Make the next document or task pane active.
noteAction	Create an Outlook "sticky" note that includes the selected host data.
officeToolsPaneAction	Open the **Office Tools** task pane.
openAction	Open any kind of document from the Workspace menu or the **Quick Access** toolbar.
openURLAction	Open a Web page from within Reflection.
pageSetupAction	Open the **Page Setup** dialog box.
pasteAction	Paste data from the Clipboard to the current cursor location.
pasteNextAction	Insert the remaining text in the paste next buffer within the host application.
pauseMacroAction	Pause a recording macro.
playBackTraceAction	Select a trace file to play back.
playNextTraceRecordAction	Play the next record in the current trace file.
playPreviousTraceRecordActio	Play the previous record in the current trace file.

n	
printAction	Print the current document from the Workspace menu or the **Quick Access** toolbar.
printSetupAction	Open the **Print Setup** dialog box.
processRUOTraceAction	Process a trace file to generate a Reflection Basic script file, or to add system details to the text format report.
quickKeysAction	Open a gallery of buttons that you can click to send PA keys, PF keys, or other commands to the host.
quickPrintAction	Print the current document without opening the Print dialog box.
recentTypingPaneAction	Open the **Recent Typing** task pane.
recordMacroAction	Record a macro.
runEBEditAction	Run EXTRA! Basic Editor.
runHostExplorerMacro	Run a macro that contains Hummingbird Basic commands.
runLegacyExtraMacroAction	Open an EXTRA! file that contains macros, and select one to run.
runLegacyMacroAction	Run an embedded legacy Reflection macro.
runLegacyMacroWithDataAction	Run an embedded legacy Reflection macro with data. (This allows the user to type parameters to execute with the macro.)
runLegacyRBEditAction	Run Reflection Basic Editor.
runLegacyRBMacroAction	Run a legacy Reflection Basic macro.
runLegacyReflectionMacroAction	Run an external legacy Reflection macro.
runMacroAction	Run a Reflection Workspace macro.
runPCommMacroAction	Open an IBM Personal Communications file that contains a macro.
RunQWSMacroAction	Open a QWS3270 file that contains a macro.
runRCLScriptAction	Run an RCL script.
runRumbaMacroAction	Open a RUMBA file that contains macros, and select one to run.
runSupportToolAction	Runs a utility to help Attachmate Support collect Reflection application data
saveAction	Save the current document from the Workspace menu or the **Quick Access** toolbar.
saveAsAction	Save the current document with a new name or location.
saveLayoutAction	Save the current layout.

saveRSFTAction	Save the current document configuration as a template.
scratchPadPaneAction	Open the **Scratch Pad** task pane.
screenHistoryPaneAction	Open the **Screen History** task pane.
selectAllAction	Select all data on the screen.
sendHostKeyAction	Send a preconfigured key to the host.
sendHostTextAction	Send some preconfigured text to the host.
sendWordAction	Send the word at the current cursor location to the host, followed by a Return (VT) or an Enter (3270/5250) key. This is typically mapped to a mouse button.
settingsAction	Open the document settings from the Workspace menu or the **Quick Access** toolbar.
setupLoggingAction	Open the **Logging Settings** dialog box.
showAPIGuideAction	Open the .NET API Guide.
showAPIHelpAction	Open the .NET API Help.
showAutoCompleteSettingsAction	Open the **Configure Auto Complete** dialog box.
showAutoExpandAction	Open the **Configure Auto Expand** dialog box.
showContextMenuAction	Open the context menu. This is the default action of the right mouse button.
showHelpAboutAction	Show the **About** dialog from the **Help** menu.
showLiveScreenAction	Return to the current host screen for your session from anywhere in the screen history sequence.
showMouseMapperAction	Open the **Mouse Mapper**.
showPrivacyFilterAction	Open the **Set Up Privacy Filters** dialog box.
showProductivitySettingsAction	Open the **Configure Productivity Defaults** dialog box.
showRecentTypingSettingsAction	Open the **Configure Recent Typing** dialog box.
showScreenHistorySettingAction	Open the **Configure Screen History** dialog box.
showSpecificContextMenuAction	Specifies the context menu to open when the action is performed.
showSpellCheckAction	Open the **Configure Spell Checking** dialog box.
showUIDesignerAction	Open the UI Designer to customize your Ribbon.
showVBAGuideAction	Open the VBA Guide.
showVBAHelpAction	Open the VBA Help.
spellCheckFieldAction	Check spelling in the currently active host field.

spellCheckScreenAction	Check spelling in the current host screen.
startLoggingAction	Turn logging on for a VT session.
startTraceAction	Create a new trace and begin the trace process.
stopLoggingAction	Turn logging off for a VT session.
stopMacroAction	Stop the currently running macro.
stopTraceAction	Stop the currently active trace.
taskAction	Create an unscheduled Outlook task that includes the selected host data in the task body field.
terminalAppearanceSettingsAction	Open the **Configure Terminal Settings** dialog box.
themeSettingsAction	Open the **Manage Themes** dialog box.
toggleMacroRecordAction	Record your actions in a VBA macro.
togglePauseMacroAction	Pause the macro recording process.
toggleRibbonStateAction	Hide the Ribbon, then invoke again to show the Ribbon.
undoAction	Undo the last cut or paste.
vbaMacroDialogAction	Open the **Run Macro** dialog box to select a macro to run.
wordDocumentAction	Create a Word document that includes the selected host data.

Customized Files and Where to Deploy Them

Deploy these files	**To these folders**

Session document files
 	
(These files store configurations for host connection and security options)
 	
(`rdox, rd3x, or rd5x, urlx`)
	For all users:
	
	Any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file.. For example:
	
	`[CommonAppDataFolder]\Attachmate\Reflection\`
	
	For only the user who installs:
	
	`[PersonalFolder]\Attachmate\Reflection\`

Layout file
 	
`.rwsp`
	For all users: Any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file. For example:
	
	`[CommonAppDataFolder]\Attachmate\Reflection\`
	
	For only the user who installs:
	
	`[PersonalFolder]\Attachmate\Reflection\`

Customized workspace settings `Application.settings`	Only for the user who installs the package: `[AppDataFolder]\Atachmate\Reflection\Workspace\R2014_`*`version`*
Customized (or minimized) ribbon `frame.settings`	

Customized Quick Access toolbar
 	
`Application.settings`
 	
`frame.settings`
 	
`Reflection2007.Application.Ribbon.xuml`	

Restricted feature settings `.access`	Only for the user who installs the package: `[AppDataFolder]\Attachmate\Reflection\Workspace\R2014_`*`version`*

Deploy these files	To these folders

Kerberos settings
`Rscrb5.xml`
	For all users: Any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file. By default, these directories are:
	`[CommonAppDataFolder]\Attachmate\Reflection`
	Only for the user who installs the package:
	`[AppDataFolder]\Attachmate\`
	These locations are required if you want the Kerberos settings to be configured automatically the first time a user uses Reflection Kerberos.

Secure Shell User-specific files
`config`
`known_hosts`
	`[PersonalFolder]\Attachmate\Reflection\.ssh`

Secure Shell User-specific files Reflection Certificate Manager settings: `.pki_config`	`[PersonalFolder]\Attachmate\Reflection\.pki`
Secure Shell User-specific files Reflection Trusted Certificate Authorities: `trust_store.p12`	`[PersonalFolder]\Attachmate\Reflection\.pki`

Secure Shell Global files
Global Secure Shell client configuration file:
`ssh_config`
Global known hosts file:
`.ssh_known_hosts`
	Any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file.. For example:
	`[CommonAppDataFolder]\Attachmate\Reflection`

Deploy these files	To these folders

Set up Secure Shell and SSL Global files
`pki_config`
`trust_store.p12`
	A .pki subdirectory of the data directory. If a shared store exists, trusted roots are read exclusively from the shared store. Trusted roots you have configured for individual user accounts no longer have any effect.
	
