Ivanti Secure Access Client Administration Guide

22.2R1 - 22.8R3

Copyright Notice

Contents

Revision History

The following table lists the revision history for this document:

Revision	Date	Feature	Add/Update/Remove
22.8R3	July 2025	• Portuguese Language support	All sections that include localization info.
22.8R2	May 2025	• Single Stack IPv6 Support • Ubuntu 24.4 support	Updated section Single Stack IPv6 Support Updated section Installing ISAC on Linux using CLI
22.8R1	February 2025	• Silent deep clean script • Enable/Disable ISAC URL launch • Enable/Disable Dynamic Certificate Trust	Updated Section Uninstalling ISAC. Updated section Installing Ivanti Secure Access Client on Windows Endpoints Using a Preconfiguration File
22.7R3	July 2024	• Disable Secure DNS for Embedded Edge Browser • Uninstalling ISAC • jamCommands for Admin Mode only	• Updated section Using jamCommand to change DNS Cache settings. • Added Section Uninstalling ISAC. • Updated section Using jamCommand to Import Ivanti Connections
22.7R2	June 2024	Removal of unsupported client information	Removed Client Software Feature Comparison
22.7R2	May 2024	Using jamCommand to change DNS Cache settings	Added a section Using jamCommand to change DNS Cache settings.

Revision	Date	Feature	Add/Update/Remove
22.7R1	January 2024	Ivanti Secure Access Client Command-line Launcher	Updated the format to include session Selection.
22.6R1	October 2023	None	Typos and small error fixes.
22.3R1	January 2023	None	Typos and small error fixes.
22.2R1	July 2022	Initial release as Ivanti Secure Access Client; Previously Pulse Client.	Complete rebranding to Ivanti Secure Access Client.

Preface

Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Ivanti technical documentation.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used in the flow of the text to highlight specific words or phrases.

Format	Description
bold text	Identifies command names
	Identifies keywords and operands
	Identifies the names of user-manipulated GUI elements
	Identifies text to enter at the GUI
italic text	Identifies emphasis
	Identifies variables
	Identifies document titles
Courier Font	Identifies command output
	Identifies command syntax examples

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.

Convention	Description
italic text	Identifies a variable.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Non-printing characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, member[member...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.
bold text	Identifies command names, keywords, and command options.

Notes and Warnings

Note, Attention, and Caution statements might be used in this document.

A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

CAUTION
A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

Requesting Technical Support

Technical product support is available through the Ivanti Global Support Center (PSGSC). If you have a support contract, file a ticket with PSGSC.

- Product warranties—For product warranty information, visit https://forums.ivanti.com/s/contactsupport/product-service-policies/

Self-Help Online Tools and Resources

For quick and easy problem resolution, Ivanti provides an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: https://forums.ivanti.com/s/contactsupport
- Search for known bugs: https://forums.ivanti.com/s/contactsupport
- Find product documentation: https://www.ivanti.com/support/product-documentation
- Download the latest versions of software and review release notes: https://forums.ivanti.com/s/contactsupport
- Open a case online in the CSC Case Management tool: https://forums.ivanti.com/s/contactsupport
- To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://forums.ivanti.com/s/contactsupport

For important product notices, technical articles, and to ask advice:

- Search the Ivanti Knowledge Center for technical bulletins and security advisories: https://forums.ivanti.com/s/searchallcontent

Opening a Case with PSGSC

You can open a case with PSGSC on the Web or by telephone.

- Use the Case Management tool in the PSGSC at https://forums.ivanti.com/s/contactsupport.
- Call 1-844 751 7629 (Toll Free, US).

For international or direct-dial options in countries without toll-free numbers, see https://forums.ivanti.com/s/contactsupport/support/support-contacts/

Deploying Ivanti Secure Access Client

Ivanti Secure Access Client Installation Overview

This section describes how to deploy Ivanti Secure Access Client for Windows and Ivanti Secure Access Client for macOS client software from Ivanti Policy Secure and Ivanti Connect Secure platforms.

Ivanti Policy Secure and Ivanti Connect Secure include a default connection set and a default component set. These defaults enable you to deploy Ivanti Secure Access Client to users without creating new connection sets or component sets. The default settings for the client permit dynamic connections, install only the components required for the connection, and permit an automatic connection to Ivanti Connect Secure or Ivanti Policy Secure to which the endpoint connects.

For detailed configuration of the Ivanti Secure Access Client on Ivanti Connect Secure, refer to Ivanti Secure Access Client Configuration on Ivanti Connect Secure.

In all deployment scenarios, you must have already configured authentication settings, realms, and roles.

You can deploy Ivanti Secure Access Client to endpoints from Ivanti Connect Secure and Ivanti Policy Secure in the following ways:

- **Web install**: With a Web install (also called a server-based installation), users log in to the Ivanti server's Web portal and are assigned to a role that supports a Ivanti Secure Access Client installation. When a user clicks the link to run Ivanti Secure Access Client, the default installation program adds Ivanti Secure Access Client to the endpoint and adds the default component set and the default connection set. If you do not make any changes to the defaults, the endpoint receives a Ivanti Secure Access Client installation in which a connection to the Ivanti server is set to connect automatically. You can edit the default connection set to add connections of other Ivanti servers and change the default options.

Note:The exact mechanism used to launch and install a particular Ivanti Secure Access Client from a web browser depends on a number of factors, including:
- The Ivanti Secure Access Client (Windows/Mac desktop client, Host Checker, WSAM, Windows Terminal Services) being launched/installed.
- The endpoint operating system type and version.
- The web browser type and version.
- The security settings of the endpoint operating system and browser.

A Web install is not compatible with the Ivanti rebranding tool, BrandPackager.

- **Preconfigured installer**: Create the connections that an endpoint needs for connectivity and services, download the settings file (.pulsepreconfig), and download default Ivanti Secure Access Client installation program. For Windows endpoints you run the Ivanti Secure Access Client installation program by using an msiexec command with the settings file as an option. For OS X endpoints, you run the default installer and then import the .pulsepreconfig file using a separate command.

Download the Ivanti Secure Access Client from Software Download Portal. You need to have the login credentials to access the portal.

- **Default installer**: You can download the default Ivanti Secure Access Client installation program and distribute it to endpoints using your local organization's standard software distribution method (such as Microsoft SMS/SCCM). Ivanti Secure Access Client software is installed with all components and no connections. After users install a default Ivanti Secure Access Client installation, they can add new connections manually through Ivanti Secure Access Client user interface or by using a browser to access a Ivanti server's Web portal. For the latter, the Ivanti server's dynamic connection is downloaded automatically and the new connection is added to Ivanti Secure Access Client's connections list when the user starts Ivanti Secure Access Client by using the Ivanti server's Web portal interface. Dynamic connections are created as manual rather than automatic connections, which means that they are run only when the user initiates the connection or the user browses to a Ivanti server and launches Ivanti Secure Access Client from the server's Web interface.

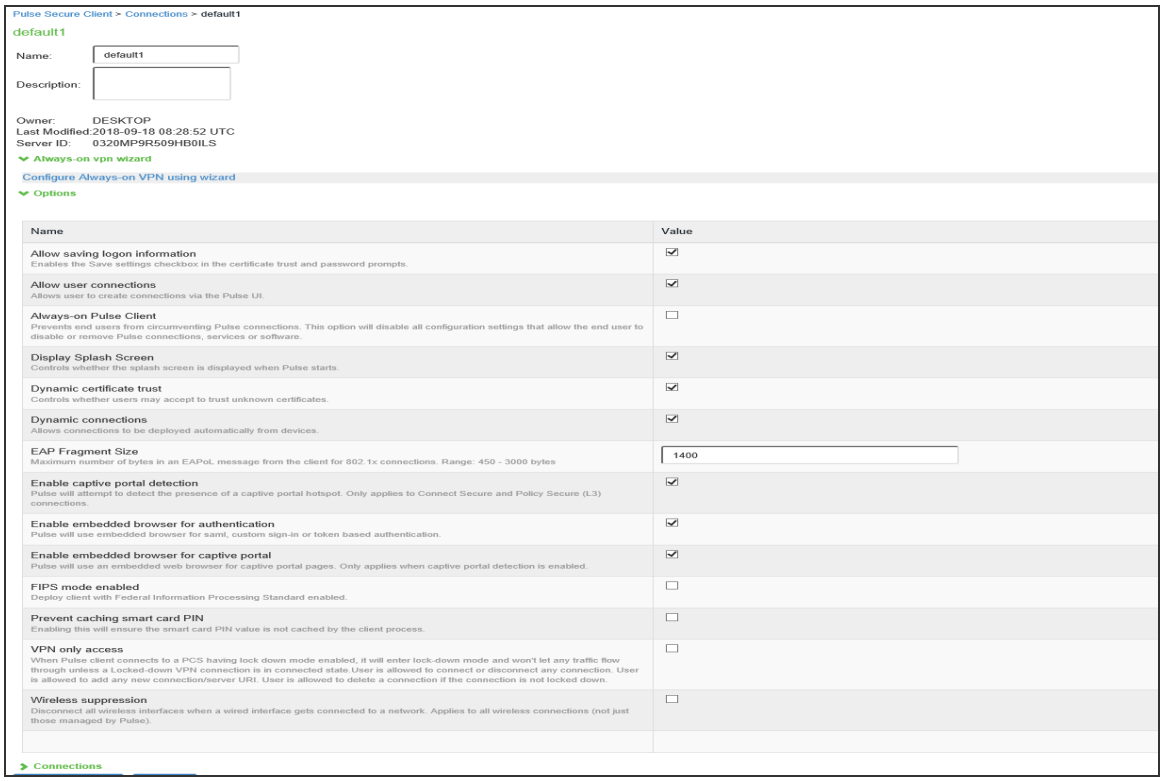
If the Windows endpoints in your environment do not have admin privileges, you can use the Ivanti Secure Access Client Installer program, which is available on the admin console System Maintenance Installers page. The Ivanti Secure Access Client Installer allows users to download, install, upgrade, and run client applications without administrator privileges. In order to perform tasks that require administrator privileges, the Ivanti Secure Access Client Installer runs under the client's Local System account (a powerful account with full access to the system) and registers itself with Windows' Service Control Manager (SCM).

- Installing the Ivanti Secure Access Client Installer MSI package requires administrator rights to install onto your client systems. If you plan to use the EXE version, administrator rights are not needed as long as a previous version of the access service component (deployed through, for example, JIS, Ivanti Secure Access Client, and so forth) is already present. If policies are defined for your client with the group policy "Run only Allowed Windows Application", the following files must be allowed to run in the group policy. If not, client applications might not install.
    - dsmmf.exe

  - PulseCompMgrInstaller.exe
  - PulseSetupClient.exe
  - PulseSetupClientOCX.exe
  - PulseSetupXP.exe
  - uninstall.exe
  - x86_Microsoft.*.exe
- You should ensure that the Microsoft Windows Installer exists on the client system prior to installing the Ivanti Secure Access Client Installer.

Adding a Configuration to a New Ivanti Secure Access Client Installation

When you install Ivanti Secure Access Client for Windows or Ivanti Secure Access Client for macOS client on an endpoint using the default Ivanti Secure Access Client installation program, the endpoint has all the Ivanti Secure Access Client components it needs to connect to Ivanti servers. However, Ivanti Secure Access Client needs a configuration that identifies the Ivanti servers it can connect to, that is, the connections. Connection properties also define how the connections are to be started, manually, automatically, or according to location awareness rules, and how Ivanti Secure Access Client connections receive updates. These connection set properties are also called machine settings. Figure 95 shows the default Ivanti Secure Access Client connection set properties (machine settings) that are passed to Ivanti Secure Access Client as its configuration. Figure 96 shows the connection set properties as they appear in a Ivanti Secure Access Client preconfiguration file, which you can use to add the Ivanti Secure Access Client configuration when you install Ivanti Secure Access Client. The preconfiguration file also includes Ivanti Secure Access Client connections.



There are two methods for installing an initial configuration on a new Ivanti Secure Access Client:

- Use a Ivanti Secure Access Client preconfiguration file (.pulsepreconfig) when you install Ivanti Secure Access Client on endpoints using the default Ivanti Secure Access Client installer.
- Instruct users to open a browser and login to the Ivanti server Web portal where the Ivanti Secure Access Client configuration has been defined. After successful login, the user should start Ivanti Secure Access Client from the Web page. Or you can enable Auto-launch as a role option to have the Ivanti Secure Access Client installation begin automatically after login.

The first time Ivanti Secure Access Client connects to a server that offers a Ivanti Secure Access Client configuration, the configuration settings are installed on the client, and the client is bound to that server, which means that only that server can update the client's configuration. Any Ivanti server can update the Ivanti Secure Access Client software version if that feature is enabled, and any Ivanti server can add a connection to an existing Ivanti Secure Access Client configuration if the Dynamic connections option is enabled as part of the connection set on the binding server. Only the binding server can update Ivanti Secure Access Client's configuration.

If the Ivanti Secure Access Client configuration has Dynamic connections enabled, then connections from other Ivanti servers are automatically added to Ivanti Secure Access Client's connections list when the user connects to the other Ivanti server through that server's Web portal, and the user starts Ivanti Secure Access Client using the Ivanti server's Web portal interface. For example, a user has a Ivanti Secure Access Client configuration from IvantiServerA (the binding server) and the Ivanti Secure Access Client configuration allows dynamic connections. If the user browses to IvantiServerB and successfully authenticates through that server's Web portal and clicks the Ivanti Secure Access Client button, the server adds a IvantiServerB connection to the Ivanti Secure Access Client configuration, and it appears in Ivanti Secure Access Client's connection list. This new connection is set to start manually so that it does not attempt to connect when the endpoint is restarted or conflict with the connections from the binding server. A dynamic connection is added to Ivanti Secure Access Client's connections list. However, the connection's target URL is Ivanti Web server URL; it does not use the URL that is defined for the connection in the server's Ivanti Secure Access Client connection properties. In most cases, these URLs will be the same.

You can see a Ivanti Secure Access Client configuration by creating and viewing a pulsepreconfig file. (To create the file, go to the Ivanti Secure Access Client Component screen, select a component set, and then click the **Download Installer Configuration** button.) The .pulsepreconfig file contains a section that defines the machine settings and separate sections for each Ivanti Secure Access Client connection deployed to the client, as shown in figure.

```
schema version {
     version: "1"
}

machine settings {
     version: "14"
     guid: "bf4801a3-527f-4f98-9ea3-7dcb7e271bc9"
     connection-source: "preconfig"
     server-id: "0241ML82A0PRD1VR"
     allow-save: "true"
     user-connection: "true"
     splashscreen-display: "true"
     dynamic-trust: "true"
     dynamic-connection: "true"
     wireless-suppression: "false"
}

ive "8211f09f-6674-4bdb-a44a-e6fa8b7402eb" {
     friendly-name: "SA"
     version: "2"
     guid: "8211f09f-6674-4bdb-a44a-e6fa8b7402eb"
     server-id: "0241ML82A0PRD1VR"
     connection-source: "preconfig"
     factory-default: "true"
     uri: "10.64.78.34"
     connection-policy-override: "true"
     use-for-secure-meetings: "false"
     use-for-connect: "true"
     connection-identity: "user"
     connection-policy: "automatic"
     client-certificate-location-system: "false"
}

8021x "06cc1f68-3714-4871-9abf-458f1c0ef4b0" {
     friendly-name: "MachAuthCnxn"
     version: "2"
     guid: "06cc1f68-3714-4871-9abf-458f1c0ef4b0"
     server-id: "0241ML82A0PRD1VR"
     connection-source: "preconfig"
     adapter-type: "wireless"
     outer-username: "anonymous"
     scan-list: "juniper_wireless_network"
     non-broadcast-ssid: "false"
     connection-identity: "machine-only"
     connection-policy: "automatic"
}
```

The machine settings and each centrally configured connection include the server ID (server-id) of the binding server. When a user browses to a Ivanti server, the server can offer a new configuration, (that is, updates to the machine settings). If the server-id under machine settings matches, Ivanti Secure Access Client accepts the configuration update. If the server-id does not match, Ivanti Secure Access Client ignores the update.

Configuration files have a version number as well. When Ivanti Secure Access Client connects to its binding server, Ivanti Secure Access Client compares the version of its existing configuration to the version on the server. If the server version is later than the existing client version, the client configuration is updated. The update might add, change, or remove connections and change machine settings.

If you have several Ivanti servers and you want to provision the same Ivanti Secure Access Client configuration from all of the servers, the server ID of the Ivanti Secure Access Client configuration must be the same across all of the servers. To accomplish this, you create the configuration on one server, and then use the "push config" feature of the Ivanti server to push the configuration to the other Ivanti servers. This method ensures that the server ID of the configuration file is the same across all of the Ivanti servers so that clients can receive a configuration update from any of the Ivanti servers.

Installing Ivanti Secure Access Client from the Web

For a Web install, you direct users to the Web interface of the Ivanti server. After a successful login, a user is assigned to a role that includes an automatic download and installation of Ivanti Secure Access Client software.

In order to install the Ivanti Secure Access Client from a web browser, you may need to enable certain browser plugins or other technologies on the endpoint device.

Ivanti Connect Secure and Ivanti Policy Secure introduced a new web-installation option called "Pulse Secure Application Launcher" (PSAL). PSAL leverages "URL handler" functionality by invoking a custom URL in a manner that instructs the web browser to execute a program that launches/installs the appropriate Ivanti Secure Access Client.To read more about PSAL, see the Ivanti Knowledge Center article "KB40102" (https://forums.ivanti.com/s/searchallcontent).

For a full discussion of this subject, see the "Adaptive Delivery" section of the Ivanti Secure Access Client Supported Platforms Guide.

The default Ivanti Secure Access Client installation settings includes minimal components, which includes the Host Checker component, and a connection to the Ivanti server. If you want a Web install that has customized settings, you can do any of the following:

- Edit the default connection set and add new connections. The default installer uses the default component set which includes the default connection set.
- Create a new connection set and edit the default component set to include the new connection set.
- Edit the role to specify a component set that includes the connections you want for the default installation.

A Ivanti Secure Access Client installation causes a restart of active network connections on a Windows endpoint. When a user initiates a Ivanti Secure Access Client installation through a WAN connection to the Web interface of a Ivanti server, the user might need to log in to their service provider again to reestablish network connectivity. Users need to be aware of this issue before they begin the installation.

Launching Ivanti Secure Access Client from the Ivanti server Web Portal

One typical method of establishing a VPN connection is for users to browse to the Ivanti server's Web portal, login, and then launch Ivanti Secure Access Client from the Web page.

The following items describe the Ivanti Secure Access Client connection behaviors:

- Ivanti Secure Access Client has been installed on the endpoint by using the default Ivanti Secure Access Client installer. The installed Ivanti Secure Access Client does not yet have any connections. The user browses to the Ivanti server, logs into the server, and then clicks the Ivanti Secure Access Client button on the Web portal page. The following action occurs:
  - The default Ivanti Secure Access Client connection set is automatically deployed to the client.
  - The connection that has a URL that matches the server URL is launched.
- Ivanti Secure Access Client has been installed on the endpoint and it has a connection from the Ivanti server. The user browses to the Ivanti server, logs into the server, and then clicks the Ivanti Secure Access Client button on the Web portal page. The following action occurs:
  - The connection that has a URL that matches the server URL is launched.

- Ivanti Secure Access Client has been installed on the endpoint and it has a connection from two different Ivanti servers. The user browses to one of these Ivanti servers, logs into the server, and then clicks the Ivanti Secure Access Client button on the Web portal page. The following action occurs:
  - Only the connection that has a URL that matches the server URL is launched.
- Ivanti Secure Access Client has been installed on the endpoint. It has a connection for one Ivanti server but the user browses to a different Ivanti server, logs into the server, and then clicks the Ivanti Secure Access Client button on the Web portal page. The following action occurs:
  - A new dynamic connection is created on Ivanti Secure Access Client for this Ivanti server. (Note that the default connection on the server must be configured as a dynamic connection.) This new connection is a manual connection, that is, it does not start automatically when Ivanti Secure Access Client starts.
  - The new connection for this Ivanti server is started based on matching URLs.

Usage Notes

The Web browser method of launching Ivanti Secure Access Client is affected by the following configuration issues:

- The Ivanti Secure Access Client connection URL and the server URL must be an exact match. Ivanti Secure Access Client does not perform reverse DNS lookup to find a match.
- Connections that have the connection property **Allow user to override connection policy** disabled cannot be launched from the browser even if URLs match.

Launching Ivanti Secure Access Client using URL

Launching Ivanti Secure Access Client using URL feature enables the user to launch the Ivanti Secure Access Client using the admin prescribed URL. This feature is supported for Windows only.

Administrator creates a web URL (in a prescribed format), and provides it to the user in the following ways:

- URL is placed in a web page in the form of a link and the address of the link is provided to the user.
- URL itself is provided to the user.

User clicks on the link or types the URL in the browser. Ivanti Secure Access Client gets launched and the connection is redirected to the gateway mentioned in the URL.

User receives a link or a URL which has been crafted by an administrator. Following is the format of the URL:

```
pulsesecureclient://
connect?name=NAME&server=SERVERURL&userrealm=REALM&username=USER&stor
e=TRUE
```

Table lists the parameter and their description mentioned in URL:

Parameter	Mandatory/Optional	Action
pulsesecureclient	Mandatory	// URI scheme for URL launching.
connect	Mandatory	This parameter is an action item and establishes the connection.
name	Mandatory	This parameter is an unique parameter, which defines the name of the connection. This connection name is used to identify a specific connection. Connection name will be suffixed by (Auto Launch) for Ivanti Secure Access Client connection established through URL.Connection name will be displayed as Name(Auto Launch). name parameter is case sensitive. For example, a connection named as Connection1 will be different from a connection named as connection1.
server	Mandatory	This parameter defines the sign-in URL, to which Ivanti Secure Access Client should get connected. It can be any one of the following: FQDN IP address (IPv6 and IPv4) A Sign-in URL
userrealm	Optional	This parameter defines the user realm.

Parameter	Mandatory/Optional	Action
		userrealm parameter is case sensitive.
username	Optional	This parameter defines the username. username parameter is case sensitive.
store	Optional	If store value is "True", then the connection information gets saved in the connection store. If store value is "False", then the connection information will not be saved in the connection store. It provides the flexibility for the user to save the connection information for future purposes.

Following is the scenario to understand the behaviour of this feature:

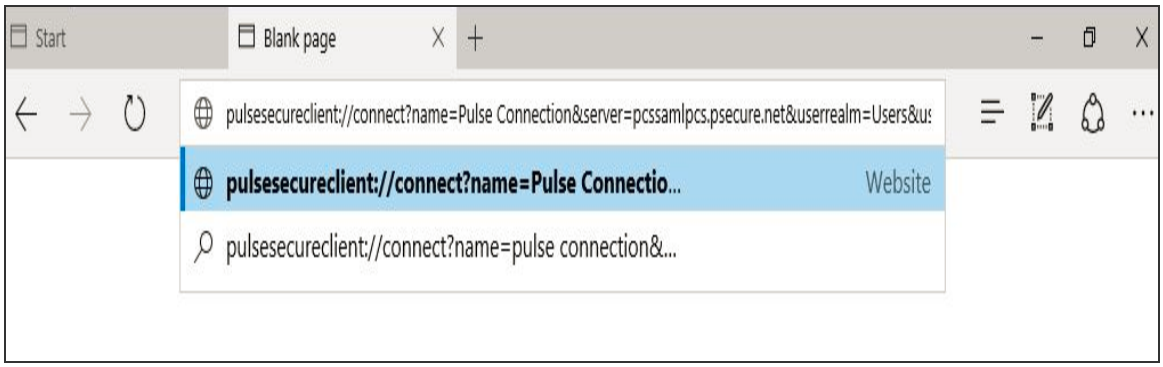
In this scenario, the user establishes a Auto Launch connection to the Ivanti Connect Secure server with userrelam as "Users" and username as "test_user". Also, user wants to store the connection in Ivanti Secure Access Client for future references.

Administrator will craft the URL with the values mentioned in below table:

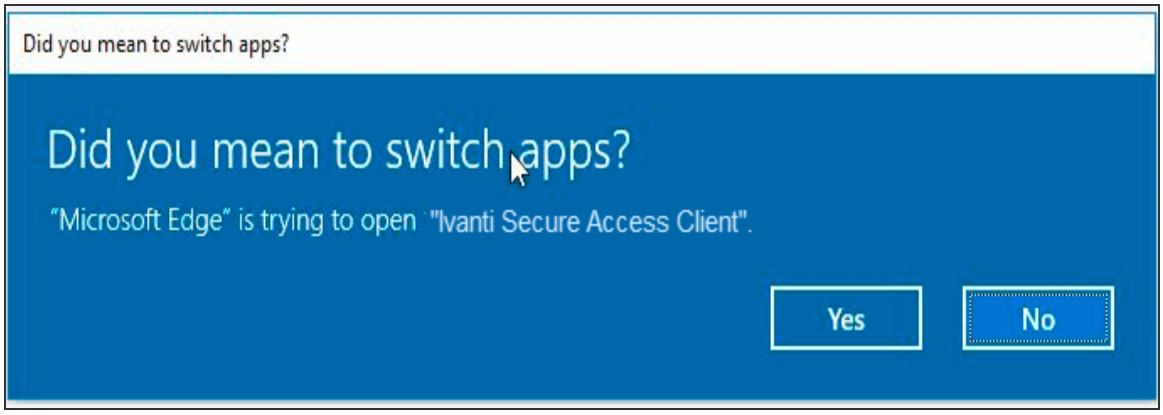
Parameter	Values
name	Test Connection
server	https://pcssamlpcs.psecure.net/
userrealm	Users
username	test_user
store	true

1. User receives a link or the below mentioned URL which has been crafted by an administrator.

   ```
   pulsesecureclient://connect?name=Test Connection&server=https://pcssamlpcs.psecure.net/&userrealm=Users&username=test_user&store=true
   ```



2. Once the user opens the URL (in Edge browser), following screen appears:



   A permission dialog box appears to get the confirmation from the user to launch Ivanti Secure Access Client application via URL.

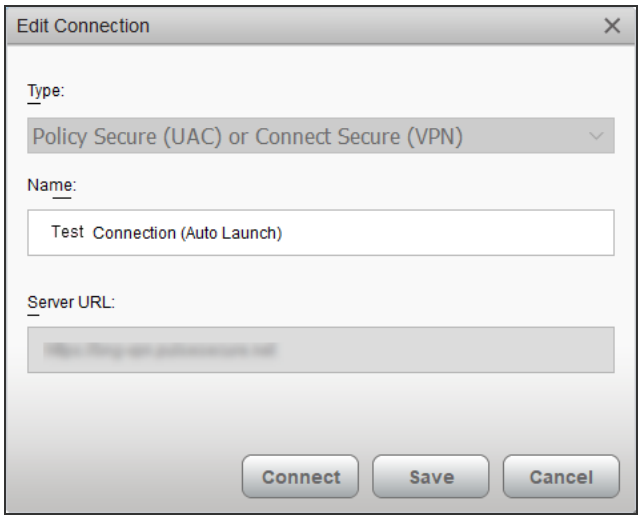
3. User clicks **Yes** button and Ivanti Secure Access Client gets launched.

   A connection with the name specified in the URL is added in the Ivanti Secure Access Client and following screen appears:

Connection name will be suffixed by (Auto Launch) for Ivanti Secure Access Client connection established through URL.

4. User enters the password and clicks the **Connect** button.

   Now, connection <*Connection Name*>*(Auto Launch)* with provided values as mentioned in the table is established. The full connection name can be viewed in Edit window as shown in the following screen.



After this, Ivanti Secure Access Client is launched, and a connection named Test Connection (Auto Launch) is established. This connection is then established with username as test_user.

After successful connection establishment, if a user decides to disconnect the Auto Launch connection, click **Disconnect** button. Auto Launch connection gets disconnected and connection details gets stored in the Ivanti Secure Access Client for future references, as store parameter is set to true in this scenario.

Otherwise, if store parameter is set to false, then the connection details of Auto Launch connection is not be stored after disconnection. Also, next launch of the Ivanti Secure Access Client with same URL will create a new connection.

If the user tries to connect the connection with same connection name but with different server URL, following error message appears:

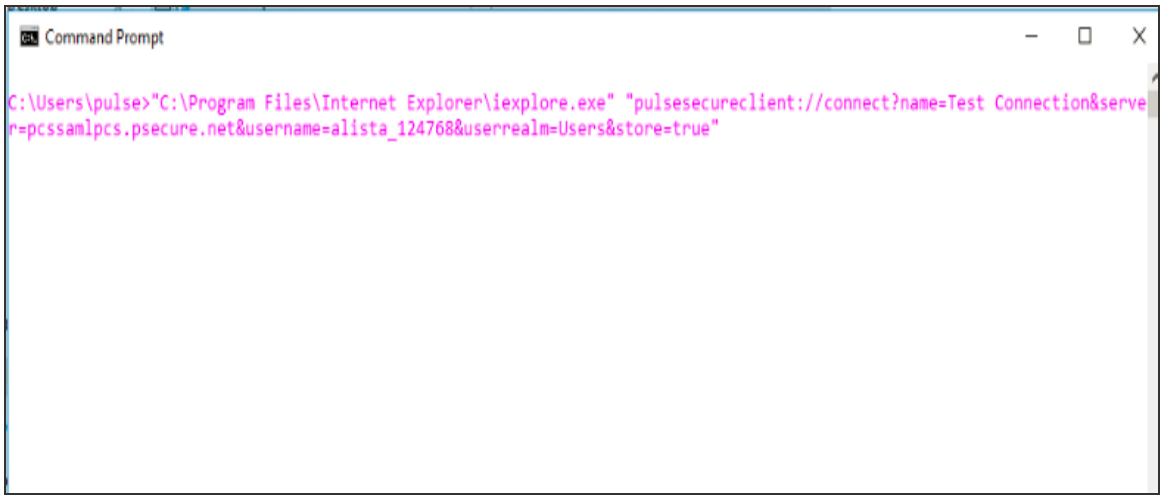
Benefits

Following are the benefits of this feature:

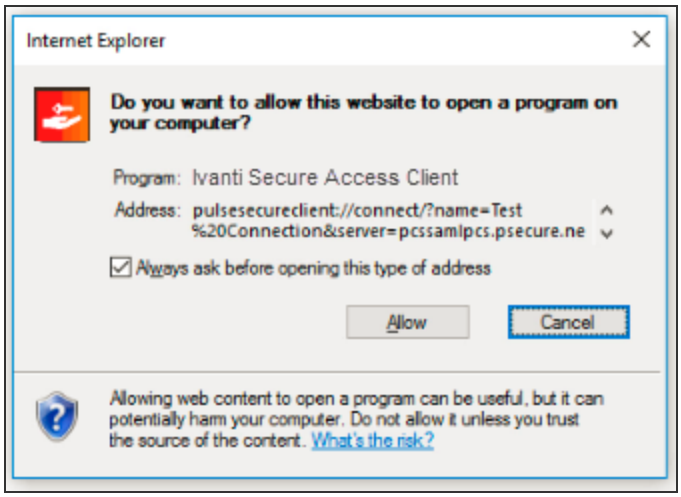
- **Fast Connection**: As URL will handle the Ivanti Secure Access Client launch, user needs not to login through Ivanti Connect Secure, which reduces number of logins, hence time saving and fast connection.
- **Enhancing User Experience**: When ICS (IP or FQDN based), username and realm are prefilled, user just needs to enter the password to login.
- With the help of Store parameter in launch URL format, it will be possible to have temporary client entries. This ensures that each connection need not to be stored in the PDC and PDC does not get filled up with a pile of entries.
- **Scriptability**: Programmatically driven launch of Ivanti Secure Access Client lessens the burden of the Administrator.

Following is the scenario to understand the scriptability behaviour of this feature:

- User enters the URL in command Prompt as shown below:

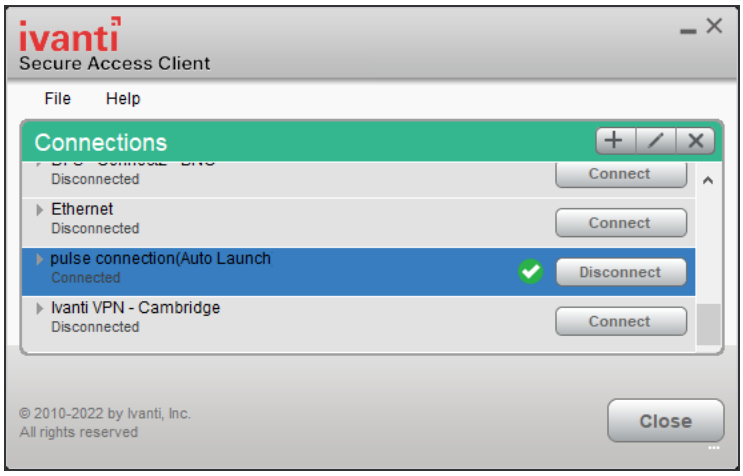


A permission dialog box appears to get the confirmation from the user to launch Ivanti Secure Access Client application.



- User clicks **Allow** button, following authentication screen appears for user to authenticate:

- Click Connect. Following screen appears:



Connection named Test Connection(Auto Launch) with provided values in table is established.

Installing Ivanti Secure Access Client on Windows Endpoints Using a Preconfiguration File

The following procedures apply to Windows installations only.

After you create client connection sets and specify the connections to include within a client component set, you can create a preconfiguration file with all of the connections you want to distribute with Ivanti Secure Access Client. You specify the preconfiguration file as an option when you run the Ivanti Secure Access Client MSI installer program using an msiexec (windows\system32\msiexec.exe) command.

Download the Ivanti Secure Access Client from Software Download Portal. You need to have the login credentials to access the portal.

To create a preconfigured Ivanti Secure Access Client installer for distribution to Windows endpoints:

1. Select **Users > Ivanti > Connections** and create a connection set with the connections that you want to distribute.
2. Select **Users > Ivanti > Components**.
3. If necessary, create a new component set with the connection sets you want to distribute.

   It does not matter which component option you select, All components or No components. The Ivanti Secure Access Client installer installs all components.
4. Select the check boxes next to the component sets that you want to distribute.
5. Click **Download Installer Configuration**.

