z/Scope Anywhere

User's guide

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1 z/Scope

z/Scope Anywhere

User guide

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2 Introduction

z/Scope Anywhere is a Web-to-Host Terminal Emulator for accessing to IBM Mainframes, AS/400 and Unix systems. It is an HTML5 based product that allows users to access their Hosts Emulation from any browser or device.

Highlights:

- ✓ Browser-based Terminal Emulator client
- ✓ Cross-browser, cross-operating system and cross-device
- ✓ Multiple protocols: TN3270E, TN5250E and VT100/VT220/VT320/VT420/ SSH1/SSH2 Telnet Servers
- ✓ Multi-session support: run several sessions on the same client instance
- ✓ File Transfer: exchange files between the mainframe and the web client
- ✓ Touch and virtual keyboard enabled
- ✓ No client installations (Pure HTML/Javascript client)
- ✓ SSL encrypted communication
- ✓ Secure SSL encrypted communication
- ✓ Admin Control Panel
- ✓ Load Balancing for a better performance on large deployments.
- ✓ Real-time Statistics

What's new:

Printer terminal support:

- ✓ Integrated printer emulation: printing terminals support implemented. Send print jobs to your browser-side printer, or download them to a file. TN3287 and TN3812 support.
- ✓ Easier access to printing job files: printing queue, print preview, and more.

Updated and flexible authentication scheme:

- ✓ Provide anonymous access to connections, avoiding the login process.
- ✓ Combine authenticated and anonymous access connections for logged in users.

New integration possibilities:

- ✓ Direct access to the emulation screen through a dedicated virtual path per connection. Facilitate integration by allowing the user to bypass the landing page.

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- ✓ HLLAPI.js: new HLLAPI javascript interface to provide programmatic access from external applications to z/Scope.
- ✓ One Time URL (OTURL): create a temporary, unique URL to provide one time access to a specific connection. This URL expires as soon as it's used or after a specific period of time.
- ✓ Secure access to core company data: multiple authentication options and simplified Single Sing-On. Enable access for end-users via one or more of these authentication methods: Logon, OAuth/2 (Google, Facebook, etc), RADIUS or customize the authentication process using a DLL.

New and enhanced user interface:

- ✓ New navigation and user interface. Classic, Coverflow, Gallery and Grid modes available.
- ✓ Open new connections on different tabs or manage them within the z/Scope environment.
- ✓ Create Display, Printer or Display and Printer connections.
- ✓ Autosuggestion: This useful and time-saving feature consists in contextual menus that are displayed when typing into input fields. These contextual menus contain a list of the recently typed phrases that match the user's initial keystrokes.

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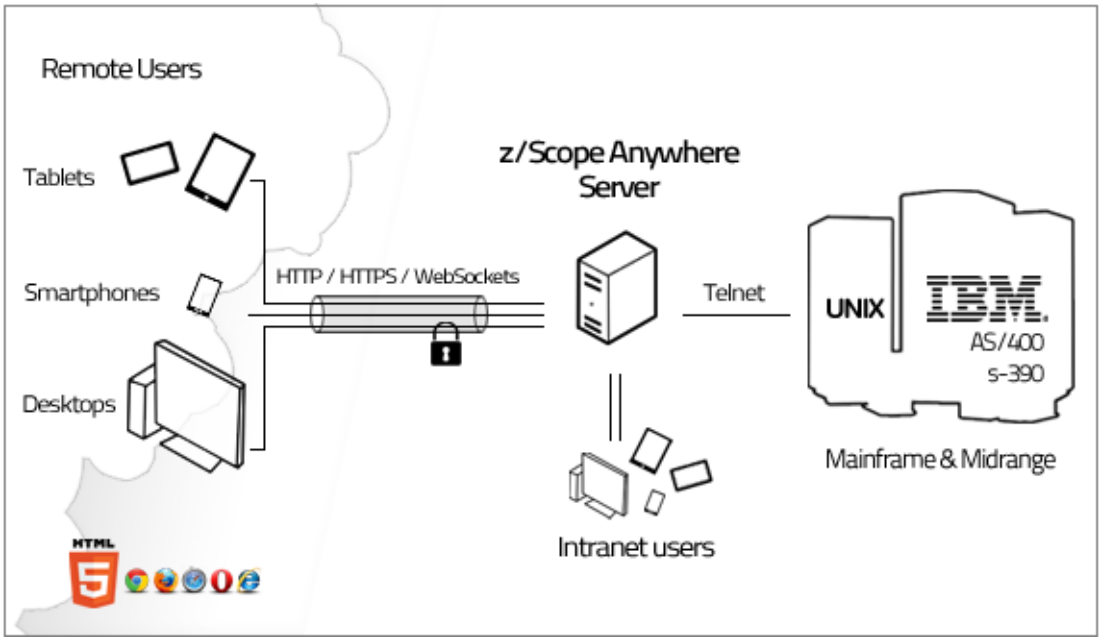
3 Architecture

Z/Scope Anywhere is based on a 3-tier architecture:

The client:
HTML5-capable Web Browser

The server:
z/Scope Anywhere Server

The host:
IBM Mainframe, Midrange or Unix system.



How it Works

The remote user connects to the z/Scope Anywhere server using any HTML5 compliant browser. Once the connection is established the server will interpret and send commands to the specific host/protocol, and send back the results after converting the updated screens to native web structures.

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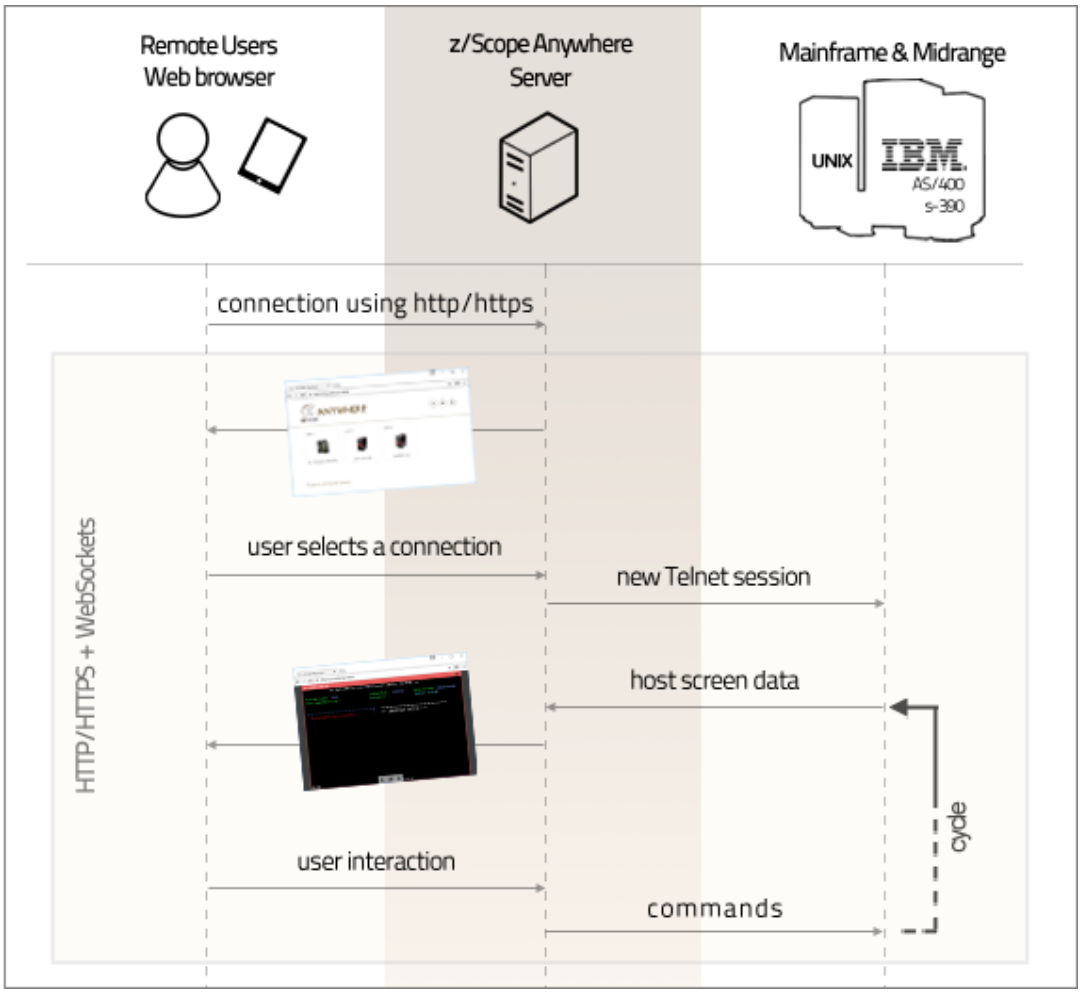

Load Balancing Architectures for z/Scope Anywhere

z/Scope Anywhere can be configured in two different load balancing architectures:

- z/Scope Anywhere Load Balancer
- z/Scope Anywhere Load Balancer with a DNS for multiple brokers

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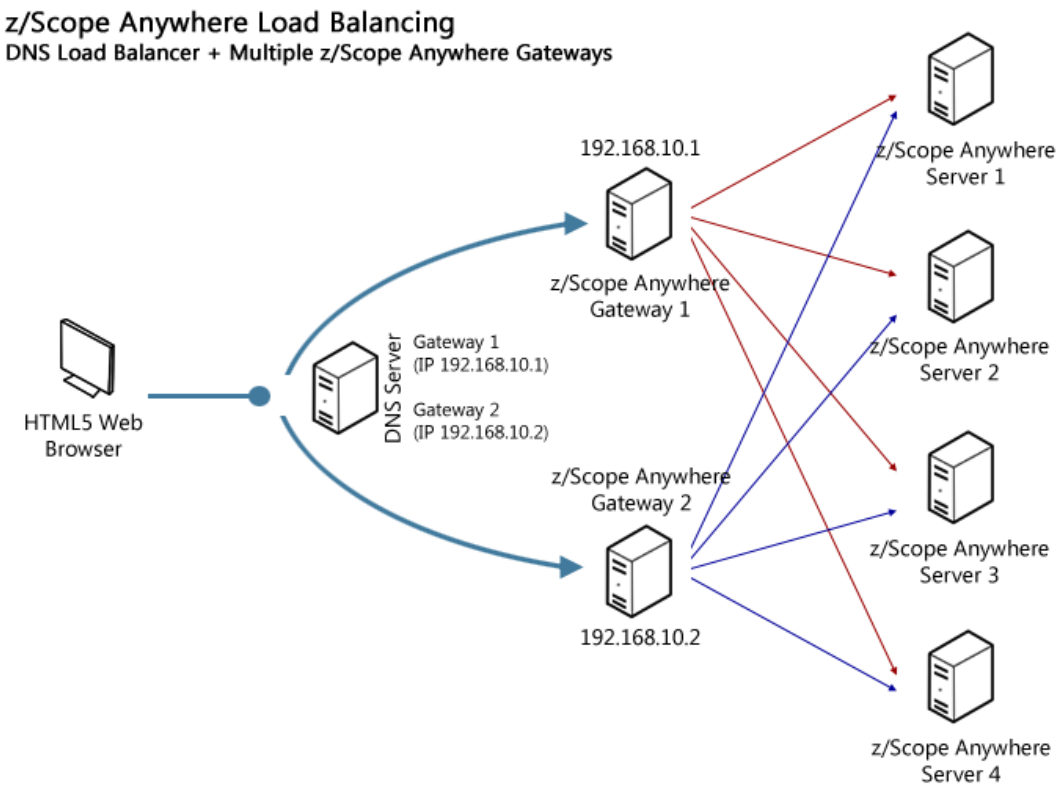

Read more about load balancing.

Requirements

Client

- OS independent
- HTML5-compliant Web Browser:
  - Internet Explorer 9.0, 10.0, 11.0
  - Edge 10+
  - Firefox 17+
  - Chrome 22+
  - Safari 6.0.1+
  - iOS 5.1.1+
  - Android 2.3, 4.0+

Server

- Windows XP 32-bit / 64-bit
- Windows Vista 32-bit / 64-bit
- Windows 7 32-bit / 64-bit
- Windows 10 32-bit / 64-bit
- Windows Server 2003 32-bit / 64-bit
- Windows Server 2008 32-bit / 64-bit
- Windows Server 2012 32-bit / 64-bit

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- Windows Server 2016 32-bit / 64-bit

Host

- IBM Mainframe
- AS/400
- Unix

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4 Getting to Know z/Scope Anywhere

This section is intended to provide first-time users an initial approach to the basic functionality of z/Scope Anywhere.

Learn How To:

- Install z/Scope Anywhere
- Start the Application

Discover z/Scope Anywhere:

- The User Interface
- Establishing a Connection
- Private and Shared Connection Profiles

For Administrators:

Administrators manage connection profiles, user permissions and other settings in the Configuration Manager. End-Users will only have access to The User Interface.