	For example:
	`[CommonAppDataFolder]\Attachmate\Reflection\.pki`

FTP user-specific files `settings.rfw`	For all users: Any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (application.settings) file. For example: [CommonAppDataFolder]\Attachmate\Reflection\ For only the user who installs: `[PersonalFolder]\Attachmate\Reflection\`
`rftp.xml`	`[AppDataFolder]\Attachmate\Reflection`

Custom keyboard map file
`.xkb`
	For all users: A Keyboard Maps folder in a trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file. For example:
	`[CommonAppDataFolder]\Attachmate\Reflection\Keyboard Maps`
	For only the user who installs:
	`[PersonalFolder]\Attachmate\Reflection\ Keyboard Maps`

Custom mouse map file
`.xmm`
	For all users:
	A Mouse Maps folder in any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file.. For example:
	`[CommonAppDataFolder]\Attachmate\Reflection\Mouse Maps`
	For only the user who installs:
	`[PersonalFolder]\Attachmate\Reflection\ Mouse Maps`

Define virtual buttons in terminal sessions
Hotspot files
`.xhs`
	For all users:
	A Hotspots Maps folder in any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file.. For example:
	`[CommonAppDataFolder]\Attachmate\Reflection\Hotspots Maps`
	For only the user who installs:
	`[PersonalFolder]\Attachmate\Reflection\ Hotspots Maps`

Deploy these files	**To these folders**

Custom Ribbon Interface files
 	
`.xuml`
	For all users:
	
	A CustomUI folder in any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file.. For example:
	
	`[CommonAppDataFolder]\Attachmate\Reflection\CustomUI`
	
	For only the user who installs:
	
	`[PersonalFolder]\Attachmate\Reflection\CustomUI`

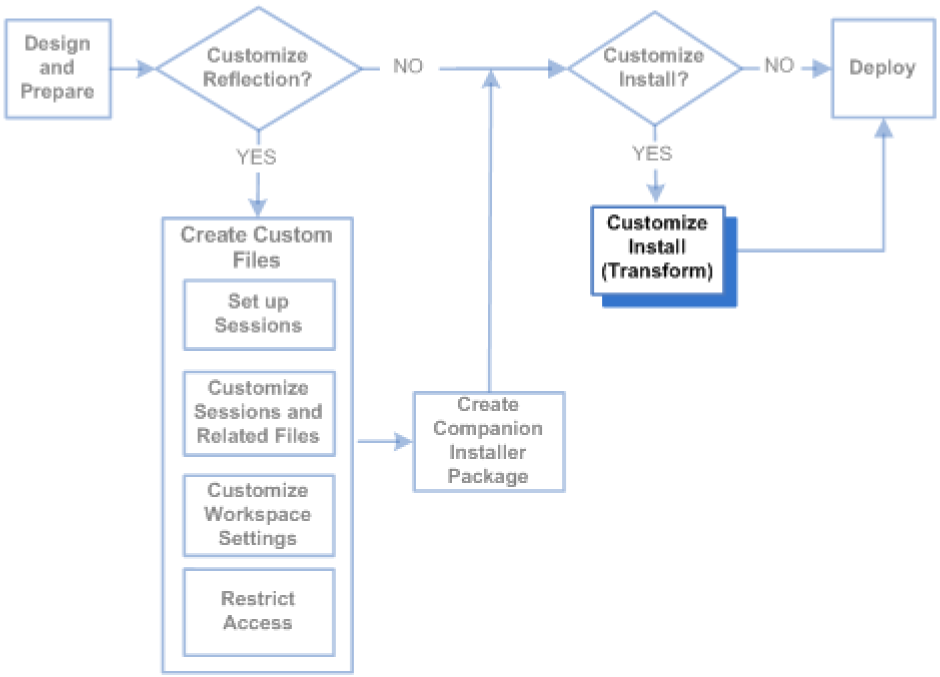
Custom appearance of a session
 	
Theme files (if you use a custom file)
 	
`.themex`
	For all users:
	
	A Themes folder in any trusted location that exists on the users workstations and is defined as the data directory in the Reflection workspace (Application.settings) file.. For example:
	
	`[CommonAppDataFolder]\Attachmate\Reflection\Themes`
	
	For only the user who installs:
	
	`[PersonalFolder]\Attachmate\Reflection\Themes`

Custom Office Productivity features Word and PowerPoint templates `.dotx or. ppt`	
User templates `.rsft`	`[AppDataFolder]\Attachmate\Reflection\Workspace\R2014_`*`version`*`\templates`

CHAPTER 4

Modify the Installation

You can customize how Reflection is installed, such as specifying the installation directory, removing or adding commands from the Windows Uninstall or change a program list, and other options. To do this, use the Attachmate Customization Tool to create a transform file (.mst) and then deploy it with the base installation package.



What do you want to do?

Create a Transform

Use the Attachmate Customization Tool to modify the default installation — that is, to change how Reflection installs, looks and acts on the end user's computer.

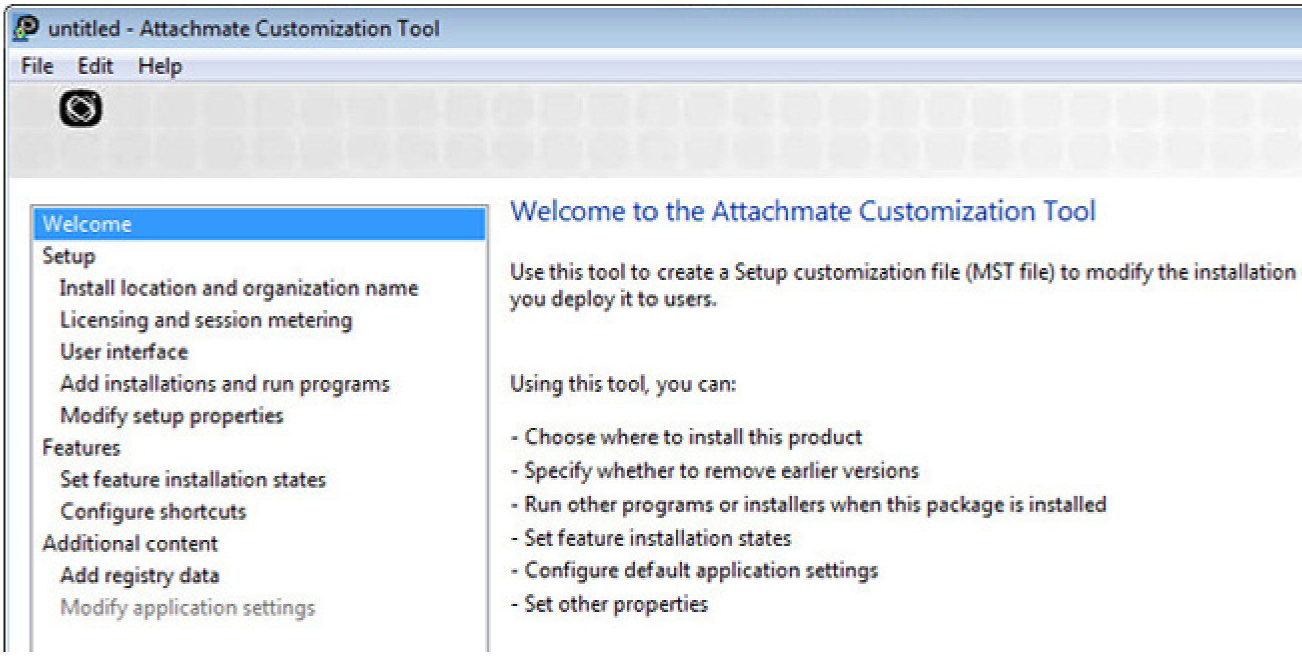
This example shows how to set up a transform that can be applied to an install on a command line. To automatically deploy the transform in an installation that uses the Attachmate Setup program, see Apply a Transform to Your Installation (page 69).