   You are prompted to save the preconfiguration. You can also specify the name of the target Ivanti server for the connections, which enables you to create configuration files that are the same except for the target server.

   The default filename of the .pulsepreconfig file is the name of the selected component set. Make note of the filename and location where you put the file. The preconfiguration file must be available to the clients either through a network share or distributed along with the Ivanti Secure Access Client installation file.
6. Select **Maintenance > System > Installers**.

   If necessary for your environment, download and install the Ivanti Secure Access Client Installer. To install Ivanti Secure Access Client, users must have appropriate privileges. The Ivanti Secure Access Client Installer allows you to bypass privilege restrictions and allow users with limited privileges to install Ivanti Secure Access Client.
7. Download the appropriate Ivanti Secure Access Client installer for your Windows environment:
   - Ivanti Secure Access Client installer (32-bit)
   - Ivanti Secure Access Client installer (64-bit)

For a Windows installation (.msi) that uses an automated distribution mechanism and where the users do not have administrator privileges, you should ensure that the installation is run in the proper context, typically the USER context. To install in USER context, first advertise the .msi while in the SYSTEM context. For example, to advertise the 64-bit Windows installation to all users, use the following msiexec command:

```
msiexec /jm \PulseSecure.x64.msi
```

The advertisement allows the installation to be run in USER context even if the user is a restricted (non-admin) user. The location where the advertisement is run and where the actual installation is run must be the same. If the installation is an upgrade, you must advertise the upgrade version before running it. (Note that it is much easier to upgrade Ivanti Secure Access Client by not disabling the automatic upgrade feature on the Ivanti server.) After the installation is run by the user, Ivanti Secure Access Client will use the correct user certificate and context.

Installing Ivanti Secure Access Client Using Advanced Command-Line Options

The Ivanti Secure Access Client installer includes Ivanti Secure Access Client and all the software components for all related services. The preconfiguration file contains the definitions of the Ivanti Secure Access Client connections that provide client access to specific Ivanti servers and services.

Usage Notes:

- The preconfigured installer installs all Ivanti Secure Access Client components.
- When you run msiexec, you should append /qn or /qb (msiexec options) to the command line to suppress the installation program user interface. The /qn option specifies a silent install, so no user interface appears. The /qb option also hides the user interface but it displays a progress bar.
- The procedures in this topic are valid with Windows installations only. For information about installing Ivanti Secure Access Client on OS X endpoints, see "Installing Ivanti Secure Access Client on OS X Endpoints Using a Preconfiguration File" on page 29.

You run the Ivanti Secure Access Client preconfigured installer program with msiexec (the command line for launching .msi programs on Windows platforms) and specify the following options.

Command-line options CONFIGFILE is case sensitive and must be all caps.

If the path to the pulsepreconfig file includes spaces, be sure to use quotes around the path.

- **CONFIGFILE**: This property specifies a configuration file to be imported into Ivanti Secure Access Client during installation. The property must include the full path to the configuration file. For example:

```
msiexec /i PulseSecure.x86.msi CONFIGFILE="c:\temp\my
configuration..pulsepreconfig "
```

Examples

To install Ivanti Secure Access Client on a 32-bit Windows endpoint using a configuration file:

```
msiexec /i PulseSecure.x86.msi
CONFIGFILE=c:\temp\myconfiguration.pulsepreconfig /qb
```

To install Ivanti Secure Access Client on a 64-bit Windows endpoint using a configuration file:

```
msiexec /i PulseSecure.x64.msi
CONFIGFILE=c:\temp\myconfiguration.pulsepreconfig /qb
```

To enable or disable the ISAC URL Launch feature through the installer, using the following command:

```
msiexec /i PulseSecure.msi ENABLE_PULSE_URL_LAUNCH=<1/0>
```

To enable or disable the Dynamic Certificate Trust feature via the installer, using the following command:

```
msiexec /i PulseSecure.msi ENABLE_DYNAMIC_CERT_TRUST=<1/0>
```

Repairing a Ivanti Secure Access Client Installation on a Windows Endpoint

Ivanti Secure Access Client uses an MSI installer, which supports a repair function. If problems with Ivanti Secure Access Client on a Windows endpoint indicate missing or damaged files or registry settings, the user can easily run the installation repair program. The repair program performs a reinstallation and replaces any missing files. The repair program does not install any files that were not part of the original installation. For example, if the file that holds Ivanti Secure Access Client connection configurations is damaged, the file installed by the repair program does not replace any Ivanti Secure Access Client connections that were created by the user or deployed to the endpoint after the original Ivanti Secure Access Client installation.

To repair a Ivanti Secure Access Client installation on a Windows endpoint:

1. On the Windows endpoint where Ivanti Secure Access Client is installed, click **Start > Programs > Ivanti > Repair Ivanti**.
2. Follow the prompts for the installation wizard.
   When the program is finished, you might be prompted to reboot the system.

Installing Ivanti Secure Access Client on OS X Endpoints Using a Preconfiguration File

The following procedures apply to OS X installations only.

After you create client connection sets and specify the connections to include within a client component set, you can create a preconfiguration file with all the connections you want to distribute with Ivanti Secure Access Client. After you run the Ivanti Secure Access Client installer on the endpoint, you run a special command that imports the settings from the preconfiguration file into Ivanti Secure Access Client.

To create a preconfigured Ivanti Secure Access Client installer for distribution to OS X endpoints:

1. Select **Users > Ivanti Secure Access Client> Connections** and create a connection set with the connections that you want to distribute.
2. Select **Users > Ivanti Secure Access Client> Components**.
3. If necessary, create a new component set with the connection sets you want to distribute.

The All components or No components options apply to Web-based installations only. The Ivanti Secure Access Client installation program for OS X always installs all components.

4. Select the check boxes next to the component sets that you want to distribute.
5. Click **Download Installer Configuration**.

   You are prompted to save the pre-configuration. You can also specify the name of the target Ivanti server for the connections, which enables you to quickly create multiple configuration files that are the same except for the target server.

   The default filename of the ".pulsepreconfig" file is the name of the selected component set. Make note of the filename and location where you put the file. The preconfiguration file must be available to the clients either through a network share or distributed along with the Ivanti Secure Access Client installer file.
6. Select **Maintenance > System > Installers**.
7. Download the Ivanti Secure Access Client installer, "Ivanti Secure Access Client installer (Macintosh)".

Installing Ivanti Secure Access Client on OS X Endpoints Using Command-Line Options

The Ivanti Secure Access Client installer includes Ivanti Secure Access Client and all of the software components for all of the Ivanti Secure Access Client services. The preconfiguration (.pulsepreconfig) file contains the definitions of the Ivanti Secure Access Client connections that provide client access to specific Ivanti servers and services. After you distribute the Ivanti Secure Access Client installation package, you must first run the installer, and then run a separate program called jamCommand, which imports the settings from the .pulsepreconfig file. The jamCommand program is part of the Ivanti Secure Access Client installation.

The Ivanti Secure Access Client file you download from the Ivanti server is in compressed (.dmg) format. You must unpack the file before you run the Ivanti Secure Access Client installation program.

The following steps include sample commands to install Ivanti Secure Access Client on an OS X endpoint and then import Ivanti Secure Access Client connections from a .pulsepreconfig file.

1. Run the Ivanti Secure Access Client installation program:

   ```
   sudo /usr/sbin/installer -pkg <full-path-to-the-pulse-install-package> -target /
   ```

2. Import the settings from the .pulsepreconfig file:

```
/Applications/Ivanti\ Secure\
Access.app/Contents/Plugins/JamUI/./jamCommand -importfile
/Users/<user profile>/<pre-config file location on local
disk>/<preconfig file name>
```

Installing Ivanti Secure Access Client on Linux Using Command-Line Options

The nss3-tools and net-tools are dependency packages required to successfully install the Ivanti Secure Access Client. Use the following commands to install these dependency tools manually.

Fedora: `yum install <dependency tool name>`

Ubuntu and Debian: `apt-get install < dependency tool name >`

ISAC 22.8R2 is qualified with Ubuntu 24.04. As a pre-requsite, you need to Install libwebkit2gtk-4.0 .
Follow the steps to install libwebkit2gtk-4.0:

1. Open sources list: `vi /etc/apt/sources.list`
2. Add the below line to sources.list and close the file: `deb http://gb.archive.ubuntu.com/ubuntu jammy main`
3. Run commands: `sudo apt update` and `sudo apt install libwebkit2gtk-4.0-dev`
4. Install libcurl4-openssl using command: `sudo apt install libcurl4-openssl-dev`

The Installation Command:

Debian – based installation

```
dpkg -i <package name>
```

RPM – based installation

```
rpm -ivh <package name>
```

The Uninstallation Command:

Debian – based installation

```
dpkg -r <package name>
```

RPM – based installation

```
rpm -e <package name>
```

The upgrade from old Pulse client to new Ivanti Secure Access Client is not supported.

Ivanti Secure Access Client Command-line Launcher

The Ivanti Secure Access Client Launcher (pulselauncher.exe) is a standalone client-side command-line program that allows you to launch Ivanti Secure Access Client and connect to or disconnect from a Ivanti server (Ivanti Connect Secure or Ivanti Policy Secure) without displaying the Ivanti Secure Access Client graphical user interface.

Ivanti Secure Access Client Launcher Usage Notes:

- Ivanti Secure Access Client Launcher runs on Windows 32-bit and 64-bit endpoints.
- The Ivanti Secure Access Client Launcher program, pulselauncher.exe, is installed as part of a Ivanti Secure Access Client installation in Program Files\Common Files\Ivanti\Integration or Program Files (x86)\Common Files\Pulse Secure\Integration.
- Ivanti Secure Access Client Launcher works only for the Connect Secure or Policy Secure (L3) connection type. Ivanti Secure Access Client Launcher does not support Policy Secure (802.1X) connection types.
- The Ivanti Secure Access Client Launcher program does not support the role mapping option that prompts a user to select from a list of assigned roles. If you use the Ivanti Secure Access Client Launcher and more than one role can be assigned to a user, you must configure the role mapping settings for the realm to merge settings for all assigned roles. If the realm settings require the user to select a role, the Ivanti Secure Access Client Launcher command fails and exits with return code 2.
- Ivanti Secure Access Client Launcher does not support secondary authentication.

To use Ivanti Secure Access Client Launcher:

1. Write a script, batch file, or application.
2. Include a call to the Ivanti Secure Access Client Launcher executable, pulselauncher.exe.
3. Include logic in your script, batch file, or application to handle the possible return codes.

Table lists the Ivanti Secure Access Client Launcher arguments.

The following command shows the complete pulselauncher.exe command syntax:

```
pulselauncher [-version|-help|-stop|-loglevel] [-sessionselection
<connect|cancel>] [-url <url> -u <username> -p <password> -r <realm>]
[-d <DSID> -url <url>] [-cert <client certificate> -url <url> -r
<realm>] [-signout|-suspend|-resume -url <url>] [-t timeout)]]
```

Argument	Action
-version	Display the Ivanti Secure Access Client Launcher version information, then exit.
--sessionselection	Allows to terminate the first session when a new session is attempted on reaching maximum number of concurrent sessions This option restricts the user interference and allows the scripts to run automatically.
-help	Display available arguments information.
-stop	Stop Ivanti Secure Access Client and disconnect all active connections.
-L loglevel	Specify the log level to show in logs. 3: Normal - Log Critical, Error, Warning and Info messages (default) 5: Detailed - Log All messages This parameter is applicable for Linux client only.
-url <url>	Specify the Ivanti server URL.
-u <user>	Specify the username.
-p <password>	Specify the password for authentication.
-r <realm>	Specify the realm on the Ivanti server.
-d <DSID>	Passes a cookie to Ivanti Secure Access Client Launcher for a specified Ivanti server from another authentication mechanism when Ivanti Secure Access Client Launcher starts. When you use the -d argument, you must also specify the -url argument to specify the Ivanti server.

Argument	Action
-cert <client certificate>	Specify the certificate to use for user authentication. For <client certificate> use the string specified in the Issued To field of the certificate. When using the -cert argument, you must also specify the -url and -r <realm> arguments. To use certificate authentication with the Ivanti Secure Access Client Launcher program, you must first configure the Ivanti server to allow the user to sign in via user certificate authentication. You must also configure a trusted client CA on the Ivanti server and install the corresponding client-side certificate in the Web browsers of end-users before running the Ivanti Secure Access Client Launcher. If the certificate is invalid, the Ivanti Secure Access Client Launcher displays an error message on the command line and logs a message in the log file. If Ivanti Secure Access Client is launched through a browser, the browser handles certificate verification. If Ivanti Secure Access Client is launched through an application on Windows, the application handles certificate verification. If Ivanti Secure Access Client is launched through the Ivanti Secure Access Client Launcher on Windows, Ivanti Secure Access Client Launcher handles the expired or revoked client certificates.
-signout <url>	Signout disconnects and signs out from a specific server. Suspend puts an active connection in the suspend state without removing the session information from the server. Resume restores a suspended connection. Ivanti Secure Access Client can have multiple simultaneous connections so the -url argument is required when you use -signout, -suspend, or -resume.
-suspend <url>	
-resume <url>	
-t <timeout in seconds>	The amount of time allowed for the connection to take place before the attempt fails. Min = 45 (default), Max = 600.

Code	Description
-1	Ivanti Secure Access Client is not running.
0	Success.

Code	Description
1	A parameter is invalid.
2	Connection has failed or Ivanti Secure Access Client is unable to connect to the specified gateway.
3	Connection established with error.
4	Connection does not exist. Example: the command attempts to sign out from a server that has not been added on the Ivanti Secure Access Client UI.
5	User cancelled connection.
6	Client certificate error.
7	Timeout error.
8	No user connection allowed from Ivanti Secure Access Client UI.
9	No policy override from Ivanti Secure Access Client UI.
25	Invalid action for current connection state. This error code would occur if you tried to suspend or resume a connection that was disconnected.
100	General error.

The return codes specified in Table10 refer to the executable's return codes. On Windows, you can display the last error level with "echo %errorlevel%" (without quotes). On OSX, the command is "echo $?" (without quotes).

Examples

The following command is a simple login application that captures the credentials the user enters, and passes the credentials as arguments to pulselauncher.exe:

```
pulselauncher.exe -u JDoe -p my$Pass84 -url https://int-
company.portal.com/usr -r Users
pulselauncher return code: 0
```

The following Ivanti Secure Access Client Launcher example shows a certificate authentication:

```
pulselauncher.exe -url https://int-company.portal.com/usr -cert
MyCert -url https://int-company.portal.com/usr  -r Users
```

```
pulselauncher return code: 0
```

The following example shows a command to use Ivanti Secure Access Client Launcher to specify a cookie (-d) for a specific Ivanti server (-url):

```
pulselauncher.exe -d 12adf234nasu234 -url https://int-
company.portal.com/usr
pulselauncher return code: 0
```

Using jamCommand to Import Ivanti Connections

The jamCommand.exe program is a command line program that imports a .pulsepreconfig file into Ivanti Secure Access Client. The jamCommand program is available for Windows (Vista, Windows 8.1, and later) and macOS.

From Release 22.7R3, jamCommands for user mode are not supported. However for admin mode, there are no changes.

A .pulsepreconfig file includes Ivanti Secure Access Client connection parameters. You can create a .pulsepreconfig file on the Ivanti server, and then use it as part of a Ivanti Secure Access Client installation to ensure that Ivanti Secure Access Client users have one or more Ivanti Secure Access Client connections when they start Ivanti Secure Access Client for the first time.

One typical use case for jamCommand on a Windows endpoint is to first run jamCommand to import one or more Ivanti Secure Access Client connections from a .pulsepreconfig file, and then run pulselauncher.exe to start Ivanti Secure Access Client.

To install Ivanti Secure Access Client connections using jamCommand:

1. Create a .pulsepreconfig file on the Ivanti server.

   In the Ivanti server admin console, click **Users > Ivanti Secure Access Client > Components**.

2. Select the component sets you want, and then click **Download Installer Configuration**.
3. Distribute the .pulsepreconfig file to the Ivanti Secure Access Client endpoints.
4. Run jamCommand with the .pulsepreconfig file as an option. For example:

On Windows:

```
\Program Files\Common Files\Pulse Secure\JamUI\jamCommand -importfile
myfile.pulsepreconfig
```

On macOS:

```
/Applications/Ivanti\ Secure\
Access.app/Contents/Plugins/JamUI/./jamCommand -importfile
/Users/<user profile>/<pre-config file location on local
disk>/<preconfig file name>
```

On Linux

```
/opt/pulsesecure/bin/jamCommand /ImportFile
~/Downloads/pulsepreconfig
```

If Ivanti Secure Access Client is running when you run jamCommand, the new Ivanti Secure Access Client connection or connections appear immediately. The connection name appears as it was defined when you created the connection in the Ivanti server admin console.

Using jamCommand to change DNS Cache settings

The ISAC installer supports enabling DNS caching at the system level and removing the setting upon uninstallation. End users can use jamcommand.exe to enable, disable, or remove the DNS caching configuration at the user level.

By default, when a client upgrades or installs to version 22.7R2 or the later, DNS caching is Enabled at the global level under the following registry path:

```
HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Pulse Secure\Pulse
```

Use the following commands to change the DNS caching settings:

Action	Command
Enable DNS caching	jamcommand.exe /enableGWDNSCaching 1
Disable DNS caching	jamcommand.exe /enableGWDNSCaching 0
Remove DNS caching	jamcommand.exe /enableGWDNSCaching 2

To disable secure DNS for Embedded Edge Browser then end user machine needs full control permission for the following registry keys:-

`HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\` → system context need full control permission

`HKEY_CURRENT_USER\SOFTWARE\Policies\Microsoft\` → user context need full control permission

jamCommand Reference

Syntax	`jamCommand [-import [script]] [-tray] [-log [level]]`
	
	`/import`
	
	`/importFile <script>`
	
	`/tray`
	
	`/log <level>`
	
	`/stop`
	
	`/suspend <GUIDS>`
	
	`/resume <GUIDS>`
	
	`/resume`
	
	`/brand <brandfile>`
	
	`/unbrand`
	
	`/norestart`

Release Information	Introduced with Ivanti Secure Access Client R1.0. Ivanti Secure Access Client R3.1 introduced the suspend and resume options. Ivanti Secure Access Client R4.0.3 introduced new options to support Ivanti Secure Access Client Customization tool.

Description	The jamCommand.exe program is a command line program that imports a .pulsepreconfig or a "Branding.PulseBrandingPackage" file into Ivanti Secure Access Client. The jamCommand program is available for Windows and macOS.
Options	**import**: Import script from the default memory-mapped file. **importFile <script>**: Import script from the specified file. **tray**: Launch the tray notify application. **log**: Set the global log level. **stop**: Stop the Ivanti Secure Access Client UI. **suspend <GUIDS>**: Suspend the Ivanti Secure Access Client UI. **resume <GUIDS>**: Resume a suspended Ivanti Secure Access Client UI. **brand <brandfile>**: Install the Ivanti Secure Access Client UI changes defined in the Ivanti Secure Access Client branding file. **unbrand**: Remove the changes applied by the Ivanti Secure Access Client branding file. **norestart**: Do not restart Ivanti Secure Access Client after applying the Ivanti Secure Access Client branding file.
Required Privilege Level	administrator

Managing Server Certificate Authorities

Ivanti Secure Access Client verifies server certificate with trusted Certificate Authorities (CA) store in the system. Follow the instructions to add issuing CA certificate to store.

CA certificates are stored in PEM format in trusted CA store. Following command is used to convert CA certificates to PEM format from DER format.

```
openssl x509 -in cert.crt -inform der -outform pem -out cert.pem
```

Linux (Ubuntu, Debian)

To Add CA certificate into system store:

1. Install the ca-certificate package

   ```
   sudo apt-get install ca-certificates
   ```

2. Copy the CA certificate which has been used to sign the device certificate, to /usr/local/share/ca-certificates directory:

   ```
   sudo cp device-ca.crt /usr/local/share/ca-certificates/device-ca.crt
   ```

3. Copy the CA certificate which has been used to sign the certificate of Identity Provider (IdP) (in case of SAML authentication), to /usr/local/share/ca-certificates directory:

   ```
   sudo cp idp-ca.crt /usr/local/share/ca-certificates/idp-ca.crt
   ```

4. Update the CA store:

   ```
   sudo update-ca-certificates
   ```

Linux (Fedora)

To add CA certificate into system store:

1. Become Super User of the machine using the following command:

   ```
   su-
   ```

2. Install the ca-certificates package:

   ```
   yum install ca-certificates
   ```

3. Copy the CA certificate which has been used to sign the device certificate, to /usr/local/share/ca-certificates directory:

   ```
   sudo cp device-ca.crt /etc/pki/ca-trust/source/anchors/
   ```

4. Enable the dynamic CA configuration feature:

   ```
   update-ca-trust force-enable
   ```

5. Copy the CA certificate which has been used to sign the certificate of Identity Provider (IdP) (in case of SAML authentication), to /usr/local/share/ca-certificates directory:

   ```
   sudo cp idp-ca.crt /usr/local/share/ca-certificates/idp-ca.crt
   ```

6. Use command:

   ```
   update-ca-trust extract
   ```

If the user connects to servers which have certificates not trusted by the machine the following error message displays:

If connecting to untrusted sites through Embedded browser, the following error displays:

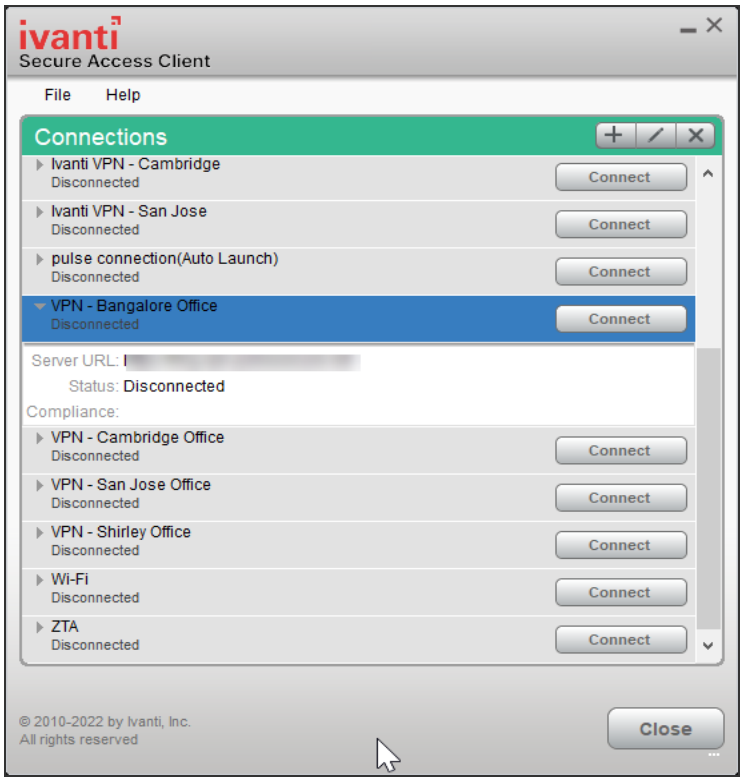
Chromium Embedded Framework (CEF) Support

Chromium Embedded Framework (CEF) is used as the embedded browser for custom sign-in, SAML Authentication, on all the platform to work with FIDO U2F.

CEF installation on UI

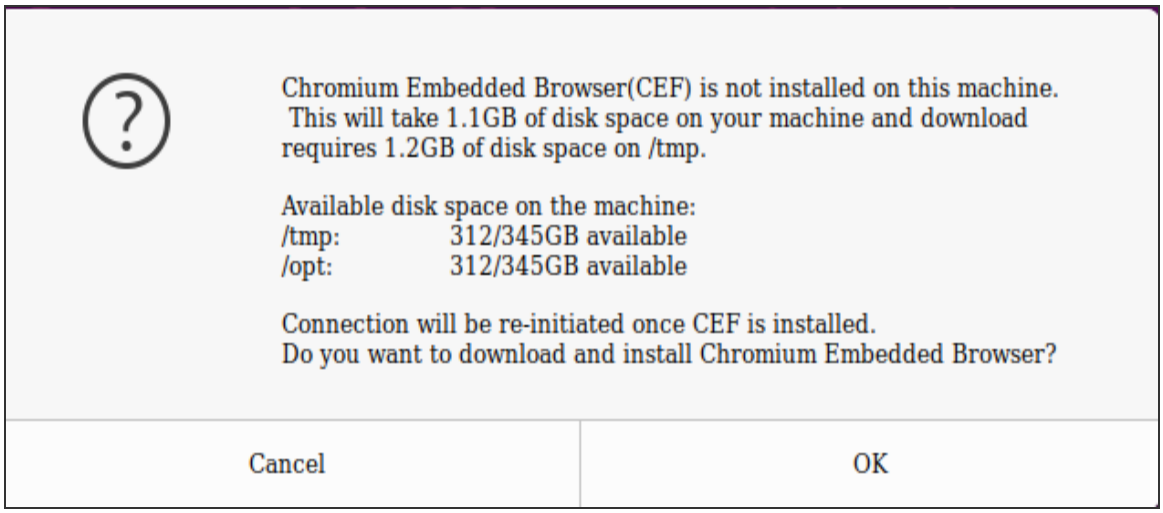
To install CEF browser using Pulse UI, use the following procedure.

1. Launch Ivanti Secure Access Client application and select a connection and click **Connect**.

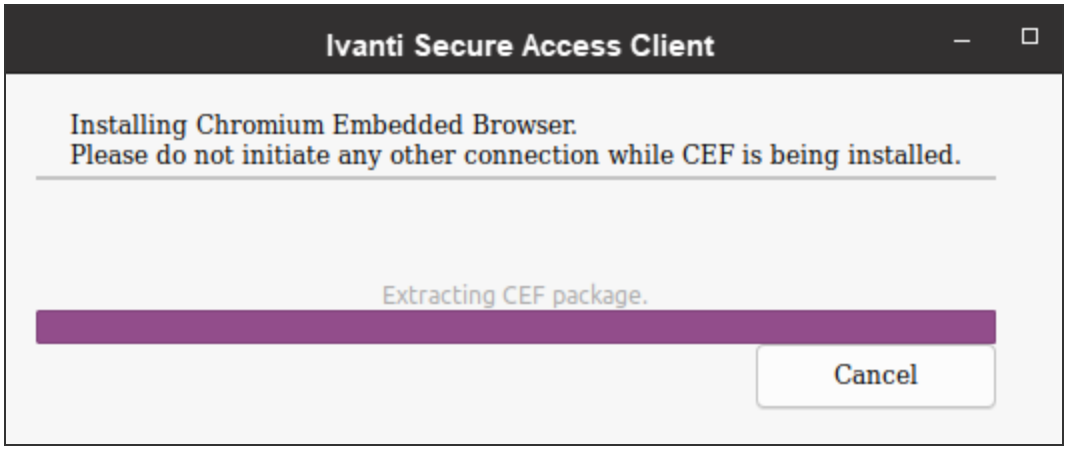


2. An authentication confirmation window appears. Click **OK** to continue.

3. A CEF download confirmation window appears, click **OK** to download and install CEF browser.



The installation progress and status displays. Ensure not to initiate any other connection when CEF installation is in progress.



User is prompted for authentication and the Connection proceeds.

If Ivanti Secure Access Client is not closed, and opened again, the client authenticates the user without prompting for credentials after the first successful authentication.

CEF Installation Using scripts

Use the following util scripts “setup_cef.sh” to manage CEF using the scripts.

```
/opt/pulsesecure/bin$ ./setup_cef.sh <install|reinstall|uninstall >
[-tmpDirPath <Path>]
```

The CEF package downloads and extracts to a temporary directory -*tmpDirPath* This directory is cleared upon installation.

- **install:** installs CEF only if not already installed.
- **reinstall:** removes and reinstalls CEF.
- **Uninstall**: removes the CEF.

CEF reinstall is supported only using scripts.

- The **install** option runs only with root privileges.
- Installation requires 1276 MB of free space in the tmpDirPath. This space is used only during installation and freed upon installation.
- 1063 MB of free space is needed in the /opt

To check if CEF is installed

```
/opt/pulsesecure/bin$ ./setup_cef.sh check_installed
```

Uninstalling Ivanti Secure Access Client does not remove CEF library or the client certificates used for Certificate Authentication.

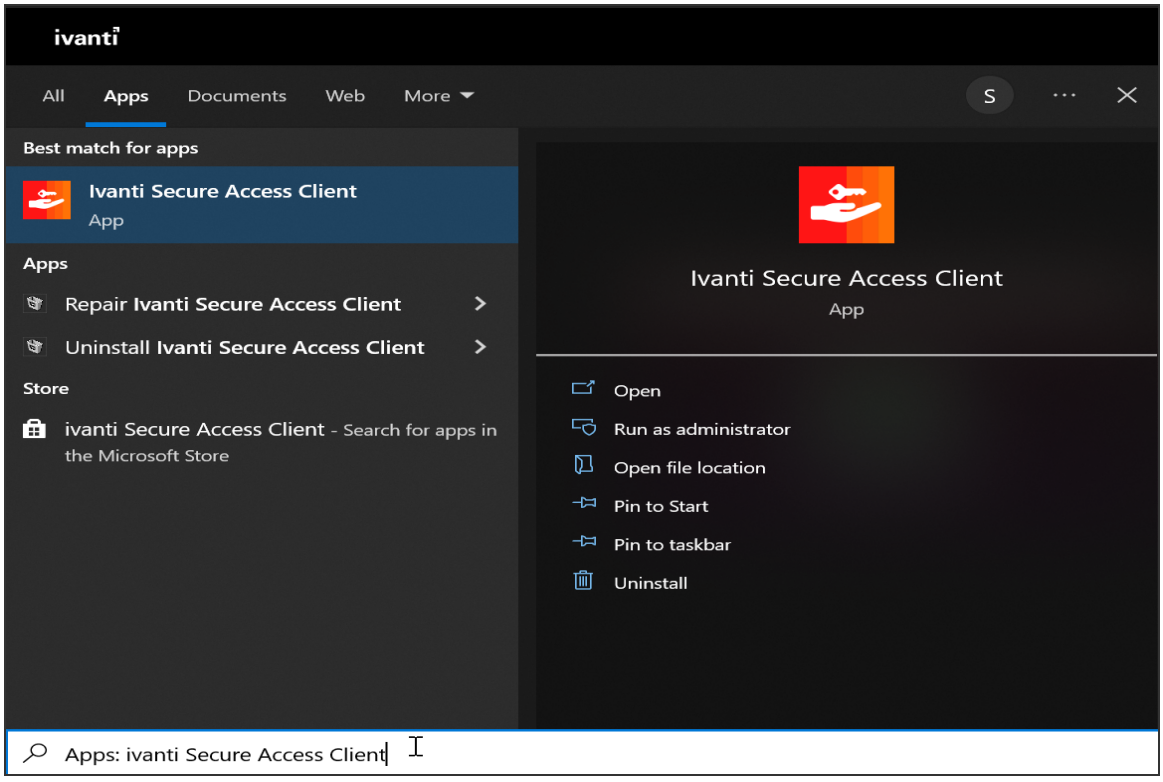
Using Ivanti Secure Access Client Interface

To launch Ivanti Secure Access Client from Desktop

Pulse Secure Client is re-branded as Ivanti Secure Access Client. The release numbering is updated to 22.RX. Complete UX rebranding and the UI upgrade is implemented. There is also an option to switch between the Classic UI and New-UI to maintain user experience. The Pulse Secure client icon is replaced by Ivanti Secure Access Client icon . For more information refer KB45301.

To enable the New-UX installation, sideloading of Windows Apps must be enabled on the system.

Launch Ivanti Secure Access Client by searching for Ivanti Secure Access Client Icon under Applications List.



To launch Ivanti Secure Access Client from the Terminal

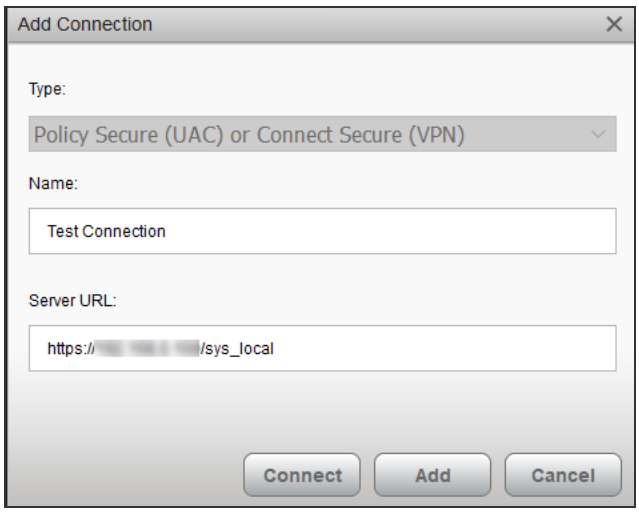
Launch the UI by executing the below command

```
/opt/pulsesecure/bin/pulseUI
```

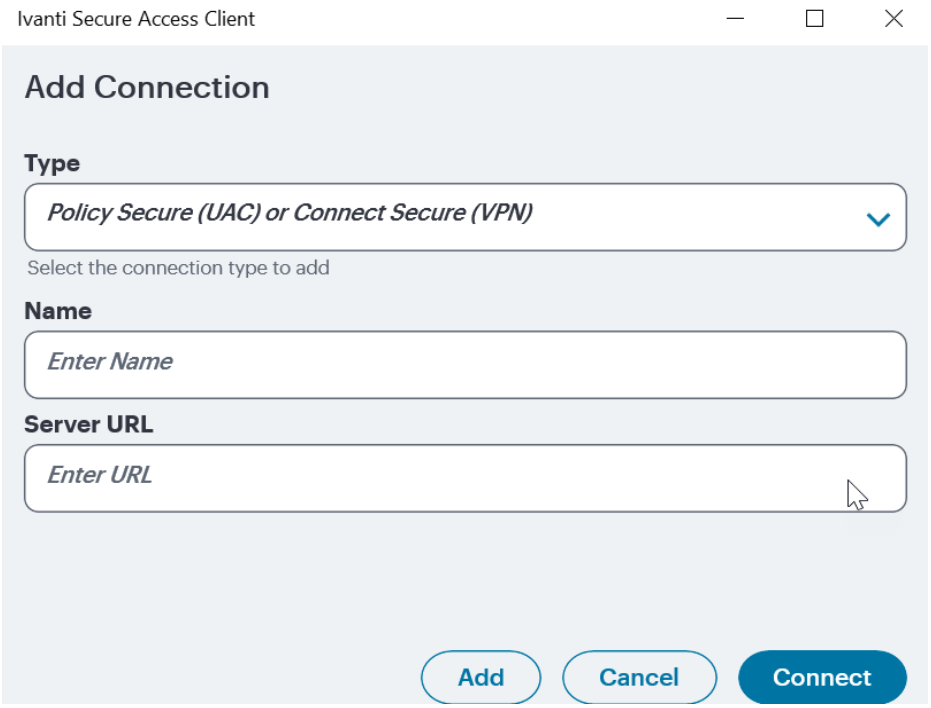
Adding VPN Connections

To create a Ivanti VPN connection on a device:

Classic UI



New-UX



Click Add icon on the top-right-hand corner of the main Ivanti Secure Access Client screen.