If you are an administrator:

- Learn how to create shared connection profiles
- Check out the Advanced Settings to learn
- Use the Configuration Manager and Gateway Manager reference.
- Learn the difference between Private and Shared Connection Profiles

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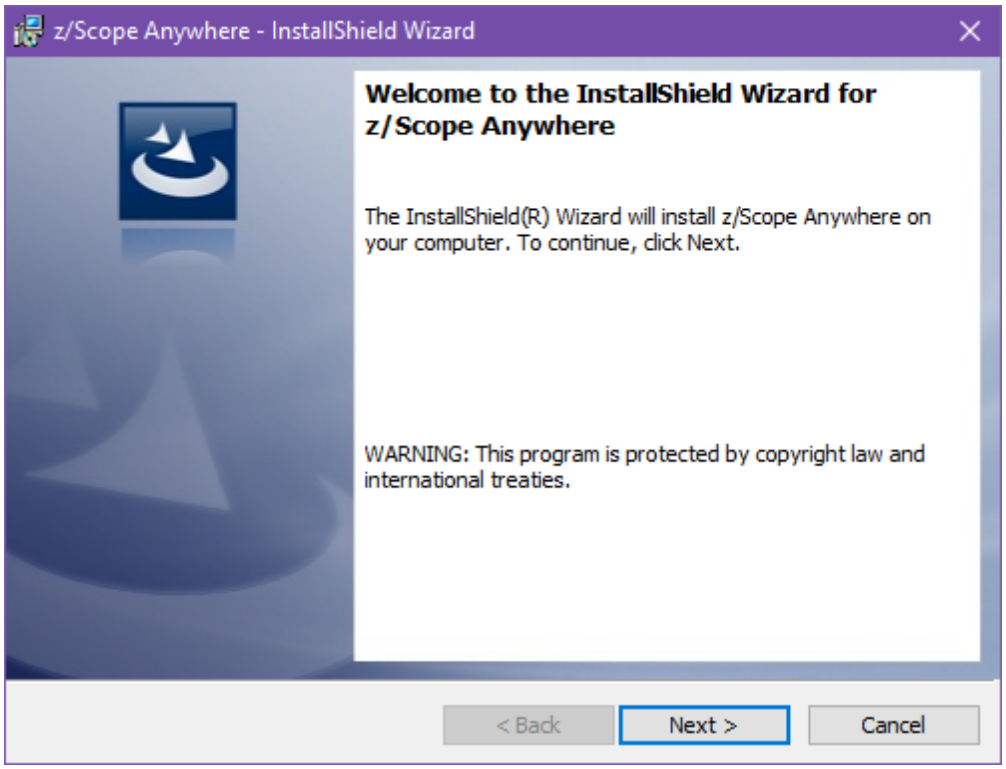
4.1 Installing z/Scope Anywhere

Z/Scope Anywhere can be installed very easily:

1. Download the installer from the download page:

   http://www.cybelesoft.com/download/

2. Execute the installer on the target machine.



3. Select the setup type:

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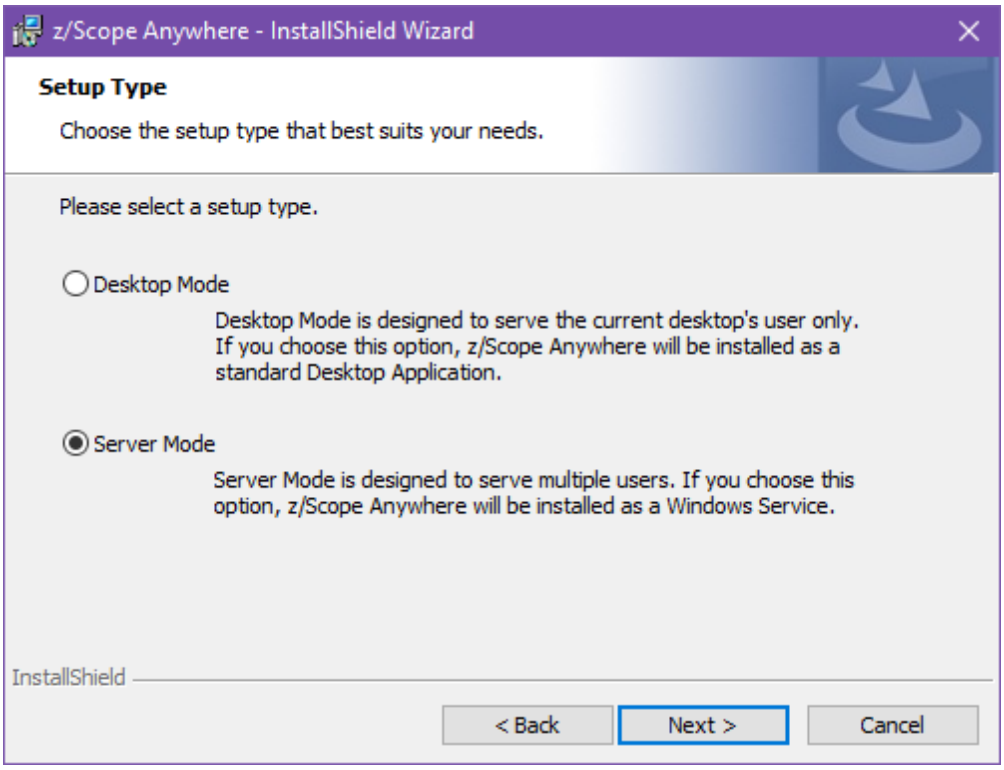

Desktop Mode

Designed for serving the current desktop user only. If you choose this mode, z/Scope Anywhere will be installed as a standalone application. On this mode, there will be only one personal preferences setting corresponding to the logged in user.

Server Mode

Designed for serving remote users. If you choose this mode, z/Scope Anywhere will be installed as a Windows service and will manage remote users accessing their connections. This mode supports multiple authentication schemes, anonymous connections and Load Balancing. The users preferences are saved separately, allowing every user to have their own environment.

If you choose Server Mode, you will be presented with the following screen:

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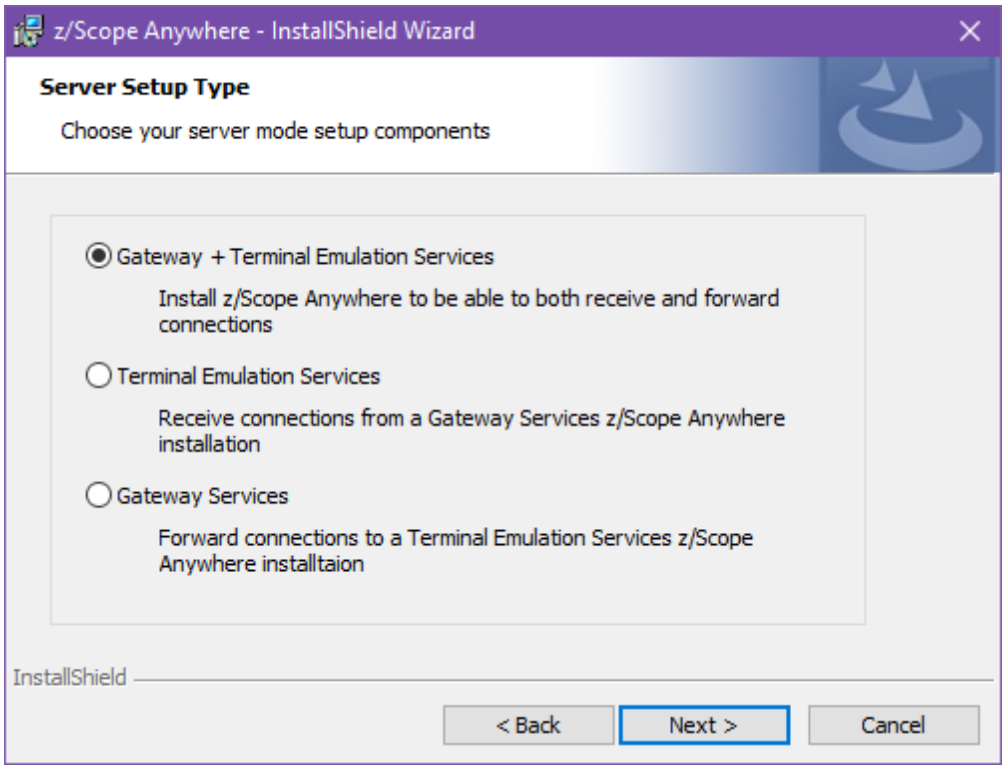

Gateway + Terminal Emulation Services
Choose this option for a server mode standalone installation. Both a Gateway and a Server are installed in the same computer. Also this installation can work together with other z/Scope Anywhere Terminal Emulation Services and Gateway installations in a Load Balancing architecture.

Terminal Emulation Services
The Terminal Emulation Services installation is only used when you have a Load Balancing architecture.

Gateway Services
The Gateway Services installation is only used when you have a Load Balancing architecture.

4. Press Next and wait for the installation process to finish. When it is done, press the "Finish" button.

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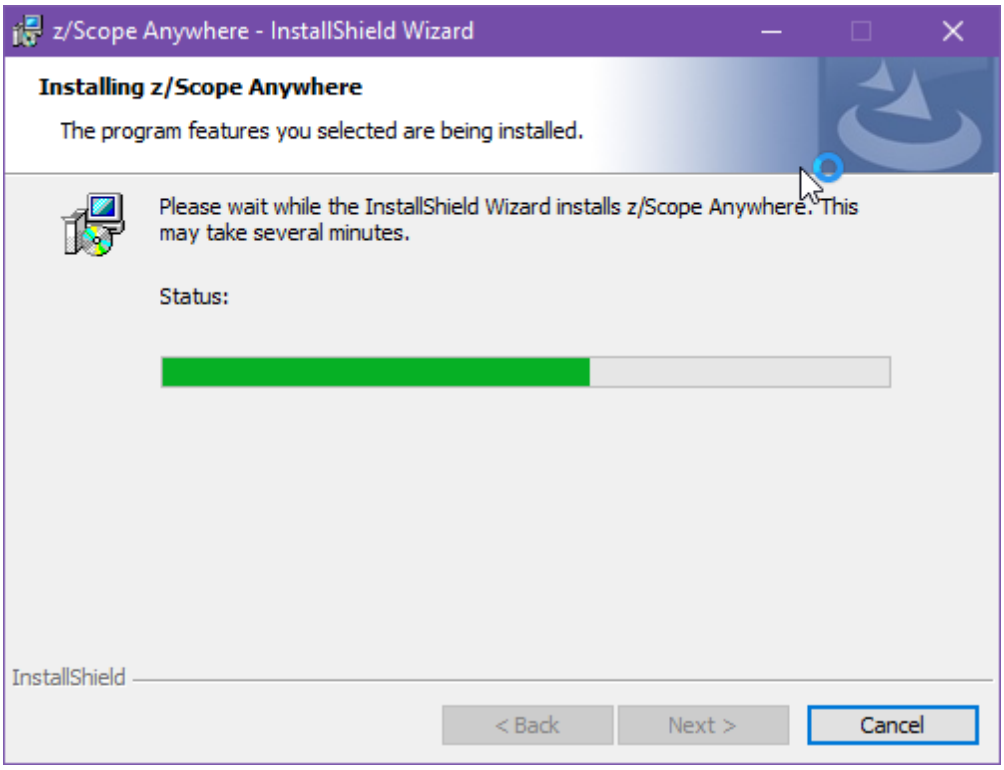

Next topic: learn how to Start the Application for both of the installation modes.

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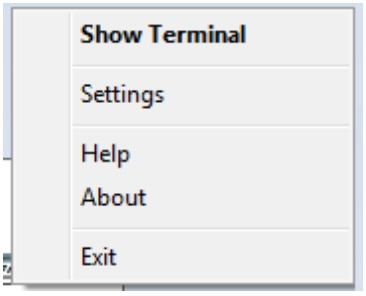
4.2 Starting the Application

The application will be available under different menus, depending on the installation mode you have selected:

Desktop Mode

The desktop mode installation starts the application automatically every time Windows starts. Look for the z/Scope icon on the tray icon bar.

Tray icon menu



Show Terminal
Opens the z/Scope Anywhere web user interface on the machine's default web browser. Another possible way to open the web interface is by opening a web browser and typing in the z/Scope Anywhere address.

Settings
It will open the Configuration Manager, accessing most of the application features and settings.

Help
Opens the online z/Scope Anywhere documentation.

About
z/Scope Anywhere full version number.

Exit
Closes the application. To open the application again go to the "Start Menu" and click on the "z/Scope Anywhere" menu item.

Server Mode

The server mode installation also starts the application automatically, in the machine where the server was installed. To use the web application you should open a browser and type in the server address.