To create a transform

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

```
<path_to_setup>\setup.exe /admin
```

2 Select **Create a new setup customization file for the following product**, and then click **OK**.



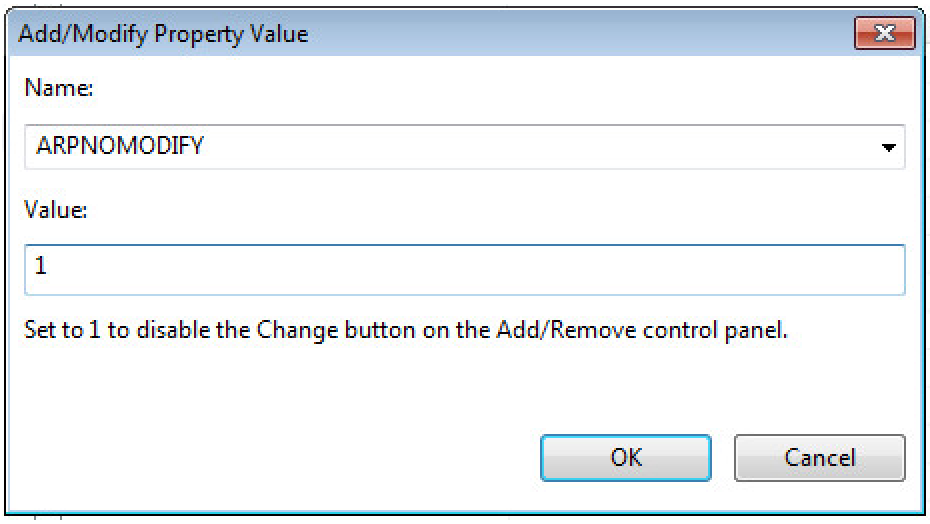
3 From the navigation pane, click **Licensing and session metering** and then select **I accept the terms of the Software License Agreement**.

4 The following optional steps describe how to create a Reflection Workspace shortcut to the user's desktop and remove the **Change** button from the Windows **Uninstall or change a program** list.

a) From the navigation pane, click **Modify setup properties**.

b) In the lower-right corner, click **Add**.

c) In the **Add/Modify Property Value** dialog box, for **Name** select ARPNOMODIFY and for **Value** enter 1. This step removes the **Change** button.



d) From the navigation pane, click **Configure shortcuts**.

e) Under **Modify shortcuts for this product**, select **Reflection workspace** and click **Modify**.

f) In the **Modify shortcut** dialog box, in the **Location** field, select **[DesktopFolder]** and click **OK**. This step creates a desktop shortcut.

5 From the **File** menu, save the transform on the administrative installation point as `myCustomInstall.mst`.

Change the Installation Directory

You can change the Reflection installation directory.

To change the installation directory

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

```
<path_to_setup>\setup.exe /admin
```

2 From the **Select Customization** dialog box, do one of the following:

- Select **Create a new Setup customization file for the following product**.
- Select **Open an existing Setup customization file or Companion installer** and, in the **Open** dialog box, select an `.mst` file.

3 On the left panel of the Attachmate Customization Tool, click **Install location and organization name**.

4 In the **Default installation folder** box, specify where to install the product files.

Note: List items that refer to folders (for example, `[ProgramMenuFolder]`) are pre-defined folder keywords. You can create customized directories by adding new folder names with typical directory syntax (such as, `[ProgramFilesFolder]\My Folder`). Alternatively, you can enter a fully qualified path (for example, `C:\Program Files\My Folder`), as long as that location is known to exist on the target machine.

Modify Setup Properties

In some cases you may want to customize your installation using Windows Installer (MSI) properties that support features not configurable on other Attachmate Customization Tool panels. For example, the installer property ARPHELPLINK, sets the URL used by the support link in the Programs and Features list.

If you want to create a custom (non-default) user data location that will be used by all installed Reflection products, specify the product-specific property WRQ_USERDIR. This property affects only those applications whose default user data directory is `%personalfolder%\Attachmate\Reflection`. Reflection applications that use this default data location include: Reflection Workspace, Reflection FTP Client, Reflection Kerberos Manager, Reflection Key Agent, Reflection IBM Printer, and Reflection X (legacy). Reflection X Advantage does not use this user data location.

To modify installation properties

1. From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

   <path_to_setup>`\setup.exe /admin`

2. From the **Select Customization** dialog box, select any of the startup options. You can modify installer properties in both transforms (`.mst`) and companion installers (`.msi`).
3. From the Attachmate Customization Tool navigation pane, select **Modify setup properties**.
4. Click **Add** to open the **Add/Modify Property Value** dialog box.
5. In the **Name** box, use the drop-down list to select commonly-used public properties that are standard to the Windows Installer. Select an item in the list to see a brief description of the selected property. For additional information about Windows Installer properties, see the Microsoft Windows Installer Guide (http://msdn.microsoft.com/en-us/library/windows/desktop/aa372845(v=vs.85).aspx). Some Attachmate products support additional properties that do not appear in the drop-down list. You can configure these properties by manually entering the property name.
6. From the **File** menu, select **Save As** and save the file to the same folder as the installer package file for Reflection (`setup.exe`).

Add/Modify Registry Data

Getting there

1. From your administrative installation point, open the Attachmate Customization Tool from a shortcut or by typing the following command line:

<path_to_setup>\setup.exe /admin

2 From the **Select Customization** dialog box, select any of the startup options. You can modify registry data in both transforms (`.mst`) and companion installers (`.msi`).

3 From the navigation pane, click **Add registry data**.

4 To add a new registry value, click **Add**.

-or-

To modify a registry value in the table, select the value, and then click **Modify**.

Specify registry keys and values to add or modify during the installation process. By modifying registry values, you can change the way the application operates. For example, for certain Attachmate applications, you can add a value that specifies to never save settings on exit.

In this field	Enter or select
Key	The complete Registry path from the root, for example: `HKEY_LOCAL_MACHINE\SOFTWARE\Reflection\Rwin\Reflection`
Name	The registry value name, for example: `SaveChanges` If the **Name** box is blank, the data entered into the **Value** box are written to the Default registry key.
Type	The data type of the value. For example: `DWORD` Types include strings, integers (DWORD), or binary values.
Value	The value. For example: `0x00000000 (0)`

Select Features, Components, and Languages

You can select which features, components, and languages to install for your end users. In addition, you can make features available to users for a later installation or hide them from view.

To select features, components, and languages to install

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut or by typing the following command line:

<path_to_setup>\setup.exe /admin

2 From the **Select Customization** dialog box, do one of the following:

- Select **Create a new Setup customization file for the following product**.
- Select **Open an existing Setup customization file or Companion installer** and select an .mst file.

3 From the Attachmate Customization Tool navigation pane, select **Set feature installation states**, and for each feature, choose from the following states:

Choose	To do this
Feature will be installed on local hard drive	Add a feature to the installation. Note: Some features listed under a selected feature may not be included when you select to install the higher-level feature. The features that are included are the recommended defaults. If you select the higher level feature a second time, all sub-features will be included.
Feature will be installed when required	Advertise a feature.
Feature will be unavailable	Leave a feature uninstalled. End users will still be able to select and install the item from the Windows **Program and Features** or the **Add or Remove Programs** control panel.
Feature will be hidden from view	Leave a feature uninstalled and hidden. The feature will not appear in the Windows **Program and Features** or the **Add or Remove Programs** control panel.

Add (Chain) Installations and Run Programs

Reflection makes it easy to "chain" installs. You can set up an install to run companion install packages automatically before or after the primary installation. You can also specify to run other scripts or programs. For example, the Reflection product Help is available as a separate program (`.msi`) that you can add to the base product installation. See Install the Reflection Help (page 67).

Note: This method of chaining installations applies only to installs performed with `setup.exe`. It does not apply to installs that use the MSI command-line method.

To chain installations and programs

1 From your administrative installation point, open the Attachmate Customization Tool from a shortcut (page 11) or by typing the following command line:

```
<path_to_setup>\setup.exe /admin
```

2 Select **Create a new setup customization file for the following product**, and then click **OK**.

3 From the navigation pane, select **User Interface** and then select **Use this customization with interactive installs using setup.exe**.

4 From the navigation pane, select **Add installations and run programs**.

5 Click **Add**.

The **Add/Modify Program Entry** dialog box opens.

6 In the **Target** list, enter or select the folder where the program `.exe` file or the `.msi` file resides, and then enter the executable to run. For example:

```
msiexec.exe
```

7 Under **Arguments**, enter the command-line arguments to execute. For example:

```
/i my_installation.msi
```

8 To specify when to run the program, select one of the following:

- **Run this program after base product has been installed**
- **Run this program before the base product has been installed**.

Note: For most cases, select **Run this program after the base product has been installed**. If you select **Run this program before the base product has been installed** and the program fails, Reflection is not installed.

9 Repeat these steps to add other programs or `.msi` files.

10 To change the execution sequence, use the arrows next to **Move** in the lower-left area of the pane. To remove a program from the list, select it in the list and click **Remove**.