1. In the **Name** field, specify the name for the Ivanti Connect Secure gateway.
2. In the **Server URL** field, specify the URL for the Ivanti Connect Secure gateway.
   You can identify the server using the server IP address, the hostname, or a URL that optionally specifies the port the connection uses and the specific sign-in page. To specify an URL, use the following format: https://hostname[:port][/][sign-in page]

   The brackets indicate options. If you specify a specific sign-in page, make sure that the name you specify matches what is defined on the Ivanti Connect Secure gateway. (**Authentication** > **Signing in** > **Sign-in pages**.)
3. Click **Add**. The new VPN connection appears in the VPN list.

   Click **Connect** to initiate a VPN connection. The VPN connection state is indicated in the VPN dropdown menu on the VPN list.

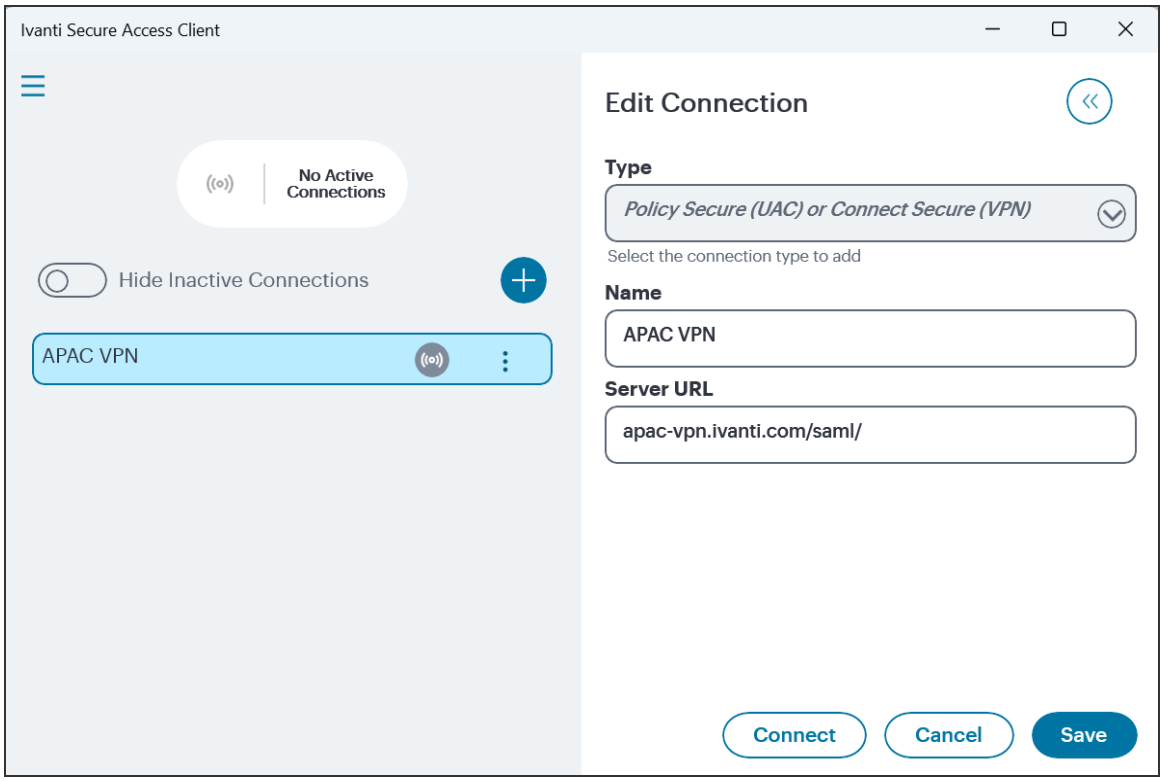
Use “JamCommand” tool to import connections to client store using CLI.

```
/opt/pulsesecure/bin/jamCommand /ImportFile
~/Downloads/pulsepreconfig
```

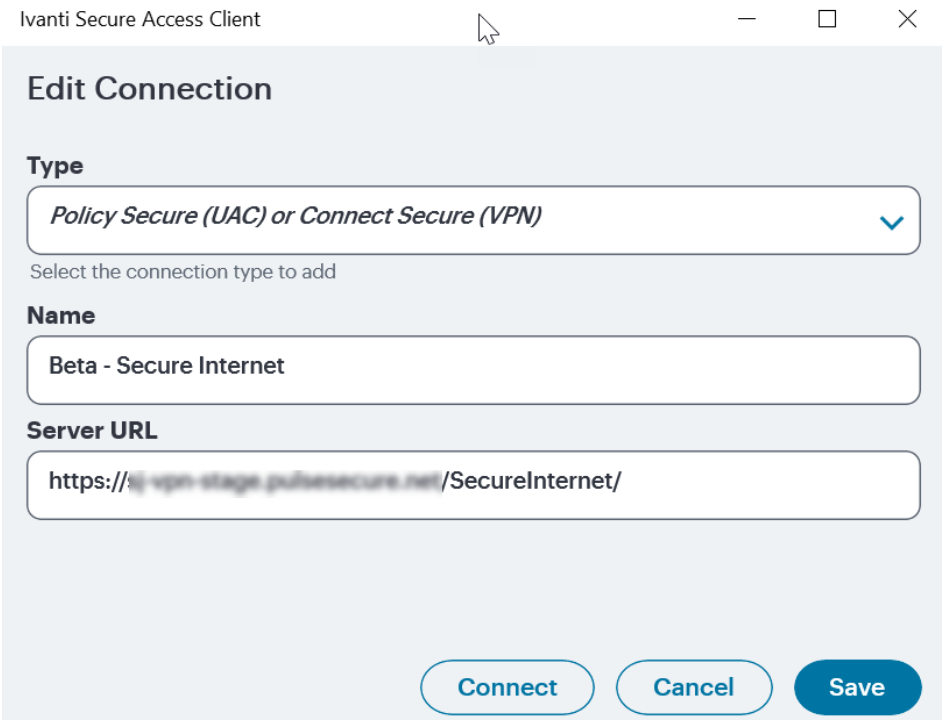
Modifying VPN Connection

To modify a Ivanti VPN connection on a device:

Classic UI



New-UX



1. Select the VPN connection and click the edit icon on the top-right-hand corner of the main Ivanti Secure Access Client screen.
2. In the **Name** field, specify the name for the Ivanti Connect Secure gateway.
3. In the **Server URL** field, specify the URL for the Ivanti Connect Secure gateway.
   You can identify the server using the server IP address, the hostname, or a URL that optionally specifies the port the connection uses and the specific sign-in page. To specify an URL, use the following format: https://hostname[:port][/][sign-in page]

   The brackets indicate options. If you specify a specific sign-in page, make sure that the name you specify matches what is defined on the Ivanti Connect Secure gateway. (**Authentication** > **Signing in** > **Sign-in pages**.)
4. Click **Save**, modified VPN connection appears in the VPN list.

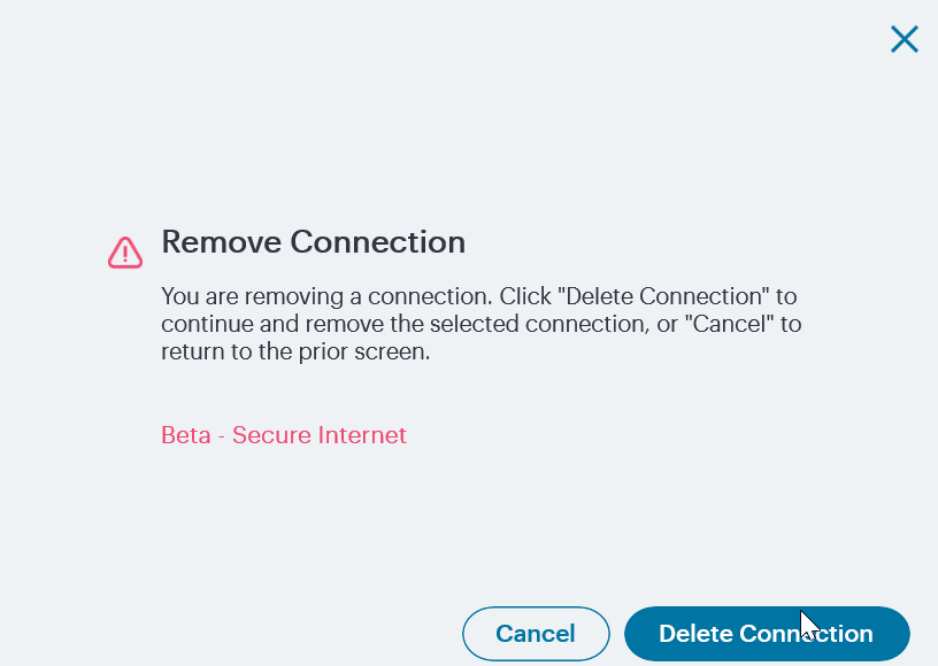
   Tap **Connect** to initiate a VPN connection. The VPN connection state is indicated in the VPN dropdown menu on the VPN list.

Deleting VPN Connection

To delete a Ivanti VPN connection on a device:

Classic UI

New-UX

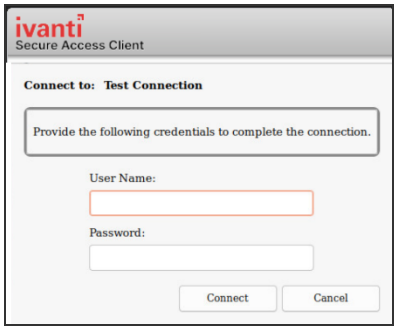


1. Select the VPN connection and click on the delete icon on the top-right-hand corner of the main Ivanti Secure Access Client screen.
2. VPN connection is removed from the VPN list after user click the **OK** button on the above screen.

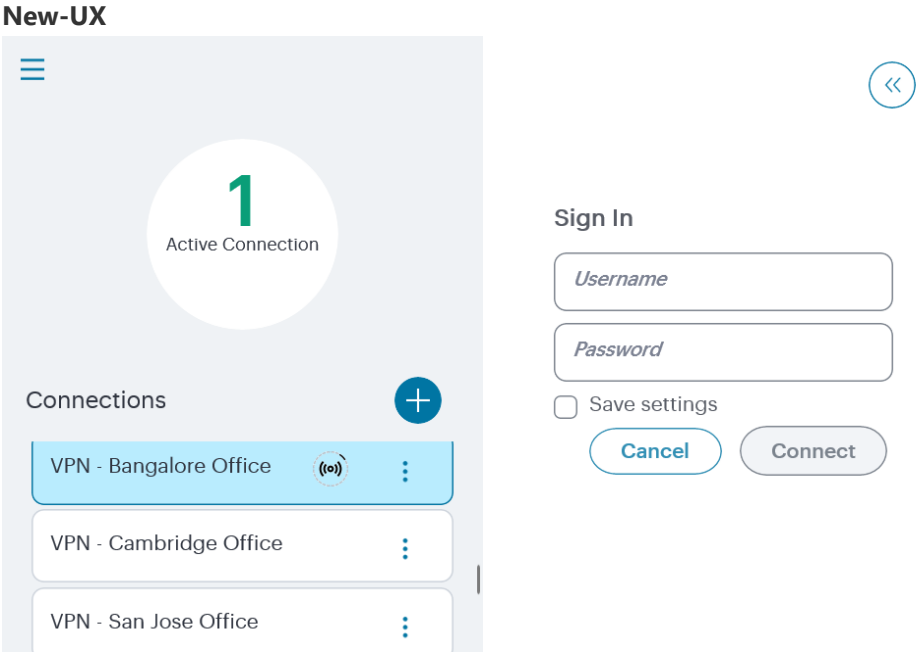
Initiating VPN Connection

To initiate a Ivanti VPN connection on a device:

Classic UI



New-UX

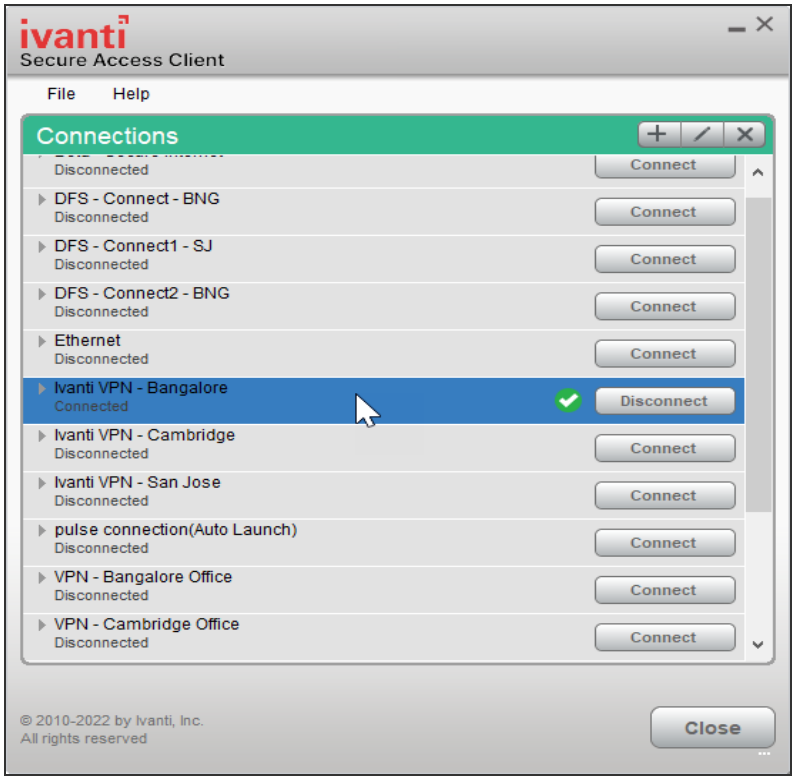


1. Select the VPN connection and click **Connect** on the main screen.
2. New window opens to continue authentication process based on the authentication method configured for the realm.

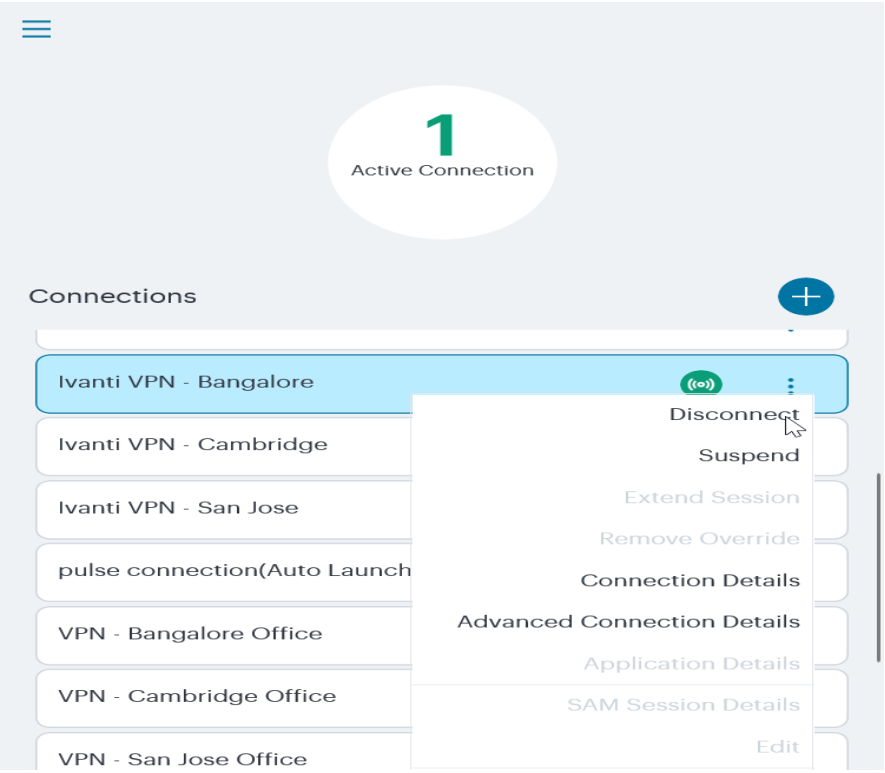
Terminating VPN Connection

To terminate a Ivanti VPN connection on a device:

Classic UI



New-UX



On Classic UI, select the VPN connection and click **Disconnect** on the main screen.

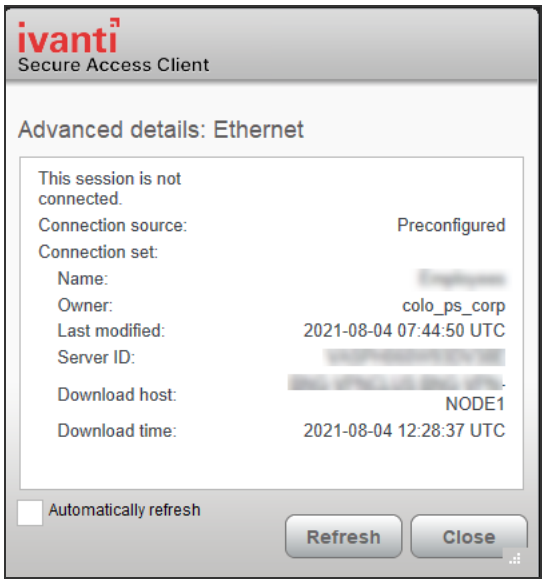
On New-UX, select the VPN connection and click ⋮ and select **Disconnect**.

Ivanti Secure Access Client automatically attempts to reconnect in case of an interrupted connection, such as temporarily losing the Wi-Fi link.

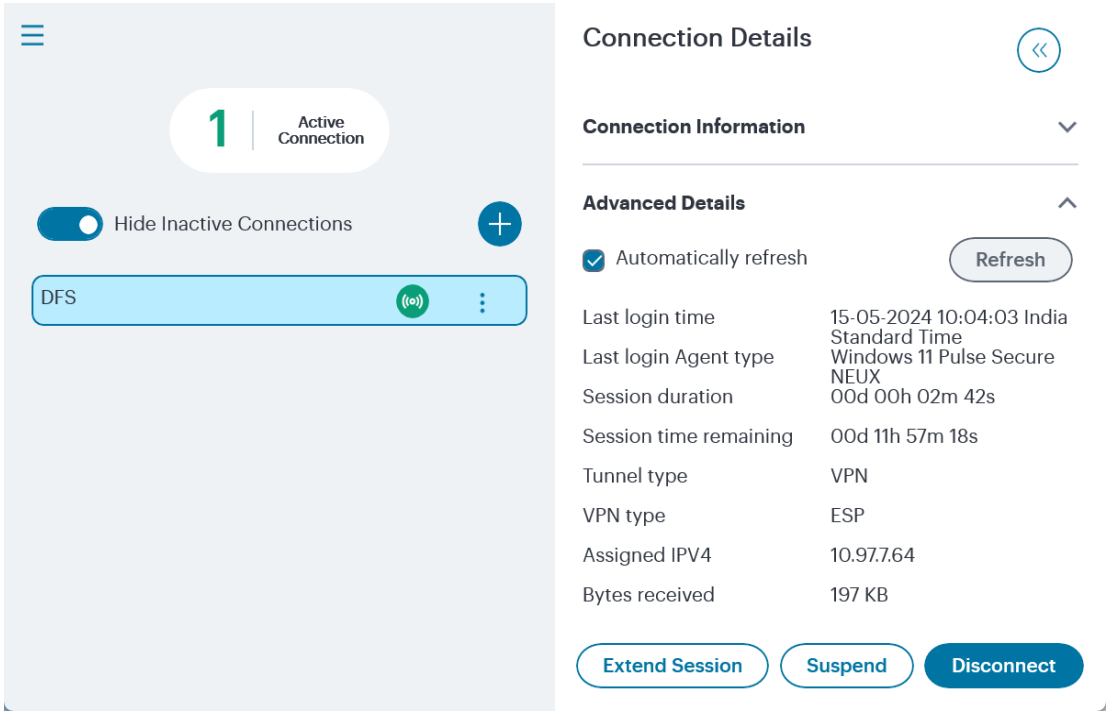
Advanced Connection Details

Advanced connection details page shows the status of the selected VPN connection from the list.

To view advanced connection details on classic UI, navigate to **File > Connections > Advanced Status Details.**



To view advanced connection details on New-UX, click ⋮ and select **Connection Details.**

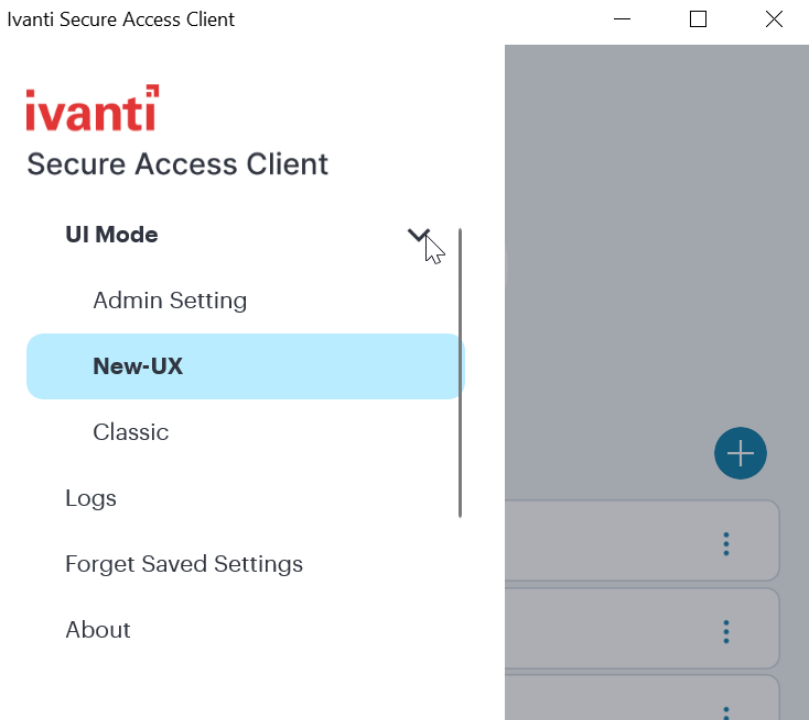


To upload logs to the VPN server, the user needs to be authenticated with an active session.

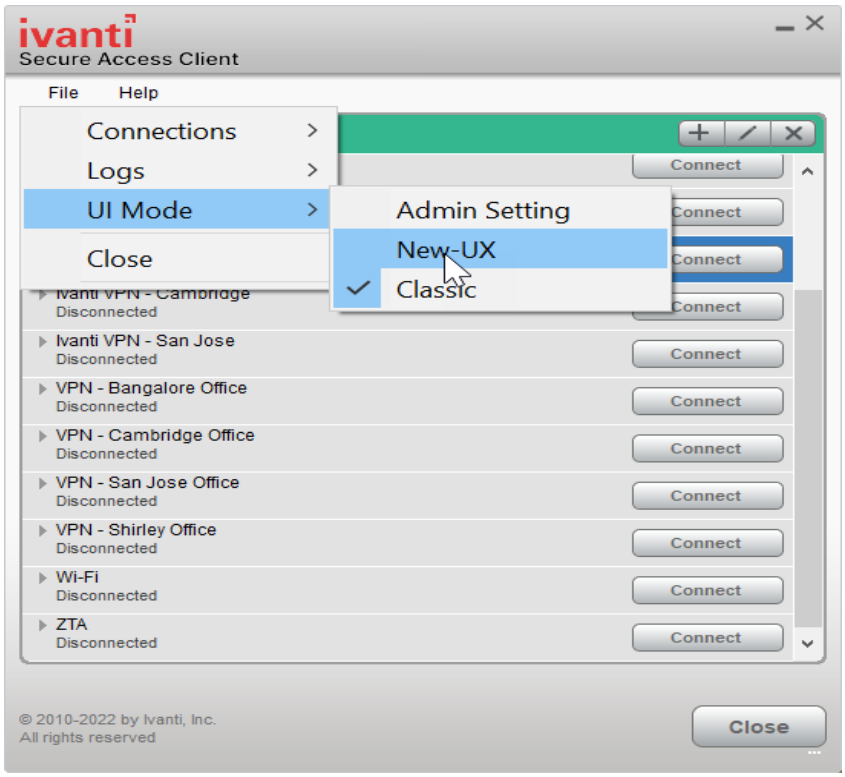
Switching UI modes

The Ivanti Secure Access Client allows to navigate from the New-UX to Classic UI and vice versa.

On New-UX, select ☰ and UI mode to switch between the modes.



On Classic UI, click **File > UI Mode** to switch between the modes.



Select **Admin Setting** to change the mode as per the server settings. Confirm the switch on the display message to reset to UI interface as set on the server.

About Ivanti Secure Access Client

To view Ivanti Secure Access Client details:

1. Click **Help>About** on classic UI or ☰ **> About** on New-UX.

Classic UI

New-UX

Uninstall Ivanti Secure Access Client

Search for Ivanti Secure Access Client Icon under Applications List. Uninstall "Ivanti Secure Access Client" form the list under Add/Remove programs.

Ivanti Secure Access Client for Windows

The Ivanti Secure Access Client for Windows user interface (see figure) lists the deployed Ivanti Secure Access Client connections. Each connection is a set of properties that enables network access through a specific Ivanti server. The user can expand a connection to see more details about the connection.

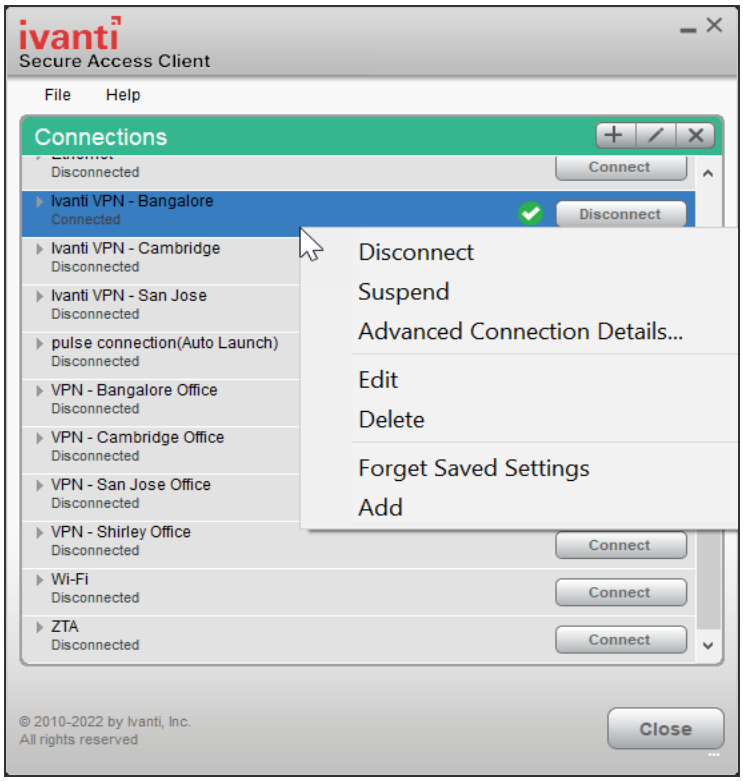
Download the Ivanti Secure Access Client from Software Download Portal. You need to have the login credentials to access the portal.

Ivanti Secure Access Client connects to the server through proxy at the first attempt and then try connecting directly upon failure.

VPN Connections

To view the VPN connection details dialog:

1. Select the VPN connection from the list of connection items.
2. Click **File** --> **Connections --> Advanced Connection Details**, or Right click the selected connection to get the context menu, refer to the following figure.



The Advanced Connection Detail information window will not update automatically. For example, the session time remaining shows how much time remains when you open the dialog. To update advanced detail information, click Refresh or click the check box labeled automatically refresh.

The Advanced Connection Details window gives the following information

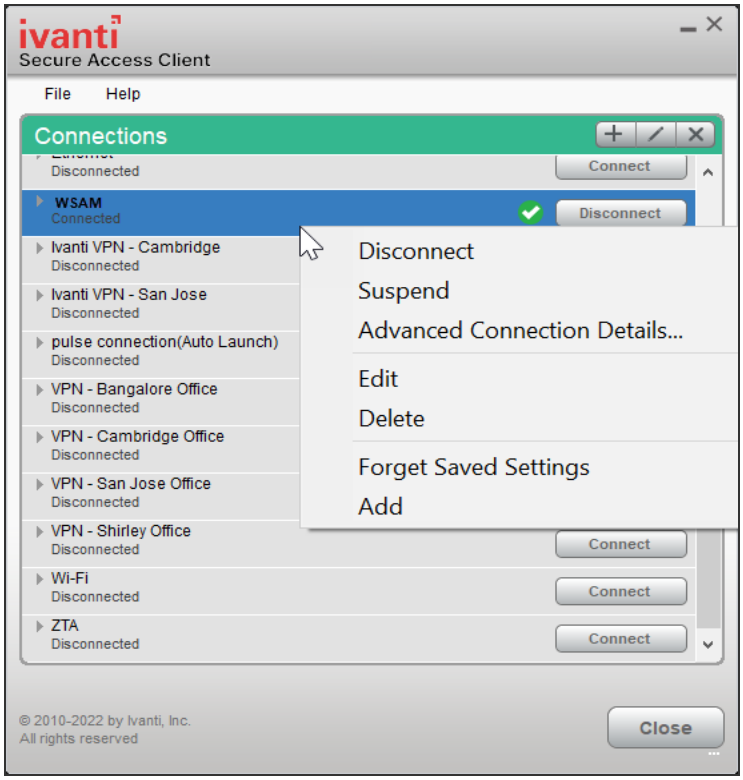
Field Name	Description
Session time remaining	The duration that the current VPN session will remain active before credentials must be re-entered or the session manually extended.
Session Duration	The duration elapsed for the session.
Tunnel type	This describes that the connection is a VPN tunnel.
VPN type	The protocol used to create the tunnel (SSL or ESP).
Assigned IPv4	The IPv4 address assigned to the virtual adapter.
Bytes in	Number of bytes received through the tunnel.
Bytes out	Number of bytes sent through the tunnel.
Connection Source	This describes how the Ivanti Secure Access Client received the connection entry: If the value is Preconfigured, then the connection entry came from a Connection Set that was downloaded from a gateway.

Field Name	Description
	And if the value is Dynamic, then it means that the connection entry was resulted from launching the Ivanti Secure Access Client by connecting a web browser to an Ivanti gateway and pressing the "Start" button on the web page

PSAM Connection Details

To view the PSAM Advanced Connection Details dialog:

1. Select the PSAM connection from the list of connection items.
2. Click **File** --> **Connections --> Advanced Connection Details**, or right click the selected connection to get the context menu, refer to the following figure.



The Advanced Connection Detail information will not update automatically. For example, the session time remaining shows how much time remains when you open the dialog. To update advanced detail information, click **Refresh** or click the check box labeled automatically refresh.

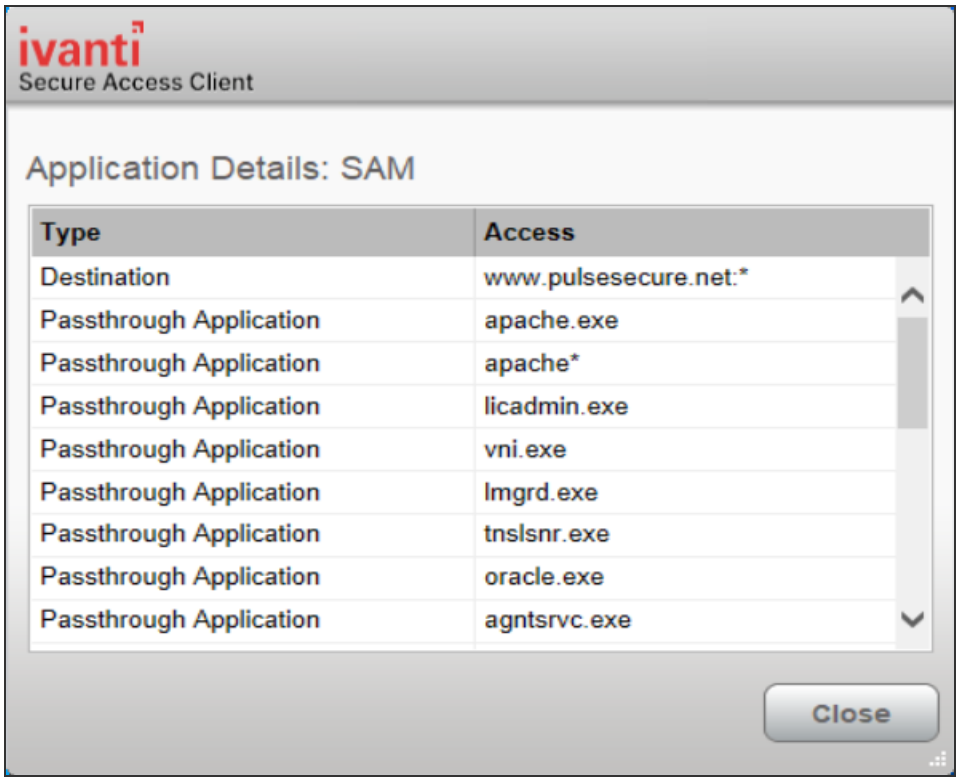
The Advanced Connection Details window gives the following information:

Field Name	Description
Session time remaining	The duration that the current VPN session will remain active before credentials must be re-entered or the session manually extended.
Session Duration	The duration elapsed for the session.
Tunnel type	This describes that the connection is a port/application mapping through SAM (Secure Access Manager).
VPN type	The protocol used to create the tunnel (SSL or ESP).
Bytes in	Number of bytes received through the tunnel.
Bytes out	Number of bytes sent through the tunnel.