The Configuration Manager can be opened through the Start Menu as well:

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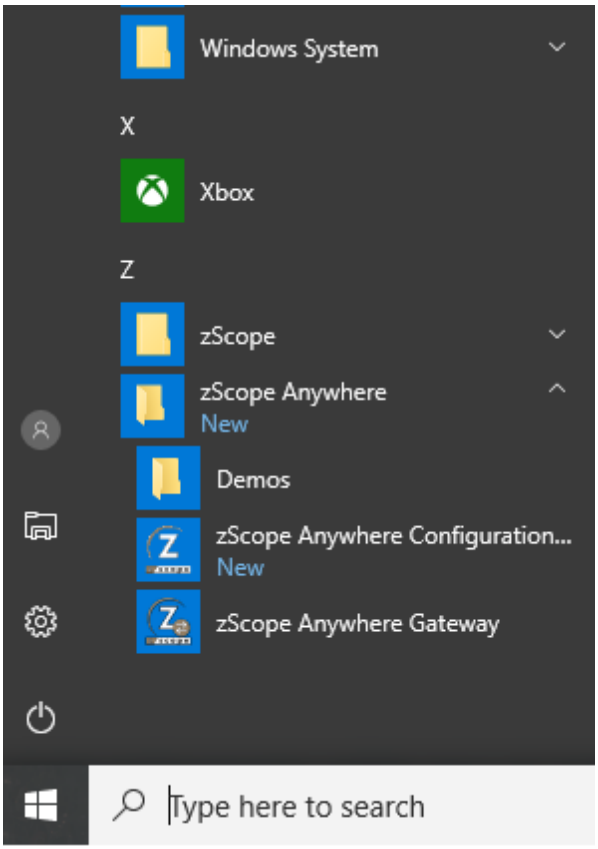

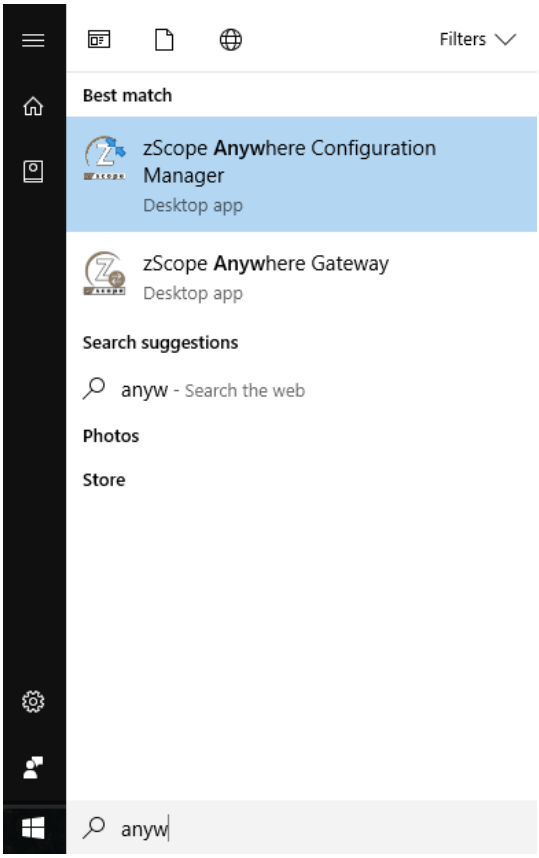

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Read More:

- The User Interface
- Establishing Your First Connection

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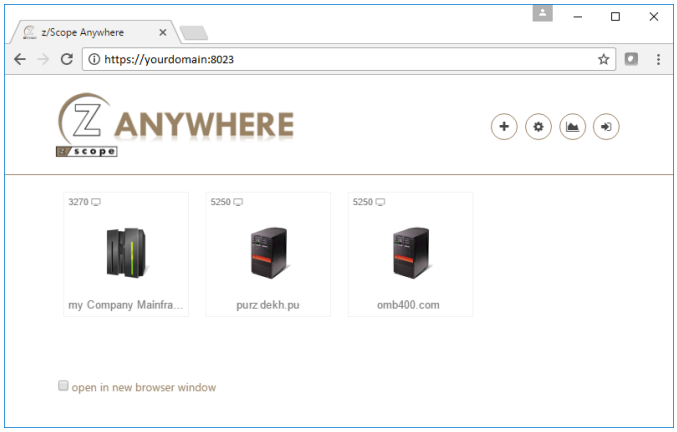
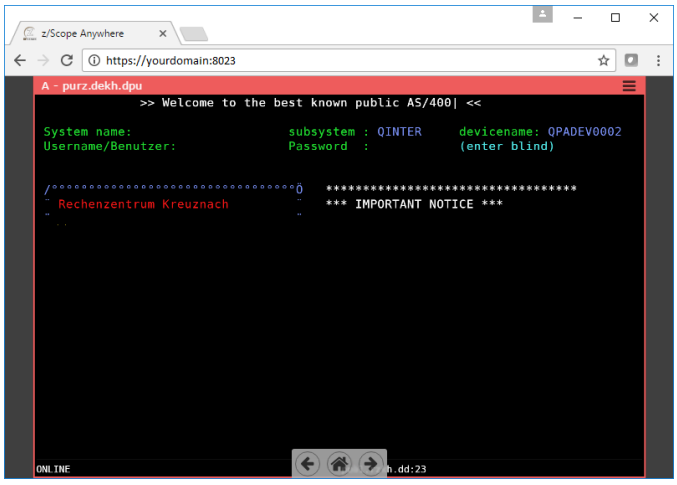
4.3 The User Interface

Z/Scope user interface has two main screen views:

Start Page (read more)



Connection Views (read more)



Read More:

- Creating a Connection from the Web
- Start Page
- Connection Views
- Navigation
- Logging In
- Mobile Devices

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4.3.1 Creating a Connection from the Web

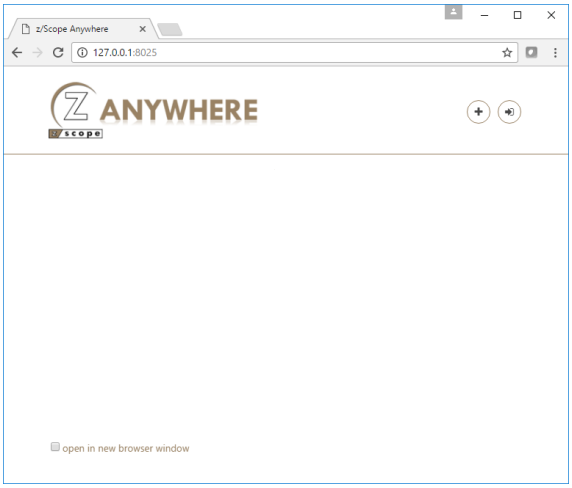
Follow the next steps and learn how establish your first connection from scratch.

1. Open your preferred web browser.

2. Type in the z/Scope Anywhere address. In a server mode installation, configure this address in the Gateway Manager. In a desktop mode installation, find these settings in the communication tab in the Server settings.

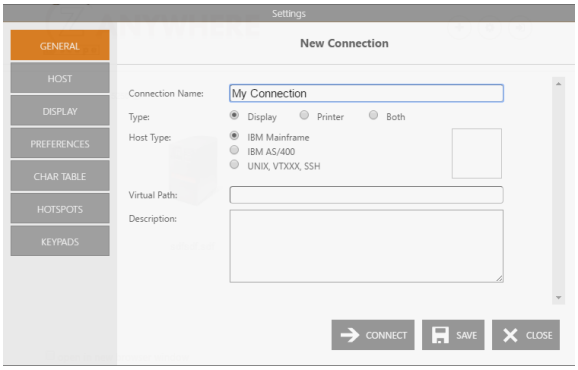
3. Inform your username and password, if required, or proceed .

4. If you have the appropriate permissions, the Start Page will be presented to you.



5. Click on the "New" button.

6. Give a name to the Connection on the "Connection Name" field.



7. Select the Host Type:

- IBM/Mainframe
- IBM AS/400
- UNIX, VTXXX SSH

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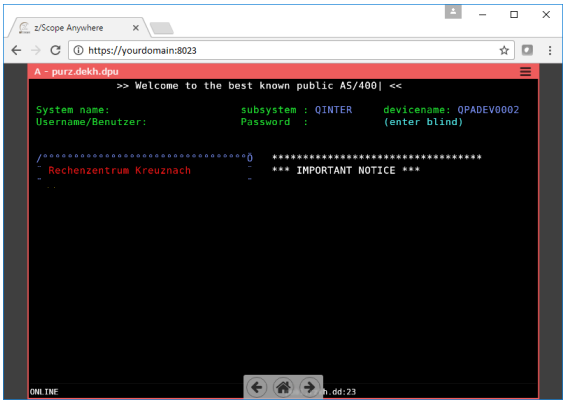
8. Go to the Host tab and inform the Host IP on the "Address" field.

9. Press the "Apply" button.

10. The new connection button will be shown on the Start Page. Click on it.

11. From this point on, you will be able to interact with the host through the emulation display that will be presented to you.



Read More:

- Customizing a connection
- Start Page
- Connection Views
- Navigation
- Logging In

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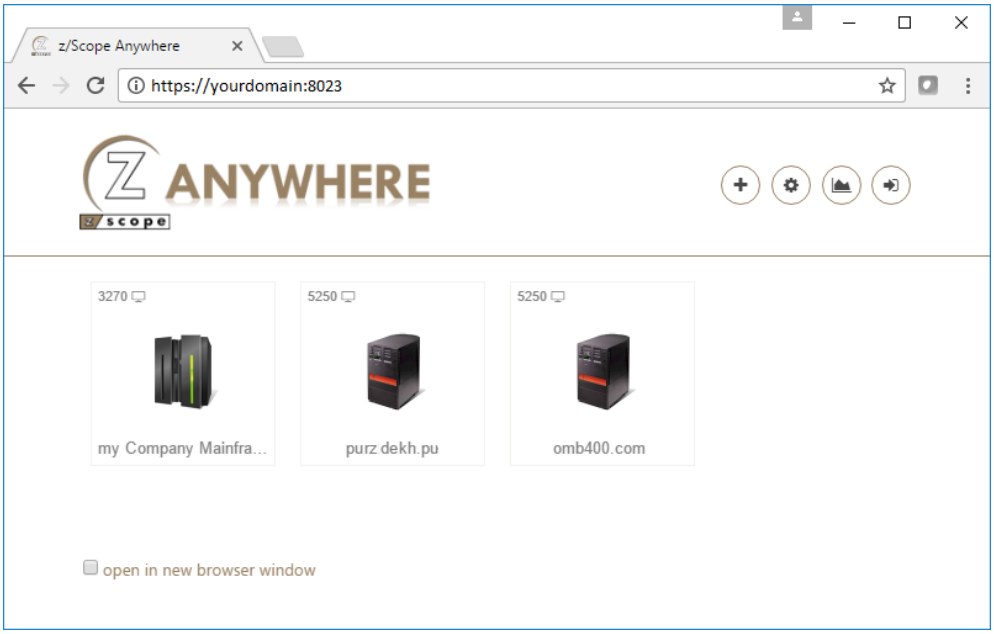
4.3.2 Start Page

The Start Page provides a convenient and quick access to the Connections and its settings.



The start page shows the anonymous and authenticated connections available for the anonymous or authenticated user. It also provides access to creating new connections, modify available connections, analytics data and logging in:

New
The 'New' button allows you to create private connections with personal preferences and communication parameters. Read the topic Creating a Connection from the Web for further information.

Settings
Through the 'Settings' button you can customize the available connections and configure personal preferences. These modified preferences are stored per user.

Analytics
The 'Analytics' button gives you access to the Admin Control Panel. Once you click on this button, the Control Panel will be open on a new browser tab/window. This feature will be only enabled to assigned users.

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Log Out / Log in
This button allows you to log out of your current session or to log in to start a session. When you are not logged in, you will only view anonymous connections.

The start page enables you to:

a) Visualize the configured connections
b) Open new sessions from the existing connections
c) Add new private connections through the "New" button
d) Customize the existing connections preferences through the "Settings" button
e) Visualize the logged user in the upper right corner.

Read about the connection buttons you will find in the start page.

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4.3.2.1 Connection Buttons

The z/Scope Anywhere Start Page has a set of buttons. Each button stands for a different kind of connection or function button:

5250 Connection
The 5250 buttons are shared connections to IBM AS/400 hosts. Click on this button to open a new 5250 connection with the host using the previously configured settings.

3270 Connection
The 3270 buttons are shared connections to IBM Mainframes. Click on this button to open a new 3270 connection with the host using the previously configured settings.

VT Connection
The light blue buttons are shared connections to UNIX, VTXXX or SSH hosts. Click on this button to open a new connection of this kind with the host using the previously configured settings.

Also in the top left corner of the connection buttons you can find different icons:

Protocol
The connection button will either say 5250, 3270 or VT. Indicating the connection's protocol.

User
This icon means that it is a private connection profile created by the logged user.

Display
This icon indicates that the profile has a connection view. It can be combined with the printer icon in a printer and display view.

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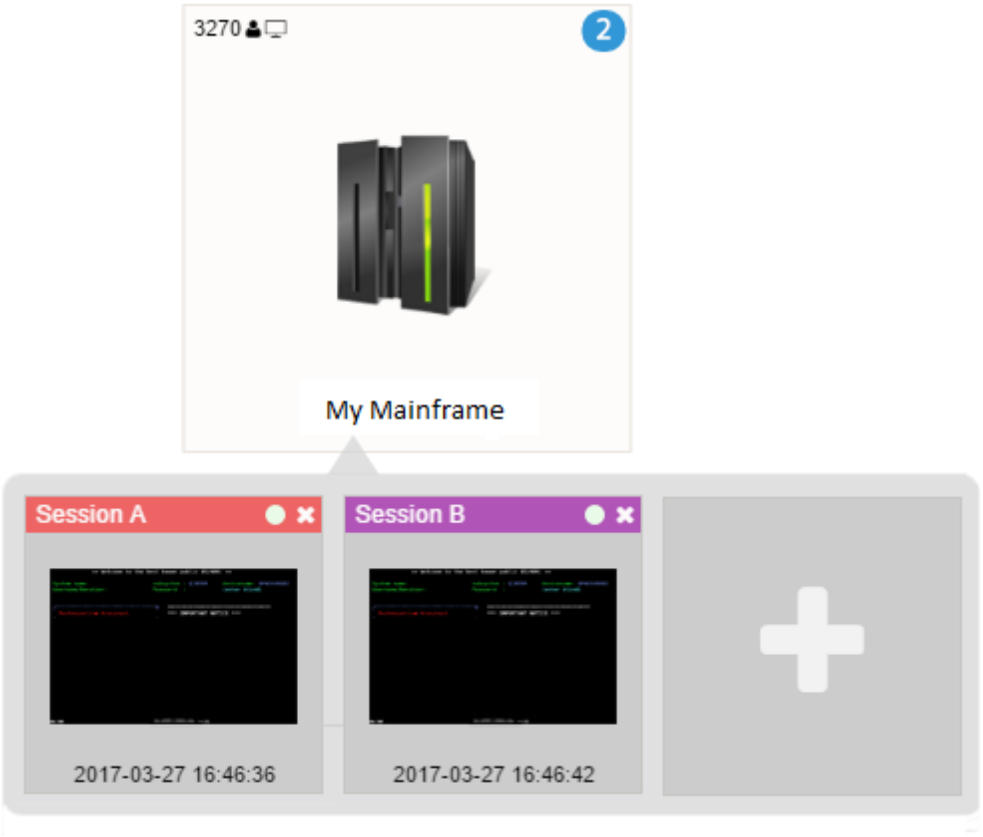
Printer
This icon indicates that the profile has a printer view. It can be combined with the printer icon in a printer and display view.