Install the Reflection Help

By default, the Reflection Help browser opens from the Attachmate website. To open the Help from the local hard drive you must install the product Help after installing Reflection and change the Reflection Workspace (page 17) settings.

To configure the Reflection Workspace to open Help locally

1 Open the **Reflection Workspace Settings dialog box**.

The steps depend on your user interface mode.

User Interface Mode	Steps
Ribbon (Office 2007)	On the Reflection button , choose **Reflection Workspace Settings**.
Ribbon (Office 2010)	On the **File** menu, choose **Reflection Workspace Settings**.
Reflection Browser	On the Reflection menu, choose **Settings** and then **Reflection Workspace Settings**.
Mobile UI	Tap the Gear icon and then select **Reflection Workspace Settings**.

2 Under **Workspace Settings**, select **Configure Workspace Attributes**.

3 Under **Help System**, select **Use installed help system**.

If Reflection can't find the help files on the local drive, it will start your default browser and open the help files from Attachmate.com.

To install the Help locally

- Do one of the following:
    - On a workstation where Reflection is already installed, from the installation image, open the HelpInstaller folder and double-click `setup.exe`.

      - or -

    - Chain the Help installer to the main installation, selecting **Run this program after base product has been installed**. For more information, see Add (Chain) Installations and Run Programs (page 66).

Note: If you install Reflection to a Windows Server and Enhanced Security (IE ESC) is enabled, viewing the Help will result in security prompts each time you open a page. To resolve this problem, do the following:

1 Turn off **Internet Explorer Enhanced Security for users and administrators**.

2 Turn Off **Internet Explorer Enhanced Security** on Windows 2008 Server.

3 Enable scripting for Internet Explorer. See Technical Note 2293 (http://support.attachmate.com/techdocs/2293.html).

Predefined System Folders

When you configure destination locations using Attachmate Customization Tool, your options include a list of supported Windows system folder properties (http://msdn.microsoft.com/en-us/library/aa372057.aspx?ppud=4). During installation, the Windows installer expands these to show the appropriate location for your operating system. Default system folder locations for newer Windows operating systems (including Windows 8, Windows 7 and Windows Server 2008) are shown below.

The list of available folders for adding files to a companion installer depends on whether you are installing for all users (the default) or for individual users. (Configure this option using the **Specify install locations** pane.)

All-user installations

Property name	Default Windows location	Default path using Windows variables
[CommonAppDataFolder]	`C:\ProgramData`	`%programdata%`
[CommonDocumentsFolder]	`C:\Users\Public\Documents`	`%windir%`
[CommonFilesFolder]	`C:\Program Files\Common Files`	`%ProgramFiles%\Common Files`
[ProgramFilesFolder]	`C:\Program Files`	`%ProgramFiles%`
[RootDrive]	`C:\`	`\`

[WindowsFolder]	C:\Windows	%windir%

Individual user installations

Property name	Default Windows location	Path using Windows variables
[AppDataFolder]	C:\Users\<user>\AppData\Roaming\	%appdata%
[LocalAppDataFolder]	C:\Users\<user>\AppData\Local\	%localappdata%
[PersonalFolder]	C:\Users\<user>\Documents\	%userprofile%\documents
[RootDrive]	C:\	\
[%UserProfile]	C:\Users\<user>	%userprofile%

Apply a Transform to Your Installation

If you have created a transform to customize how Reflection is installed, you need to deploy the transform with the primary installation. (This is in contrast to companion installation packages, which can be chained with the primary installation or installed separately.) Any install started with setup.exe or with command-line installs can include a transform.

To add the transform to installs started with setup.exe

1. Start Attachmate Customization Tool and select **Create a new Setup customization file for the following product**.
2. Go to the **User interface** panel.
3. Select **Use this customization with interactive installs using setup.exe**.

   When you save your transform with this option selected, the Attachmate Customization Tool automatically updates the setup.ini file to apply the transform to the Reflection installation by adding the following line to the [Setup] section:

   ```
   CustomTransform=<your_transform.mst>
   ```

   This modification to setup.ini means that any install using setup.exe (using either the interactive user interface or using setup.exe on a command line) will automatically apply this transform.

4. Save the transform to the default location (the folder that includes setup.exe).

   The transform can now be deployed to end users via the setup.exe file. (Users can run setup.exe directly or setup.exe can be called from a script or initiated from a command line.)

Note: If the setup.ini file already specifies the transform file you want to install (as noted in step 3 of the previous procedure) do not specify the transform on the command line.

To add the transform to a setup.exe command-line install

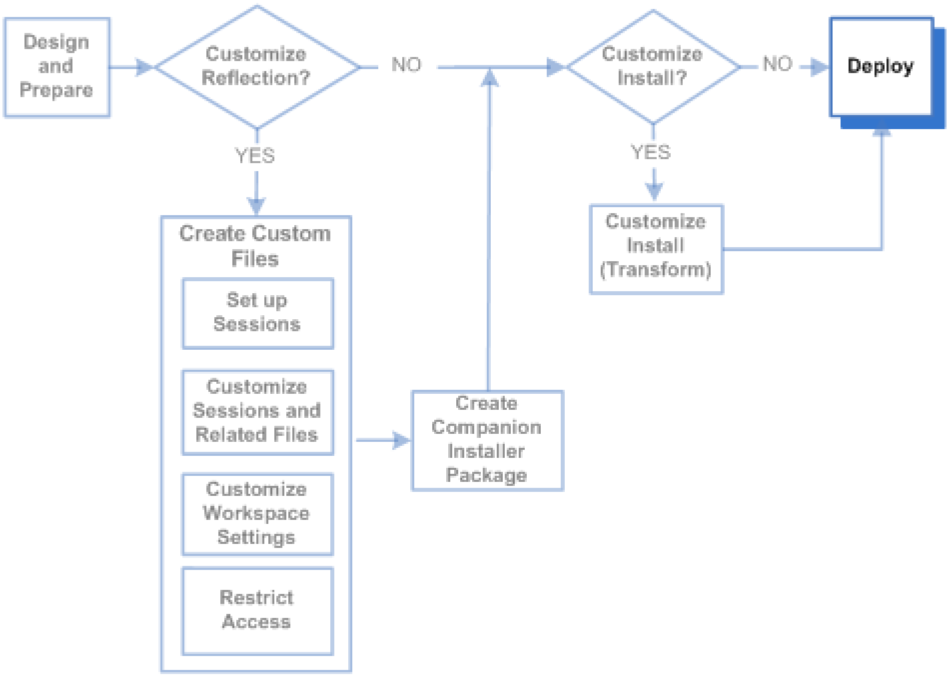
- From the command line, use the following syntax:

```
<path_to_setup>\setup.exe /install TRANSFORMS=<transform.mst>
```

CHAPTER 5

Deploy Reflection

This chapter provides instructions on deploying Reflection, companion installer packages, and the API.



What do you want to do?

Deploy with the Attachmate Setup Program

The Attachmate Setup Program (`setup.exe`) is the recommended tool for installing and deploying Reflection.

`Setup.exe` has a command-line interface that you can run from a command line, a batch file, or a deployment tool. You can type command-line options to set installation parameters and limit user interaction as Reflection is installing, or use command-line options to prepare Reflection for installation by users. Command-line installations may have additional system requirements (page 8).

To see a list of available command-line parameters, type:

```
setup.exe /?
```

To install a companion installer package with the Setup program, add it to a transform and then apply that transform to `setup.exe`. This "chains" the companion installer package to the main installation. You can set the package to deploy before or after the main installation.

The following procedures show command-line options commonly used for deployment, including switches for silent installations.

To deploy Reflection “out-of-the-box”

Use this command to deploy Reflection with default settings.

- At a command prompt on a test workstation, enter:

  path_to_administrative_installation_point`\setup.exe /install`

To perform a silent installation

- At a command prompt, change to the directory in which the `setup.exe` file resides and do one of the following:

To perform	Type
A silent install that displays a progress bar and disables the Cancel button	`setup.exe /install /passive`
A silent install with no display	`setup.exe /install /quiet`

To deploy Reflection and a transform

- At a command prompt, enter:

  path_to_administrative_installation_point`\setup.exe /install TRANSFORMS=` *myCustomInstall*`.mst`

Note: You can also set up the Attachmate Setup Program to deploy a transform automatically. See Add (Chain) Installations and Run Programs (page 66).