PSAM Application Details

1. Select the PSAM connection from the list of connection items.

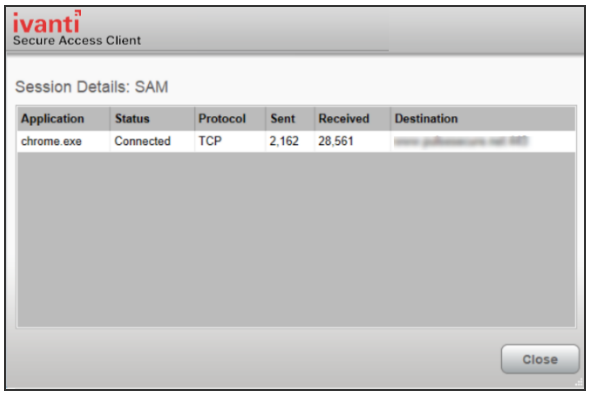
2. Click **File** --> **Connections --**> **Application Details**, or right click on the selected connection to get the context menu, refer to the following figure.



PSAM Session Details

To view the PSAM Session Details dialog:

1. Select the PSAM connection from the list of connection items.
2. Click **File** --> **Connections --> SAM Session Details**, or right click the selected connection to get the context menu, refer to the following figure.



The PSAM Session Details window gives the following information:

Field Name	Description
Application	The name of the application running in the active session.
Status	The status of the application in the session.
Protocol	The protocol used for the session.
Sent	Number of bytes sent in the established session.
Received	Number of bytes received in the established session.
Destination	The target used by the application.

Ivanti Secure Access Client also displays a system tray icon that provides connection status, and can allow the user to connect and disconnect and enables quick access to the program interface. One tray icon provides status for all active connections.

Typically, the network administrator defines and deploys the Ivanti Secure Access Client connections but you can also enable users to define, edit, and remove their own connections.

New-UX Indicator	Classic UI Indicator	Description
		Connected.
		Connecting.

New-UX Indicator	Classic UI Indicator	Description
		Connected with limitations
		Connection attempt failed.
		Connection suspended.
		Connected to the local network but no Internet access available. Public WiFi locations often deploy a captive portal that requires the user to enter authentication information or to accept terms of service before network access is granted. Ivanti Secure Access Client detects the presence of captive portals and does not initiate a connection to a Ivanti server until Internet access is granted.

Ivanti Secure Access Client supports the Federal Information Processing Standard (FIPS), which defines secure communication practices for the U.S. government. If FIPS is enabled on the endpoint, "FIPS On" appears near the bottom the Ivanti Secure Access Client window.

A single system tray icon indicates the status of all active Ivanti Secure Access Client connections. You can right-click the system tray icon to control Ivanti Secure Access Client connections, to open the Ivanti Secure Access Client interface, or to exit from Ivanti Secure Access Client. The following table shows the connection status indicated by the system tray icon.

Tray Icon Indicator	Description
	No connection
	Connecting. A connection stays in this state until it fails or succeeds.
	Suspended
	Connected with issues

Tray Icon Indicator	Description
	Connection failed
	Connected
	Connected to the local network but no Internet access available. Public WiFi locations often deploy a captive portal that requires the user to enter authentication information or to accept terms of service before network access is granted. Ivanti Secure Access Client detects the presence of captive portals and does not initiate a connection to a Ivanti server until Internet access is granted.

Ivanti Secure Access Client for macOS

Ivanti Secure Access Client supports Apple computers running macOS. You deploy Ivanti Secure Access Client to Mac endpoints the same way you deploy the Windows client.

Download the Ivanti Secure Access Client from Software Download Portal. You need to have the login credentials to access the portal.

Ivanti Secure Access Client for Mac endpoints supports the following features:

- Connections to Ivanti Policy Secure
- Connections to Ivanti Connect Secure

Ivanti Secure Access Clients connect to the Ivanti Connect Secure in SSL fallback mode.

- PSAM on macOS
- Host Checker
- Host Checker for macOS supports the following rules and remediation actions:
    - Port
    - Process
    - File
    - Custom IMC

- Enable Custom Instructions
- Kill Processes
- Delete Files
- Send reason strings

Ivanti Secure Access Client for Linux

Ivanti Secure Access Client for Linux provides secure connectivity between a device running Linux and Ivanti Connect Secure. After installing the Ivanti Secure Access Client VPN package on a Linux device, the user can configure a connection and establish Layer 3 VPN communications.

Download the Ivanti Secure Access Client from Software Download Portal. You need to have the login credentials to access the portal.

The following features are supported by the Ivanti Secure Access Client for Linux:

- Ivanti Secure Access Client Usability Improvements
- VPN (SSL) connections to a Ivanti Secure Access Client SSL/VPN server.
- IPV6 mixed modes like IPv4 connections in IPV6 tunnels and vice versa
- Source IP enforcement through Ivanti Policy Secure
- SAML and Custom Sign-in support for Linux
- 64-bit Operating Systems Support
- Multi-Factor Authentication (MFA) Support
- Host Checker
- Command Line Support
- RPM/DEB Package Support
- Pre- and post-authentication sign-in notification messages
- Client Certificate Authentication Support
- VPN tunneling connections for IPv4 and IPv6 resource access
- IP based split tunneling and route monitoring

User Experience

From the user perspective, Ivanti Secure Access Client presents a clean, uncomplicated interface. The user can enter credentials, select a realm, save settings, and accept or reject the server certificate. When you configure the Ivanti Secure Access Client, you can specify whether to permit end users to modify settings, such as by adding connections.

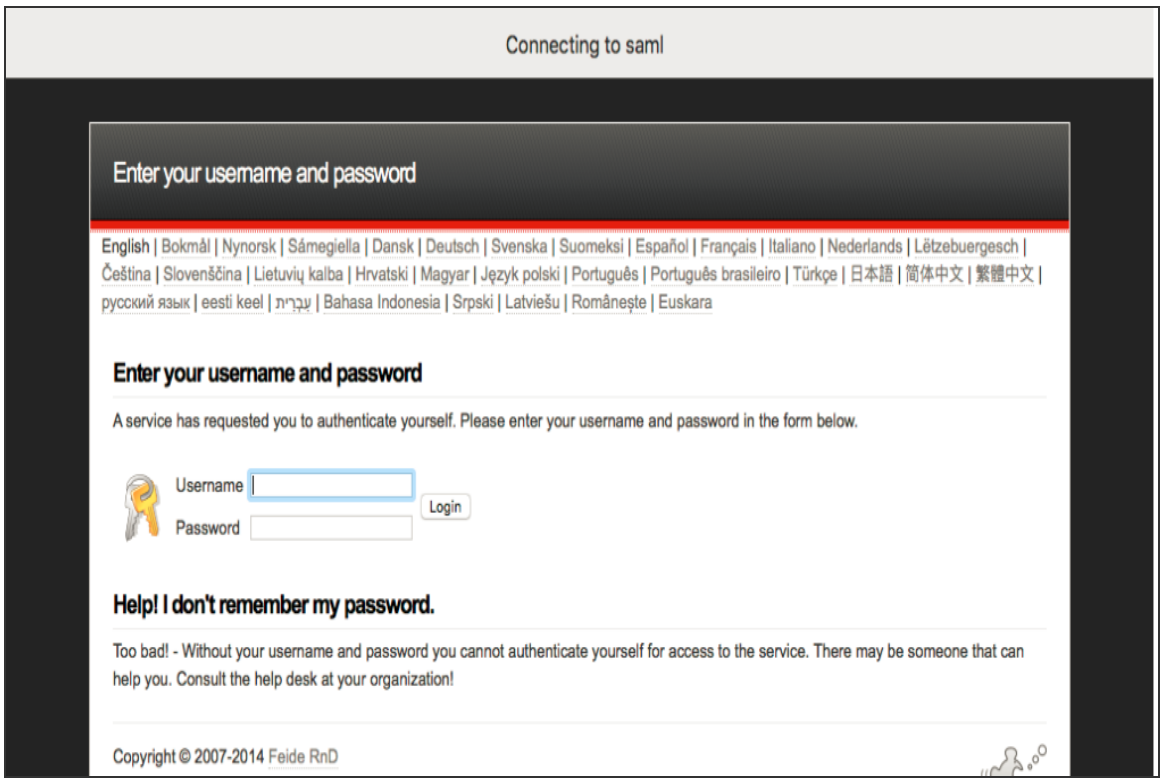
Security Assertion Markup Language (SAML) Authentication

Ivanti Secure Access Client facilitates SAML authentication for Single Sign-on (SSO) in the following two ways:

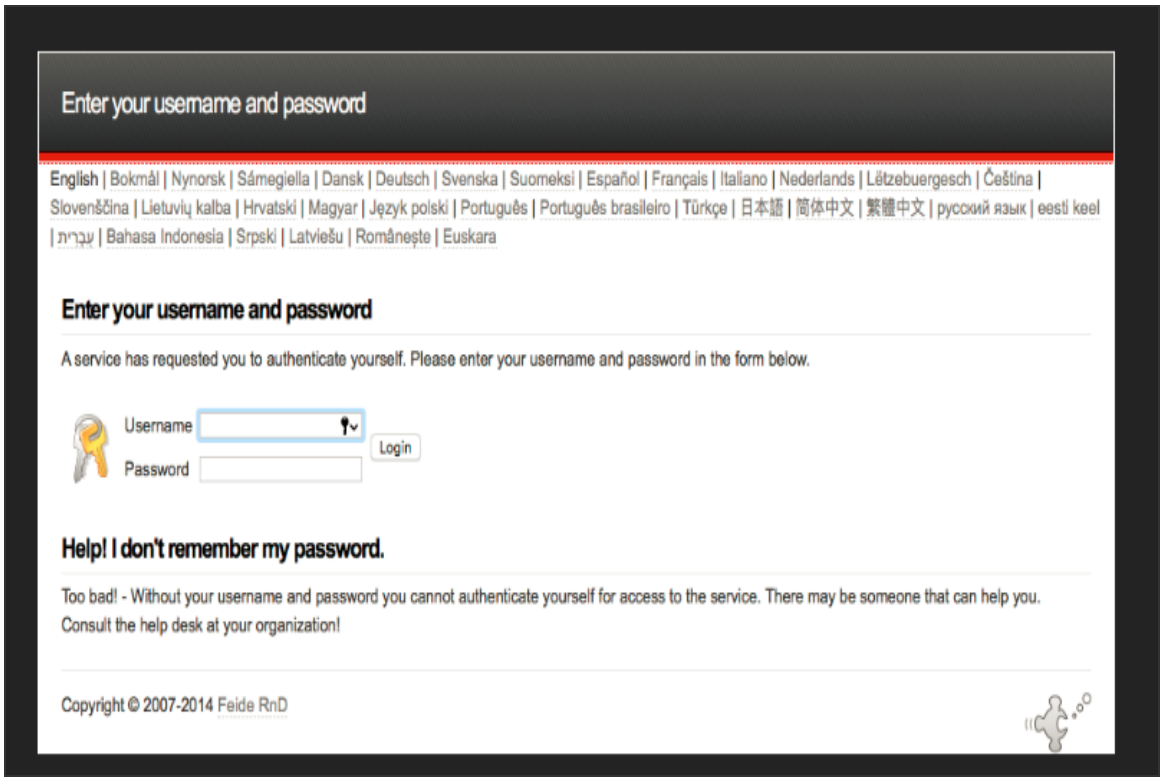
- The Ivanti Secure Access Client user sees an embedded browser (see figure) - if **Enable embedded browser for authentication** is enabled.

Ivanti Secure Access Client will close the embedded browser, once the SAML authentication is done.

If user resizes the Embedded browser window, size will remain same even if user reconnects to Ivanti Secure Access Client. Embedded browser window size will remain as pre-selected size which was set by the user for the first time, until user resizes it again.



- The Ivanti Secure Access Client user sees an external browser (see figure). if **Enable embedded browser for authentication** is disabled.



Single Logout

Single logout is a mechanism provided by SAML for logging out a particular user from all the sessions created by the identity provider.

Ivanti Secure Access Client supports Single Logout only when embedded browser is enabled.

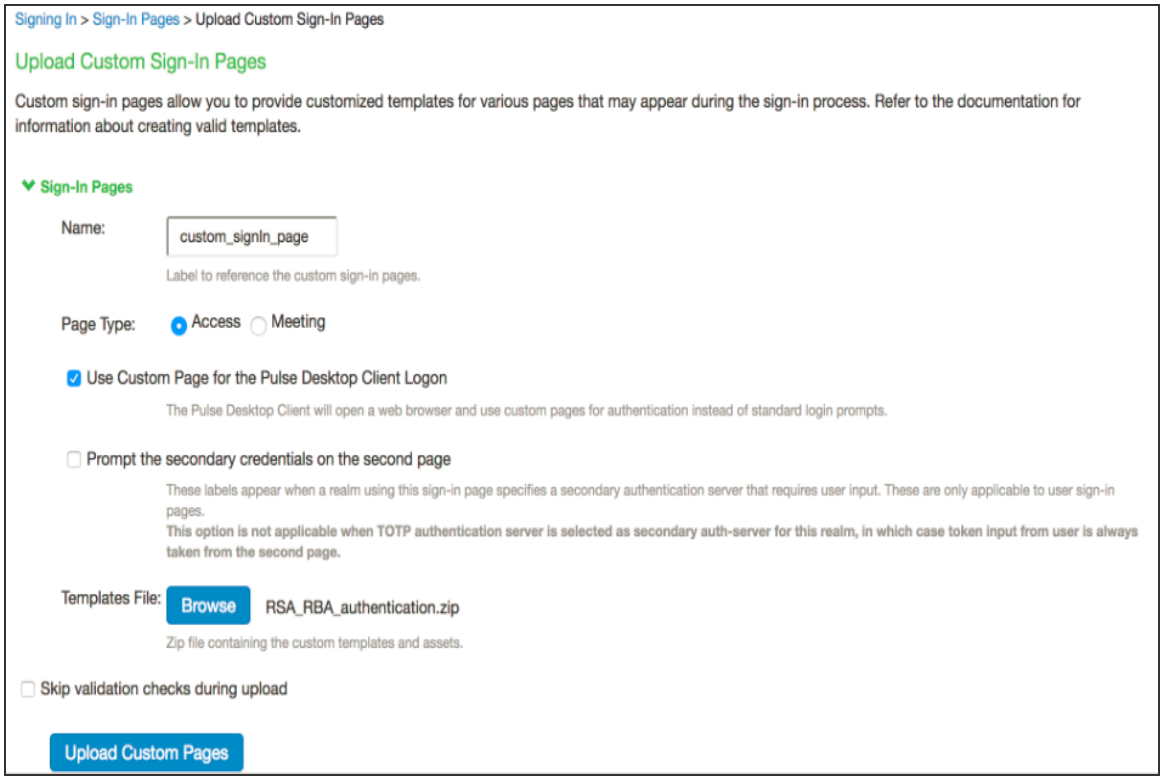
Select this option if the system must receive and send a single logout request for the peer SAML identity provider. If you use the metadata option, the Single Logout Service URL setting can be completed by selecting the SLO service URL from the list. The list is populated by the identity provider entities defined in metadata files added to the **System** > **Configuration** > **SAML** page. The system sends Single Logout requests to this URL. In addition, if you use the metadata option, the Single Logout Response URL setting is completed based on your selection for Single Logout Service URL.

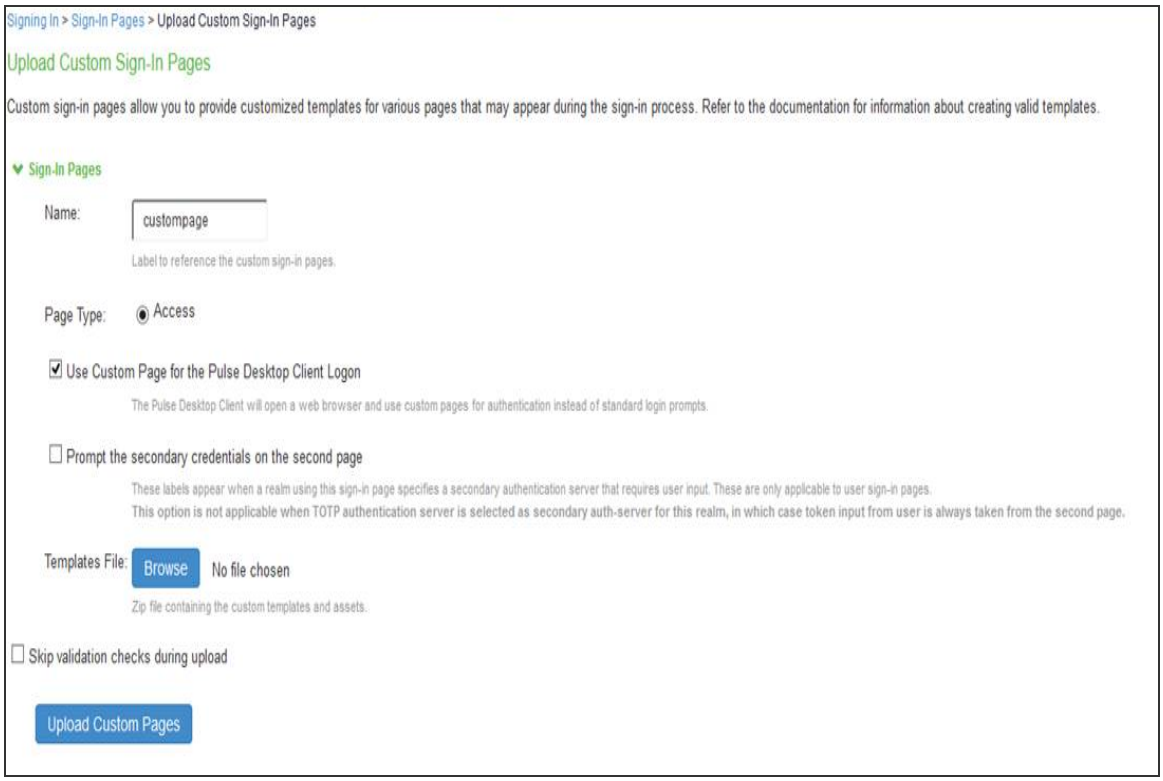
If the identity provider has left this setting empty in its metadata file, the system sends the Single Logout response to the SLO service URL. If you complete these settings manually, ask the SAML identity provider administrator for guidance. The Support Single Logout service for the identity provider must present a valid certificate.

Custom Sign-in Page in Embedded browser

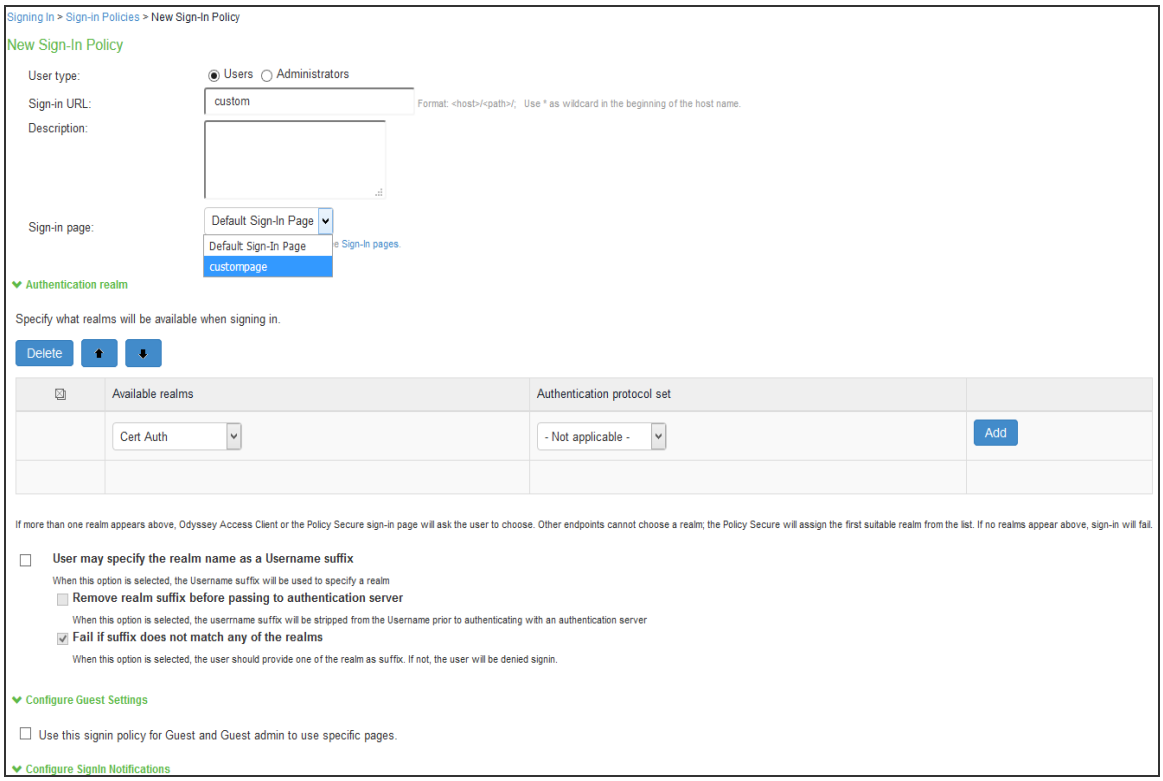
To upload a custom sign-In page in Ivanti Secure Access Client, admin needs to perform the following steps:

1. Log into Ivanti Connect Secure/Ivanti Policy Secure as admin.
2. Go to **Authentication > Signing-In > Sign-In Pages > Upload Custom Sign-In Pages**.
3. Select the option **Use Custom Page for the Pulse Desktop Client Logon**.





4. Click **Browse** and select the custom sign-in page file and click **Upload Custom Pages**.
5. Go to **Signing In > Sign-In Policies > New Sign-In Policy** to create the new Sign-In policy.
6. Under Sign-In page, select the uploaded custom page from the drop-down box to associate custom Sign-In page with the Sign-In Policy.

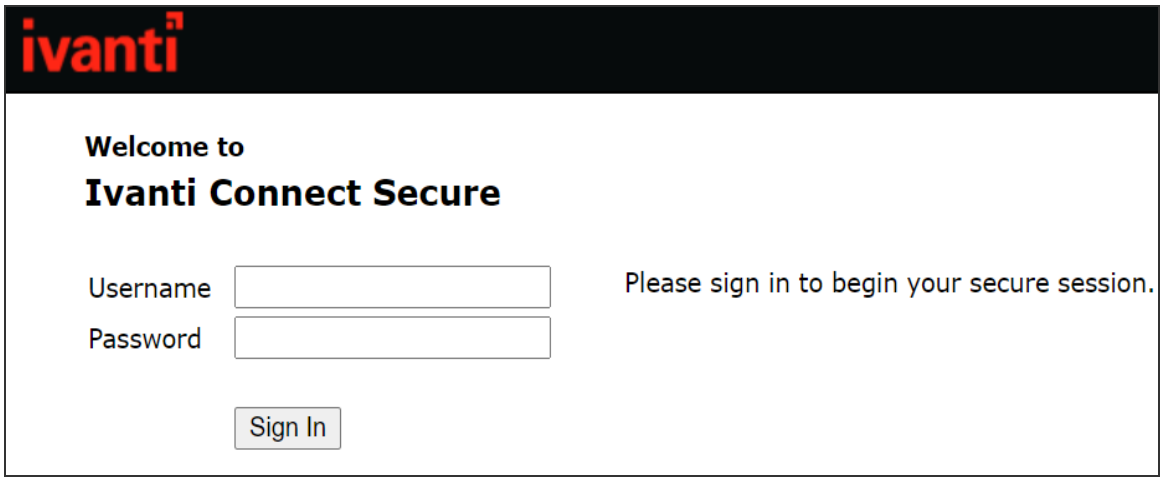


Ivanti Secure Access Client can open a custom sign-In page in the following two ways:

- A Ivanti Secure Access Client user sees an embedded browser (see figure) if **Enable embedded browser for authentication** is enabled.

Ivanti Secure Access Client closes the embedded browser once the authentication is done.

Whenever user logs into the custom sign-in URL from Ivanti Secure Access Client, embedded browser will be launched with custom sign-in pages uploaded into it.



L3 and PSAM Coexistence

L3 and PSAM coexistence (supported on Windows only) enables the user to establish Layer 3 connection to Ivanti Connect Secure and PSAM connection simultaneously.

To achieve, L3 and PSAM coexistence, Ivanti Secure Access Client should have minimum two Ivanti Connect Secure connections, each for L3 and PSAM. Also, maximum three active user connections are allowed at once.

Limitation for L3 and PSAM coexistence:

- At any given point, for any user only one L3 and one L4 is supported.

With L3 and PSAM coexistence, the way the packet is tunneled, depends on how the L3 and PSAM tunnel are configured. It can be done in following two ways:

Following are the 2 scenarios, where L3 and PSAM coexistence is supported.

Scenario-1: PSAM is behind L3

ICS1 has L3 tunnel configuration and ICS2 is behind ICS1.

Scenario-2: L3 and PSAM are independent

ICS1 has L3 tunnel configuration and ICS2 has PSAM configuration.

L3 Connection for Ivanti Connect Secure is established, split tunneling should be enabled and exclude the ICS2 IP from the spilt tunneling networks.

If single user needs to access two different set of resources available on ICS1 and ICS2, then one specific set of resources is under ICS1 and another set of resources is under ICS2.

As ICS1 and ICS2 are at different locations and user can not establish two L3 connections to access both set of resources on ICS1 and ICS2, so PSAM can provide the secure access to set of resources on ICS2.

L3 based FQDN Split Tunneling feature with PSAM coexistence is not supported.

HVCI Compatibility

Ivanti Secure Access Client for Windows is compatible with Microsoft Windows 10 HVCI settings. Windows 10 HVCI settings are part of Windows Device Guard security features for mitigating cybersecurity threats. When HVCI is enabled, Windows OS performs code integrity checks and allows only secured applications. Ivanti Secure Access Client for Windows is compatible with these settings which would help customers adopt the latest security features of Windows.

PSAM IPv6 Support

PSAM IPv6 support is available for Windows 8.1 and later.

Internet Protocol Version 6 (IPv6) is the protocol designed to succeed Internet Protocol Version 4 (IPv4). PSAM (PSAM) supports IPv6 PSAM tunneling along with IPv4 PSAM tunneling with the help of new option for internet traffic filtering, Windows Filtering Platform (WFP) driver.

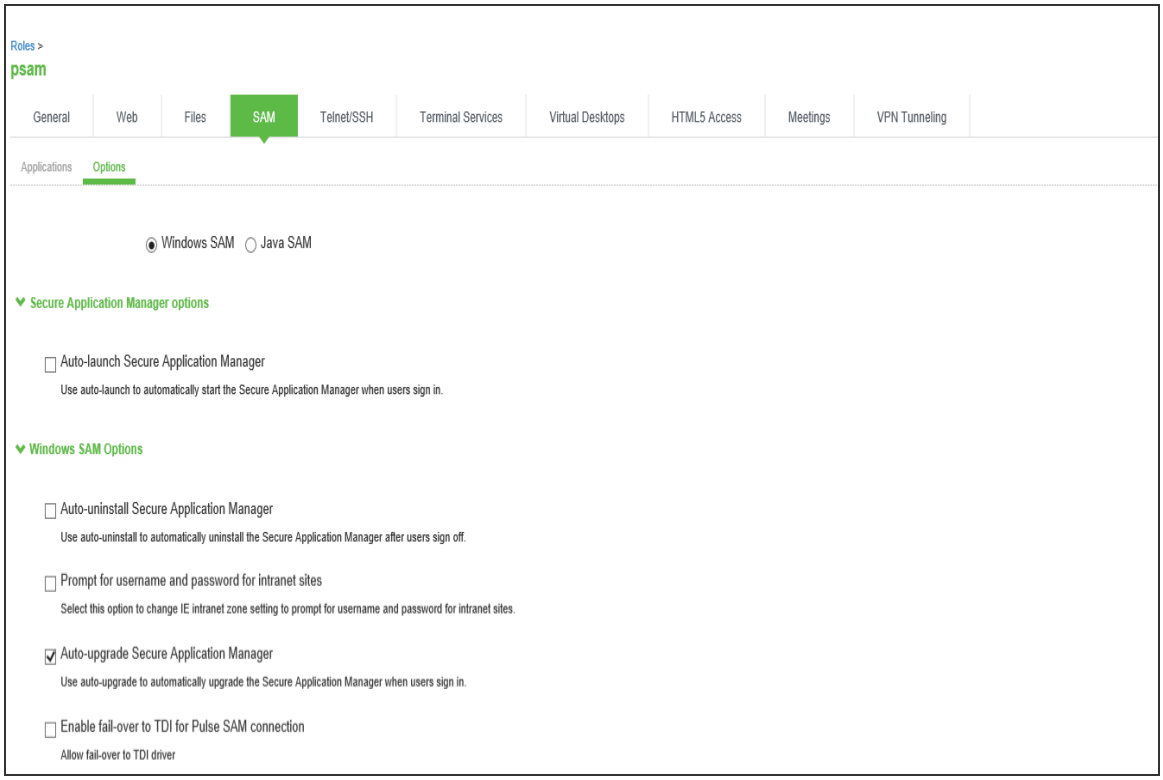
WFP driver supports both IPv6 and IPv4, however TDI driver supports only IPv4. WFP driver allows the user to provide a deeper inspection and control of packets by modifying or examining TCP/IP traffic at any TCP/IP stack layer.

Administrator can switch from WFP driver (supporting both IPv6 and IPv4) to classic TDI driver (supporting IPv4 only) with fallback mechanism, in case of any issue due to WFP driver installation.

Following are the steps to switch from WFP to TDI:

1. Go to **Users** > **User Role**.

2. Select the role.
3. Go to **SAM > Options**. The screen in figure appears.
4. Select **Enable fail-over to TDI for PSAM connection**.



Benefits

Following are the benefits of this feature:

- PSAM will be able to filter the traffic from Windows 10 and Windows 8.1 Metro Mode Applications.
- PSAM will be able to filter the traffic from Microsoft Edgewith Enhanced Protected mode.
- PSAM will support Dual Stack (both IPv6 and IPv4).

Deployment Scenarios

The following table summarizes the IPv6 in IPv6, IPv4 in IPv6 and IPv6 in IPv4 scenarios:

Client	Endpoint	ICS External Interface	ICS Internal Interface	Tunnel	Description of the Connection
Dual Stack or IPv6 only	Dual Stack (IPv6 and IPv4) or IPv6 only	IPv6	Dual Stack or IPv6 only	IPv6-in-IPv6	IPv6 resource on IPv6 PSAM session.
Dual Stack or IPv6 only	Dual Stack (IPv6 and IPv4) or IPv6 only	IPv6	IPv4	IPv4-in-IPv6	IPv4 resource on IPv6 PSAM session.
Dual Stack or IPv4 only	Dual Stack (IPv6 and IPv4) or IPv6 only	IPv4	Dual Stack or IPv4	IPv6-in-IPv4	IPv6 resource on IPv4 PSAM session.

For PSAM (L4) connections, endpoints having IPV4 only cannot access IPV6 resources, or endpoints having IPV6 only cannot access IPV4 resources.

Search device DNS only

The Ivanti Secure Access Client supports the Search device DNS only feature when IPv4 or IPv6 DNS servers are configured in a tunnel Connection Profile. When Search device DNS only option is enabled along with IPv4/IPv6 DNS servers configured in a tunnel Connection Profile, the IPv4/IPv6 DNS servers on the end user system are replaced with the device DNS servers. This ensures the DNS resolution on the end user system happens only through the device DNS servers.

Recommendations for different configurations:

Connection Profile	Endpoint	Recommended device DNS servers
Single Stack IPv6	IPv6 only, Dual Stack OR IPv4 only	IPv6 DNS Servers
Dual Stack	IPv6 only, Dual Stack OR IPv4 only	Primary as IPv6 DNS server. Secondary as IPv4 DNS server.

Single Stack IPv6 Support

The Ivanti Secure Access Client now supports Single Stack IPv6 tunnel connections. It supports connecting to an ICS configured with a Single Stack IPv6 tunnel Connection Profile.

If the ISAC client prior to 22.7R4 Windows or any non-Windows client connects to single stack IPv6 connection profile then IPv4 tunnel address will be assigned through Automatic Private IP Addressing. IPv4 DNS address also uses Automatic Private IP Addressing to assign IPs and no traffic flows through these IPs.

Deployment Scenarios

The following table summarizes the Single Stack IPv6 connections with different Split Tunneling configurations on various endpoints:

Endpoint IPv4 Only Dual Stack IPv6 Only	IPv4 Exclude Policy	IPv6 Exclude Policy	Expected Client Behaviour on Physical Adapter	Expected Client Behaviour on Virtual Adapter
IPv4 Only	No	No	No IPv4 traffic.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
IPv4 Only	Yes	No	All Excluded IPv4 traffic only.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
IPv4 Only	Yes	Yes	All Excluded IPv4 traffic only.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic. (A special case is mentioned in the next table)
IPv4 Only	No	Yes	No IPv4 traffic.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
Dual Stack	No	No	No IPv4 traffic.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
Dual Stack	Yes	No	All Excluded IPv4 traffic only.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.

Endpoint IPv4 Only Dual Stack IPv6 Only	IPv4 Exclude Policy	IPv6 Exclude Policy	Expected Client Behaviour on Physical Adapter	Expected Client Behaviour on Virtual Adapter
Dual Stack	Yes	Yes	All Excluded IPv4 traffic and Excluded IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
Dual Stack	No	Yes	All Excluded IPv6 traffic only.No IPv4 traffic.	All IPv6 traffic.No IPv4 traffic.
IPv6 Only	No	No	No IPv4 traffic.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
IPv6 Only	Yes	No	No IPv4 traffic.No IPv6 traffic.	All IPv6 traffic.No IPv4 traffic.
IPv6 Only	Yes	Yes	All Excluded IPv6 traffic.No IPv4 traffic.	All IPv6 traffic.No IPv4 traffic.
IPv6 Only	No	Yes	All Excluded IPv6 traffic.No IPv4 traffic.	All IPv6 traffic.No IPv4 traffic.