Connection Profile Icon
This is the default connection profile icon, which you can change. Check out the customizing a connection profile topic for editing Private Connection Profiles and creating/editing shared connection profiles for Shared Connection Profiles.

The amount of different sessions of the same connection are shown with a light blue number. If you hover your mouse over a connection you will see a preview of these sessions. From this view you can open, close and select sessions:



Read More:
- Navigation

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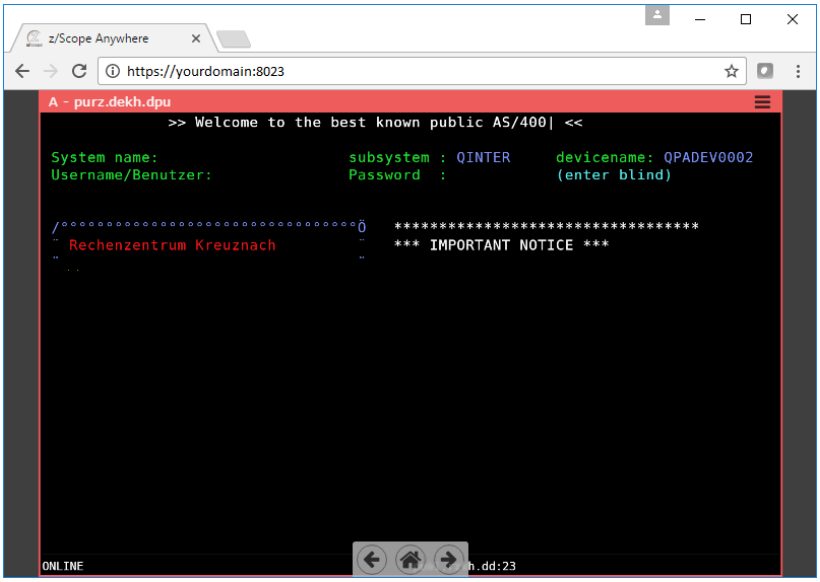
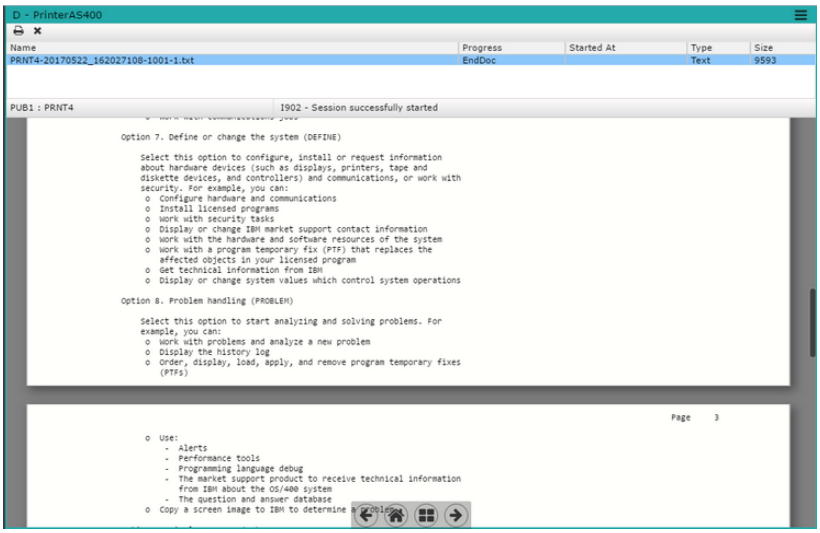
4.3.3 Connection Views

Every time you open a new connection you will be presented with the host emulation screen. The images below show you how connections can look.

Display connection view:



Printer connection view:



Display and Printer connection view (open printer panel):

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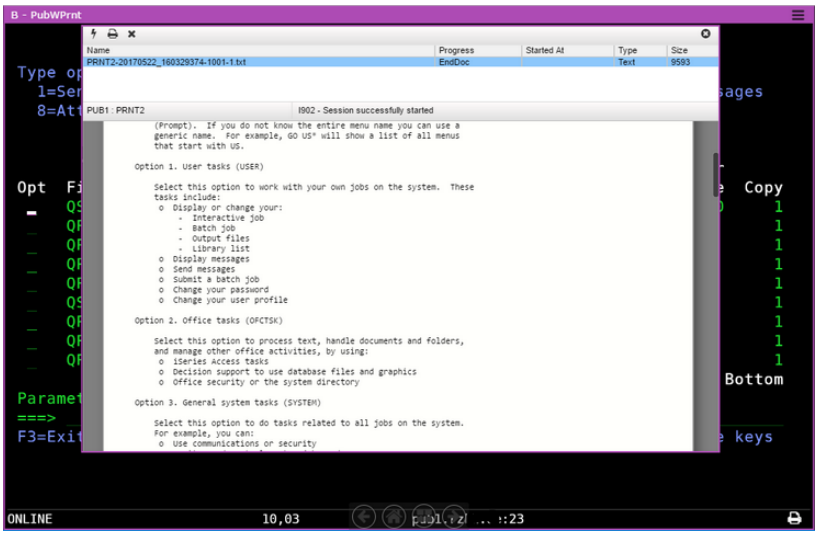

Check out the Display View and Printer View to learn more.

Read More:

- Macros
- Keypads
- Printer View
- Connection View Menu

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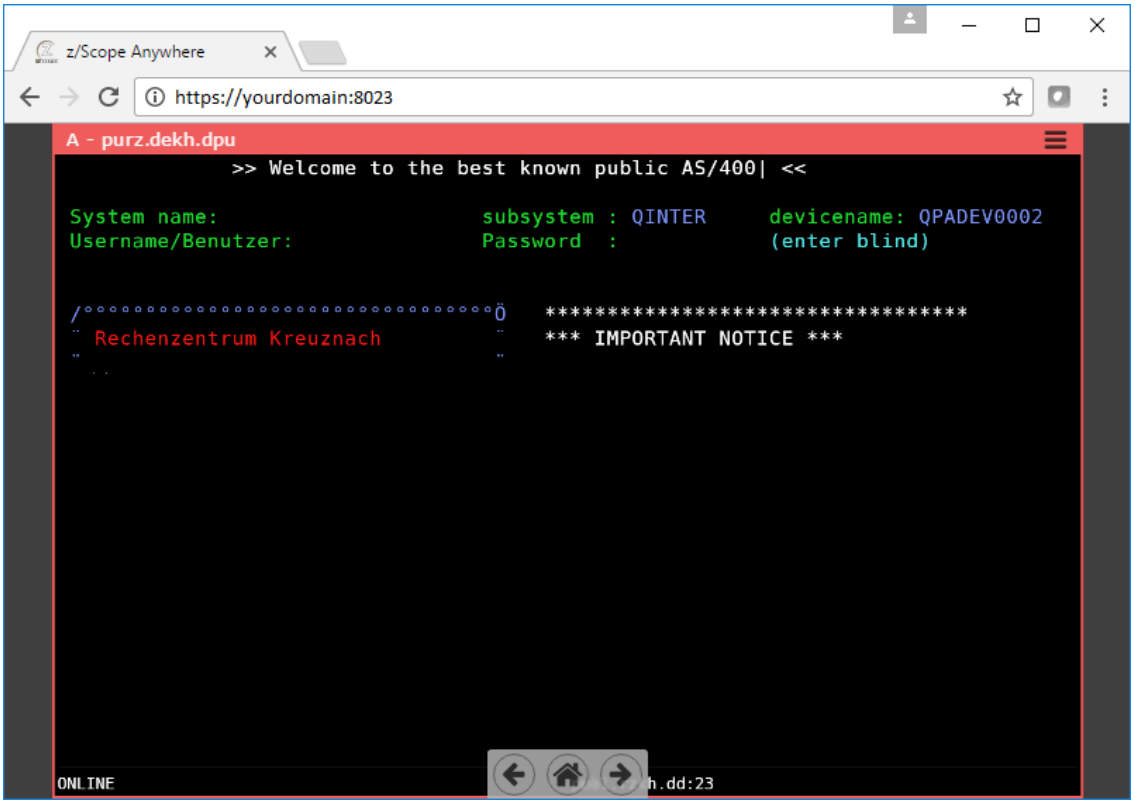
4.3.3.1 Display Connection View

The Display connection view consists of:



- the Emulation Display
- the Connection Menu
- Virtual Keyboards (only for connections using mobile devices)

You can also create a Display and Printer connection.

Read More:
- Printer Connection View
- Connection Menu

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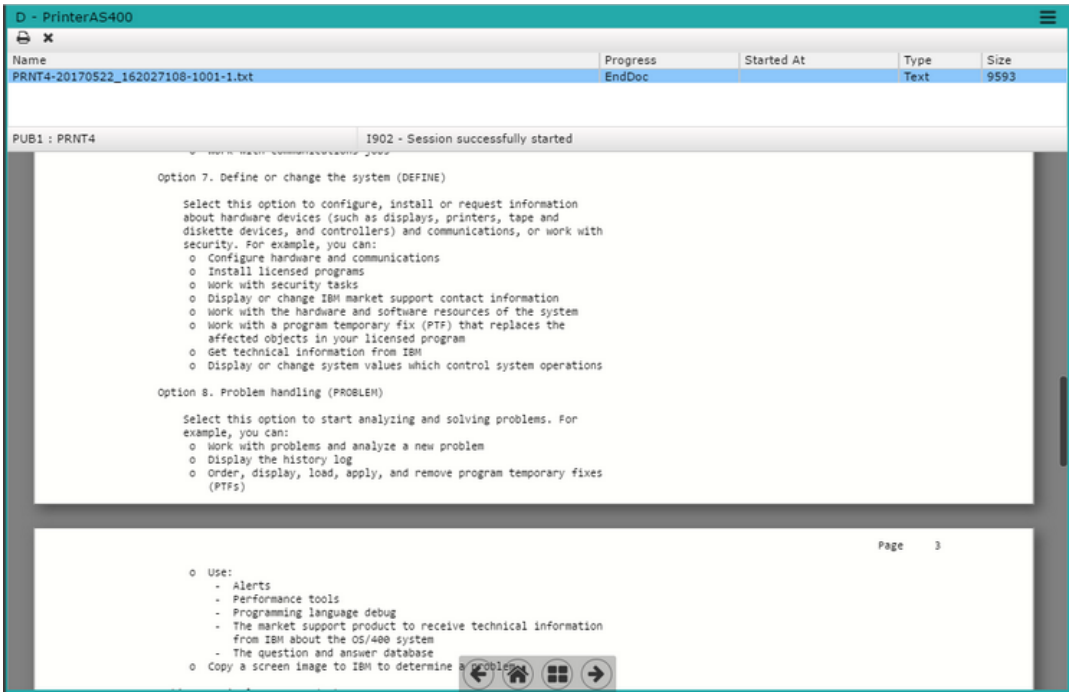
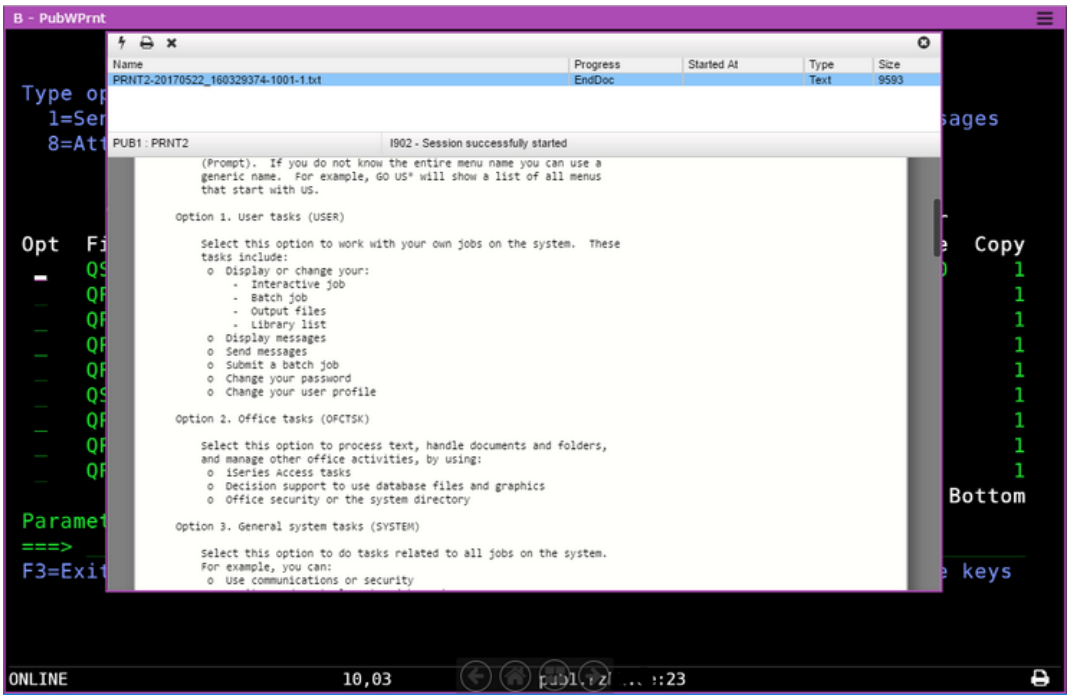
4.3.3.2 Printer Connection View

This is the printer connection view. You can select a print job and see a preview of the file:



And this is a display and printer connection view:



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Name
Name of the print job.