To remove Reflection with the Attachmate Installation Program

CAUTION: If you use the following instructions to find the product code in the registry, make sure you do not change any registry values. Changing these values can damage an installation. If you prefer not to use the registry, you can get the product code by contacting Attachmate Technical Support.

1 Open the registry editor (`regedit.exe`) and find this key:

   32-bit platforms

   ```
   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
   ```

   64-bit platforms

   ```
   HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\Windows\CurrentVersion\U
   ninstall
   ```

2 Each key under the **Uninstall key** is the product code or Globally Unique Identifier (GUID) for a product installed on the computer.

3 In the **Uninstall** key, search for Attachmate Reflection to find the Attachmate Reflection product code.

4 Verify that the **DisplayName** includes “Attachmate Reflection … 2014”

5 At a command prompt, change to the directory in which the setup.exe file resides and enter:

   ```
   setup.exe /uninstall ProductCode
   ```

Deploy with MSI

Use these procedures to install Reflection from a command line with MSI.

To customize your installation, specify Windows Installer properties on the command line or pass them in a transform file. For a list of public properties that are standard to the Microsoft Windows Installer, see the Modify Setup Properties (page 64) pane in the Attachmate Customization Tool, or refer to the Microsoft Windows Installer Guide (http://msdn.microsoft.com/en-us/library/windows/desktop/aa372845(v=vs.85).aspx).

If you want to create a custom (non-default) user data location that will be used by all installed Reflection products, specify the product-specific property WRQ_USERDIR. This property affects only those applications whose default user data directory is `%personalfolder%\Attachmate\Reflection`. Reflection applications that use this default data location include: Reflection Workspace, Reflection FTP Client, Reflection Kerberos Manager, Reflection Key Agent, Reflection IBM Printer, and Reflection X (legacy). Reflection X Advantage does not use this user data location.

To deploy Reflection “out-of-the-box” directly with MSI

- At a command prompt on a test workstation, change to the directory in which the `.msi` file resides and enter:

  ```
  msiexec /i path_to_administrative_installation_point\yourVersion.msi
  ```

  where *`yourVersion`*`.msi` is the specific version of the reflection MSI that you downloaded (for example, `SE11R1c.msi`).

To deploy Reflection and a transform directly with MSI

- At a command prompt, enter:

  ```
  msiexec /i path_to_administrative_installation_point\yourVersion.msi
  TRANSFORMS= yourCustomInstall.mst
  ```

  where *yourVersion*.msi is the specific version of the Reflection MSI that you downloaded (for example, SE11R1c.msi).

Deploy an MSI File Independently

You can deploy configuration files that are “packaged” in a companion installer package separately from Reflection. This allows you to deploy and maintain these files between Reflection software updates without removing Reflection.

If you use Reflection Security Gateway, you can upload MSI files to the Package Manager and silently deploy them to users' workstations. See Deploy MSI Packages from Reflection Security Gateway (page 86).

To deploy a companion installer package directly with MSI

- At a command prompt, enter:

  ```
  msiexec /i path_to_administrative_installation_point\
  your_companion_file.msi
  ```

To remove a companion installer package directly with MSI

- At a command prompt, change to the directory in which the companion installer package file resides and enter:

  ```
  msiexec /x your_companion_file.msi
  ```

Publish with Active Directory

To assign and publish your product installation using Microsoft Active Directory, you must meet the following requirements:

- Windows Administrative Tools are installed on your workstation.
- You are a member of **Domain Admins** and **Group Policy Creators and Owners**. (This is required to publish software.)

For more information, see "Active Directory groups" in the Microsoft Management Console help.

To install with Active Directory

1. From the **Active Directory User and Computers Console**, advertise your product installation to members of any organizational units in your Active Directory using appropriate transform modifications.

2. If multiple transforms are specified, make sure that the listed order of the transforms is correct, and click **OK**. (If you need to change the order for any reason after you click **OK**, you will have to start over again.)

> Note: For more information about assigning and publishing, see "assigning applications" and "publishing applications" in the Microsoft Management Console help.

Deploy with System Center Configuration Manager

You can deploy Reflection with Microsoft Systems Center Configuration Manager (or Microsoft Systems Management Server).

To deploy with System Center Configuration Manager

1. Create an administrative install image on your site server.

   This serves as the administrative installation point for deployment.

2. Use the product Package Definition File (`.sms`) to create the product installation package.

> Note: The Package Definition File (`.sms`) is created during the administrative installation and can be found at the root of the administrative installation point. Alternatively, you can reference the `.msi` file directly — consult the Microsoft SMS documentation for more information.

3. Advertise the installation packages to your users.

CHAPTER 6

Deploy with Reflection Security Gateway

This section provides instructions on deploying Reflection sessions using Attachmate Reflection Security Gateway. Reflection Security Gateway provides increased security to legacy host applications by leveraging the current enterprise authentication infrastructure.

Requirements

- Reflection Security Gateway, the components of which can be installed on one or more servers available over the network
- On the Administrator's workstation, installation of Attachmate Reflection 2014 and a browser (with Java enabled)
- On the user's workstation, installation of Attachmate Reflection 2014 and a browser (with Java enabled)

Connect to Hosts using the Reflection Security Proxy

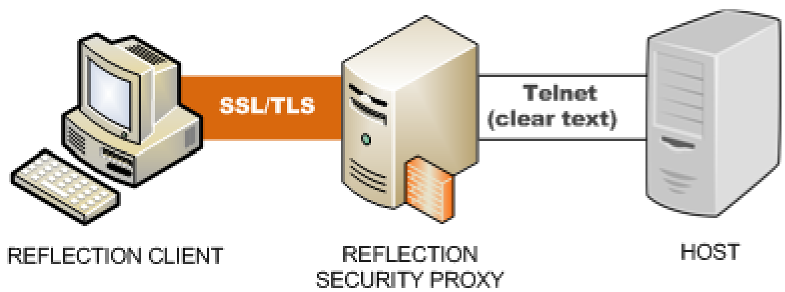
You can centrally control access to your sessions and reduce host visibility by connecting emulation sessions through the Reflection Security Gateway.

Note: If you plan to customize Reflection, create a companion installer package in the Attachmate Customization Tool or another MSI tool and deploy it to users or groups from the Package Manager. See Deploy MSI Packages from Reflection Security Gateway (page 86).

The Reflection Security Gateway offers several configuration options:

Client Authorization

When using the default configuration for the Security Proxy, users are authorized using security tokens. Transmitted data between the client and the Security Proxy is encrypted; transmitted data between the Security Proxy and the host is not. The Security Proxy server should be installed behind a corporate firewall when used in this mode. See Connect using Client Authorization.

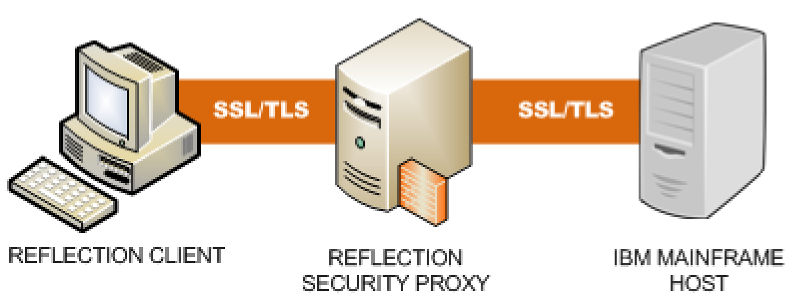


Pass Through

When configured as a Pass Through Proxy, the Security Proxy passes data to the destination host without regard to content (that is, it ignores any SSL handshaking data). You can secure data traffic using SSL between the client and the destination host by enabling SSL user authentication on the destination host. When using a Pass Through proxy, client authorization is not an option. See Connect using Pass Through Mode.

End-to-End Security

This option, available for 3270 sessions only, combines user authorization with SSL security for the entire connection. Single sign-on capability using the IBM Express Logon is also supported, provided the host supports SSL. See Connect using End-to-End Security and Express Logon in 3270 Sessions.