If Split tunnel DNS Search order is set as 'Search device DNS only' then DNS traffic flows via virtual adapter only and no DNS traffic flows via physical adapter.

Use cases related to Single Stack IPv6 tunnel

If both IPv4 and IPv6 IPs of a particular FQDN resource are configured under Deny Split Tunneling rules, ISAC ensures that the resource traffic is routed through the Physical adapter(IPv4) and not through the tunnel(IPv6). This feature works only when Search device DNS only is enabled. This use case is specific to IPv4 only endpoints.

Endpoint	ICS config	IPv4 Exclude Policy	IPv6 Exclude Policy	dummy.com traffic
IPv4 Only	Single Stack Connection profile with Search device DNS only	1.1.1.1 (IPv4 of some FQDN dummy.com)	2001:0db8::1 (IPv6 address of same website dummy.com)	dummy.com (1.1.1.1) will get accessed via the physical adapter IPv4

DNS64/NAT64 is generally configured to provide access to IPv4 only resources through synthesized IPv6 addresses. ISAC ensures that in DNS64/NAT64 environment, the Denied IPv4 FQDN resources are accessed only through the IPv4 of Physical Adapter and not through the synthesized IPv6 tunnel.

Endpoint	IPv4 Exclude Policy	IPv6 Exclude Policy	Expected Client Behaviour on Physical Adapter	Expected Client Behaviour on Virtual Adapter
IPv4 Only	1.1.1.1 (IPv4 of some IPv4 only FQDN dummy.com)	NA	dummy.com (1.1.1.1) is accessed through the physical adapter IPv4	All non-excluded IPv6 traffic including other synthesised IPv6 traffic.
Dual Stack	1.1.1.1 (IPv4 of some FQDN dummy.com)	NA	dummy.com (1.1.1.1) is accessed through the physical adapter IPv4. All other excluded IPv4 and IPv6 traffic.	All non-excluded IPv6 traffic including other synthesised IPv6 traffic.

Endpoints classification

The endpoints are classified based on the following behaviour.

IPv4 Only endpoints: Endpoints where IPv6 is disabled or IPv6 has only a Link-Local IPv6 address (fe80::)

Dual Stack endpoints: IPv4 endpoints with Unique-Local IPv6 address prefixed with fc00::/7 or IPv4 endpoints with Global Unicast address (Dual Stack)

IPv6 Only endpoints: IPv6 only endpoints with Global Unicast address (Dual Stack)

Location Awareness

The location awareness feature enables you to define connections that are activated automatically based on the location of the endpoint. Ivanti Secure Access Client determines the location of the endpoint by evaluating rules that you define. For example, you can define rules to enable Ivanti Secure Access Client to automatically establish a secure tunnel to the corporate network through Ivanti Connect Secure when the user is at home, and to establish a Ivanti Policy Secure connection when the user is in the office and connected to the corporate network over the LAN. Ivanti Secure Access Client does not re-establish a VPN tunnel when the endpoint re-enters the trusted/corporate network. Location awareness rules are based on the client's IP address and network interface information.

Centralized Ivanti Secure Access Client Configuration Management

Centralized configuration management is a key feature of Ivanti Secure Access Client. Ivanti Secure Access Client connection sets (the configurations that define how and when a Ivanti Secure Access Client connects), are bound to a particular Ivanti server. The binding server is the one that provides the initial configuration to the Ivanti Secure Access Client. For example, if you create a Ivanti Secure Access Client connection set on Server A, and then distribute those connections to endpoints, those clients are bound to Server A.

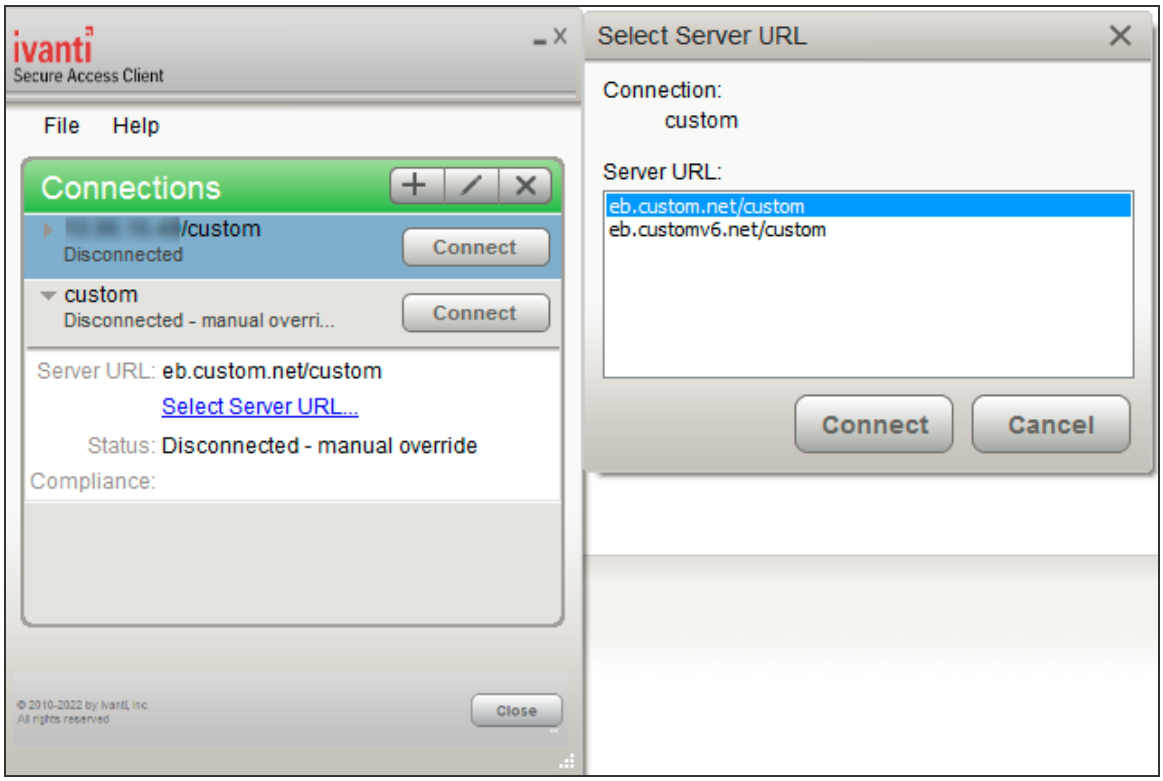
A bound client is managed by its particular Ivanti server. The Ivanti administrator defines Ivanti Secure Access Client connections and software components that are installed on the endpoint. When Ivanti Secure Access Client connects to the Ivanti server that is managing it, the server automatically provisions configuration and software component updates. The administrator can permit the user to add, remove, and modify connections. The administrator can also allow dynamic connections (connections that are added by Ivanti servers when the user logs into the server using a browser). A dynamic connection enables a bound client to add connections from Ivanti servers other than the one the client is bound to. Dynamic connections are created as manual rather than automatic connections, which means that they are run only when the user initiates the connection or the user browses to a Ivanti server and launches Ivanti Secure Access Client from the server's Web interface. Dynamic connections create the connection with the minimum configuration required to make the connection, which means that the URL used to install or launch Ivanti Secure Access Client from the Ivanti server's Web interface is used as the Connection URL and connection name. Binding Ivanti Secure Access Clients to a particular server ensures that the client does not receive different configurations when it accesses other Ivanti servers. A bound endpoint receives connection set options and connections from its binding server, but it can have its Ivanti Secure Access Client software upgraded from any Ivanti server that has the automatic upgrade option enabled.

Ivanti Secure Access Client can be bound to only one Ivanti server connection set at a time. Ivanti Secure Access Client can receive updates and changes to that bound connection set from other Ivanti servers only if the connection set is exported from the Ivanti server and then imported to another Ivanti server.

Ivanti Secure Access Client does not need to be bound to a Ivanti server. An unbound client is managed by its user. If Ivanti Secure Access Client software is installed without any connections, the user must add connections manually. Dynamic connections can be added by visiting the Web portals of Ivanti servers. An unbound client does not accept configuration updates from any Ivanti server.

Smart Connections - List of URLs

Each Ivanti Secure Access Client connection that connects to Ivanti Policy Secure or Ivanti Connect Secure can be configured with a list of Ivanti servers. Ivanti Secure Access Client attempts to connect to each of the servers in the URL list until it succeeds. You can choose different modes to control the behavior of a Ivanti Secure Access Client connection that is starting from a disconnected state, start at the top of the list, start with the most recently connected URL, or choose randomly. The random option helps distribute the connection load across different Ivanti servers. If a Ivanti Secure Access Client connection that is already established gets disconnected, for example, the wireless connection is interrupted, Ivanti Secure Access Client always tries to connect to the most recently connected URL. If that connection fails, Ivanti Secure Access Client uses the server list. The Ivanti Secure Access Client user can also choose a connection from the list as shown in figure.



Security Certificates

Users cannot add CA servers or manage the server list. Ivanti Secure Access Client handles certificates in the same way that a browser handles certificates. If the Ivanti Secure Access Client dynamic certificate trust option is enabled for a connection, the user can accept or reject the certificate that is presented if it is not from a CA that is defined in the endpoint's certificate store.

Compliance and Remediation

Ivanti Secure Access Client supports the Host Checker application to assess endpoint health and update critical software. You configure rules in Host Checker policies for Ivanti Connect Secure and Ivanti Policy Secure to specify the minimum criteria for the security compliance of endpoints that are allowed to enter the network. Endpoints that fail can be connected through a remediation role that provides limited access.

Host Checker can be deployed from a Ivanti server to Ivanti Secure Access Clients on Windows and macOS endpoints. It will be downloaded and run when a browser is used on a Windows or macOS endpoint to connect to the Ivanti server Web portal. You can use Host Checker policies at the realm or role level.

Host Checker is not supported in the use case where the user employs a browser on the mobile device to connect to the Ivanti server Web portal.

For Windows and OS X clients, you can use Host Checker to perform the following:

- Virus signature monitoring

  You can configure Host Checker to monitor and verify that the virus signatures, operating systems, and software versions installed on client computers are up to date. You can configure automatic remediation for those endpoints that do not meet the specified criteria.

- Patch management information monitoring and patch deployment

  You can configure Host Checker policies that check for Windows endpoints' operating system service pack, software version, or desktop application patch version compliance.

- Patch verification remediation options

  Ivanti Secure Access Client and Host Checker support endpoint remediation through Microsoft System Management Server or Microsoft System Center Configuration Manager (SMS/SCCM). With SMS/SCCM, Ivanti Secure Access Client triggers a preinstalled SMS/SCCM client to get patches from a pre-configured server.

- Endpoint configuration

  You can configure custom rules to allow Host Checker to check for third-party applications, files, process, ports, registry keys, and custom DLLs.

Ivanti Secure Access Client supports a set of Host Checker functions that vary from one OS to the next. For complete information on Host Checker for mobile clients.

Two Factor Authentication

Ivanti Secure Access Client supports RSA SecurID authentication through soft token, hard token, and smart card authenticators. The SecurID software (RSA client 4.1 and later) must already be installed on the client machine.

Captive Portal Detection

Public WiFi locations often deploy a captive portal that requires the user to enter authentication information or to accept terms of service before network access is granted. Ivanti Secure Access Client detects the presence of captive portals and does not initiate a connection to a Ivanti Connect Secure or Policy Secure server until internet access is granted. Ivanti Secure Access Client displays appropriate status information to enable the user to establish the portal and network connections.

Captive portal detection notes:

- Captive portal detection is supported on Ivanti Secure Access Client for both Windows and Mac. Captive portal detection is not supported on Windows In-Box Ivanti Secure Access Client or Ivanti Secure Access Client.
- If Ivanti Secure Access Client connects through a proxy in Captive Portal scenario, the captive portal detection algorithm is disabled and Ivanti Secure Access Client tries connecting directly to ICS.

Sign In Notifications

The notifications feature on Ivanti Connect Secure and Ivanti Policy Secure allows the network administrator to display notifications to Ivanti Secure Access Client users prior to the user logging in and after the user has already logged in. For example, you could display a legal statement or a message stating who is allowed to connect to the server before you display the Ivanti Secure Access Client credentials dialog. After the user has connected, you could display a message that notifies the user of scheduled network or server maintenance.

Automatic Software Updates

After you deploy Ivanti Secure Access Client software to endpoints, software updates occur automatically. If you upgrade the Ivanti Secure Access Client configuration on the server, updated software components are pushed to a client the next time it connects. You can disable this automatic upgrade feature.

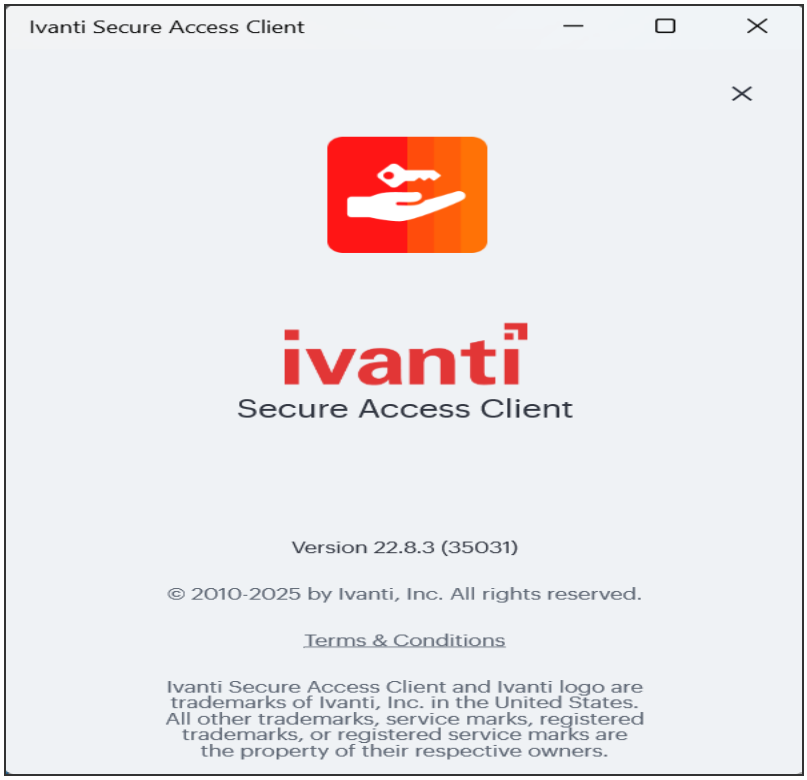
The automatic update feature is supported on Ivanti Connect Secure and Ivanti Policy Secure servers only.

If you configure Ivanti Secure Access Client to make 802.1X-based connections, a reboot might be required on Windows endpoints.

Ivanti Secure Access Client Customization and Rebranding

The Ivanti Secure Access Client customization tool (BrandPackager) enables you to customize the appearance of Ivanti Secure Access Client for Windows and Ivanti Secure Access Client for Apple OS X. You can add your own identity graphic to the Ivanti Secure Access Client splash screen, to the program interface, and to Windows credential provider tiles. "User Experience" on page 70 shows graphic customizations applied to the Ivanti Secure Access Client for Windows. You can also customize error and informational message text, the text that appears in dialog boxes and on buttons, and make limited changes to Ivanti Secure Access Client online Help. For example, you might want to add your help desk phone number to Ivanti Secure Access Client error messages and the Ivanti Secure Access Client online Help.

BrandPackager is available for download from the Ivanti website (www.ivanti.com).



Ivanti Secure Access Client Configuration Overview

You configure Ivanti Secure Access Client settings on the Ivanti server so that when users request authentication, they are assigned a role based on the role mappings and optional security profile that you create. Access to specific resources is permitted only for users and devices that provide the proper credentials for the realm, that are associated with the appropriate roles, and whose endpoints meet security restrictions. If a user attempts to connect to the network from an endpoint that does not comply with the security restrictions you have defined, the user cannot access the realm or role.

As you plan your Ivanti Secure Access Client configuration, be sure you know how you want to deploy Ivanti Secure Access Client. You can use one or more of the following Ivanti Secure Access Client deployment options:

- Use the defaults or make changes to the Ivanti Secure Access Client default component set and default connection set, and then download and distribute Ivanti Secure Access Client by having users log in to the gateway's user Web portal and be assigned to a role. After the installation is complete, users have all the connections they need to access network resources.
- Create connections that an endpoint needs for connectivity and services, download the Ivanti Secure Access Client settings file (.pulsepreconfig), download default Ivanti Secure Access Client .msi installation program, and then run the .msi installation program by using an msiexec command with the settings file as an option. You can use the msiexec command to deploy Ivanti Secure Access Client using a standard software distribution process, such as SMS/SCCM.
- Distribute Ivanti Secure Access Client with no preconfiguration. You can download the default Ivanti Secure Access Client installation file (Mac or Win) from the device, and then distribute the file to endpoints using your organization's standard software distribution methods. Because the installer does not contain preconfigured connections, users must define network connections manually. Or you can create dynamic connections on each access gateway. These connections are automatically downloaded to the installed Ivanti Secure Access Client when users provide their login credentials to the gateway's user Web portal.

The following tasks summarize how to configure Ivanti Secure Access Client on the device:

- Create and assign user roles to control who can access different resources and applications on the network. If you are converting your access environment from agentless or a VPN Tunneling environment, you should create new roles that are specific for Ivanti Secure Access Client.
- Define security restrictions for endpoints with Host Checker policies.

- Define user realms to establish authentication domains. If you are converting your access environment from agentless or a NC environment, typically you can use your existing realms.
- Associate the roles with appropriate realms to define your access control hierarchy using role mapping.
- Define Ivanti Secure Access Client component sets, connection sets, and connections.
- Deploy Ivanti Secure Access Client to endpoints.

Ivanti Secure Access Client Status Icons

The Ivanti Secure Access Client interface (Windows and OS X) displays a system tray icon (Windows) or a menu bar icon (OS X) that indicates connection status, provides access to menu items that let the user connect and disconnect from networks and meetings, and enables quick access to the program interface. Only one icon is visible even when there are multiple connections. One icon provides the status for all connections by indicating the most important connection state information.

New-UX Indicator	Classic UI Indicator	Description
		Connected.
		Connecting.
		Connected with limitations
		Connection attempt failed.
		Connection suspended.
		Connected to the local network but no Internet access available. Public WiFi locations often deploy a captive portal that requires the user to enter authentication information or to accept terms of service before network access is granted. Ivanti Secure Access Client detects the presence of captive portals and does not initiate a connection to a Ivanti server until Internet access is granted.

Installation Requirements

For detailed information about supported platforms and installation requirements, see the Ivanti Secure Access Client Supported Platforms Guide, available from the Ivanti website (www.ivanti.com).

Ivanti Secure Access Client Error Messages Overview

Ivanti Secure Access Client error and warning messages reside in message catalog files on the endpoint. Each message includes a short description that states the problem and a long description that provides more details and suggests actions the user can take to resolve the issue.

You can edit Ivanti Secure Access Client messages by using the optional Ivanti Secure Access Client branding tool, BrandPackager. See "Editing Ivanti Secure Access Client Messages" on page 114 for more information.

All message catalog files are localized. The filename indicates the language. For example, MessageCatalogConnMgr_EN.txt is the English-language version of the file. The following filename conventions indicate the language:

- DE-German
- EN-English
- ES-Spanish
- FR-French
- IT-Italian
- JA-Japanese
- KO-Korean
- PL-Polish
- ZH-Chinese (Traditional)
- ZH-CN-Chinese (Simplified)
- PT-BR-Portuguese

Uninstalling Ivanti Secure Access Client

Ivanti Secure Access Client can be uninstalled from the endpoints in the following ways:

- **Remove the current version ISAC application**: Remove only the current version of ISAC application but retain the associated components for further use when ISAC is upgraded.
- **Remove ISAC application along with the components**: Remove ISAC application and all associated components from the endpoint.
- **Deep cleaning**: After removing the ISAC application, few files and registry settings may still exist. To completely remove all changes pertaining to ISAC application, refer to ISAC deep clean procedure.

Uninstall Ivanti Secure Access Client from Windows

Search for Ivanti Secure Access Client Icon under Applications List. Uninstall "Ivanti Secure Access Client" form the list under Add/Remove programs. On the prompt, choose an option to remove only the application or all associated components along with the application.

Uninstall Ivanti Secure Access Client from macOS

Using Finder, move the Ivanti Secure Access Client found in /Applications/Pulse Secure.app to the Trash/Bin. On the prompt, choose an option to remove only the application or all associated components along with the application.

Uninstall Ivanti Secure Access Client using Intune

The ISAC is uninstalled from devices in the selected groups if Intune has previously installed the application onto the device through an "Available for enrolled devices" or "Required" assignment using the same deployment. For more information, refer Application Assignment.

Ivanti Secure Access Client Deep Clean procedure

Deep Clean Process for Windows

From release 22.8R1, the Powershell deep clean script is enhanced to run the script silently in the background and avoid any user intervention during the process. Ivanti recommends to use the PowerShell script for deep clean process on WindowsOS endpoints.

To remove Ivanti Secure Access Client components manually for deep cleaning on Windows system:

1. Uninstall "Ivanti Secure Access Client" from the list under Add/Remove programs. On the prompt, choose the option to remove only the application or all associated components along with the application.
2. Remove Juniper/Pulse secure folder from the following locations:
   - C:\Program Files
   - C:\ProgramData
   - C:\Users\CurrentUser\AppData\Roaming
   - C:\Users\CurrentUser\AppData\Local
   - C:\Users\Public
3. Navigate to C:\Users\CurrentUser\AppData\Local\Temp and remove all the temp files.
4. Remove the following files from Windows/System32 folder:
   - C:\Windows\System32\DRVSTORE\jnprns_260C6334D987C71B41EC39304CE4AE75D6794E54
   - C:\Windows\System32\drivers\jnprns.sys
   - C:\Windows\System32\drivers\jnprTdi_821_227.sys
   - C:\Windows\System32\drivers\jnprva.sys
   - C:\Windows\System32\drivers\jnprvamgr.sys
5. Remove the Juniper/Pulse Secure adapter under Control Panel/Device Manager/Network adapters. Uninstall all the Ivanti Secure and third-party adapters if any.
6. Open the registry and delete Juniper/Pulse Secure folders from the below location:

- On 32-bit machines:
  - HKEY_LOCAL_MACHINE\SOFTWARE\Juniper Networks\
  - HKEY_LOCAL_MACHINE\SOFTWARE\Pulse Secure\
- On 64-bit machines:
  - HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Juniper Networks\
  - HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Pulse Secure\
- HKEY_CURRENT_USER\Software\Juniper Networks
- HKEY_CURRENT_USER\Software\Pulse Secure\
- HKLM\SYSTEM\CurrentControlSet\Services\JnpRTDI*
- HKLM\SYSTEM\CurrentControlSet\Services\Jnprva
- HKLM\SYSTEM\CurrentControlSet\Services\Jnprvamgr

7. Remove all files from the location C:\Windows\Downloaded Program Files.
8. Refer to Fix problems that block programs from being installed or removed for more troubleshooting to remove the ISAC application.

Alternatively, you can use the PowerShell script for deep clean process on WindowsOS endpoints.

Deep Clean Steps for macOS

1. Using Finder, move the Ivanti Secure Access Client found in /Applications/Pulse Secure.app to the Trash/Bin. On the prompt, choose an option to remove only the application or all associated components along with the application.
2. Execute the following commands from the terminal window
   - defaults write com.apple.Finder AppleShowAllFiles true
   - Killall Finder
   - sudo rm -rf ~/Library/Application\ Support/Juniper\ Networks/SetupClient
   - sudo rm -rf ~/Library/Application\ Support/Juniper\ Networks/HostChecker.app
   - sudo rm -rf ~/Library/Application\ Support/Pulse\ Secure/SetupClient

- sudo rm -rf ~/Library/Application\ Support/Pulse\ Secure/HostChecker.app
- rm -rf ~/Library/Logs/Juniper\ Networks
- rm -rf ~/Library/Logs/Pulse\ Secure
- sudo rm -rf /Applications/Network\ Connect.app
- sudo rm -rf /Applications/Pulse\ Secure.app
- sudo /usr/local/juniper/nc/install/uninstall_nc.sh
- sudo rm -rf ~/Library/Application\ Support/Pulse\ Secure
- rm -rf ~/Library/Logs/Pulse\ Secure
- sudo rm -rf /Applications/Ivanti\ Secure\ Access.app

3. Navigate to Finder on the following location and drag the Juniper/Pulse Secure Folders to the Trash.
4. From the User profile, remove:
   - ~/Library/Application Support/Juniper Networks
   - ~/Library/Application Support/Pulse Secure
5. At the same location, from the root i.e Macintosh HD
   - /Library/Application Support/Juniper Networks
   - /Library/Application Support/Pulse Secure
6. Execute the following commands:
   - /Library/LaunchDaemons/net.juniper.UninstallPulse.plist.org<http://net.juniper.UninstallPulse.plist.org>
   - /Library/LaunchDaemons/net.pulse.UninstallPulse.plist.org<http://net.pulse.UninstallPulse.plist.org>
   - /Library/LaunchAgents/net.juniper.UninstallPulse.plist.org<http://net.juniper.UninstallPulse.plist.org>
   - /Library/LaunchAgents/net.pulse.UninstallPulse.plist.org<http://net.pulse.UninstallPulse.plist.org>

Try navigating through Finder and verify if all the files are removed.

Rollback Ivanti Secure Access Client

Currently, in-place rollback of Ivanti Secure Access Client to lower versions is not supported.

If a lower version of Ivanti Secure Access Client is required, perform a deep clean of the existing version and perform a fresh installation of the required version.

Handling ISAC Upgrade failure

For failed upgrades of Ivanti Secure Access Client, during auto-upgrade through Ivanti Connect Secure on managed or unmanaged endpoints, perform a deep clean for the existing version and install the client using the URL provided by the administrator (browser-based installation).

If upgrade failure persists and cause cannot be determined, contact Ivanti support.

Accessing Ivanti Secure Access Client Error Messages on macOS Endpoints

Ivanti Secure Access Client error and warning messages reside in message catalog files on the OS X endpoint. Each message includes a short description that states the problem and a long description that provides more details and suggests actions to resolve the issue.

You can edit Ivanti Secure Access Client messages by using the optional Ivanti Secure Access Client branding tool, BrandPackager. See "Editing Ivanti Secure Access Client Messages" on page 114 for more information.

All message catalog files are localized. The filename indicates the language. For example, MessageCatalogPulseUI_EN.txt is the English-language version of the file. The following filename conventions indicate the language:

- DE-German
- EN-English
- ES-Spanish
- FR-French
- IT-Italian

- JA-Japanese
- KO-Korean
- PL-Polish
- ZH-Chinese (Traditional)
- ZH-CN-Chinese (Simplified)
- PT-BR-Portugues

To view Ivanti Secure Access Client catalog files on macOS endpoint, use Finder to display the package contents of the Ivanti Secure Access Client application.

Ivanti Secure Access Client Log Files

Ivanti Secure Access Client writes information to log files on Windows and Apple OS X endpoints. If you need to investigate a problem with connectivity on a Ivanti Secure Access Client endpoint, you can instruct the user to save the client logs and e-mail them to you.

The user saves logging information by opening Ivanti Secure Access Client and then clicking **File > Logs > Save As**. All relevant log files are added to a single file, LogsAndDiagnostics.zip. The user saves the .zip file and then makes it available to you.

Ivanti Secure Access Client maintains its own log files on all supported platforms. On Windows, Ivanti Secure Access Client also logs its major operational events into Windows Event Log. Network administrators can review the Ivanti Secure Access Client event log to help troubleshoot problems. "Ivanti Secure Access Client Log Files" above lists the Ivanti Secure Access Client messages that can appear in the Windows event log.

To view the Ivanti Secure Access Client messages:

1. Open the Windows Event Viewer.

2. Click **Applications and Services > Ivanti > Operational**.

ID	Level	Message	Description
600	error	The connection <ID> failed authentication: Error <ID>.	802.1X EAP authentication failure.

ID	Level	Message	Description
601	informational	User has canceled authentication of the connection <ID>.	The user canceled 802.1X EAP authentication.
602	error	Failure writing wireless LAN profile for connection <ID> Error <ID>: Reason <ID>: Profile: <ID>.	A failure occurred while a wireless LAN profile was being created or modified.
603	error	Failure writing wireless LAN profile for connection <ID> Error <ID>.	A failure occurred while a wireless LAN profile was being deleted.
604	error	Failure writing wired LAN profile for connection <ID> Error <ID>: Profile: <ID>.	A failure occurred while a wired LAN profile was being created or modified.
605	error	Failure writing wired LAN profile for connection <ID> Error <ID>.	A failure while a wired LAN profile was being deleted.
500	informational	Pulse servicing has completed successfully. All components are up to date.	Ivanti Secure Access Client servicing was successful.
501	informational	Pulse servicing has completed successfully. All components are up to date.	Servicing was requested but all components were up to date.
502	error	Pulse servicing has failed. Failure summary:	Ivanti Secure Access Client servicing failed.
100	informational	User requested connection <ID> to start.	The user initiated a connect request.
101	informational	User requested connection <ID> to stop.	The user initiated a disconnect request.

ID	Level	Message	Description
102	informational	Connection <ID> is starting because its policy requirements have been met. Connection Policy: <ID>.	A connection was started because of a policy evaluation.
103	informational	Connection <ID>) is stopping because of its policy requirements. Connection Policy: <ID>.	A connection was stopped because of a policy evaluation.
104	informational	Connection <ID> is stopping because of transition to context <ID>.	The machine-to-user connection was disconnected to transition to another identity.
105	informational	Connection <ID> is starting because of transition to context <ID>.	The machine-to-user connection was connected as part of the transition to another identity.
106	informational	Connection <ID> is disconnected due to computer suspend.	The connection to Ivanti Connect Secure was disconnected because the computer is being suspended.
107	informational	Connection <ID> is disconnected due to login error.	A credential provider connection was disconnected because of a login error.
108	informational	Connection <ID> is disconnected because it was modified.	A connection was disconnected because it was modified.
109	informational	User requested connection <ID> to suspend.	The user initiated a suspend request.
110	informational	User requested connection <ID> to resume.	The user initiated a resume request.
1	informational	The Ivanti service version <ID> has successfully started.	The Ivanti Secure Access Client service started.

ID	Level	Message	Description
2	informational	The Ivanti service has stopped.	The Ivanti Secure Access Client service stopped.
200	error	No connections matching URL <ID> were found in Pulse database. Request to start a connection from the browser has failed.	Ivanti Secure Access Client failed to resume a connection from the browser.
400	error	The host check for connection <ID> has failed. Failed policies: <ID>.	Host Checker failed one or more policies.
300	informational	The connection <ID> was established successfully through web-proxy <ID>.	Ivanti Secure Access Client established a connection to Ivanti Connect Secure or Ivanti Policy Secure through a Web proxy.
301	informational	The connection <ID> was established successfully to address <ID>.	Ivanti Secure Access Client established a direct (nonproxy) connection to Ivanti Connect Secure or Ivanti Policy Secure.
302	informational	The connection <ID> was disconnected.	The Ivanti Secure Access Client connection was disconnected from the Ivanti server.
303	error	The connection <ID> encountered an error: <ID> Peer address: <ID>.	A connection encountered an error.
304	error	The connection <ID> was disconnected due to change in routing table. Interface address changed from <ID> to <ID>.	Ivanti Secure Access Client detected a change in the route to the Ivanti server.

ID	Level	Message	Description
305	informational	VPN tunnel transport for connection <ID> switched from ESP to SSL mode due to missing ESP heartbeat.	ESP to SSL fallback occurred because of missing ESP heartbeats.
306	informational	VPN tunnel for connection <ID> is switched to ESP mode.	Tunnel transport switched to ESP mode.
307	error	The connection <ID> encountered an error: System error: <ID> Peer address: <ID>.	The Ivanti Secure Access Client connection failed because of a system error.
308	error	The server disconnected connection <ID> Reason <ID>: Peer address: <ID>.	The server disconnected a connection.

Deleting Ivanti Secure Access Client Log Files

Ivanti recommends that you do not delete Ivanti Secure Access Client log files.

Ivanti Secure Access Client controls log file size automatically. When a current log file reaches 10MB, a new one is created and the oldest log file is deleted. If you need to delete Ivanti Secure Access Client log files, do not delete the file without first moving it to the Recycle Bin or renaming it.

To safely delete Ivanti Secure Access Client log files on a Windows endpoint:

1. Use a command line or Windows Explorer to locate and delete debuglog.log and, optionally, debuglog.log.old. When prompted if you want to move the file to the Recycle Bin, answer Yes. Do not press Shift+Delete, which permanently deletes a file without moving it to the Recycle bin.

   The file location varies depending on which version of Windows the endpoint is running. For example, the following path is valid for a Windows 8.1Enterprise 64-bit endpoint: C:\ProgramData\Ivanti\Logging.

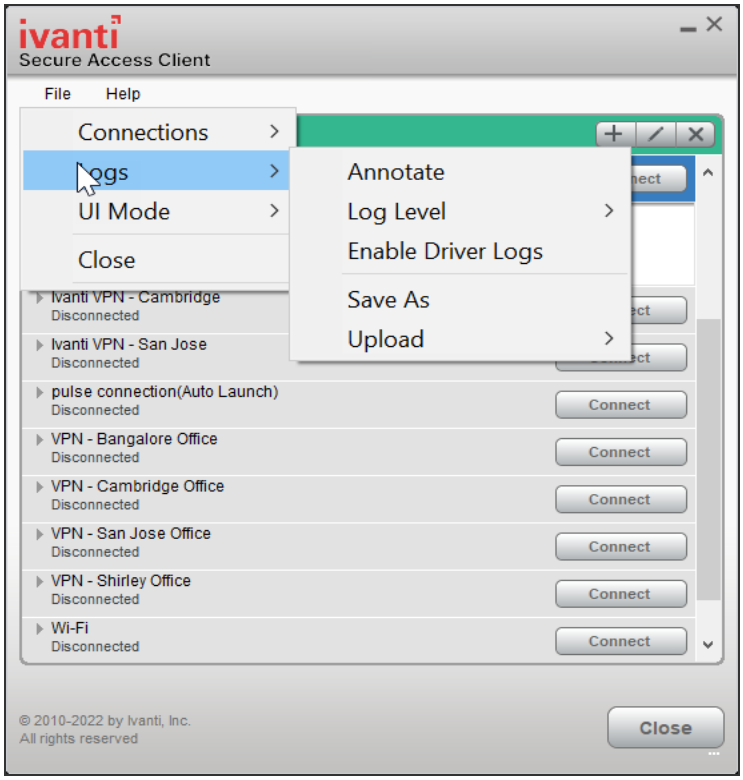
2. Empty the Recycle Bin.