Progress
How much of the print job is complete.

Started At
The start time of the print job.

Type
Shows the print job type.

Size
Shows the print job size.

The printing status bar also will show information about the printer connection and the menu includes these options:

Connect or disconnect
Press this button to connect or disconnect from the printer.

Print
Select a print job and send it to the local printer.

Delete
Select a print job and delete it from the printing queue.

In a Display and Printer connection, access the printing panel with the printer icon you will find in the bottom right corner of the connection view:

Keyboard shortcuts
You can move around the printer connection view using your keyboard:

Up	Moves the selection up the print job list.
Down	Moves the selection down the print job list.
Delete	Deletes the selected print job.

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Escape	Closes the printer popup in a Printer and Display Connection View.
Shift+Up	Moves the selection up the print job list when the focus is in the document preview.
Shift+Down	Moves the selection down the print job list when the focus is in the document preview.

Read More:

- Connection Views
- Connection Menu

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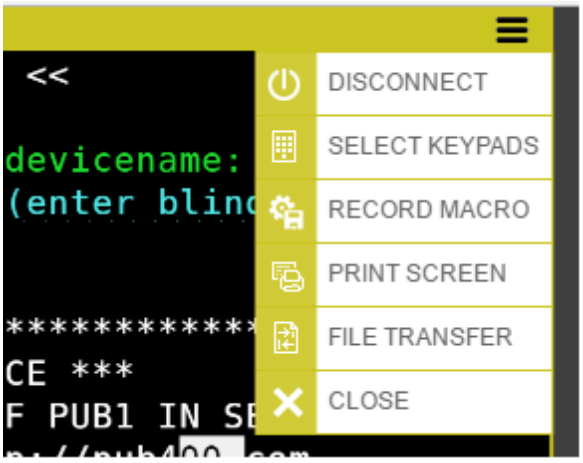
4.3.3.3 Connection View Menu

On the top right corner of the Connection Views you will find its menu:



The Connection View menu includes:

Disconnect
Disconnects the session.

Select Keypads
Click to see all keypads enabled for this connection. This option will not be shown if no keypads are enabled for the connection.

Record Macro / Save Macro
Click on this button to record a new macro sequence. When you are done, click on the 'Save Macro' button that you will see in its place. Read more: Creating a Macro.

Manage Macros
Click on the Macros icon to see the existing macros. It is shown only when there macros for the current connection. You will be able to rename and delete the existing macros.

Print Screen
Send a screenshot of the session to the printer. You can choose 4 different printing modes.

File Transfer
Open the File Transfer Manager to upload or download files from the

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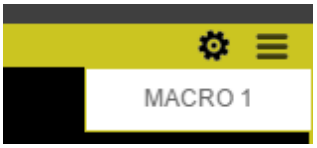
host.

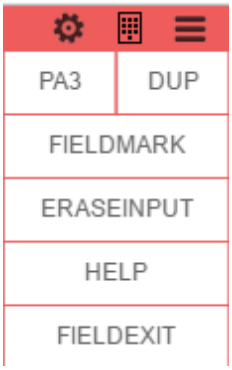
Close
Closes the session.

The macros recorded for this session will be shown in the Connection View Menu:



Select the macro to run it.

Keypads enabled for this connection will also be shown in the Connection View Menu:



Read More:

- Navigation

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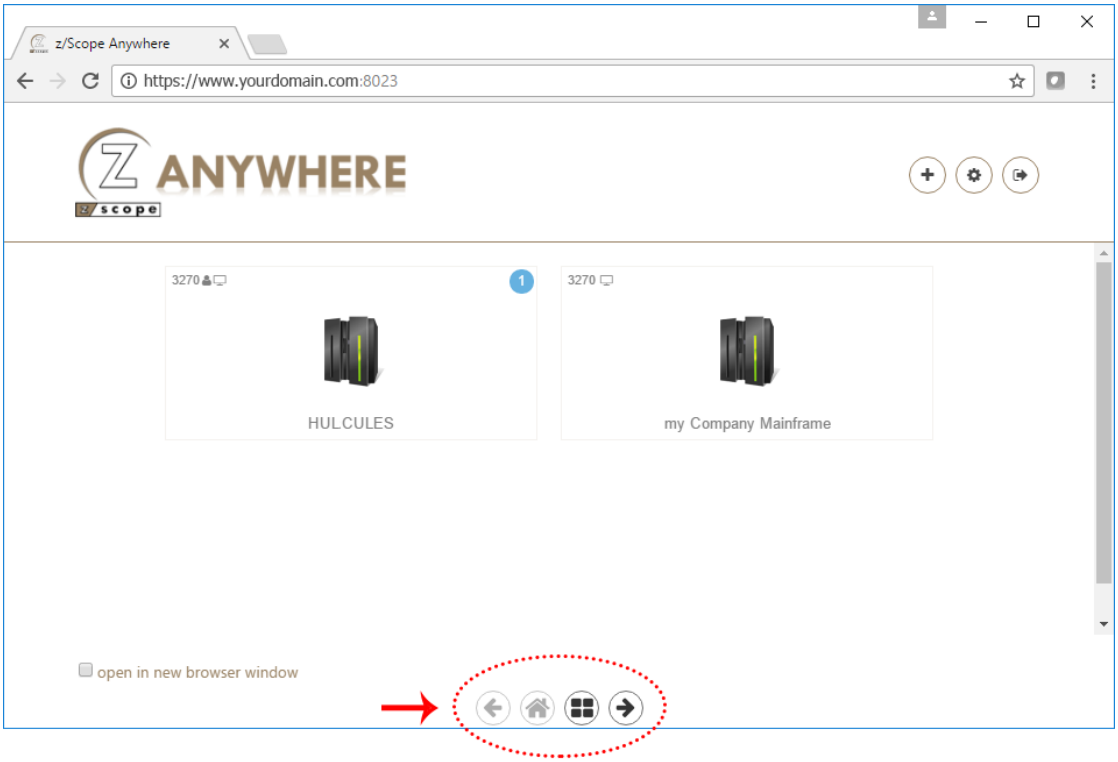
4.3.4 Navigation

On the main page bottom you will find the Navigation Toolbar:



The Navigation Toolbar includes:

Previous / Next
This button goes back and forth the active sessions and the home connections page. You can also use it to see more connections when displaying them as a grid.

Home
This button takes you to the home page where you can see the connections.

Connection Views
Press this button to display and choose a connection view. You can choose: Coverflow, Gallery and Grid.
This button shows a grid with up to four active sessions, allowing you to easily work on different connections at a time while seeing all of them at the same time.
Click on each session to work on it. When there are more than 4 active sessions, you can use the previous / next buttons to see a different group of connections.

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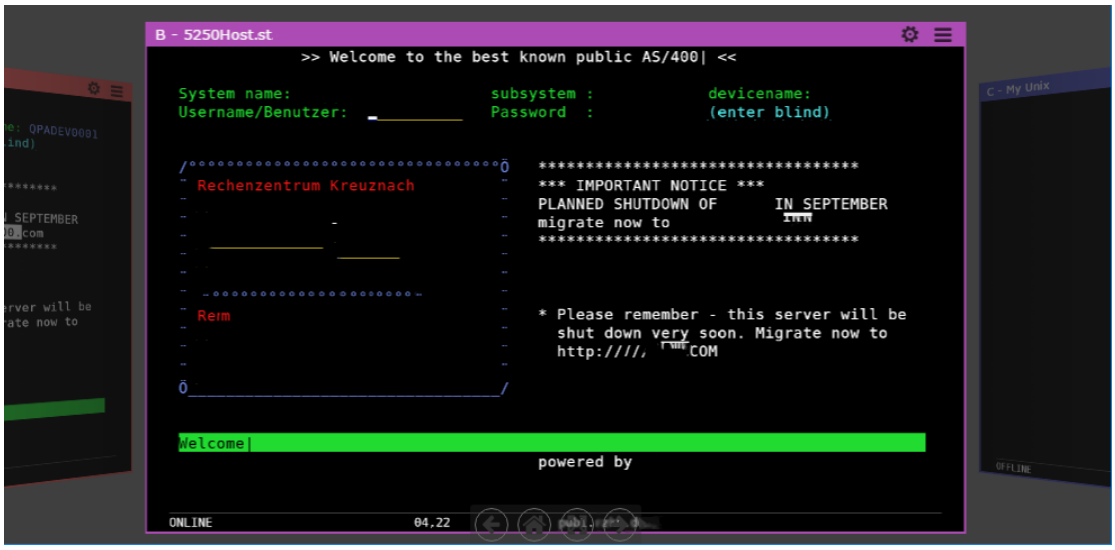
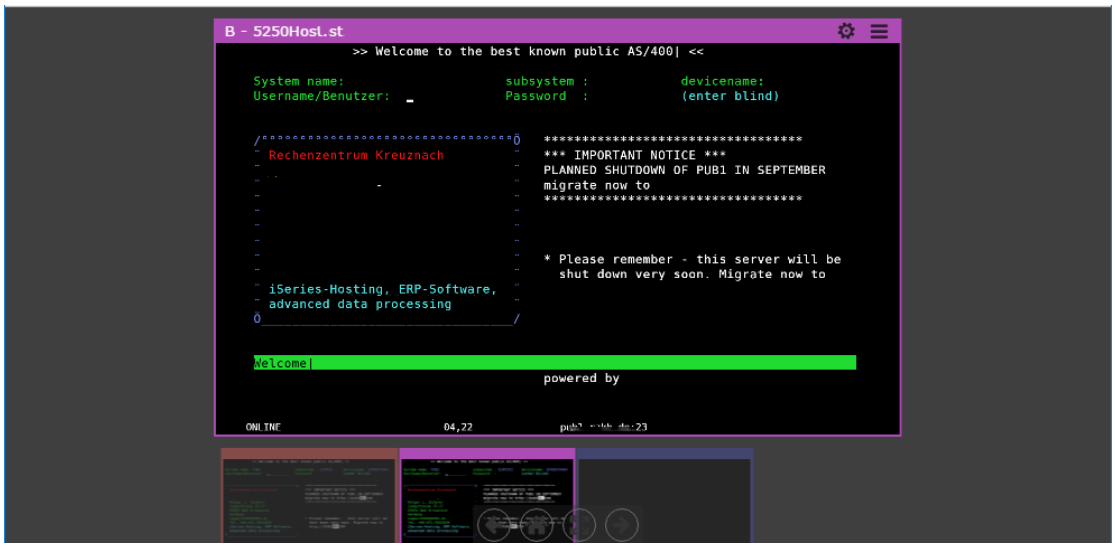
Restore
When you are in Coverflow, Gallery or Grid mode, press this button to show the classic, full screen connection view.