Connect using Client Authorization

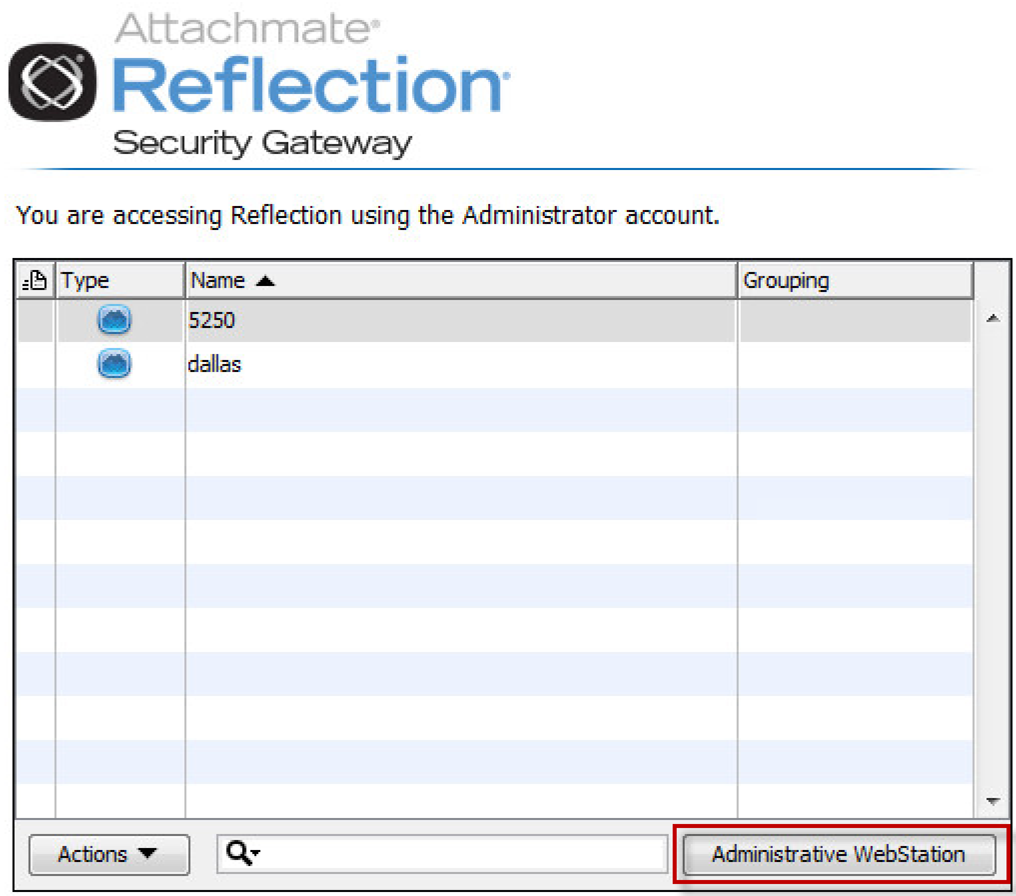
Use this procedure to create an Reflection emulation session that connects to the Reflection Security Proxy and requires a user token for client authorization. Client authorization is a configurable option in Reflection Security Proxy that is enabled by default.

To configure a session

1 In a web browser, start Reflection Security Gateway by setting the URL to:

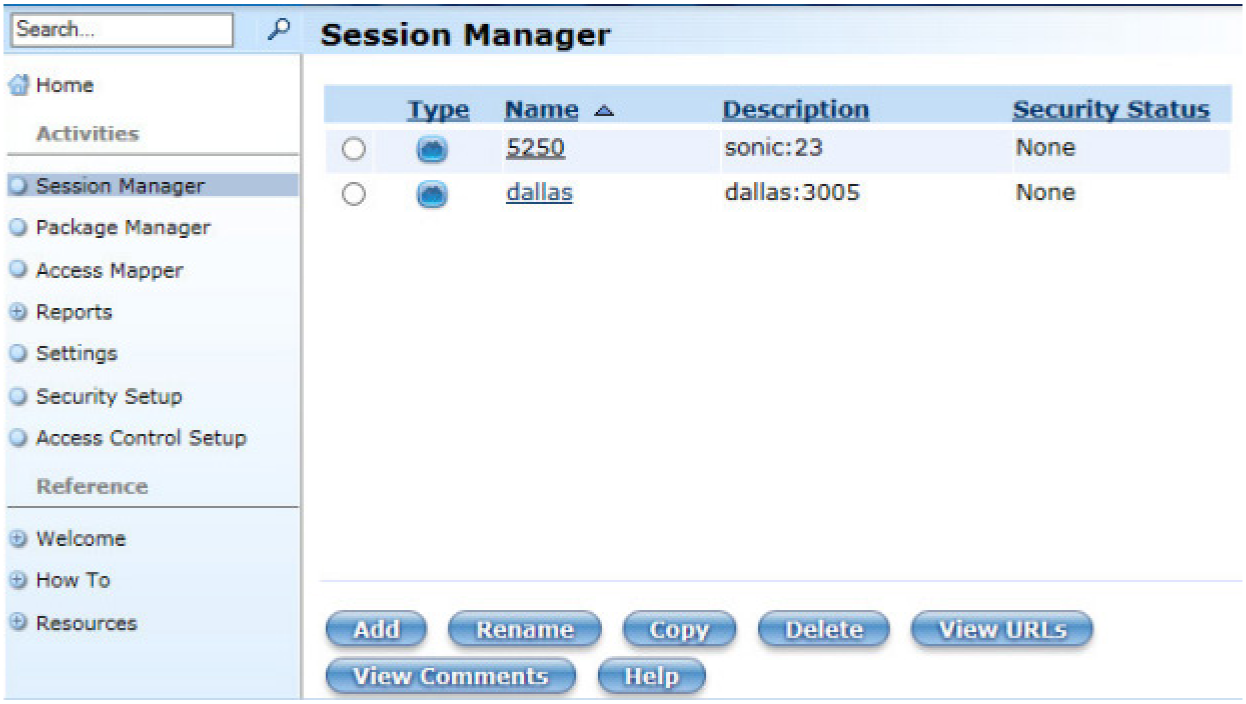
`http://server:port/rweb/AdminStart.html`

where *server* and *port* are replaced with the Reflection Management server address.



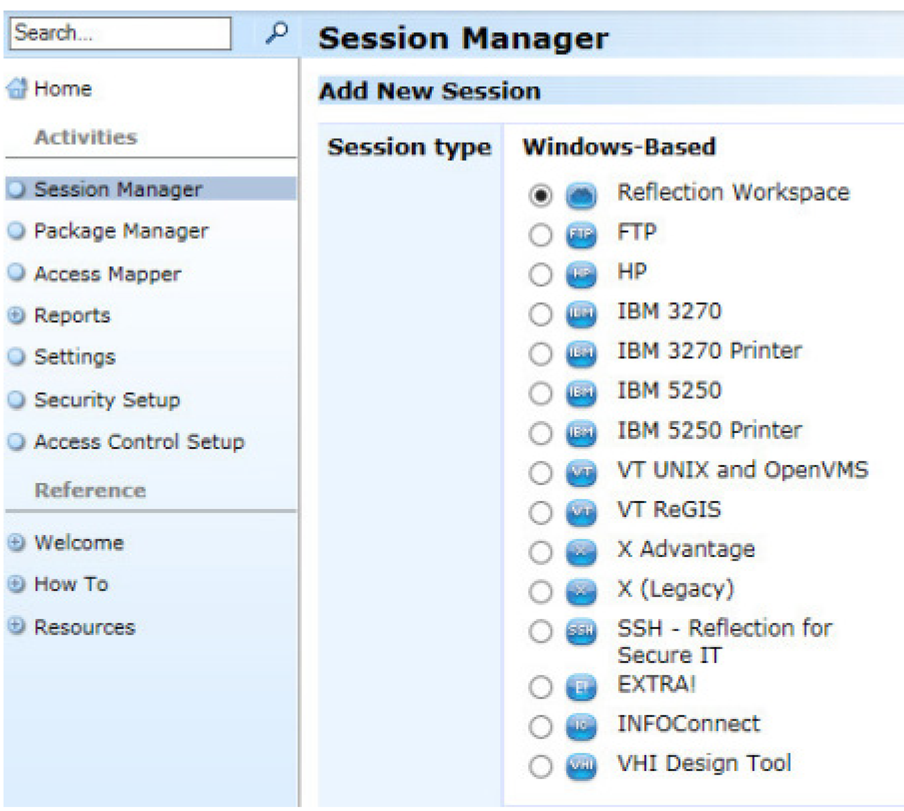
2 Click **Administrative WebStation** and log on as administrator.