Alternatively, you could first rename debuglog.log and then delete it. After you delete the log file, Ivanti Secure Access Client creates a new one. However, that operation might take some time depending on the activities of Ivanti Secure Access Client.

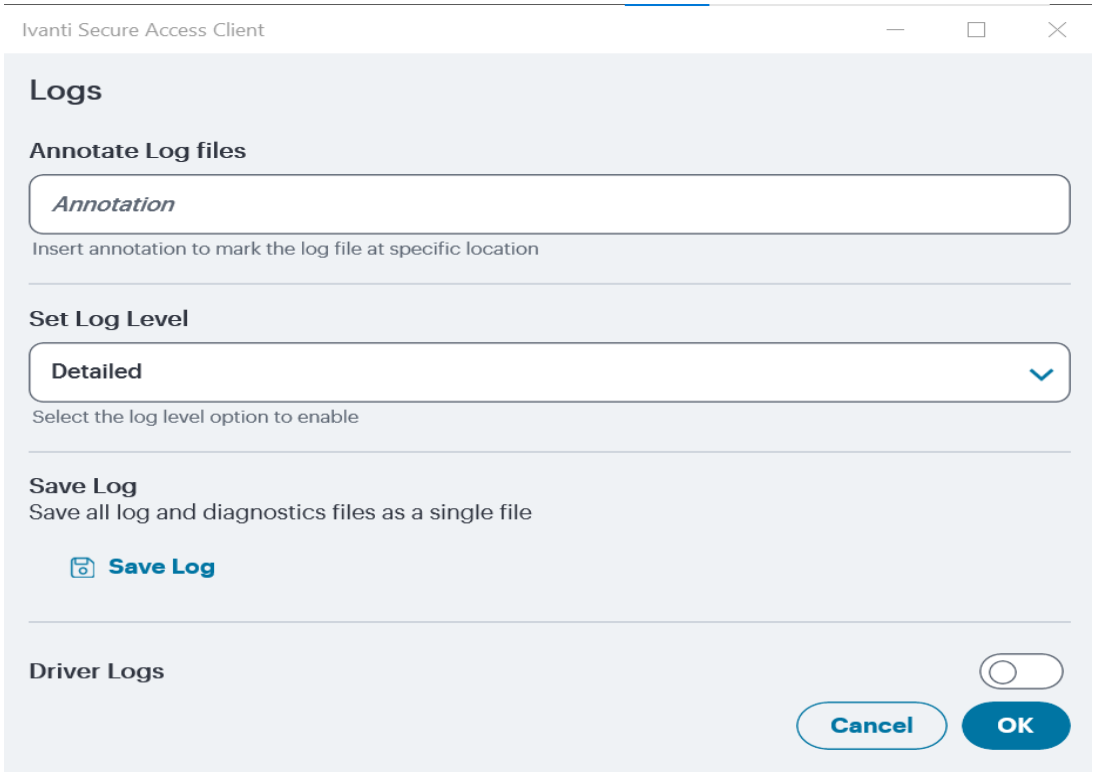
Uploading Ivanti Secure Access Client Log Files

The Ivanti Secure Access Client for Windows makes it easy to transmit diagnostic log bundles to ICS gateways for analysis by system administrators. To send a log bundle to the Ivanti Connect Secure, when a VPN connection is active, run the following from the desktop client user interface: **File > Logs > Upload**.

Classic UI



New-UX



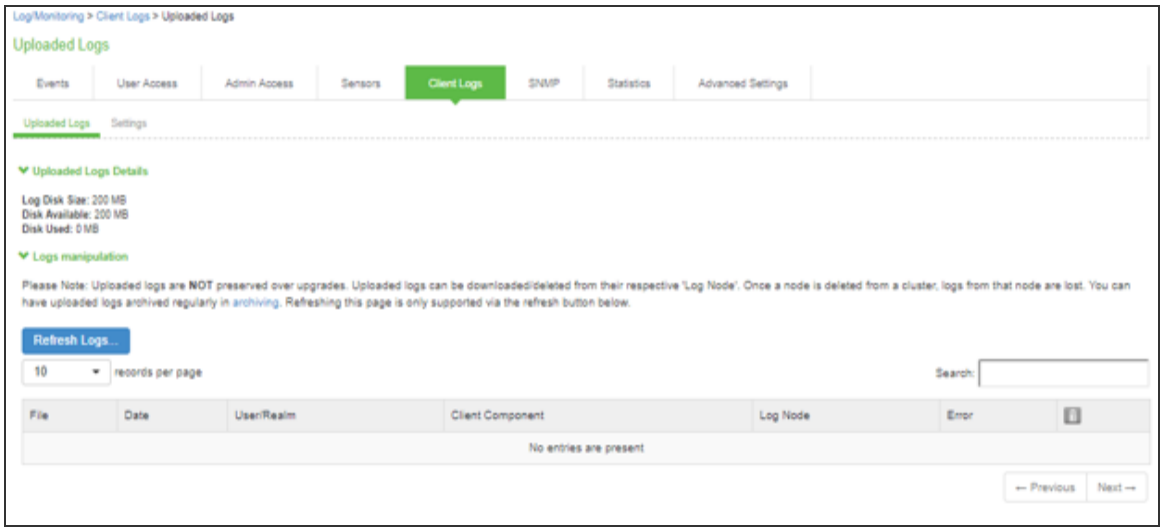
The user must select the server to send the logs to. A dialog will appear that shows the progress of the upload.

Note that a system administrator must enable this feature on the server side before an end user can upload log files to the Ivanti gateway. To do this, the system administrator must launch the Ivanti server administrative console and navigate to **Users > Roles > General > Session Options > Enable Upload Logs**.

The admin must check the "Enable Upload Logs" checkbox, as shown below:

The admin must also enable which clients can send log files by traversing the following menus in the admin console and clicking on Ivanti Secure Access Client: **System > Log/Monitoring > Client-Side Log > Settings**

Once this work is done, the system administrator can view uploaded logs in the administrative console here: **System > Log/Monitoring > Client-Side Log > Uploaded Logs**



Predictable Ivanti Server Hostname Resolution with IPv6

When connecting to a Ivanti server, Ivanti Secure Access Client uses the services of the endpoint operating system to resolve the hostname to an IP address. If a Ivanti server hostname resolves to both IPv4 and IPv6 addresses, an IPv4 or an IPv6 address is presented to Ivanti Secure Access Client as the preferred IP address. The behavior depends on the operating system and how it is configured. For example, Windows 8.1adheres to IETF standards that define how to establish the default address selection for IPv6. macOS 10.6 does not support that standard. Additionally, Windows 8.1 default settings can be changed by netsh commands, so RFC compliance can be modified on the endpoint. For these and other reasons, it is difficult to predict which Ivanti server IP address would get resolved to on a given client machine.

For predictable hostname resolution, we recommend that you use different Ivanti server hostnames for IPv6 and IPv4 addresses. For example, configure myserver1.mycompany.com for IPv4 addresses and myserver1-v6.mycompany.com for IPv6 addresses. The Ivanti server administrator can publish myserver1-v6.mycompany.com to the Ivanti Secure Access Client users who are expected to connect over IPv6, and others will continue using myserver1.mycompany.com.

Customizing Ivanti Secure Access Client

Customizing Ivanti Secure Access Client Overview

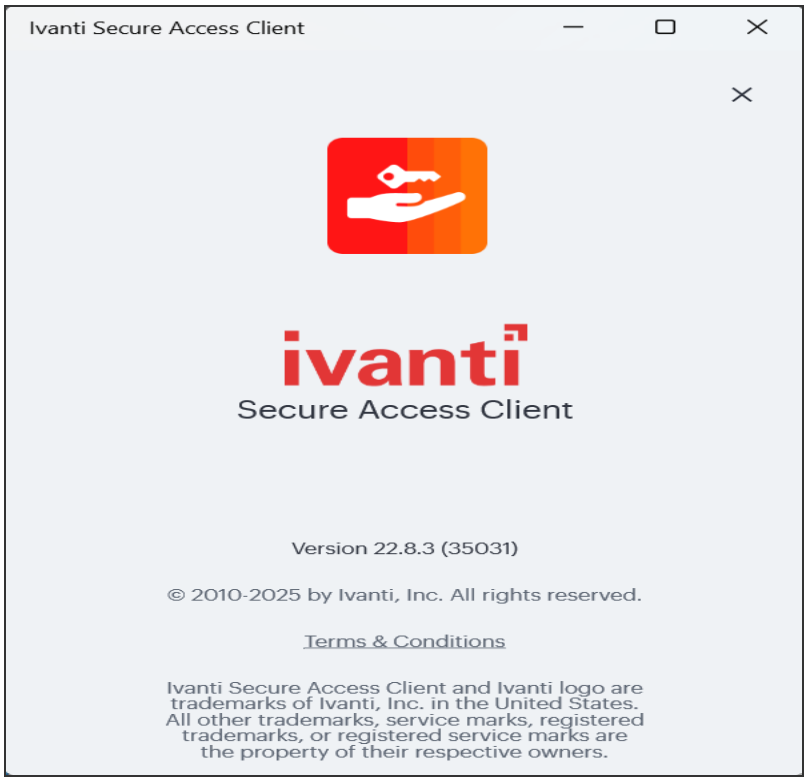
The Ivanti Secure Access Client (Ivanti Secure Access Client) customization tool *BrandPackager* enables you to customize the appearance of the Ivanti Secure Access Client for Windows and Apple OS X. You can add your own identity graphic to the Ivanti Secure Access Client splash screen, to the program interface, and to Windows credential provider tiles. Figure 107 shows graphic customizations applied to the Ivanti Secure Access Client for Windows. You can also customize error and informational message text, the text that appears in dialog boxes and on buttons, and make limited changes to Ivanti Secure Access Client online Help. For example, you might want to add your help desk phone number to Ivanti Secure Access Client error messages and the Ivanti Secure Access Client online Help.

BrandPackager is available for download along with client packages at: https://forums.ivanti.com/s/product-downloads.

BrandPackager runs on Windows only, but you use it to create the package files for Ivanti Secure Access Client for Windows and Ivanti Secure Access Client for OS X. A package file contains your edits to Ivanti Secure Access Client resource files. The edited resource files are installed into a special folder on the client. When Ivanti Secure Access Client needs to access a particular file, it checks this special folder first and uses the file if it is present. If Ivanti Secure Access Client does not find the file there, it uses the file that resides in the normal Ivanti Secure Access Client resource file location.

For Windows, you deploy the package to endpoints and use an MSIEXEC command-line installation option to instruct the installation program to apply your package file on the endpoint. For OS X, you copy the package file, the Ivanti Secure Access Client installation program, and a script file from the BrandPackager file set to an OS X computer, and then use them to add the package file to the Ivanti Secure Access Client installation file.

You can apply your changes to new or upgrade installations. You can also apply your customizations to an existing Ivanti Secure Access Client installation without installing or upgrading Ivanti Secure Access Client. Your changes to the Ivanti Secure Access Client user interface, message text, and online Help persist through normal client software upgrades.



BrandPackager Usage Notes:

- BrandPackager supports Ivanti Secure Access Client for Windows and Ivanti Secure Access Client for macOS.
- BrandPackager is compatible with Ivanti Secure Access Client R5.0 or later.
- Ivanti Secure Access Client customizations cannot be installed through Ivanti Web portal (server) installations.
- When you edit Ivanti Secure Access Client resource files, you must preserve the UTF-8 encoding. UTF-8 files include 3 bytes {0xEF, 0xBB, 0xBF}, the Byte Order Mark (BOM), at the beginning of the file.
- The Ivanti Secure Access Client interface and the online Help include separate resource files for each of the supported languages. If you make a change in the English file, you should make the same change in the files for the other languages that you support in your environment. If you do not do so, then the edited English version is always used.

- Ivanti Secure Access Client online Help can include new information with each new release. If you edit a Help topic, your changes are retained during a Ivanti Secure Access Client upgrade. However, if Ivanti changes that topic in the new release, that new information will not be available, because your edited topic will be used instead. For this reason we recommend that you make only limited changes to the online Help. For example, you can change the topic that describes how to contact customer support to direct users to contact your own help desk.

Brand Packager Workflow

To create a rebranded Ivanti Secure Access Client, you use the BrandPackager tool. The following procedure summarizes the steps from tool installation to client deployment. See the related documentation list for links to detailed information about the steps that are summarized here.

1. Download PulseBrandingTools.zip from the Ivanti website (www.ivanti.com). Create a folder on a Windows 8 or later version for PulseBrandingTools.zip, and then unzip it. Make sure that the host computer has Ivanti Secure Access Client installed, and that the version of Ivanti Secure Access Client is the one that you want to customize and distribute to users.

   Set up the customization environment by installing *7Zip*, a free open-source archive file program, and by running the BrandPackager initialization command to copy Ivanti Secure Access Client resource files to local work folders. To edit an existing package file, first import the file as part of the initialization process.

2. Edit the Ivanti Secure Access Client user interface files as needed.

3. Edit the Ivanti Secure Access Client message text files as needed.

4. Add your customization graphics.

5. Optionally, edit the Ivanti Secure Access Client online Help. There are separate procedures for the Windows and OS X online Help systems.

6. Run the BrandPackager script file to verify the structure of your changes and to create your package files.

7. Test your packages. The BrandPackager tool set provides a script to quickly activate your changes on the local machine for testing.

8. Deploying the package file is different depending on the platform:

   - For a Windows deployment, you install the package file by using an MSIEXEC command option when you run the Ivanti Secure Access Client installer.

- For an OS X deployment, you copy the branding package, the default Ivanti Secure Access Client for OS X installation file (PulseSecure.dmg), and ConfigureInstaller to the Mac, and then run ConfigureInstaller. ConfigureInstaller is a Python script that adds the package file to the Ivanti Secure Access Client installation program. You can then run the Ivanti Secure Access Client for OS X installation.

Setting Up the Ivanti Secure Access Client Customization Environment

The Ivanti Secure Access Client BrandPackager customization tool must be run on a windows 8.1 or later version computer that has Ivanti Secure Access Client 5.0 or later installed. Make sure that the Ivanti Secure Access Client installation includes all Ivanti Secure Access Client components to ensure that you have access to all of the Ivanti Secure Access Client resource files. BrandPackager creates the package files for Ivanti Secure Access Client for Windows and Ivanti Secure Access Client for OS X. A package file contains your edits to Ivanti Secure Access Client resource files.

To create the Ivanti Secure Access Client customization environment:

1. If you have not already done so, download PulseBrandingTools.zip from the Ivanti website (www.ivanti.com). Create a folder for PulseBrandingTools.zip, and then unzip it. Make sure that the host computer has Ivanti Secure Access Client installed, and that the version of Ivanti Secure Access Client is the one that you want to customize and distribute to users.
2. Install 7Zip.

   7Zip is a free open-source archive file program. It is used during the process of creating the Ivanti Secure Access Client customization package. You can download 7Zip from http://7-zip.org/.
3. If you have not already done so, install Ivanti Secure Access Client 5.0 or later on the endpoint where you will do the Ivanti Secure Access Client customization work.

Initializing the Ivanti Secure Access Client Customization Environment

The message text and user interface strings that appear in Ivanti Secure Access Client reside in text files that reside in different Ivanti Secure Access Client installation directories. After you install the BrandPackager tool, you run an initialization command that copies all the strings from the Ivanti Secure Access Client installation directories to two language-specific files in a reference directory called StringReference. The Ivanti Secure Access Client resource files are identical on Windows and OS X installations so the files from your Ivanti Secure Access Client for Windows installation can be used for both Windows and OS X customizations.

During initiation, the Ivanti Secure Access Client customization tool creates the PulseBranding directory and copies Ivanti Secure Access Client strings from an active Ivanti Secure Access Client installation to the StringReference directory area for customization.

BrandPackager copies files from the local Ivanti Secure Access Client installation, so make sure that you have the Ivanti Secure Access Client version installed that you want to customize and distribute.

Make sure that the Ivanti Secure Access Client installation includes all Ivanti Secure Access Client components. You can download the Ivanti Secure Access Client installation program from a Ivanti Policy Secure server or from a Ivanti Connect Secure server. You can configure and include Ivanti Secure Access Client connections in the installation before you edit Ivanti Secure Access Client files.

To initialize the Ivanti Secure Access Client customization environment:

1. Run the following command:

   ```
   BrandPackager -init
   ```

   The -init option does not overwrite files. If there is already a PulseBranding directory, only missing files are written to it.

   By default, Ivanti Secure Access Client online Help files are not included. To include the Help files, specify the -help option:

   ```
   BrandPackager -init -help
   ```

The online Help files are different between Windows and OS X. BrandPackager uses the Windows files from the local Ivanti Secure Access Client installation. The OS X files are included as part of the BrandPackager file set. The -help option creates two directories. The help directory holds the Windows files. The PulseSecureHelp.Help directory holds the OS X online Help files.

You can run BrandPackager -init -help if you have already run the -init option and want to just add the Help files.

Localized files in the StringReference directory are identified by a language identifier:

- DE - German
- EN - English
- ES - Spanish
- FR - French
- IT - Italian
- JA - Japanese
- KO - Korean
- PL - Polish
- ZH-CN - Chinese (Simplified)
- ZH - Chinese (Traditional)
- PT-BR - Portuguese

Importing an Existing Customized Ivanti Secure Access Client Package

If you already have a customized BrandPackager package, you can import it and make further changes to it without starting over. Also, changes to Ivanti Secure Access Client Help are not retained during a Ivanti Secure Access Client software upgrade operation. You should import the old package that has the Help file changes, create a new package, and then include that with the upgrade.

If you are upgrading to a new major release of Ivanti Secure Access Client, make sure you have the latest version of BrandPackager before you create a new BrandPackager package.

To import an existing customized BrandPackager package into the PulseBranding directory:

1. Open a Command Prompt window and make the PulseBranding directory your working directory.
2. Run the following commands:

```
BrandPackager -init
BrandPackager -import <filename>
```

The -import option must include the filename of your existing BrandPackager package file. For example:

```
BrandPackager -import C:/Staging/PulseWin.PulseBranding
```

If your original BrandPackager package included changes to the online Help, run the optional -help option:

```
BrandPackager -init -help
BrandPackager -import <filename>
```

The -import option overwrites any files in the PulseBranding directory. The program prompts you for confirmation before it makes any changes.

Editing Ivanti Secure Access Client User Interface Labels

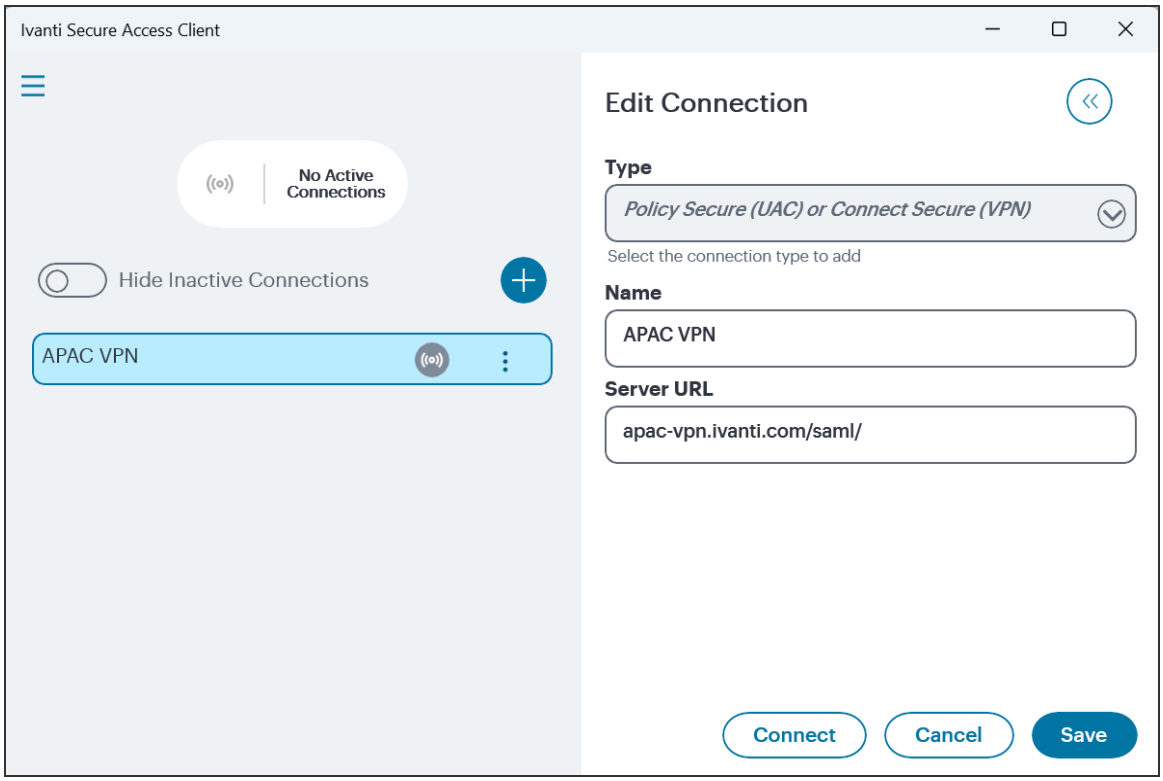
You can modify any text string that appears in the Ivanti Secure Access Client user interface. Ivanti Secure Access Client user interface strings reside in the StringReference\PulseResource_XX.txt file. Your modified strings must reside in the PulseBranding\BrandingResourceCatalog_XX.txt file. (XX indicates the language.)

If your Ivanti Secure Access Client environment uses Security Assertion Markup Language (SAML) for a Single Sign-on (SSO) authentication environment, the Ivanti Secure Access Client user sees a credential dialog box that is served from the Ivanti server instead of the local Ivanti Secure Access Client credential dialog box. The sign-in page is defined as part of the sign-in policy on the Ivanti server and Ivanti Secure Access Client embeds the sign-in page within a Ivanti Secure Access Client dialog box. To change the appearance of the SAML credential dialog, you must edit or create a new sign-in page on the Ivanti server.

The BrandingResourceCatalog files hold only the strings you modify. The default strings in their normal files are used for all strings that you do not modify.

The following procedure describes the workflow for modifying user interface strings using the English language version of the Ivanti Secure Access Client Edit Connection dialog box as an example:

1. Start Ivanti Secure Access Client and then display the Ivanti Secure Access Client string that you want to modify. For example, in the Ivanti Secure Access Client main window, select a connection and then click **Edit**.



2. Take a screen shot of the screen that you want to modify.

   The screen shot is not required but it can help you maintain or create a new shortcut character when you edit the string in the catalog file. It is good practice to keep track of what you change so you can verify your changes later.

3. Find the string that you want to modify.

   Search `StringReference\PulseResource_EN.txt` for the string. The string might appear more than once. For example, the string "Server URL" appears twice as a value in `PulseResource_EN.txt` because that string appears in two different dialog boxes. In general, the resource ID indicates where the value is used.

```
;IDS_CONNECTION_DLG_ST_NAME
[183]
Value  = Na&me:

;IDS_CONNECTION_DLG_ST_URL
[184]
Value  = &Server URL:

;IDS_CONNECTION_DLG_BTN_CONNECT
[185]
Value  = &Connect
```

Many strings use an ampersand (&) to designate a keyboard shortcut key. The ampersand causes the character that follows it to appear as an underlined character in the user interface. The presence of the ampersand can affect your results when you use the editor's search function.

4. Open PulseBranding\BrandingResourceCatalog_EN.txt with a text editor.
5. Copy the string that you want to edit from PulseResource_EN.txt to BrandingResourceCatalog_EN.txt. Be sure to copy/paste the entire entry. For example:

   ```
   ;IDS_CONNECTION_DLG_ST_URL [184] Value = &Server URL:
   ```

6. Modify the string in BrandingResourceCatalog_EN.txt. For example:

   ```
   ;IDS_CONNECTION_DLG_ST_URL [184] Value = &Server URL:
   ```

   Modify only the value. Do not change the string identifiers, `;IDS_CONNECTION_DLG_ST_URL` and `[184]`.

   We suggest that you keep the same letter for the shortcut to avoid a conflict with other strings on the screen. If the shortcut key letter does not appear in the new string, you can include it by putting it in parentheses. For example, the following entries show how to change Close to Exit and retain the "C" as a shortcut key:

   ```
   ;IDS_MAIN_DLG_BTN_CANCEL
   [188]
   Value = &Close

   ;IDS_MAIN_DLG_BTN_CANCEL
   [188]
   Value = Exit(&C)
   ```

You should change the shortcut letter only if you are certain that the new letter is not used elsewhere in that dialog box.

Each shortcut key on a screen must be unique. You can eliminate the shortcut by deleting the ampersand. However, shortcut keys are a part of good user interface design.

7. Edit that same resource ID in each of the language files that your organization supports.

   The Ivanti Secure Access Client interface includes separate files for each of the 10 supported languages. If you make a change in the English file, you should make the same change for the other languages that you support in your environment. If you do not do so, then the edited English version is always used.

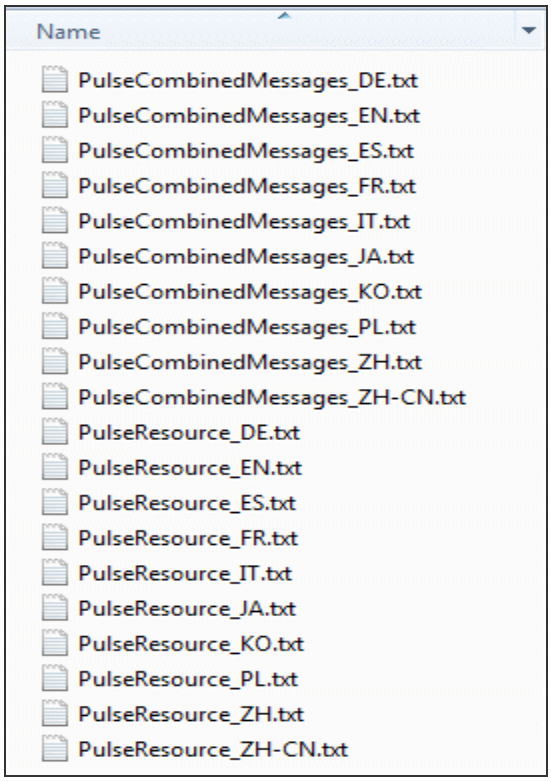
After initialization, there are two files for each language in the StringReference directory:

```
PulseCombinedMessages_XX.txt
```

Message catalog files hold the text that appears in the Ivanti Secure Access Client program interface and dialog boxes.

```
PulseResource_XX.txt
```

Resource catalog files hold the text that appears in Ivanti Secure Access Client message boxes.



To customize a particular string, you find the string you want to customize in PulseCombinedMessages_XX.txt or PulseResource_XX.txt, and then copy and paste that entire string and its resource ID to a corresponding resource or message file in the PulseBranding directory, where you edit it. This directory holds all of the files that make up your customization package.

You must use a text editor, such as Visual Studio IDE or Notepad++ that retains the byte order mark (BOM) in the resource files. (Notepad++ is free open source software available at http://notepad-plus-plus.org/).

See the Sample directory for an example of a customized Ivanti Secure Access Client file set.

Editing Ivanti Secure Access Client Messages

Ivanti Secure Access Client message strings reside in the `StringReference\PulseCombinedMessages_XX.txt` file. Modified message strings must reside in the `PulseBranding\BrandingMessageCatalog_XX.txt` file. (`XX` indicates the language.)

The BrandingMessageCatalog files hold only the strings that you modify. The default strings in the installed resource files are used for all strings that you do not modify.

It is not always possible to set up the conditions that cause a particular message to appear in Ivanti Secure Access Client. Browsing the contents of `BrandingMessageCatalog_XX.txt` is the easiest way to identify the strings you might want to change.

You can use HTML tags within the BrandingMessageCatalog entries. For example, you can use and tags to make text appear in bold type. You can use <A href=> tags to include a link to other HTML text you want. Make sure that your link displays the text in a new window. For example:

```
<A HREF="Http://www.myserver/my-messsge.html" target="_blank">
```

Keep in mind that Ivanti Secure Access Client might not be connected to the Internet when the error occurs.

Each message includes a short description and a long description. The short description is shown as a title to the longer description. There are no limits to the number of characters that you can include as the long description. However, the long description must be on one line in the message catalog file. Use HTML
 and </br> tags to insert line breaks when the message is displayed.

To modify a message:

1. Find the string that you want to modify.

Search `PulseCombinedMessages_XX.txt` for the string. In general, the resource ID indicates where the value is used.

2. Open `PulseBranding\BrandingMessageCatalog_XX.txt` with a text editor.
3. Copy the string that you want to edit from `StringReference\PulseCombinedMessages_XX.txt` to `BrandingMessageCatalog_XX.txt`. Be sure to copy/paste the entire entry. For example:

   ```
   [1731] ;kMsgCommonCertTrustPulseAuthServerIdentityNotFoundShort-desc = Authentication server not trusted. Long-desc = Authentication server identity not found in client's "Trusted Server List". Contact your network administrator.
   ```

4. Modify the string in `BrandingMessageCatalog_XX.txt`. For example:

   ```
   [1731] ;kMsgCommonCertTrustPulseAuthServerIdentityNotFoundShort-desc = Authentication server not trusted. Long-desc = Authentication server identity not found in client's "Trusted Server List". Contact the Help Desk at Ext.50123.
   ```

5. Edit that same resource ID in each of the language files that your organization supports.

The Ivanti Secure Access Client interface includes separate files for each of the 10 supported languages. If you make a change in the English file, you should make the same change for the other languages you support in your environment. If you do not do so, then the edited English version is always used.

Adding Custom Graphics to Ivanti Secure Access Client

The PulseBranding directory also includes default graphics. To add your custom graphics to the Ivanti Secure Access Client interface, simply replace the default graphics with your custom graphics.

You can add a graphic to the following areas:

- Next to the Ivanti logo on the main screen
- In dialog boxes
- On the About screen
- On the Ivanti Secure Access Client splash screen

The Ivanti Secure Access Client connection set properties, which you define on the Ivanti server, include an option to suppress the Ivanti Secure Access Client splash screen.

The PulseBranding directory includes two graphics:

- **BrandingLogo.png**: Appears on the Ivanti Secure Access Client splash screen and program interface. The default BrandingLogo.png file is an empty file with a transparent background. For best results, your graphic image should have a transparent background. The file must be a PNG file.

  The default BrandingLogo.png file is 19 by 52 pixels. The maximum height is 37 pixels, which corresponds to the size of the Ivanti logo. Maximum width is 100 pixels. A graphic larger than the recommended size might be clipped or it could obscure other graphic elements.

- **BrandingCredProv.png**: Appears as the image on credential provider tiles.

To add a custom graphic:

1. Replace PulseBranding\BrandingLogo.png with your graphic.
2. Replace PulseBranding\BrandingCredProv.png with your graphic.

   If you do not want to include a custom graphic, you should delete default graphics from PulseBranding.

   The Ivanti Secure Access Client online Help provides reference and procedural information for users. Ivanti Secure Access Client users can access the Help by clicking the Help button in the Ivanti Secure Access Client program interface. Ivanti Secure Access Client online Help is a collection of standard HTML files with CSS formatting and javascript navigation. Updating the Help requires knowledge of basic HTML coding. To edit the online Help, you must include the Help when you initialize the Ivanti Secure Access Client customization environment.

If you edit a Help topic, your edited topic is used instead of the original topic. Your edited topic is retained during an upgrade. Ivanti Secure Access Client online Help can include new information with each new release. If Ivanti changes a topic in the new release, that new information will not be available because your edited topic is used instead. To avoid this problem, we recommend that you make only the Help topic changes described in this guide.

You might want to edit that topic and substitute your own help desk contact information. Use an HTML editor to make your changes. Do not change the filename or any of the javascript code within the topic.

Ivanti Secure Access Client Help includes the following language versions:

- DE - German
- EN - English
- ES - Spanish
- FR - French
- IT - Italian
- JA - Japanese
- KO - Korean
- PL - Polish
- ZH-CN - Chinese (Simplified)
- CN - Chinese (Traditional)
- PT-BR - Portuguese

Be sure to edit the same topics for all the languages that you support.

The Ivanti Secure Access Client Help viewer includes a menu item labeled Feedback, which links to a documentation comments page on www.ivanti.com.

To change the Feedback destination URL or to remove the menu item:

1. Open j_header.html with an HTML editor.
2. Search for the following string:

   https://forums.ivanti.com/s/contactsupport
3. Either edit or remove the link.

Customizing Ivanti Secure Access Client for Apple OS X Online Help

The Ivanti Secure Access Client online Help provides reference and procedural information for users. Ivanti Secure Access Client users can access the Help by clicking the Help button in the Apple menu bar. Ivanti Secure Access Client online Help is a collection of standard HTML files with CSS formatting. Apple Help application acceleration includes special metadata in the header of each topic and a particular directory structure to properly interact with OS X. Updating the Help requires knowledge of basic HTML coding. To edit the online Help, you must include the Help when you initialize the Ivanti Secure Access Client customization environment.

If you edit a Help topic, your edited topic is used instead of the original topic. Your edited topic is retained during an upgrade. Ivanti Secure Access Client online Help can include new information with each new release. If Ivanti changes a topic in the new release, that new information will not be available because your edited topic is used instead. To avoid this problem, we recommend that you make only the Help topic changes described in this guide.

You might want to edit that topic and substitute your own help desk contact information. The file resides in `PulseSecureHelp.Help\Contents\Resources\<language>.lproj\pages`. Filenames in OS X are case-sensitive.