Coverflow mode:



Gallery Mode:



Grid Mode:

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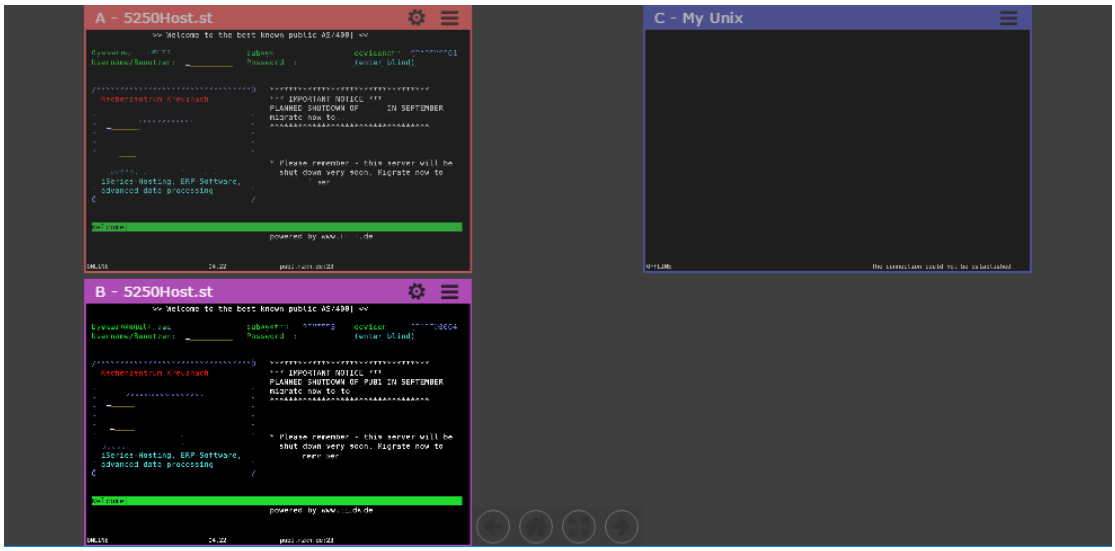

Read More:

- Start Page
- Start Page Connection Buttons
- Connection Views
- Logging In

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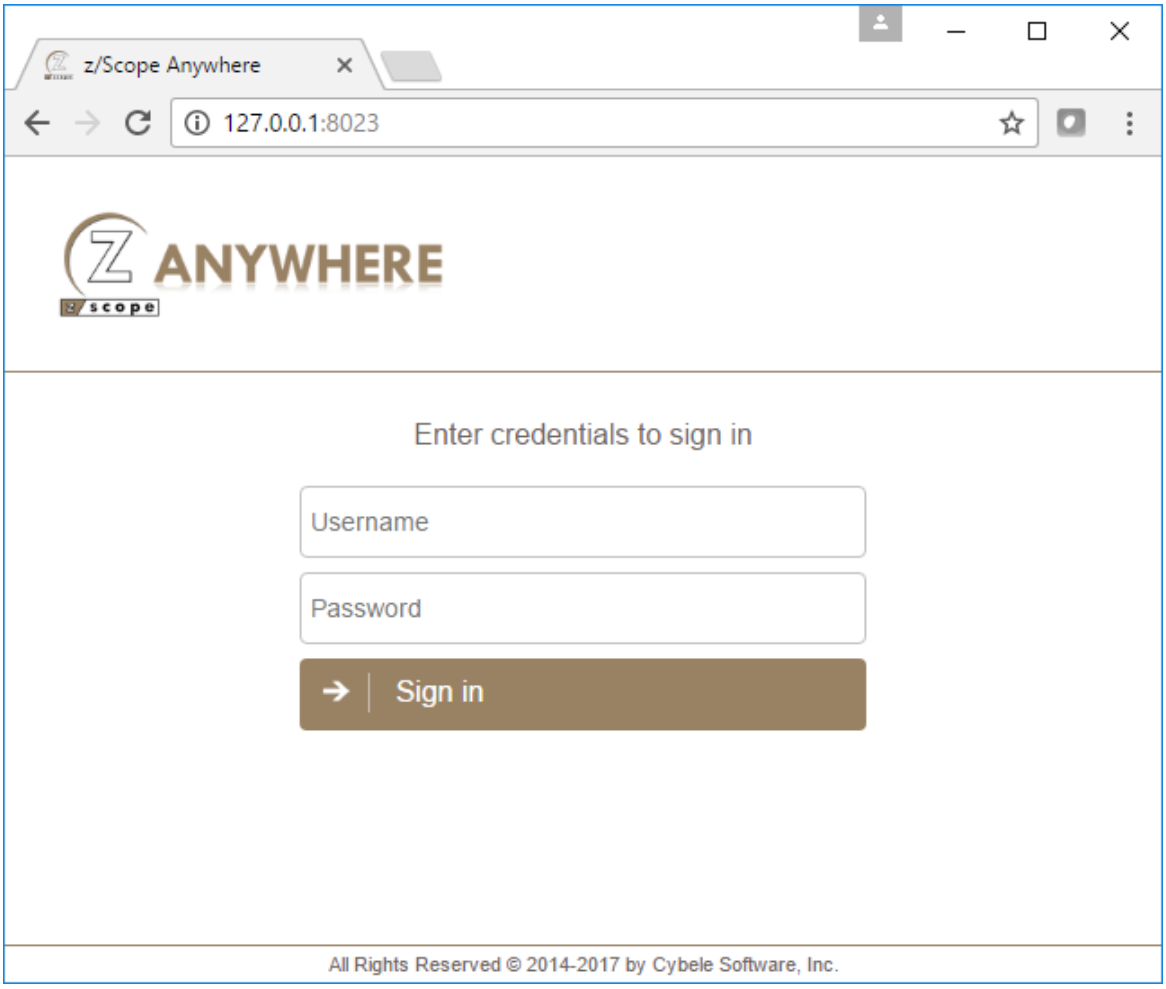
4.3.5 Logging in

z/Scope allows you to access anonymous connections, and to authenticate to access private connections.



If you have authentications other than Windows Logon, they will show to the left of the screen, while Windows Logon will be shown to the right. This allows you to choose different login methods.

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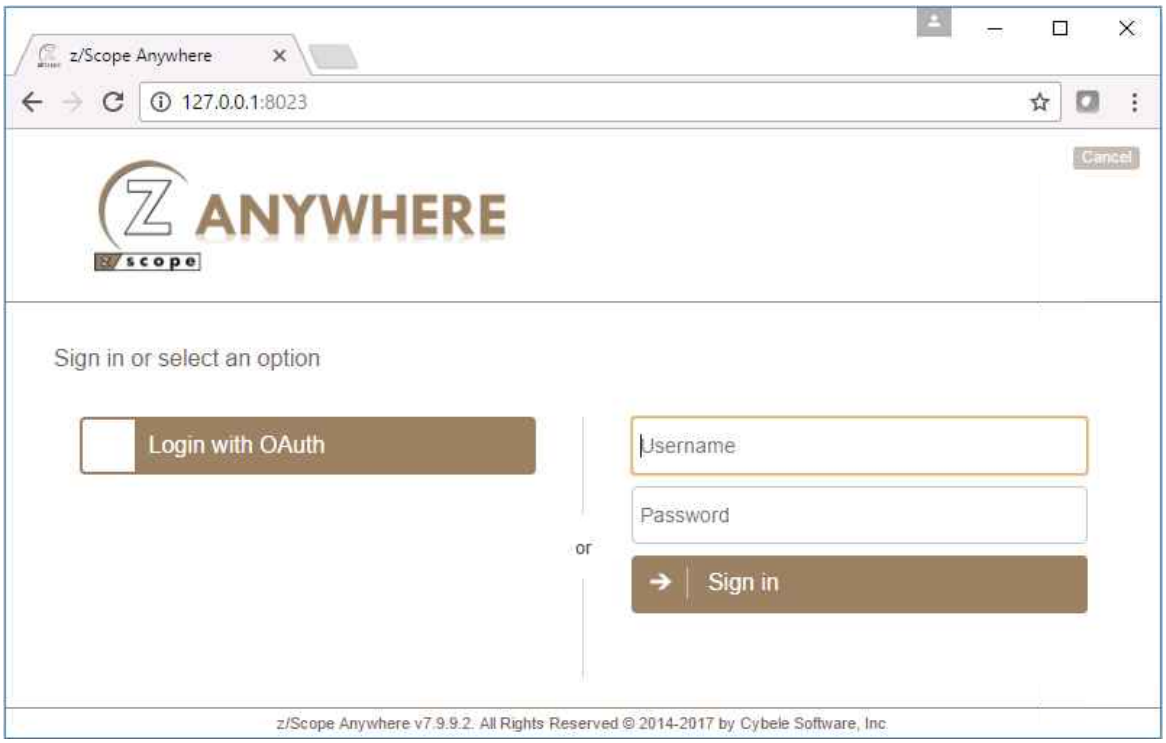

If you want to access anonymous connections only, click on the 'Cancel' option you will find in the top right corner of the screen.

Read More:

- End-User Authentication: Different Methods and How They Work
- Authentication Methods: Configuration Manager Reference

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4.4 Private and Shared Connection Profiles

z/Scope Anywhere allows you to create two different kind of connection profiles:

- Private connection profiles.
- Shared connection profiles

Read on to find which one to use and what it implies:

Private Connection Profiles

These connection profiles are created by users in z/Scope Anywhere's user interface. They are distinguished in the start page by a small user icon in the top left corner of their connection button:

The private connection profile is associated to the user and only shown to them. Anonymous access can't be define for this kind of profile. The user can access their private connection profile from any computer. The user can edit this connection profile completely or delete it, whereas shared connection profiles will only show some options for the end user to edit.

Shared Connection Profiles

These connection profiles are created by an administrator in the 'Connections' section of the z/Scope Anywhere Configuration Manager. They are distinguished in the start page because they don't have a small user icon in the top left corner of their connection button:

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The shared connection profile is shown only to the users designated by an administrator in the 'Profiles' tab of the 'Server Settings' section of the z/Scope Anywhere Configuration Manager. Also, these profiles can have anonymous access. The user can edit only show a few options for this connection profile in the Preferences, HotSpots and Keypad tabs.

Read More:
- The User Interface
- The Start Page
- The Configuration Manager
- The Connection Button

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5 Features

Z/Scope's features were specifically designed to improve your productivity on terminal emulation experience.

Access the user web interface by following the next steps:

1. Open your preferred web browser.
2. Type in the z/Scope server address.
3. Inform your username and password, if required.
4. The Start Page will be presented to you.

The following sections are intended to give you a first look at the z/Scope Anywhere features:

- Connections
- File Transfer
- HotSpots
- Keyboard Support
- Keypads
- Macros
- Screen Styles
- Admin Control Panel
- Security and Encryption
- Authentication modes

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5.1 Connections

This sections deals with Private Connection Profiles and user preferences for Shared Connection Profiles.

Read More:

- Private_and_Shared_Connection Profiles
- Setting up a Private Connection
- Customizing a Connection
- Connecting
- Deleting a Private Connection
- Setting up a Shared Connection

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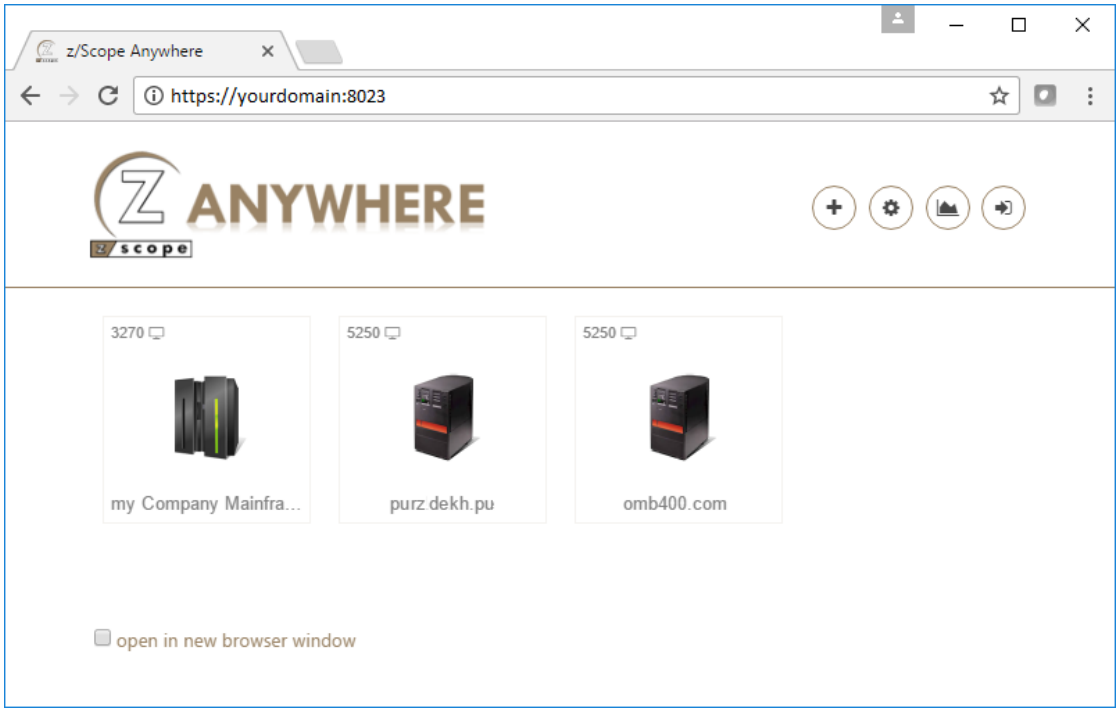
5.1.1 Setting up a Private Connection

In order to define a new connection, you should click on the New (+) button located on the top right corner of the Start page view.