3 From the left pane, click **Session Manager**.



4 Click **Add** to open the **Add New Session** page.

5 Under **Windows-Based**, select **Reflection Workspace**, and click **Continue**.



6 Specify a trusted location on the user's workstation where settings files will be stored, and then click **Launch**.

Reflection opens the new session document on your workstation in Administrative WebStation mode.

7 Configure the new session document as follows:

a) In the **Create New Document** dialog box, choose the type of session and then click **Create**.

b) Enter the **IP Address or Host** name, configure other settings as required, and then select **Configure additional settings**.

c) In the **Settings** dialog box, under **Host Connection**, click **Set Up Connection Security**.

d) In the **Configure Advanced Connection Settings** dialog box, click **Security Settings**.

e) In the **Security Properties** dialog box, select **Use SSL/TLS security** and then select **Use Reflection security proxy**.

8 If you are prompted for a certificate, accept it, wait until the session connects, and then close the session.

9 When prompted, confirm that you want to send the settings to the Administrative WebStation.

In the WebStation Session Manager page, a message indicates that the session is saved.

10 Click **Map session access** and use Access Mapper to configure which users have access to the session document.

11 Point users to the Reflection URL (for example `http://myserver/rweb`) to access Reflection sessions.

Connect using Pass Through Mode

Use this procedure to create Reflection emulation sessions that connect to a Reflection Security Proxy that is configured as a Pass Through proxy.

In Pass Through mode, the Security Proxy doesn't perform any SSL handshake, client/server authentication or encryption. If SSL is used in this mode, the SSL session is created between the client and destination host and encrypted data simply passes through the Security Proxy.

For instructions on configuring the Reflection Security Proxy, see the documentation included with Reflection Security Gateway.

To configure a session

1 In a web browser, start Reflection Security Gateway by setting the URL to:

`http://`*`server:port`*`/rweb/AdminStart.html`
where *`server`* and *`port`* are replaced with the Reflection Management server address.

2 Click **Administrative WebStation** and log on as administrator.

3 From the left pane, click **Session Manager**.

4 Click **Add** to open the **Add New Session** page.

5 Under **Windows-Based**, select **Reflection Workspace**, and click **Continue**.

6 Specify a trusted location on the user's workstation where settings files will be stored, and then click **Launch**.

Reflection opens the new session document on your workstation in Administrative WebStation mode.

7 Configure the session document as follows:

a) In the **Create New Terminal Document** dialog box, enter the **IP Address or Host** name and port, select the check box **Configure additional settings**, and click **OK**.

b) In the **Settings** dialog box, under **Host Connection**, click **Set Up Connection Security**.

c) In the **Configure Advanced Connection Settings** dialog box, click **Security Settings...**.

d) In the **Security Properties** dialog box, on the **SSL/TLS** tab, select **Use SSL/TLS security**, select the check box **Use Reflection security proxy** and enter the proxy name and port.

8 After the session successfully connects, save the session.

The session file is then saved to the Reflection Management Server.

9 Next, you make the session available to specific users (page 84).

Note: If you want to establish an SSL-secured connection between Reflection and the destination host using the Security Proxy in Pass Through mode, you may need to deselect **Host name must match certificate** or, preferably, add the Security Proxy as the **Subject Alternate name** in the host server certificate.

Connect using End-to-End Encryption in 3270 Sessions

Use this procedure to configure end-to-end encryption in sessions that connect to hosts via the Reflection Security Gateway. Without end-to-end encryption, only data between the client and proxy server is encrypted.

End-to-end encryption tunnels a direct SSL/TLS connection to the host, while still connecting through the Reflection Security Proxy Server. These connections require two certificates and SSL/TLS handshakes — one for the client/proxy server connection and another for the client/host connection.

Requirements

- SSL is enabled on the host. See the documentation included with the host for instructions.
- An installation of Reflection Security Gateway. The Security Proxy must be configured to require **Client authorization**. (It can optionally be configured to require **Client authentication**. For client authentication, you can use a single certificate or two separate client certificates on each server (Security Proxy and destination host).
- Digital certificates. To successfully establish the SSL/TLS sessions between the client and the Security Proxy, and the client and the destination host, you may need multiple digital certificates. See Setting Up Certificates.

About Certificates

Server Certificates

Destination SSL hosts and Security Proxy servers typically have server certificates already installed. Each of these server certificates must be trusted by the client. The client will trust a server certificate if:

- It is signed by the certificate authority that is trusted by the client, or
- It is self-signed and imported them into the trusted root certificate store where Reflection can find it.

To use a single server certificate for both the destination host and the Security Proxy, do one of the following:

- In the Reflection session, de-select the **Verify Server Identity** check box on the **Connection Editor** dialog box.
- (Recommended) Create a certificate that uses the destination host address for the **Subject Common Name** and the Security Proxy address for the **Subject Alternative Name**.

Client certificates

Certificates used for client authentication must be signed by a certificate authority that is trusted by both the Security Proxy and the destination host's SSL server.

Express Logon also requires that the client certificate used to authenticate on the TN3270 server be registered with RACF. (For details, see the documentation that came with the 3270 server.)

For more details on configuring SSL and creating certificates on the host, see Technical Notes 1759 http://support.attachmate.com/techdocs/1759.htm and 1760.

To configure a session with end-to-end encryption

1 In a web browser, start Reflection Security Gateway by setting the URL to:

`http://`*`server:port`*`/rweb/AdminStart.html`
where *`server`* and *`port`* are replaced with the Reflection Management server address.

2 Click **Administrative WebStation** and log on as administrator.

3 From the left pane, click **Session Manager**.

4 Click **Add** to open the **Add New Session** page.

Under **Windows-Based**, select **Reflection Workspace**, and click **Continue**.

5 Specify a trusted location on the user's workstation where settings files will be stored, and then click **Launch**.

Reflection opens the new session document on your workstation in Administrative WebStation mode.

6 Enter the host name and port, select the check box **Configure additional settings**, and click **OK**.

7 In the **Reflection Settings** dialog box, under **Host Connection**, click **Set Up Connection Security**.

a) Click **Security Settings**, and in the **Security Properties** dialog box, make the following **required** selections:

b) Select **Use SSL/TLS security**.

c) Select **Use Reflection security proxy**.

d) From **Security proxy settings**, choose your **Security proxy** and **Proxy port** from the drop-down menus.

e) In the **Destination host** box, type the host name.

f) Select the **End-to-End encryption** check box.

> Note: You can modify the level of security by adjusting the SSL protocol version and encryption key-strength setting. Click **PKI Manager** to add the Certificate Revocation List (CRL) and Online Certificate Status protocols (OCSP) to certificate validation.

8 Click **OK** to close the **Security Settings** dialog box, and then make any other modifications to the session before clicking **OK** to save it.

The session opens and attempts to connect to the host. The session file is saved to the Reflection Management server.

9 In the Administrative WebStation, click **Access Mapper** and specify which users have access to the file. The users you specify can access the file from the Links List.

Make Sessions Available to Users from Administrative WebStation

Use this procedure to give users and groups access to Reflection sessions you create in the Administrative WebStation.

To make the session available to users

- Use **Access Mapper** in the Administrative WebStation to provide access to specific users or groups.

  If the Reflection Management Server has been configured to integrate with your enterprise directory using LDAP, the Access Mapper operates in different mode. For more information, refer to the documentation included with Reflection Security Gateway.

  The user accesses the session by clicking a link on their Links List. For more information, see How Users Start Sessions from the Reflection Management Server (page 85).

How Users Start Sessions from the Reflection Management Server

This procedure explains how end users start Reflection emulation sessions created in Administrative WebStation.

To start a session

1. Click the URL provided by your Administrator, which uses the format `http://`*`servername`*`:`*`port`*`/rweb`.
2. Provide any necessary information to authenticate to the Reflection Management Server.
3. From the Links List, select the session you want to open. If the session is configured to use tokens for user authorization, you must connect before the specified expiration period. Within that expiration period, the session can disconnect and reconnect using the same token. After the token expires, you must restart Reflection by clicking the session in the Links List to retrieve a new, valid token.