Ivanti Secure Access Client for OS X online Help includes the following language versions:

- DE.lproj - German
- English.lproj - English
- ES.lproj - Spanish
- FR.lproj - French
- IT.lproj - Italian
- JA.lproj - Japanese
- KO.lproj - Korean
- PL.lproj - Polish
- TW.lproj - Chinese (Traditional)

- CN.lproj - Chinese (Simplified)
- PT-BR.lproj - Brazilian Portuguese

Be sure to edit the same topics for all the languages that you support.

Validating Customizations to Ivanti Secure Access Client

The validation process examines the files in the PulseBranding directory to ensure that they can be added to the Ivanti Secure Access Client installation package.

To validate your changes before building the BrandPackager package, run the following command:

```
BrandPackager -validate
```

Validation is a basic level of checking. After you build the new Ivanti Secure Access Client installation package, you should test the package before you deploy it.

Building the New Ivanti Secure Access Client Package

The packaging process creates two package files, one for Windows and one for OS X, that include your changes. It does not include the Ivanti Secure Access Client installation files. You include a package when you install Ivanti Secure Access Client. Or you can apply your changes to a Ivanti Secure Access Client without installing or upgrading Ivanti Secure Access Client.

To create a package, run the following command:

```
BrandPackager -package
```

When the command finishes, it creates two package files, PulseWin.PulseBranding and PulseMac.PulseBranding. To apply your changes on a Ivanti Secure Access Client endpoint, you include a package file when you install or upgrade Ivanti Secure Access Client.

Testing the Ivanti Secure Access Client Package

Before you deploy the new Ivanti Secure Access Client installation package, you should verify that your changes work correctly. `BrandInstaller.bat` installs the BrandPackager package on the local machine. `BrandInstaller.bat` employs `jamCommand.exe`, which is a program that resides in the Ivanti Secure Access Client program directory.

You must be an administrator to run BrandInstaller.

To install your BrandPackager package on the machine where you created it, run the following command:

```
BrandInstaller -brand
```

You can now view your changes on the local Ivanti Secure Access Client to make sure that you have made all the modifications correctly. Verify Ivanti Secure Access Client by checking the following:

- View the main dialog and the About screen to make sure that the branding logo appears as you want.
- View the screens that contain any of the user interface strings that you changed.
- If you have updated the Ivanti Secure Access Client for Windows Help, invoke the Help to make sure your changes are correct.

If you are satisfied, you can install the package on endpoints.

Installing or Upgrading Ivanti Secure Access Client for Windows with a Branding Package

You install or upgrade Ivanti Secure Access Client and apply the changes in PulseWin.PulseBranding to Ivanti Secure Access Client for Windows by using Microsoft Exec (`msiexec`) and setting the **BRANDINGFILE** attribute to point to the branding file. This installation requires administrative privileges.

The following example shows the `msiexec` command to install or upgrade Ivanti Secure Access Client and to apply the customizations in `PulseWin.PulseBranding`:

```
msiexec /i c:\staging\PulseSecure.x64.msi
BRANDINGFILE=c:\staging\PulseWin.PulseBranding
```

Installing or Upgrading Ivanti Secure Access Client for Apple OS X with a Branding Package

To apply the branding package changes to an Apple OS X endpoint, you must copy the necessary files to an OS X endpoint and use them to update the Ivanti Secure Access Client installation program. You can also use this process to add Ivanti Secure Access Client configurations (a .pulsepreconfig file) to the Ivanti Secure Access Client installation program. You can then use that Ivanti Secure Access Client installation program to install or update Ivanti Secure Access Client on OS X endpoints. If the specified branding package is present in the Ivanti Secure Access Client installation program, the installation process creates the following directory:

```
/Library/Application Support/Ivanti/PulseBranding
```

The `PulseBranding` directory holds the changes you made to Ivanti Secure Access Client resource files and graphics. When Ivanti Secure Access Client must access a resource file, it checks this directory first.

To add `PulseMac.PulseBranding` to `PulseSecure.dmg`, perform the following steps on an OS X endpoint:

1. Create a directory on an OS X endpoint and copy the following files to it:
   - **PulseMac.PulseBranding**: The file created for OS X by BrandPackager that contains all of your client customizations. After you edit the resource files and run BrandPackager, PulseMac.PulseBranding is available in the same directory as BrandPackager.
   - **PulseSecure.dmg**: The Ivanti Secure Access Client installation program. You can download PulseSecure.dmg from the Downloads page of Ivanti Connect Secure or Ivanti Policy Secure.
   - **ConfigureInstaller**: A Python script that adds the package file to PulseSecure.dmg. ConfigureInstaller is available in the same directory as BrandPackager. Python is part of OS X 10.2 and greater and is included in the system PATH.
2. Open a terminal window and make the directory that holds ConfigureInstaller your current directory.
3. Run ConfigureInstaller. You can run ConfigureInstaller with no options to see the command summary:

   ```
   python ./ConfigureInstaller
   ```

```
usage -s <source dmg> -b <brandingfile> -c <configfile> -t <target
dmg>
usage -s <source dmg> -b <brandingfile> -t <target dmg>
usage -s <source dmg> -c <configfile> -t <target dmg>
```

The following example shows a command for adding a branding file and a Ivanti Secure Access Client config file to the Ivanti Secure Access Client installation program:

```
python ./ConfigureInstaller -s PulseSecure.dmg -b
~/Staging/PulseMac.PulseBranding -c ~/Staging/myfile.pulsepreconfig-t
PulseSecure-new.dmg
```

When the operation completes successfully, the new Ivanti Secure Access Client installation program is ready for use.

Installing a Branding Package Only

You can add or remove the contents of a Ivanti Secure Access Client branding package on a client machine by using jamCommand. The jamCommand program is part of every Ivanti Secure Access Client installation. On Windows endpoints, jamCommand is located in the 32-bit program files directory:

```
Program Files (x86)\Common Files\Ivanti\JamUI\jamCommand.exe
```

On OS X endpoints, jamCommand is located in the Applications folder:

```
/Applications/Ivanti\ Secure\
Access.app/Contents/Plugins/JamUI/./jamCommand
```

The jamCommand program must be run with administrator privileges.

To apply the customizations in PulseWin.PulseBranding (Windows) or PulseMac.PulseBranding (OS X):

1. Run the following command:

   ```
   jamCommand -brand
   ```

To remove your customized Ivanti Secure Access Client user interface from the endpoint and allow Ivanti Secure Access Client to use default strings:

2. Run the following command:

   ```
   jamCommand -unbrand
   ```

jamCommand Usage Notes:

- Running jamCommand with the -brand or -unbrand option causes Ivanti Secure Access Client to restart. Connections are maintained and should be active after the restart. A restart is required to allow Ivanti Secure Access Client to access the customized settings. If you will be rebooting the system manually, or if there is no logged in user, then you can use the -norestart option. To avoid a restart when you run jamCommand, use the following option:

  ```
  jamCommand -norestart
  ```

- jamCommand reports its results using the following numeric error codes:

  0 - Success.

  1 - General branding error.

  2 - Error deleting branding files. This error can also occur when you install new files because the first action -brand performs is to remove the old files.

  3 - Error branding Ivanti Secure Access Client. The new branding files cannot be written.

- The Ivanti Secure Access Client version must be R5.0 or later. To verify your current version of Ivanti Secure Access Client, run jamCommand with no parameters. If the result (displayed in a window) shows the branding options (-brand, -unbrand, -norestart), then branding is supported.

The jamCommand errors are not written to the console. To see jamCommand errors, include a script that checks error codes. Additional error message information is written to the Ivanti Secure Access Client log files.

Ivanti Secure Access ClientAuthentication Types

RSA Authentication

RSA Authentication Manager (formerly known as ACE/Server) is an authentication and authorization server that allows user authentication based on credentials from the RSA SecurID® product from RSA Security Inc.

When you use RSA Authentication Manager as the authentication and authorization service for your Ivanti access management framework, users can sign into IPS using the same username and password stored in the backend server.

Method	Action
Using a hardware token and the standard system sign-in page	The user browses to the standard system sign-in page, and then enters the username and password (consisting of the concatenation of the PIN and the RSA SecurID hardware token's current value). The system then forwards the user's credentials to the authentication server.
Using a software token and the custom SoftID system sign-in page	The user browses to the SoftID custom sign-in page. Then, using the SoftID plug-in, the user enters the username and PIN. The SoftID plug-in generates a passphrase by concatenating the user's PIN and token and passes the passphrase to the authentication server.

If the RSA Authentication Manager positively authenticates the user, the user gains access to the system. Otherwise, the RSA Authentication Manager:

- Denies the user access to the system.
- Prompts the user to generate a new PIN (New PIN mode) if the user is signing into the system for the first time. Users see different prompts depending on the method they use to sign in.
- If the user signs in using the SoftID plug-in, then the RSA prompts the user to create a new pin; otherwise IPS prompts the user to create a new PIN.

- Prompts the user to enter the next token (Next Token mode) if the token entered by the user is out of sync with the token expected by RSA Authentication Manager. Next Token mode is transparent to users signing in using a SoftID token. The RSA SecurID software passes the token through the system to RSA Authentication Manager without user interaction.
- ·Redirects the user to the standard system sign-in page (SoftID only) if the user tries to sign-in to the RSA SecurID Authentication page on a computer that does not have the SecurID software installed.

Google Authentication

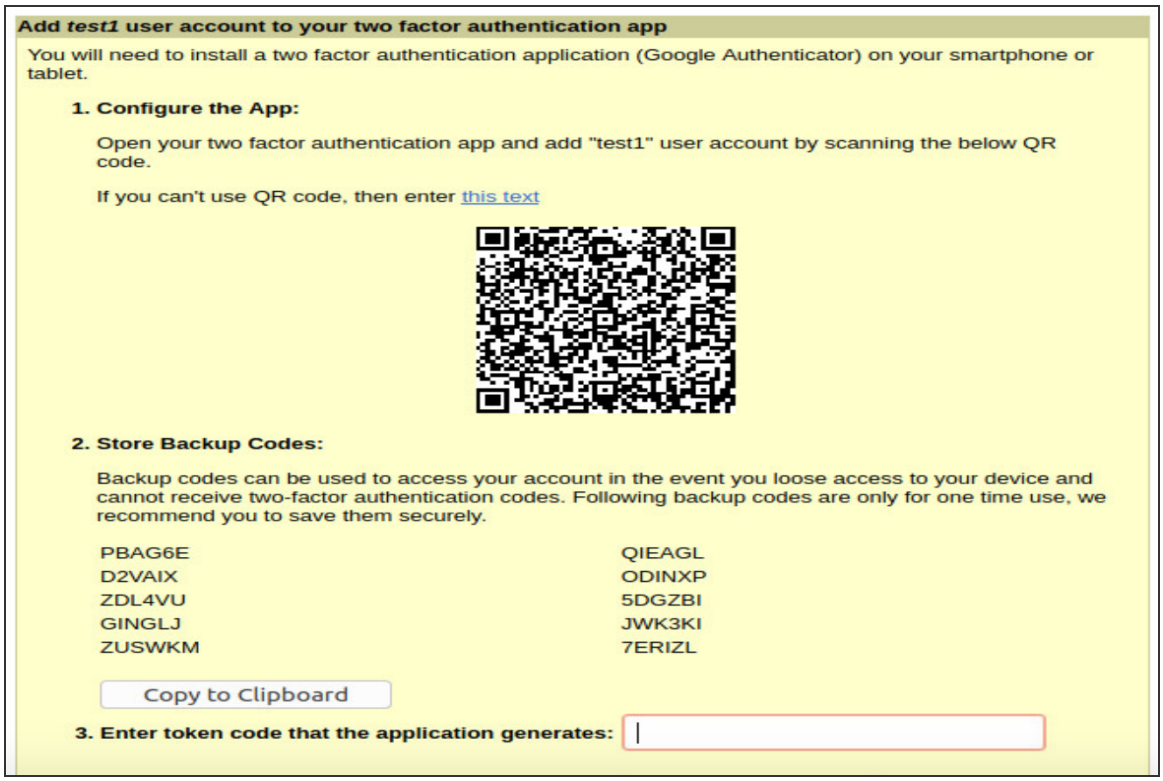
The admin can associate an end-user to a realm that has a secondary authentication server configured as TOTP authentication server.

For first time registration through web, perform the following steps:

For example: Admin associates an end-user User1 to a user-realm that has the TOTP authentication-server configured as the secondary authentication-server.

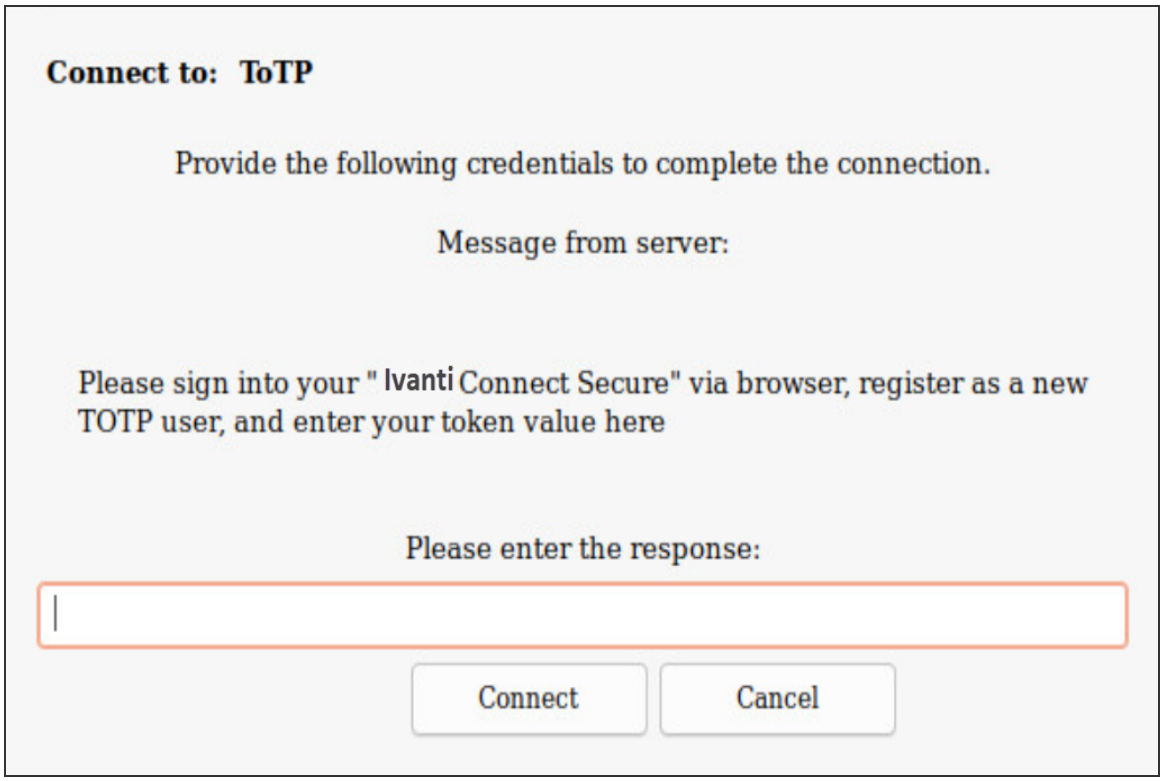
When User1 for the first time, performs a login to the above configured user-realm:

1. After successful authentication with primary authentication-server, User1 is shown the TOTP registration page.
2. User1 is given a TOTP registration key in text form/QR image form and 10 backup codes. User saves 10 backup codes in a safe place for using it later during authentication when end-user device (where Google Authenticator app is installed) is not available (in emergency).
3. Now, User1 opens the device where Google Authenticator app is installed, then either scans the QR image (or) manually adds a new user (for example: GA-User1) by entering the above given secret registration key.
4. The Google-Authentication app (for GA-User1) generates a new 6-digit number called as a token once in every 30 seconds.
5. Enter the current token in the registration page. Click on Sign In. On successful authentication with that token, User1 will be taken to his/her home page.



For already registered user, perform the following steps:

1. The already-registered user (For example: User1), whose realm was associated with secondary authentication server configured as TOTP authentication server, accesses IPS URL via web (User1 has already registered TOTP user in Google Authenticator app.)
2. After successful authentication with primary authentication server, user1 is shown TOTP Token entry page as seen in Figure 29
3. User1 opens Google Authentication app that was installed in mobile (or PC), enters the current token to the
4. Authentication Code. If mobile is not available, user can enter any of the unused backup codes.
5. On successful authentication with the token, User1 can enter any of the unused backup codes.
6. A backup code can be used only once to successfully authenticate with the TOTP authentication server. Once used, the same backup code cannot be reused.



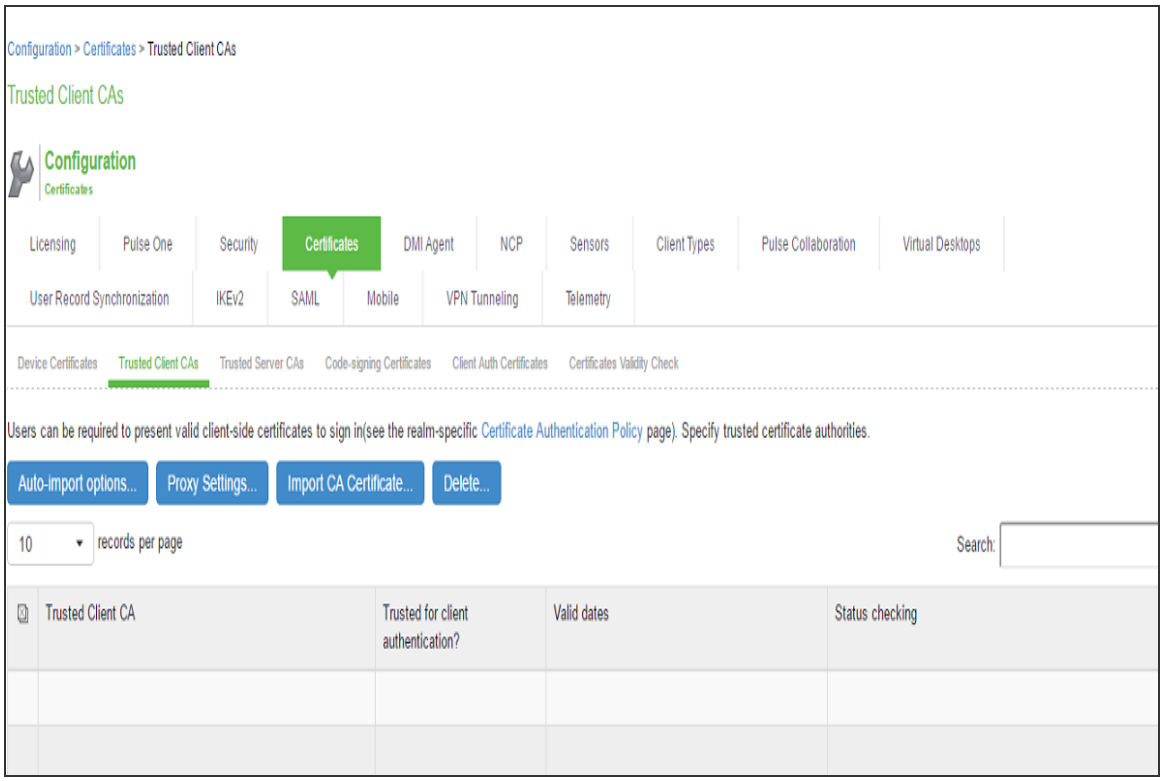
Certificate Authentication Support

This feature enables users to login to the client using their certificates. The supported scenario is “certificate-based login only" the Ivanti Secure Access Client setup is now switched to this authentication method. In a typical enterprise environment, each user will be provided with certificate which can be used for VPN login. This mechanism can be used only as a primary authentication mechanism.

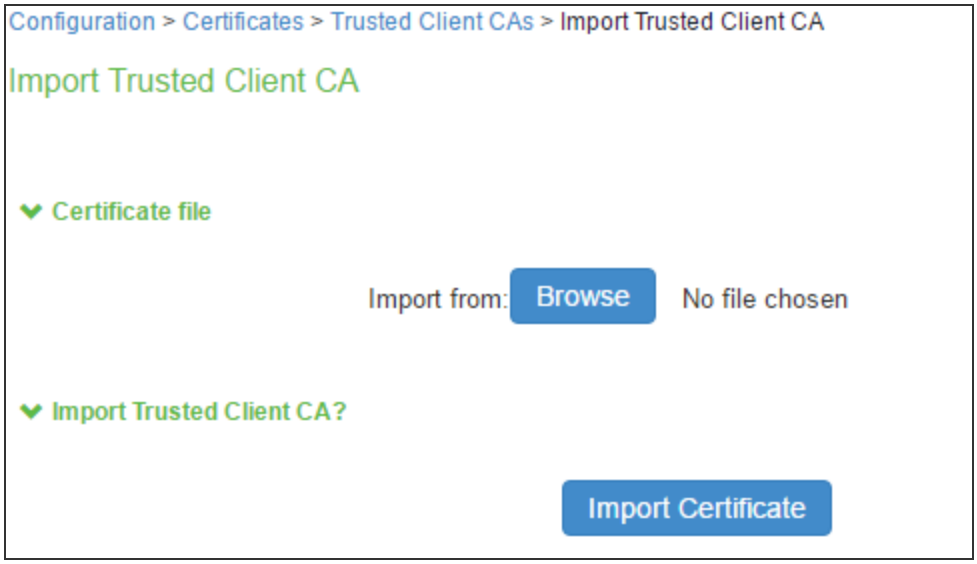
Configuring Client Certificate in Ivanti Connect Secure

To configure trusted client CA certificate:

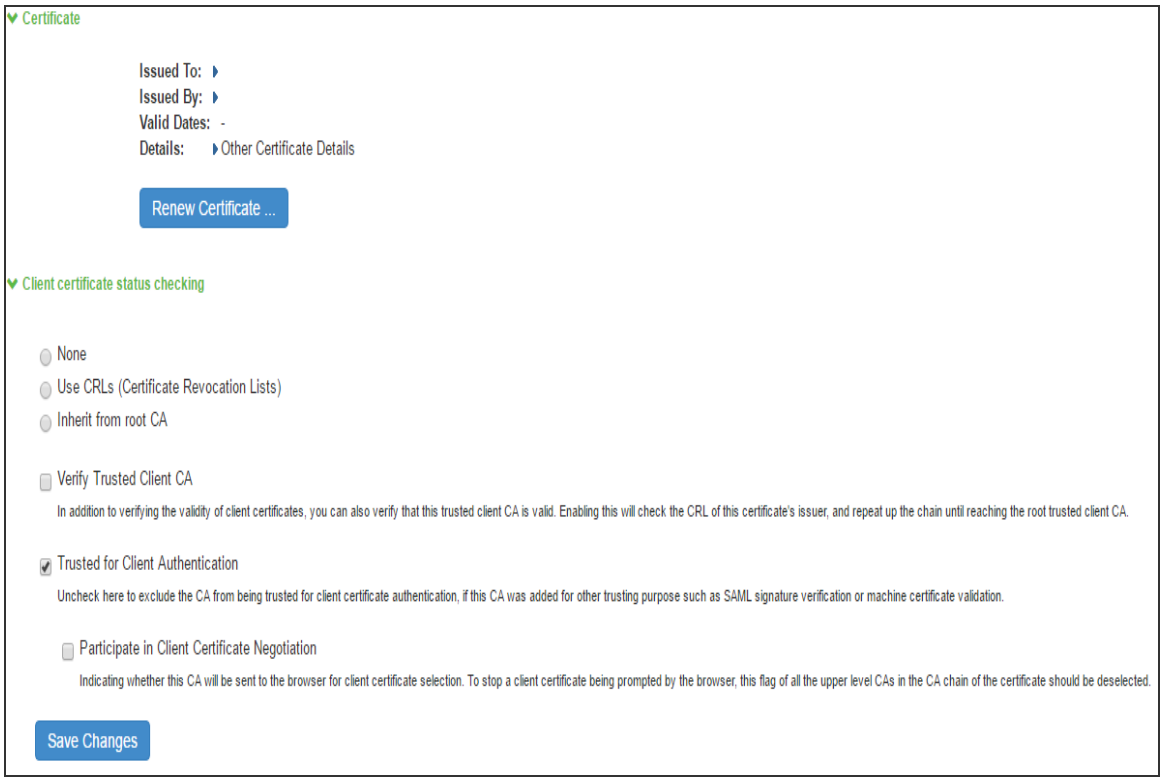
1. Select **System > Configuration > Certificates > Trusted Client CAs.**



2. Click **Import CA Certificate** to display the configuration page.



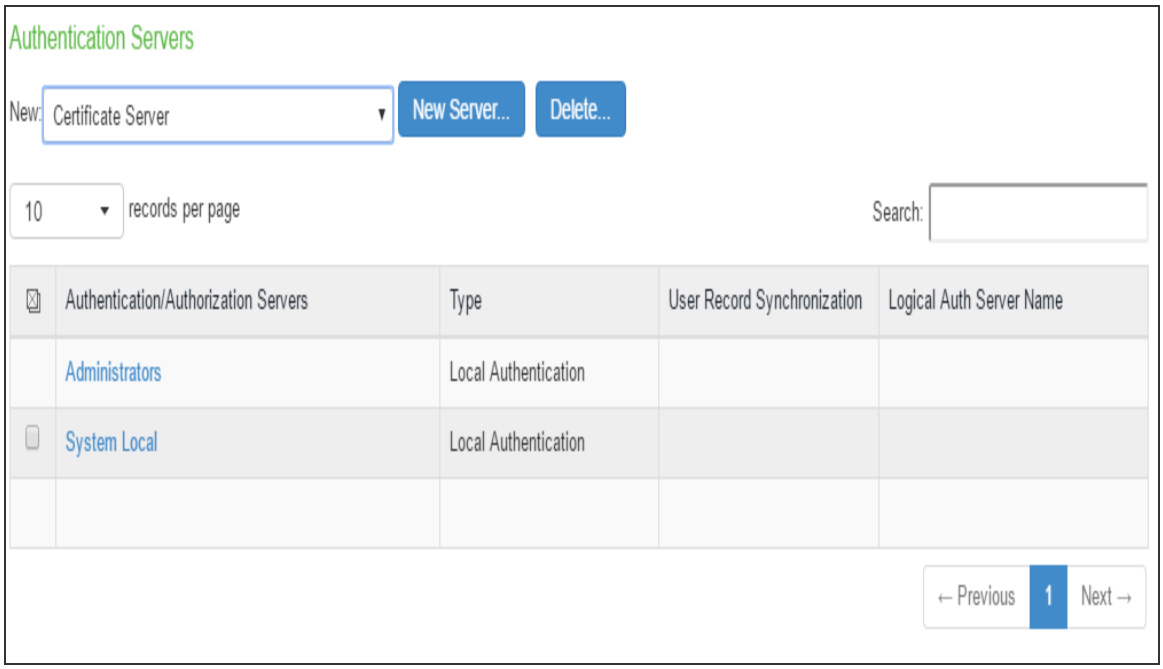
3. Browse to the certificate file and select it.
4. Click **Import Certificate** to complete the import operation.
5. Click the link for the Trusted Client CA to configure.



Configuring Authentication with the Certificate Server

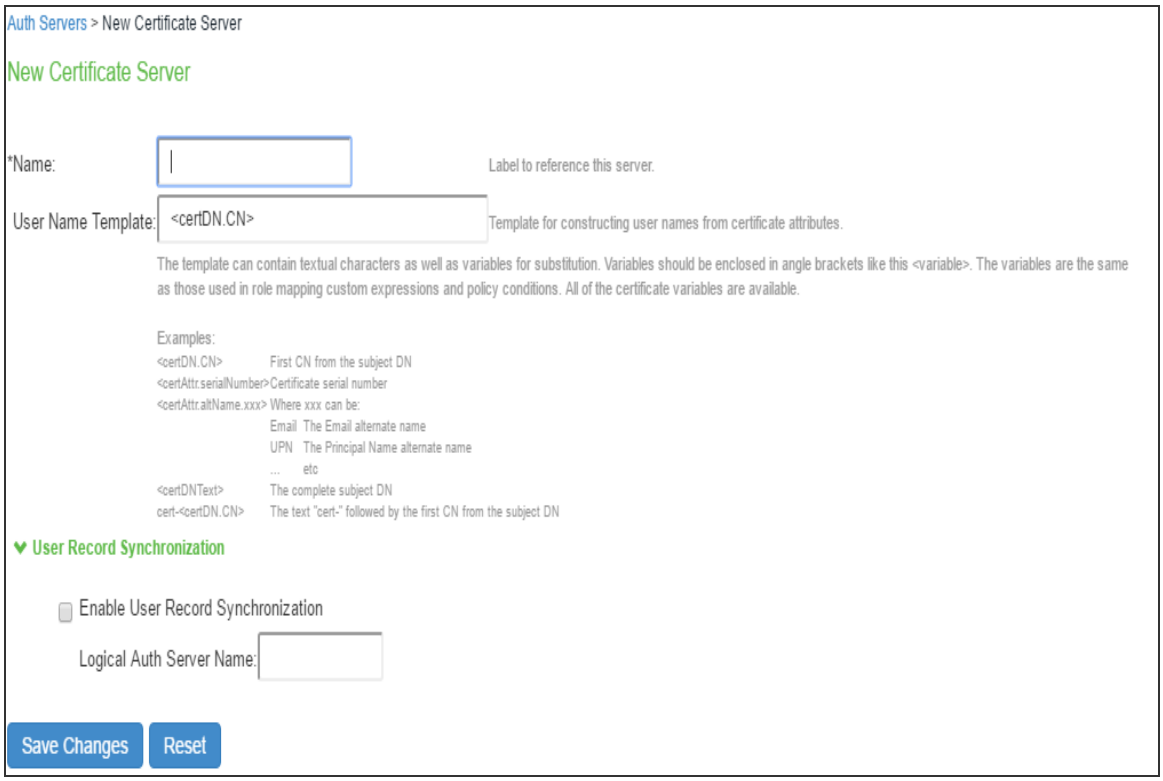
To configure authentication with the certificate server, follow the steps below:

1. Select **Authentication > Auth Servers**.
2. Select **Certificate Server** and Click **New Server** to display the configuration page.



3. Complete the configuration as described in following table:

Settings	Guidelines
Name	Specify a name to identify the server within the system
User Name Template	Specify a username template. Specify how the system should construct a username. You may use any combination of certificate variables contained in angle brackets and plain text. NOTE: This value populates the <USER> and <USERNAME> session variables for use throughout the rest of the system configuration.
User Record Synchronization	This applies only to Connect Secure.
Enable User Record Synchronization	Select this option to retain the bookmarks and individual preferences regardless of which system you log in to.
Logical Auth Server Name	Specify a logical authentication server name.



4. Save the configuration.

Client Certificate Installation

The installation of the certificates can be facilitated through a script. Client certificates can be installed using util script "**certificate_installer.sh**". Use the following commands to install or delete the certificates:

- **To install the certificate**:

  ```
  /opt/pulsesecure/bin/certificate_installer.sh install_certificates [-inpfx < PFX /P12 file >] [-inpriv <private file> -inpub <public file>]
  ```

Password is required to install private and public keys separately.

- To list the certificates on the certificate store

  ```
  /opt/pulsesecure/bin/certificate_installer.sh list_installed_certificates
  ```

- To delete the Certificate from certificate store

```
/opt/pulsesecure/bin/certificate_installer.sh delete_certificates -
certName <certificate name>
```

To delete certificates from CEF certificate store:

```
/usr/bin/certutil -d sql:/ /$HOME/.pki/nssdb -D -n <Nickname>
```

where, 'Nickname' is available in list of installed certificates

Public Certificates

Extensions	Certificate Formats
der, cer	DER
pem, crt, key, pub	PEM

Private Keys

Extensions	Certificate Formats
der, cer	DER
pem, crt, key	PEM

PFX file (Contains both Private Key and Public Keys)

Extensions	Certificate Formats
Pfx, p12	PFX

Default Certificate Selection

If multiple certificates are available for a connection, the certificates list allows the user to select the certificate and authenticate to establish the connection.

Client certificate authentication through smart cards is not supported.

YubiKey Authentication Support

YubiKey is a hardware token for Multifactor Authentication that supports OTP, with plans to adopt modern authentication approaches such as FIDO U2F with single security key.

- On Linux systems, Chromium Embedded Framework (CEF) is used as the embedded browser for custom sign-in, SAML Authentication to work with FIDO U2F. On Ivanti Connect Secure, enable "Enable embedded browser for authentication" option in Connections settings for Ivanti Secure Access Client to launch CEF for sign in.
- On macOS systems, Chromium Embedded Framework (CEF) is used as the embedded browser SAML Authentication to work with FIDO U2F. On Ivanti Connect Secure, enable "Enable FIDO2 U2F for SAML authentication" option on the connection set.
- On windows, Ivanti Secure Access Client uses Microsoft Edge WebView2 based Embedded browser, for Captive portal, SAML, Custom sign-in, and SAML Single Logout (SLO). The embedded browser also supports FIDO2 passwordless Authentication.
  Ivanti recommends to download the Evergreen Bootstrapper softwarefrom the Microsoft software download site and run it on the endpoints. If WebView2 runtime is not installed on the machine, Ivanti client attempts to install it

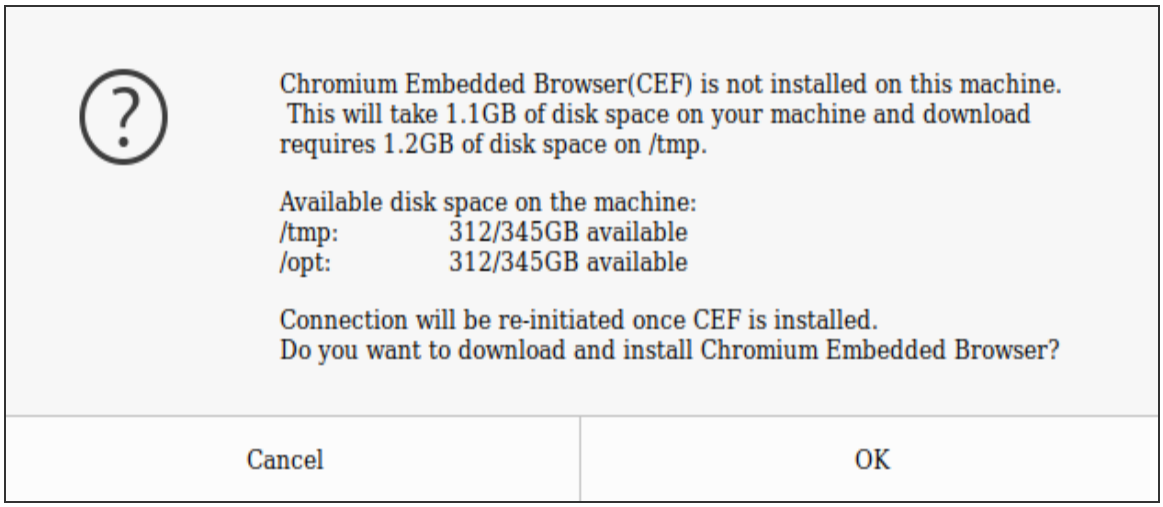
Ivanti Secure Access Client integrates YubiKey for MFA with CEF to redirect to the IDP such as Azure AD and Okta.