After clicking on "New", the screen below will be presented:

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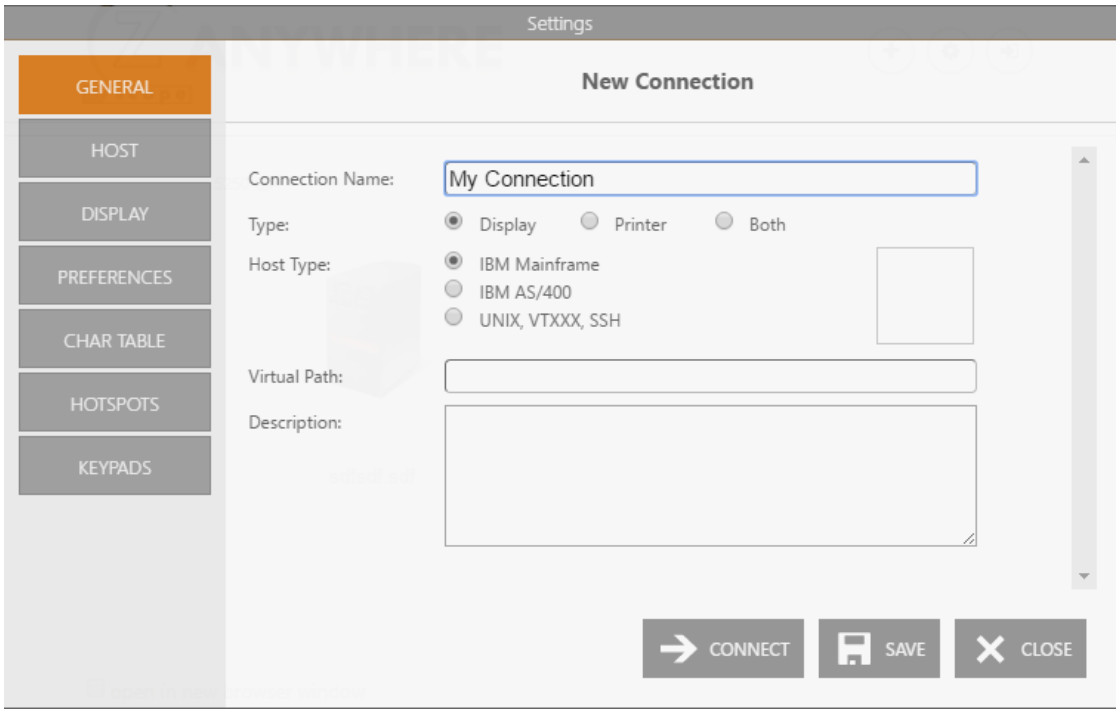

To learn about the different type of hosts you can connect to using z/Scope, refer to the following sections.

- Setting up a UNIX/VT Connection
- Setting up an IBM Mainframe or AS/400 connection

For a detailed description on how to further customize the connections you have created, see the following topics:

- Editing a Unix/VT connection
- Editing an IBM Mainframe or AS/400 Connection

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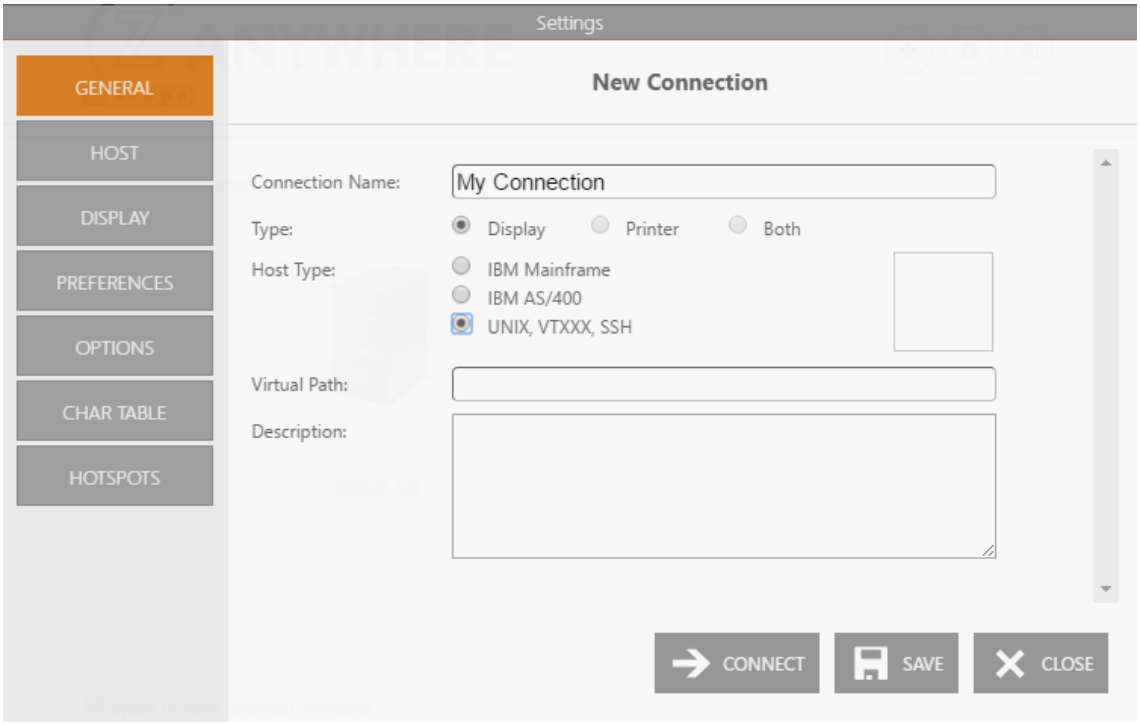
5.1.1.1 Setting up a UNIX/VT/SSH Connection

This page will guide you through the process of creating a UNIX/VT/SSH connection using the web user interface.

General

Inform the 'Connection Name' and select 'UNIX, VTXXX, SSH' as the 'Host Type'. You can also better describe the connection by filling the 'Description' field and adding an image to visually identify it.



Host

Enter the URL or IP address of the host you want to connect to.
You may check the SSH option. In that case, read the Connection with SSH topic.

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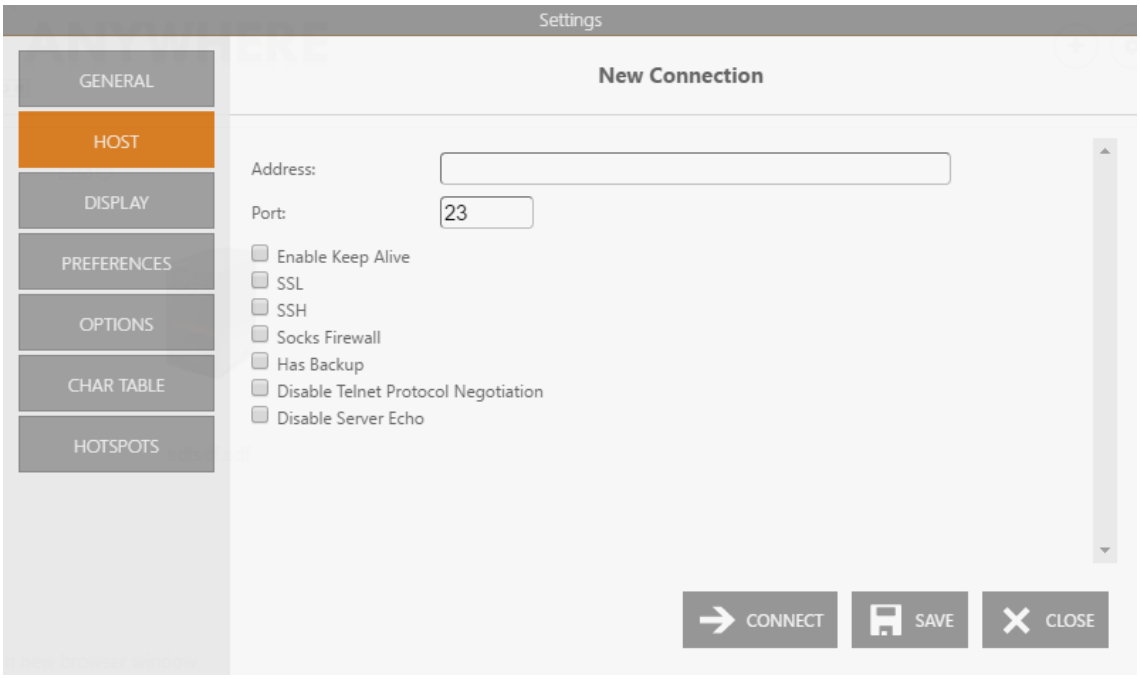
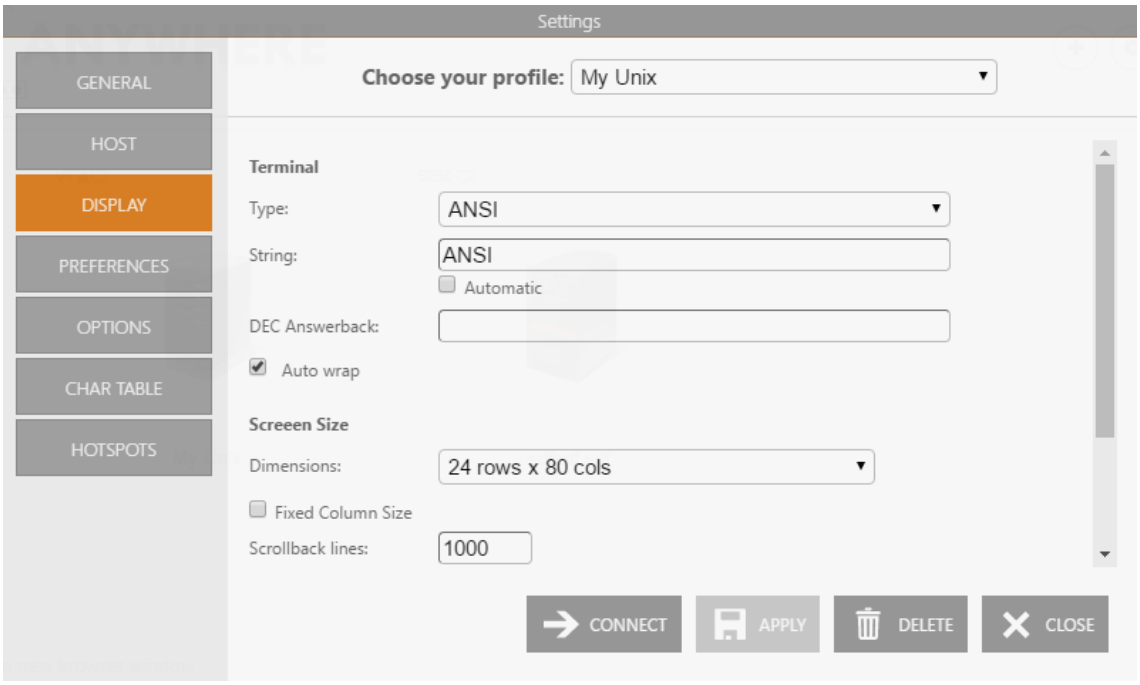


Display Type

Specify the terminal type and the screen size.



After that, click on 'Apply', 'Save' or 'Connect'.

Read More:

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- Editing a UNIX/VT Connection
- Creating a Connection

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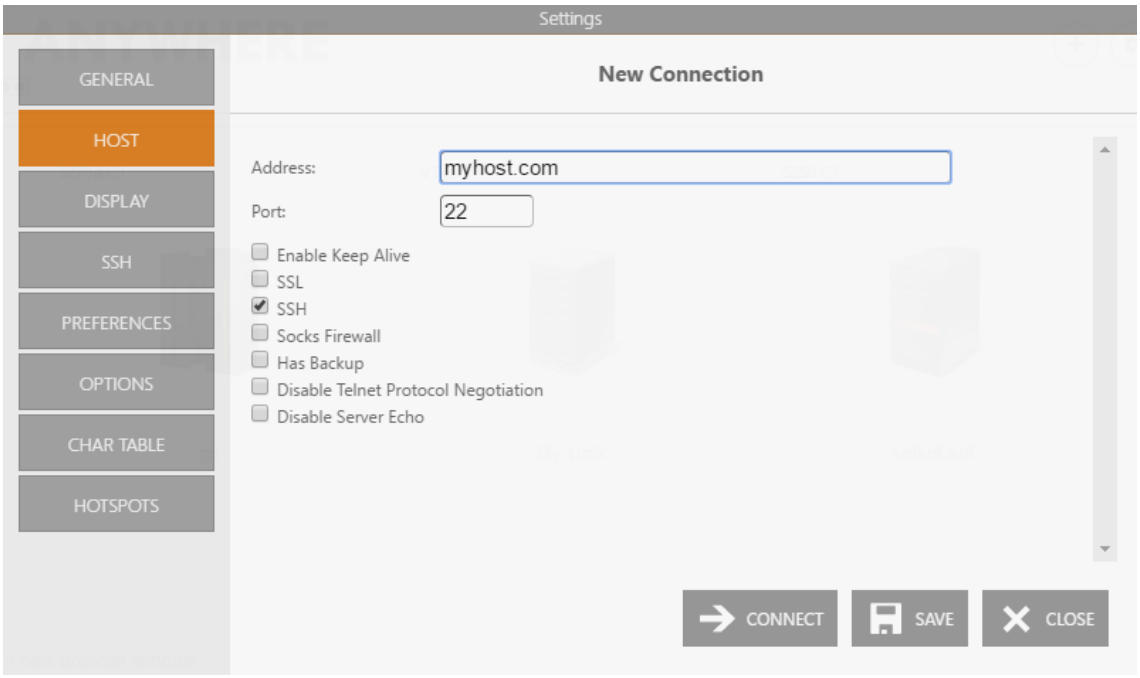
5.1.1.1.1 SSH Connection

This page will guide you through the process of creating an SSH UNIX/VT/SSH connection.

Once in the Host tab, enter the host address, the port, check the 'SSH' option and go to the 'SSH' tab.



Marking the SSH checkbox will enable the SSH tab. Enter the username and password on the Authentication section to identify you in the connection.