   The session profile and associated files are downloaded to your computer the first time the session is accessed. An updated session profile is downloaded to the client only if the previous file was deleted or if the option **Overwrite end user files** was selected in the Session Manager.

   After the session opens in Reflection and makes the connection, the status icon shows a connection to the Reflection Security Proxy Server instead of the host.

> Note: Saving a local copy of a session created in Administration WebStation is generally not recommended. If the session is modified from the Reflection Management Server, the local copy will not include the modifications.

Modify a Session Created in Administrative WebStation

Use the following procedure to modify Reflection sessions created in the Administrative WebStation. If you modify these sessions outside of Administrative WebStation, many of the Reflection security settings will be unavailable.

To modify the session's settings

1. In a web browser, start Reflection Security Gateway by setting the URL to:
2. `http://`*`server:port`*`/rweb/AdminStart.html`
   where *`server`* and *`port`* are replaced with the Reflection Management server address.
3. Click **Administrative WebStation** and log on as administrator.
4. From the left pane, click **Session Manager**.
5. Select the session you want to modify.
6. Click **Launch**.

7 After you make changes, save the file as prompted.

Your modified session file replaces the existing session file of the same name on the Reflection Management Server.

Deploy MSI Packages from Reflection Security Gateway

Use the Package Manager to upload companion install packages (.msi) to the Reflection Management Server for deployment to specified users. Companion install packages can be created in the Attachmate Customization Tool (ACT) or other MSI creation tools, and may include toolbars, macros, keyboard maps, and settings files.

These packages are automatically deployed to a user's desktop when the user logs on to the Reflection Management Server or opens a session from the Links List.

To upload a package

1. In a web browser, start Reflection Security Gateway by setting the URL to:

   `http://`*`server:port`*`/rweb/AdminStart.html`
   where *`server`* and *`port`* are replaced with the Reflection Management server address.

2. Click **Administrative WebStation** and log on as administrator.

3. Click **Package Manager** on the left.

4. Click **Add** and then **Browse** to locate the .msi file you want to add or update. You can optionally add a description about the package.

5. Click **Save** to upload the package to the Reflection Management Server.

To deploy a package to users

Use the Access Mapper to specify users to which the package will be deployed.

- Use **Access Mapper** in the Administrative WebStation to provide access to specific users or groups. If the Reflection Management Server has been configured to integrate with your enterprise directory using LDAP, the Access Mapper operates in a different mode. For more information, refer to the documentation included with Reflection Security Gateway.

  After you make the package available to a user, the next time that user accesses the Links List, the package contents are copied to the user's computer to the locations specified in the MSI package. Files on the user's computer may be overwritten, depending on the options chosen when the MSI package was created.

To update or replace a package

To update an MSI package on the Reflection Management Server, you essentially replace it with an updated file of the same name.

1. Make your changes to the MSI package and save it using the same name.

2. From Package Manager, click the MSI file that you want to replace.

3. Click **Browse**, select the modified package, and then click **Open**.

4 In the **Description** field, enter a version number or some other indicator that the package contents have changed, and then click **Save**.

Enable Usage Metering

The Reflection Metering Server allows administrators to track Reflection sessions and determine how many client workstations use the product. Metering can also be used to limit the number of concurrent users that can access a host at any given time.

Use this procedure to enable metering after the product is installed.

To enable metering via group policy

1 Install the administrative template file for Reflection. See Administer Features using Windows Group Policy.

2 Run the Windows Group Policy editor (`gpedit.msc`):

- In Windows Server 2012, Windows Server 2008, Windows 8, Windows 7, or Vista: **Computer Configuration** > **Administrative Templates** > **Classic Administrative Templates** (**ADM**) > **Reflection Settings** > **Client Metering**.
- In Windows Server 2003 or Windows XP: **Computer Configuration** > **Administrative Templates** > **Reflection Settings** > **Client Metering**.

Setting Name and Description	Value Type
Client metering, Require connection to metering server, and Metering web server: If this policy is enabled, Reflection attempts to contact the Reflection metering server at the specified URL. If Reflection cannot contact the metering server and "Require connection to metering server" is checked, Reflection exits after issuing an error message.	Enable/Disable

3 Under **Configure Client Metering**, check the **Enabled** radio button.

4 In the **Metering URL** box, enter the URL of your metering server.

Syntax:

```
http://[host name]:[port number]/[metering server context name]/meter.do
```

For example:

```
http://Myserver.com:80/rwebmeter/meter.do
```

Note: If you used the default port, you can omit the colon and port number.

5 Select **Require metering** only if you want to prevent users from launching Reflection when the metering server is not available. (Enabling this setting can be useful when you are creating a trial installation and want to test to see if the metering server is running and available.)

CHAPTER 7

Maintain Reflection

This section discusses how to distribute software updates in a standard Microsoft .msp file format, and how to remove or repair an installation.

What do you want to do?

Distribute Software Updates

Software updates are distributed as Microsoft `.msp` files. You can deploy these updates with the Attachmate Patch utility included with your distribution. Patch log files are saved in the user's Windows temporary folder(`%tmp%`) with a generated name, using the form `atmpatchxxxxxx.log`.

To distribute updates with the Attachmate Patch utility

1 From the distribution image, double-click the self-extracting executable update file.

The Attachmate Patch utility opens.

2 Follow the instructions provided by the utility.

For detailed instructions on upgrading your Attachmate products, refer to the Attachmate Patch Utility Help.

To distribute updates from the command line

- To Install to a (clean) workstation and apply a patch:

```
msiexec /i <path_to_original.msi> PATCH=<path_to_patch.msp> /qb
```

- To apply a patch to an administrative installation:

```
msiexec /p <path_to_patch.msp> /a <path_to_admin.msi> /qb
```

- To reinstall to workstation (for example, after applying patch to admin):

```
msiexec /i <path_to_admin.msi> REINSTALLMODE=vomus REINSTALL=ALL /qb
```

Remove an Installation

To remove Reflection, you can use the Windows Control Panel, the Attachmate Setup program user interface, or a command line. To remove a companion installation, you can use the Windows Control Panel or a command line.

Note: You must log on with administrator privileges to remove Reflection.

To remove an installation using the Windows control panel

1. To open the **Programs and Features** control panel go to **Start** > **Control Panel** > **Programs and Features**. (On older Windows systems, this Control Panel is called Add or Remove Programs.)
2. Select the name of the installation that you want to remove.
3. Click **Uninstall** (or **Remove**).

To remove an installation with the Attachmate Setup program user interface

1. From an administrative installation image, click the `setup.exe` file.
2. From the tab, select **Remove**, and then click **Continue**.

To remove an installation from the ACT (setup.exe) command line

CAUTION: If you use the following instructions to find the product code in the registry, make sure you do not change any registry values. Changing these values can damage an installation. If you prefer not to use the registry, you can get the product code by contacting Attachmate Technical Support.

1. Open the registry editor (`regedit.exe`) and find this key:
   `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall`

   Each key under the `Uninstall` key is the product code or Globally Unique Identifier (GUID) for a product installed on the computer.
2. In the `Uninstall` key, search for DisplayName to locate the GUID associated with the product you want to uninstall.
3. At the command prompt or the Start menu Run command, change to the directory in which the `setup.exe` file resides and enter:

   ```
   setup.exe /uninstall ProductCode
   ```

   where *`ProductCode`* is the Globally Unique Identifier (GUID) that is the principal identifier for the product.

To remove a companion installer package with MSI directly

- At a command prompt, change to the directory in which the companion installer package file resides and enter:

```
msiexec /x your_companion_file.msi
```

Repair an Installation

If you are experiencing problems with your installation, you can use the **Repair** option, which automatically searches for and replaces missing or corrupted files.

To repair an installation with the Attachmate Setup program user interface

1. From an administrative installation image, click the `setup.exe` file.
2. Click **Repair,** and then follow the installer instructions.

To repair an installation using Windows Add/Remove

1. From the Windows **Programs and Features** (or the **Add or Remove Programs**) control panel, select the name of the installation that you want to repair, and then click **Change**.
2. From the Attachmate Setup program, select **Repair**, and then click **Continue**.