To set up YubiKey for authentication and install CEF browser, use the following procedure.

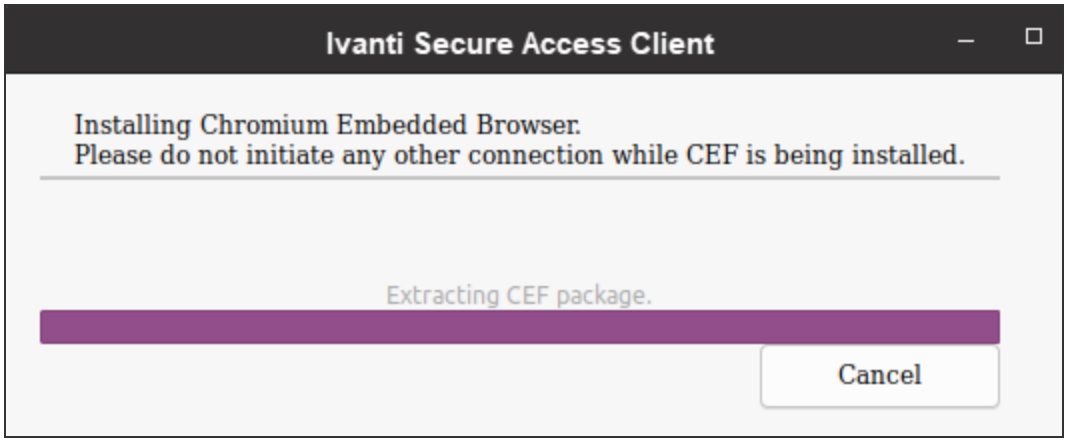
1. Launch Ivanti Secure Access Client application and select a connection and click **Connect**.

2. An authentication confirmation window appears. Click **OK** to continue.

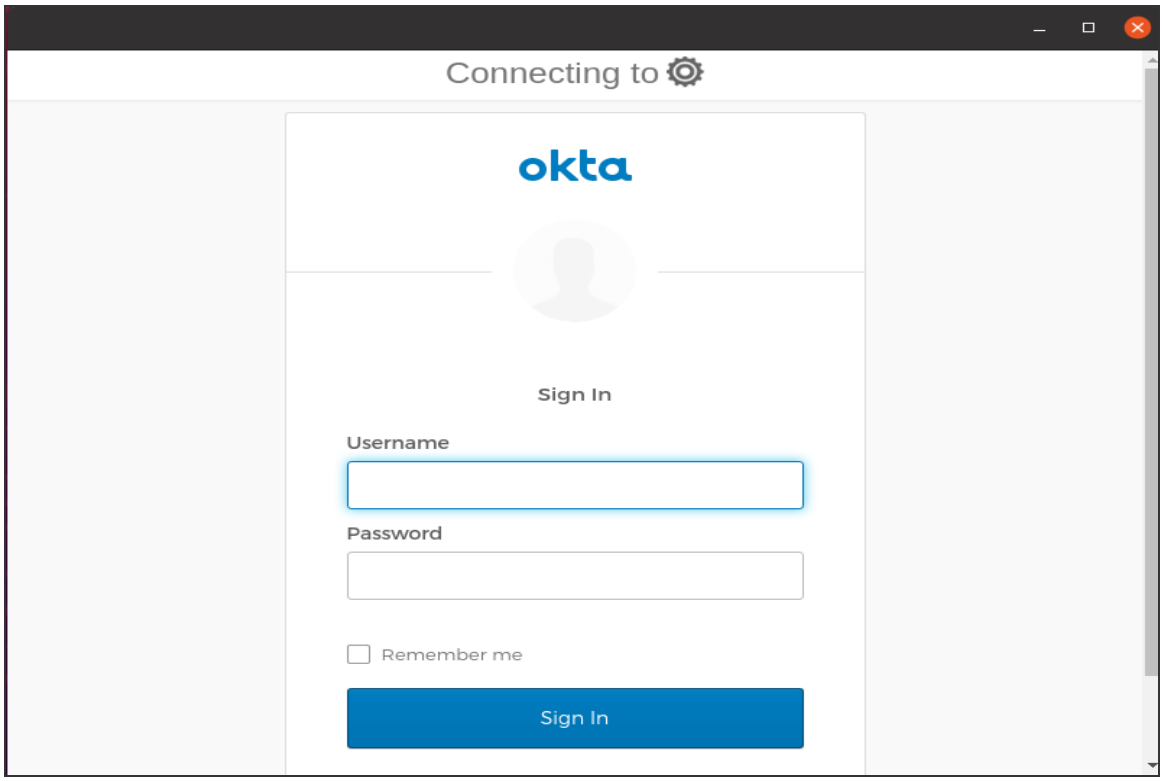
3. A CEF download confirmation window appears, click **OK** to download and install CEF browser.



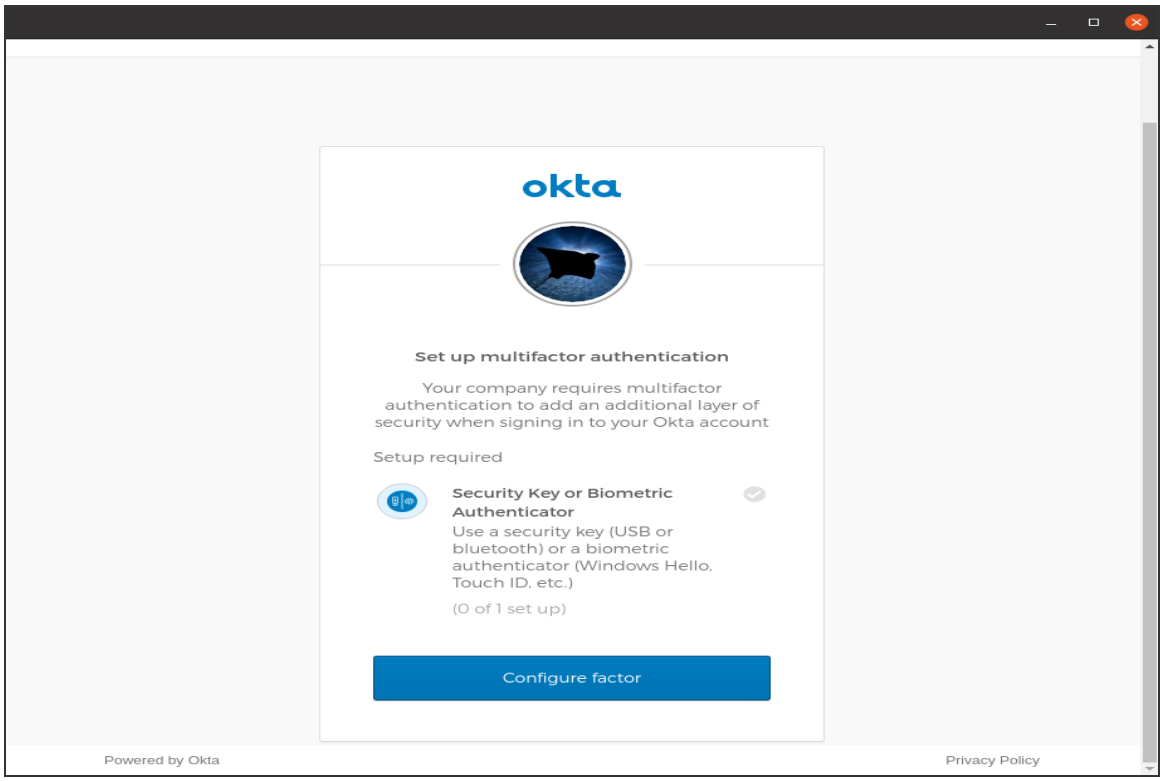
The CEF downloads automatically. The installation progress and status displays. Ensure not to initiate any other connection when CEF installation is in progress.



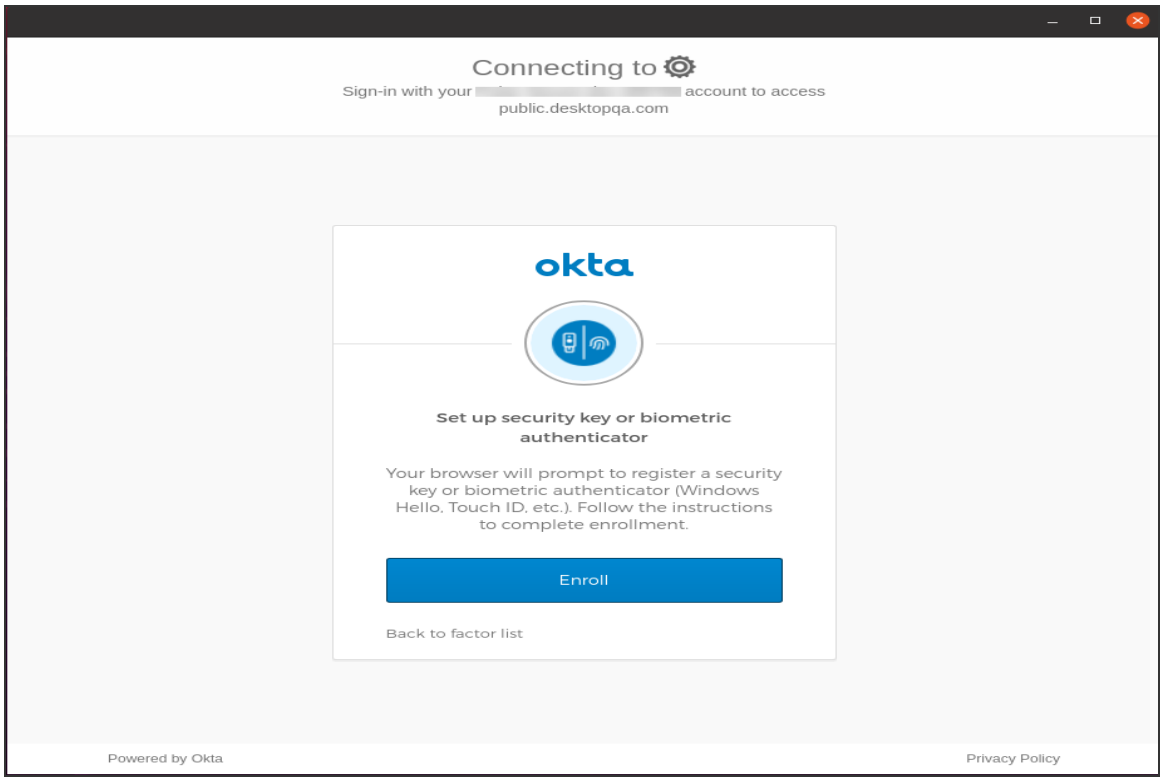
4. On successful installation of CEF Browser, YubiKey authentication window appears.
   Enter **Username** and **Password** to Sign In if already registered. If not registered, registration page displays.



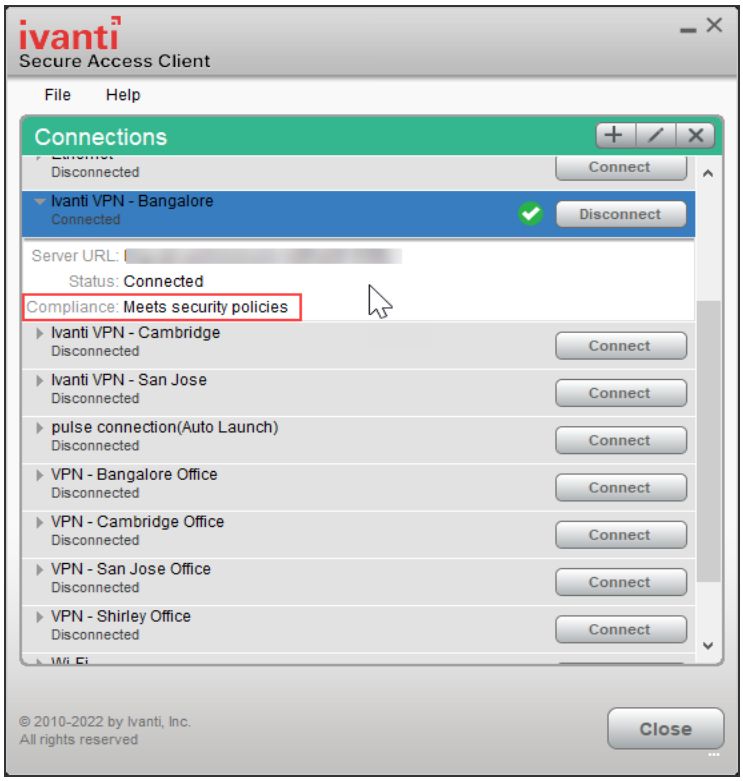
5. On “Set up multifactor authentication” window, click **Configure factor**.



6. On "Set up security key or biometric authenticator" window, click **Enroll**.



7. On “Set up multifactor authentication” window, check the enrolled factors and click **Finish**.
8. The connection is established and the connection details display.



Using Ivanti Secure Access Client with nZTA

nZTA Overview

Ivanti provides a nZTA-ready version of the Ivanti Secure Access Client software required for end-user devices to be able to connect to your secure applications and resources.

Ivanti Secure Access Client connects to nZTA services, by default, through an on-demand connection basis and can handle multiple simultaneous nZTA and non-nZTA connections. To learn more, see On-Demand and Simultaneous Connection Handling.

Ivanti Secure Access Client maintains communication with the nZTA Controller to continuously-enable synchronization of policy and configuration updates. Through this mechanism, user requests to access resources and applications are subject to continuous assessment for risk and authorization. For more details, see Dynamic Policy Update and CARTA.

To learn more about enrolling user devices for use with nZTA, see Enrolling a User Device.

On-Demand and Simultaneous Connection Handling

While active, Ivanti Secure Access Client maintains two connection channels for nZTA services, a control channel to the nZTA Controller, and a data channel to your nZTA Gateways. For more details on networking considerations when deploying Gateways, see Working with Gateways.

The control channel connection to the nZTA Controller is activated when Ivanti Secure Access Client is started up and remains in an always-on state, silently in the background. If Ivanti Secure Access Client is able to locate a valid session cookie from an earlier session, the connection is re-established automatically. If no valid cookie is present, Ivanti Secure Access Client requests re-authentication from the user. The nZTA Controller connection is terminated when Ivanti Secure Access Client is shut down.

Ivanti Secure Access Client creates data channel connections to nZTA Gateways as an on-demand service. That is, connections to resources and applications controlled by nZTA Gateways become active only when required, and the connection is suspended after a period of inactivity. The user remains unaware of the connection state, unless re-authentication becomes necessary. As a user makes a request for a resource, Ivanti Secure Access Client transitions automatically from disconnected to connected. The connection remains in this state for the duration of the session, or until one of the following events occurs:

- An idle time-out occurs (after 5 minutes)
- The connection is actively placed in a disconnected state

- Ivanti Secure Access Client is shut down

To avoid the data channel being reconnected unnecessarily, non-nZTA DNS traffic is redirected to the device's physical network adapter.

Applicable Ivanti Secure Access Client versions can manage simultaneous connections with the nZTA Controller, and with other Ivanti services such as Ivanti Connect Secure (ICS). While ICS connections must be activated and deactivated by the user, connections to nZTA are provided on-demand, as mentioned. Therefore, a nZTA connection in the Ivanti Secure Access Client does not provide the same **Connect** and **Disconnect** controls. Instead, nZTA connections include only a **ZTA** button to provide access to the nZTA Applications page. If this button is active, the connection to the Controller has been established. If the button is inactive, the connection to the Controller has not yet been established, or a communication problem has occurred. In this case, access to your applications is prevented.

When running active connections to both nZTA and ICS simultaneously, note that the following ICS features are not supported:

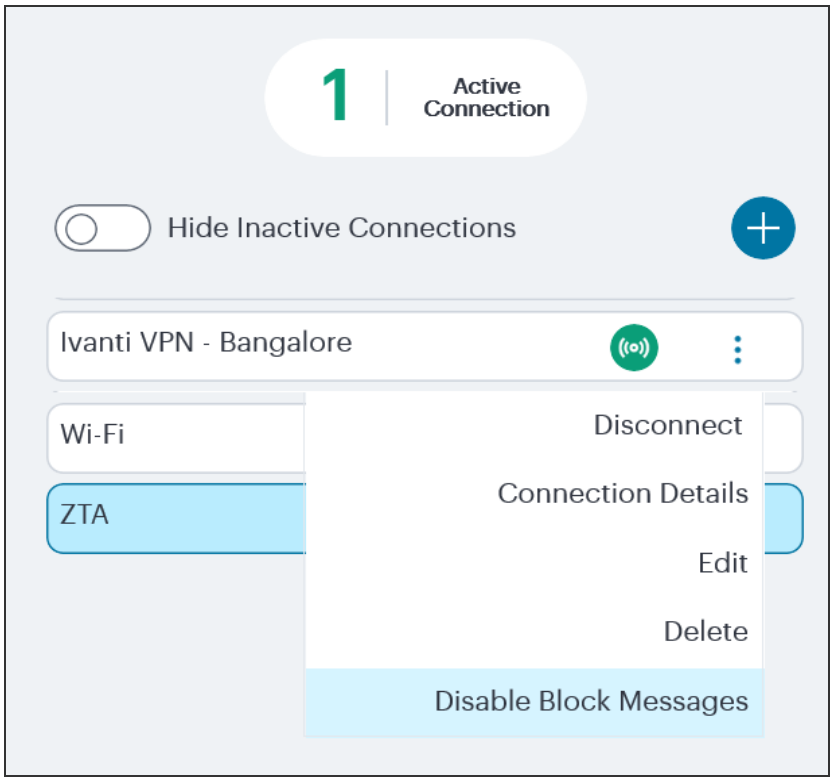
- Route Monitoring
- Traffic Enforcement
- Stealth Mode
- Always on VPN/LockDown
- Location awareness
- IPv6 support

Disabling the nZTA Connection

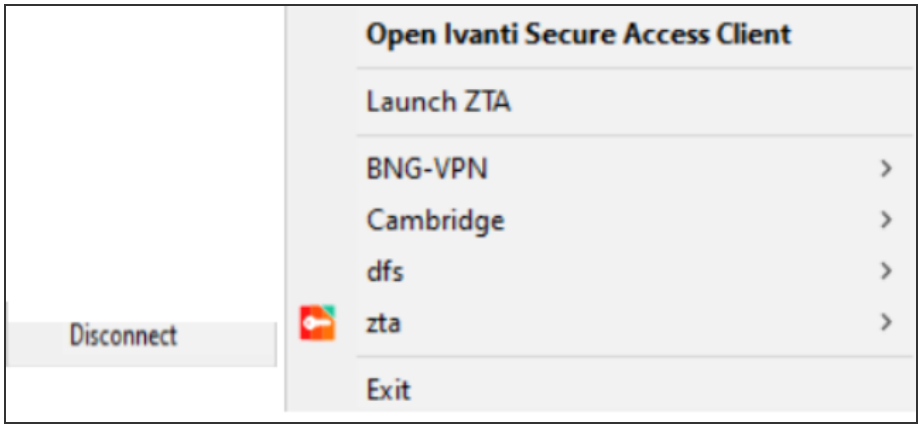
Ivanti Secure Access Client additionally provides the ability to actively disable the on-demand connection feature. Use of this facility disables the nZTA connection, avoiding the scenario where Ivanti Secure Access Client attempts to repeatedly request authentication even after the user might be unable to authenticate due to too many failed attempts, or where the user just does not require access to any PZTA-controlled resources during that session.

If a user attempts to request a PZTA-controlled resource during the period a nZTA connection is disabled, the request fails. Other Ivanti Secure Access Client connections are unaffected.

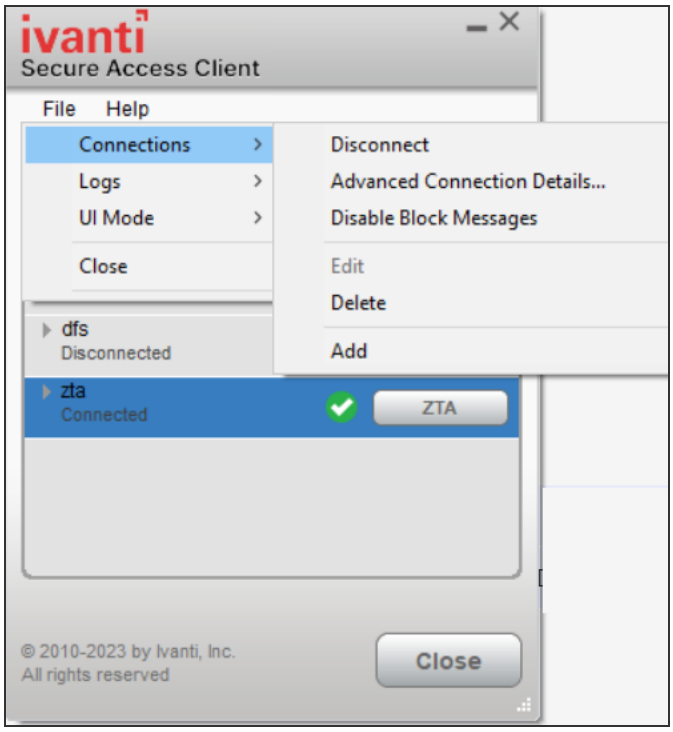
For Ivanti Secure Access Client on macOS and Windows, click **Disconnect** in the Ivanti Secure Access Client connection list context menu. Right-click a nZTA connection profile to see the available options.



For Ivanti Secure Access Client on macOS and Windows, click **Disconnect** from the System Tray icon. View the sub-menu for the nZTA connection you want to disconnect.



For Ivanti Secure Access Client on macOS and Windows, click Disconnect through the Ivanti Secure Access Client application menu. Open Ivanti Secure Access Client and select the nZTA connection profile. Then click **File** > **Connections** > **Disconnect**.



By setting the nZTA connection to be disconnected, Ivanti Secure Access Client suspends both the control channel and the data channel (where either are active). If the control channel was previously logged-in to the nZTA Controller, this remains the case to facilitate session resumption through a subsequent reconnect.

The disconnect feature is not activated by clicking or tapping Cancel in the nZTA authentication dialog. Canceling an authentication request triggers a timeout interval, after which Ivanti Secure Access Client re-displays the authentication dialog. The disconnect feature instead disables the authentication request process until the user manually reinstates it.

To reinstate the nZTA connection on macOS and Windows devices, use the Launch ZTA option in the Ivanti Secure Access Client system tray menu or tap the **ZTA** button in the nZTA connection profile in the Ivanti Secure Access Client application.

If the existing session cookie is still valid, the control channel is re-established. If the session is now invalid, Ivanti Secure Access Client prompts the user for their nZTA credentials as normal. On successful re-establishment of the nZTA session, the user is presented with the nZTA End User Portal in the default browser.

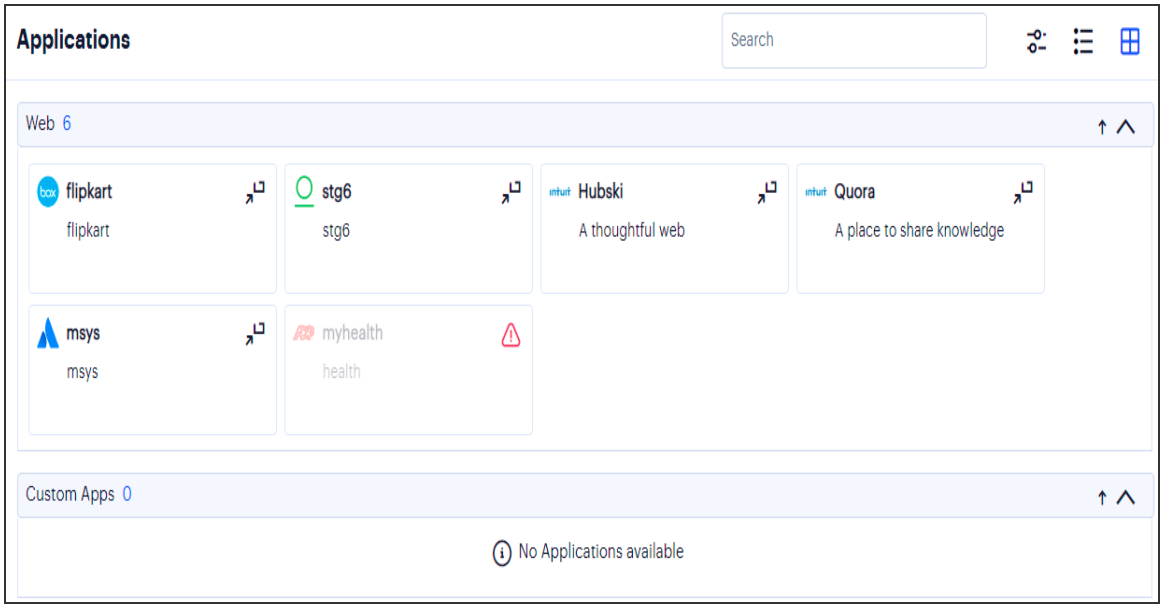
When restarting Ivanti Secure Access Client, nZTA connections default to being on-demand services. That is, a previously disabled nZTA connection is re-enabled when Ivanti Secure Access Client starts.

Dynamic Policy Update and CARTA

To complement the zero-trust approach, nZTA supports dynamic policy updates and CARTA (Continuous Adaptive Risk and Trust Assessment) for your end user devices. This framework establishes an approach of continuous assessment and updating of secure access policies on the Ivanti Secure Access Client, without the requirement to disconnect and reconnect to establish an updated authorization posture.

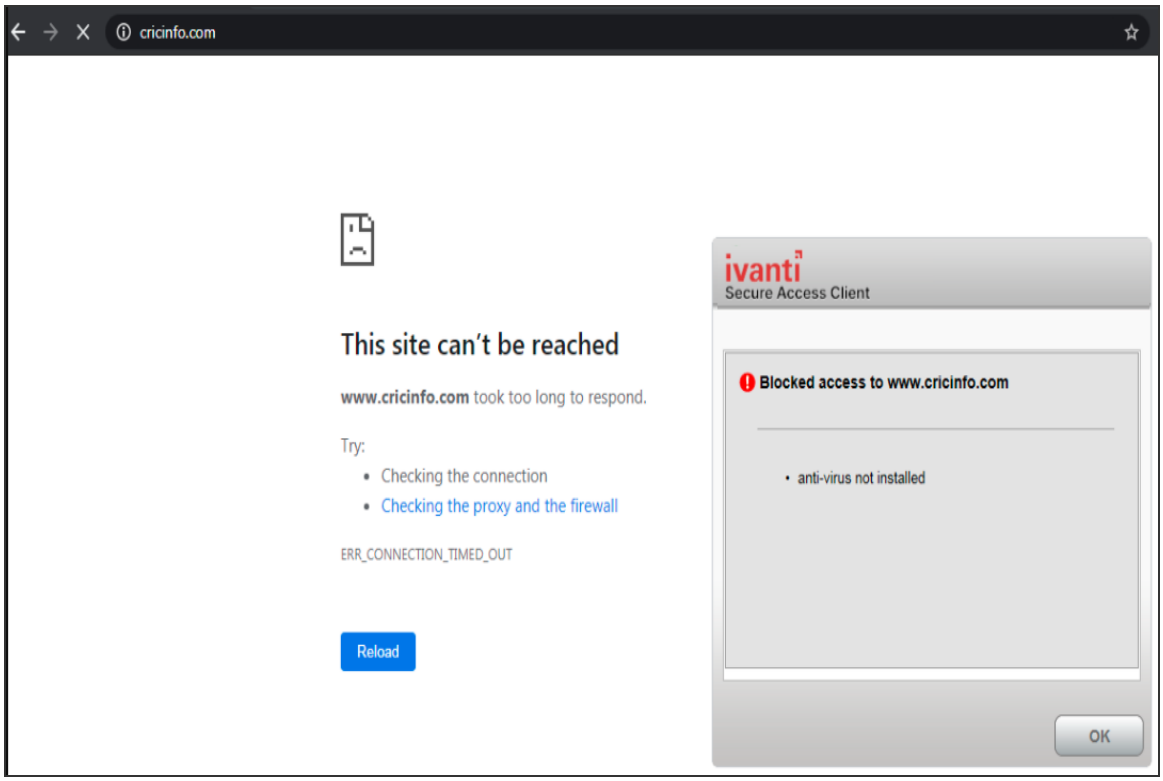
As your policies, applications, and authentication configuration are updated by the administrator on the nZTA Controller, changes are synchronized out to Ivanti Secure Access Client devices dynamically and take effect immediately. Ivanti Secure Access Client ensures that any application updates are applied and any new authentication requirements are met before continuing the session, providing the end user with a seamlessly-updated experience. This method ensures that Ivanti Secure Access Client is always updated at the point of change, and not just when establishing a connection to a nZTA Gateway to access an affected resource.

The CARTA implementation in Ivanti Secure Access Client means that the security posture of the end user is continuously assessed in conjunction with policies configured in the Controller, with allow or deny decisions enforced through dynamic assessment and updating of the current policy set. Where application access is denied or restricted, Ivanti Secure Access Client informs the user of any access restrictions or policy contravention at the point of use. For example, the Ivanti Secure Access Client Home page updates to provide visual cues with applicable error messages whenever a specific application becomes unavailable:



By hovering your pointer over the warning symbol in the inactive application, nZTA provides an explanatory message.

Furthermore, user attempts to access a restricted web resource in a browser trigger a CARTA response with Ivanti Secure Access Client presenting a pop-up resource blocked message:



Ivanti Secure Access Client implements a no-repeat interval for resource blocked messages of 2 minutes, to avoid a user repeatedly seeing the same pop-up message for every browser request for the same restricted resource. While the resource remains blocked to further access attempts, no further messages are displayed by Ivanti Secure Access Client until after 2 minutes has elapsed. You can force Ivanti Secure Access Client to continue hiding blocked resource messages indefinitely by right-clicking the connection in the Ivanti Secure Access Client dialog and selecting **Disable Block Messages**. To re-enable showing blocked resource messages, select **Enable Block Messages**.

Enrolling a User Device

To use nZTA, end users must first enroll their devices with the nZTA Controller. This process installs the Ivanti Secure Access Client software and establishes a connection to the Controller in order to obtain policies and details for a user's authorized resources.

Ivanti Secure Access Client uses this configuration to establish a secure connection to the nZTA Gateways you deploy to control access to your applications. Through this process, the user is provided a seamless connection to the resources they need and is never aware of the location or extent of the organization's application infrastructure.

A new user might arrive at this scenario from one of the following routes:

- An existing Ivanti Secure Access Client user, with a previous Ivanti Secure Access Client connection to Ivanti Connect Secure (ICS) or similar, see Existing Ivanti Secure Access Client Users.
- A first time nZTA user, with no previous Ivanti Secure Access Client software installed, see "Enrolling First Time Users" on the next page.
- An existing nZTA user enrolling a new device, or upgrading a previous version of Ivanti Secure Access Client, see "Enrolling Existing nZTA Users" on the next page.

Existing Ivanti Secure Access Client Users

Your users might have a previous version of Ivanti Secure Access Client installed if, for example, they are existing ICS users.

To enroll existing ICS users into nZTA, a ICS administrator must first push out the nZTA-ready edition of the Ivanti Secure Access Client software to the user base. An admin uploads the new Ivanti Secure Access Client software to the ICS server and activates the nZTA-ready version of Ivanti Secure Access Client from the ICS management console in the same way as any other version. This process ensures that when your users next activate a Ivanti Secure Access Client connection to the server, their device is prompted to download and install the new version.

For more details on this process, see the Ivanti Connect Secure documentation at https://www.ivanti.com/support/product-documentation.

After the new nZTA-ready version of Ivanti Secure Access Client is installed, the user can configure a nZTA connection using the same process used for other, existing, connections. To create a nZTA connection, compatible Ivanti Secure Access Client versions offer a specific connection type: "Zero Trust Access".

The tenant administrator must then supply the nZTA enrollment URL to their users to create the new nZTA connection.

Enrolling First Time Users

When enrolling a new device, an authorized user contacts the nZTA Controller to activate an initial first-time enrollment of their Ivanti Secure Access Client device. The Controller responds to a valid enrollment request by activating a download of Ivanti Secure Access Client along with a suitable client certificate.

After Ivanti Secure Access Client is installed, a secure connection request is attempted with the Controller. The request is validated against the designated authentication policy applicable to that combination of user and device and, where successful, a connection profile is downloaded to the Ivanti Secure Access Client. This profile enables Ivanti Secure Access Client to set up a secure tunnel directly to the nZTA Gateway serving the resource set the Ivanti Secure Access Client is authorized to view.

Enrolling Existing nZTA Users

After you have enrolled the new device, Ivanti Secure Access Client is installed and configured with the policies and settings relevant to the device type. Your application and resource access rights should be duplicated to the new device.

If a user device is currently using a Beta version of the nZTA-ready Ivanti Secure Access Client, Ivanti advises to remove the nZTA connection from Ivanti Secure Access Client and to re-perform the enrollment procedure through a web browser. For more details, see your support representative.