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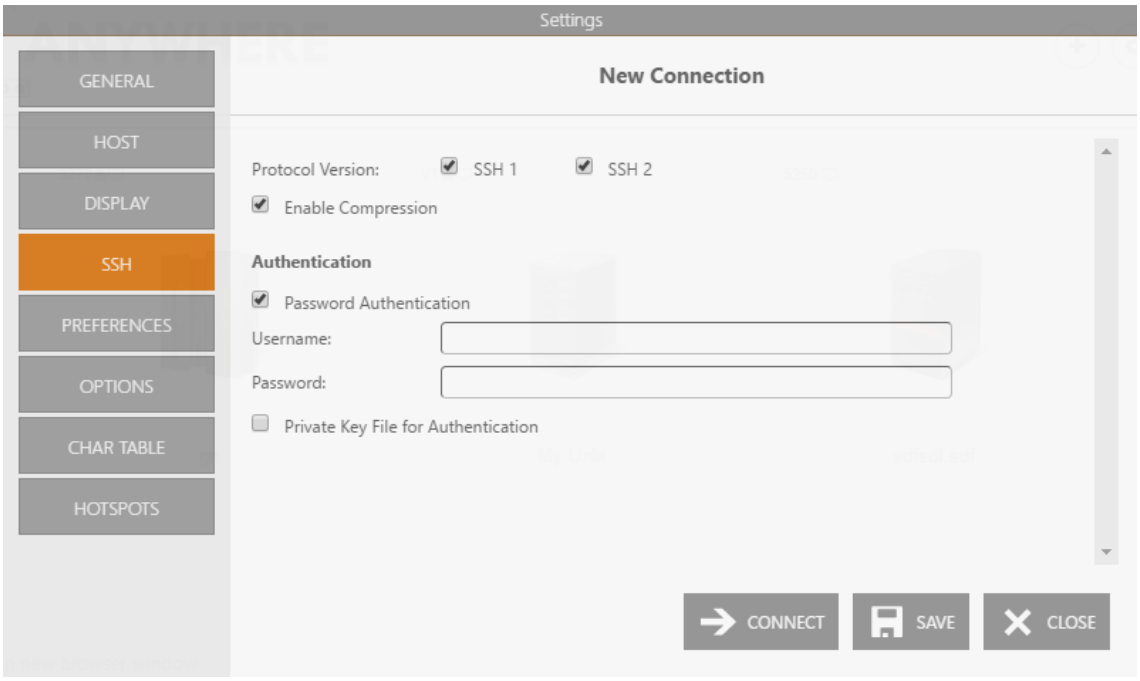

Additionally, you can specify a private key file by marking the 'Private Key Field' checkbox and informing the file location on the 'Key file' field.

After that, click on 'Apply', 'Save' or 'Connect'.

Read More:

- Editing a UNIX/VT Connection
- Creating a Connection

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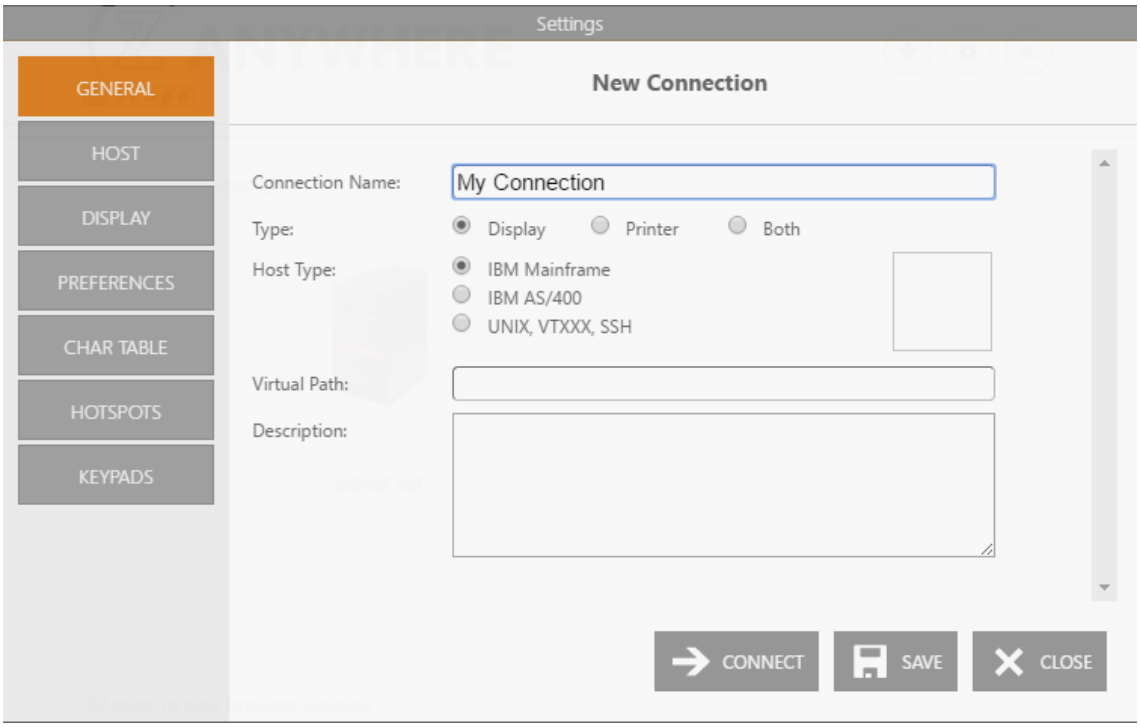
5.1.1.2 Setting up an IBM Mainframe or AS/400 Connection

This page will guide you through the process of creation an IBM Mainframe or IBM AS/400 connection profile in the web user interface.

General

Inform the 'Connection Name' and select 'IBM Mainframe' or 'IBM AS/400' as the host type. Choose whether it will be a Display, Printer, or 'Both' (display and printer) type of connection.
You can also better describe the connection by filling the 'Description' field and add an image to visually identify it. Choose between a Display, Printer, or Display and Printer connection type.



Host

Enter the URL or IP address of the host you want to connect to and the port.

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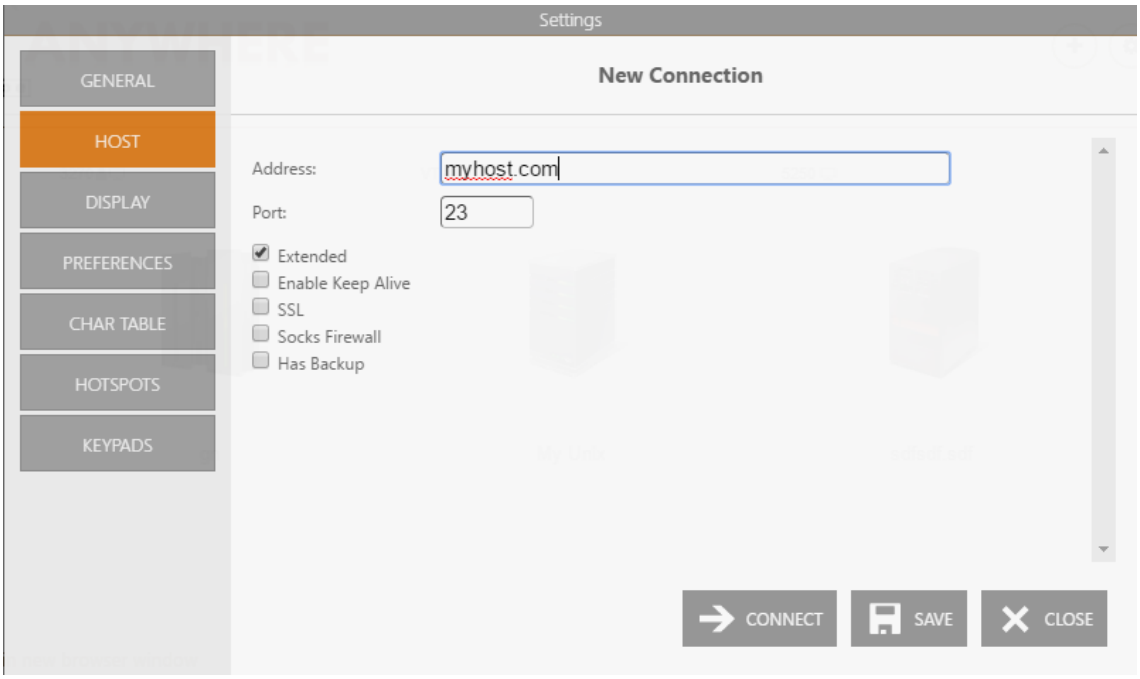
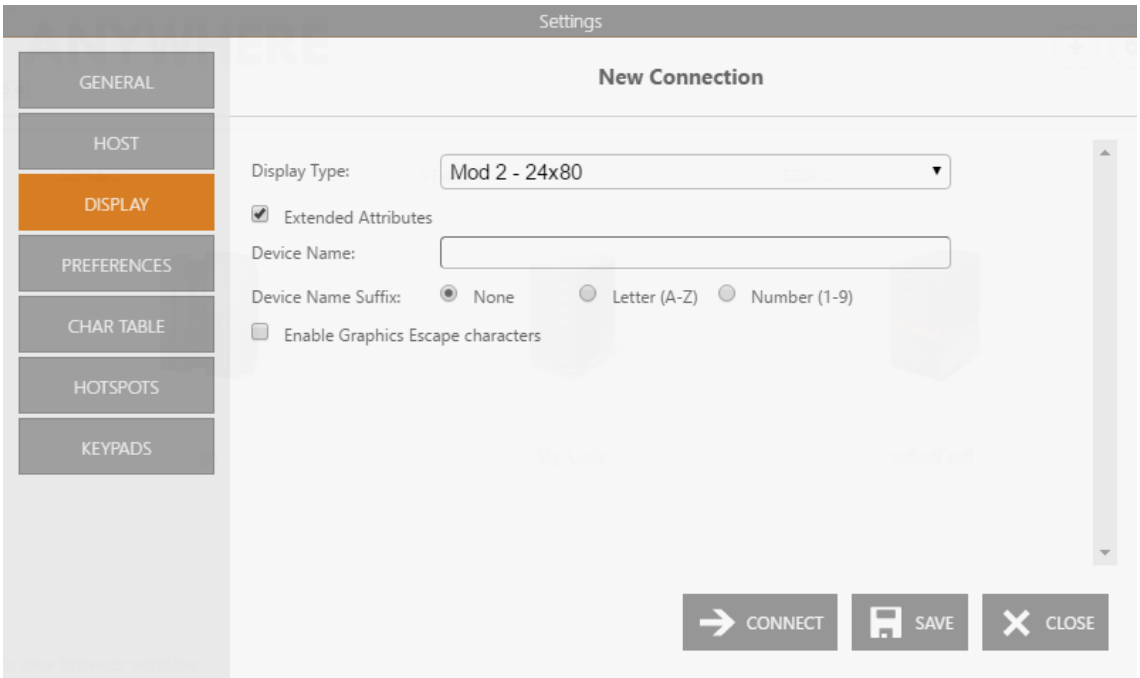


Display Type

3270

These are the Display tab options for an IBM Mainframe connection.



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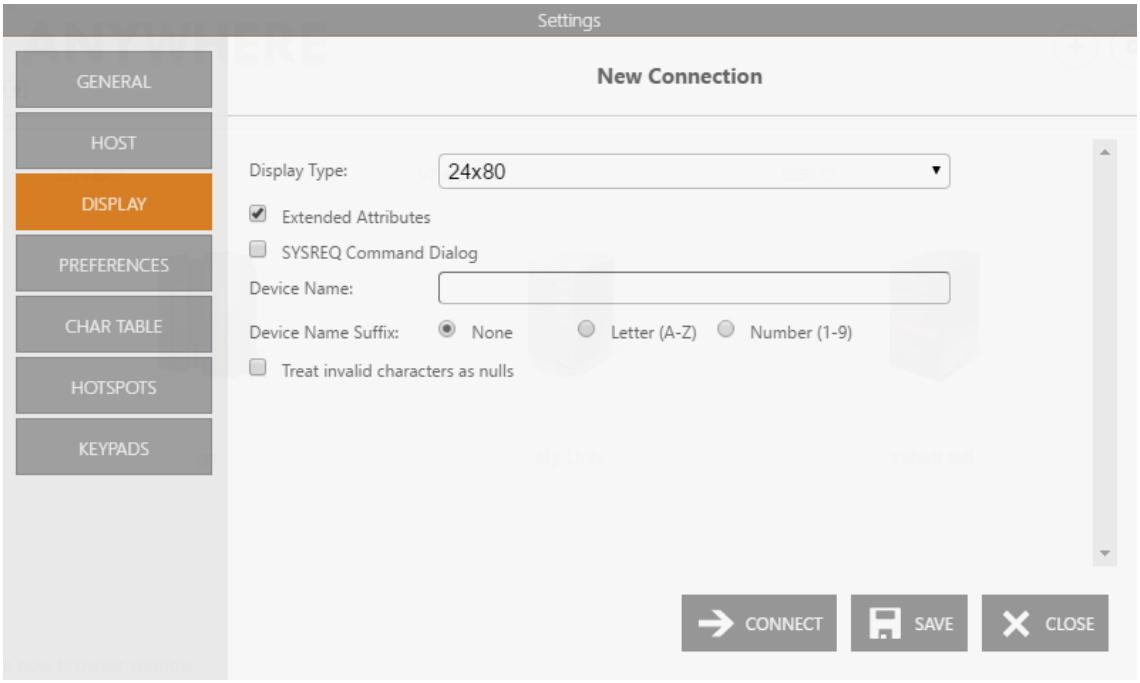
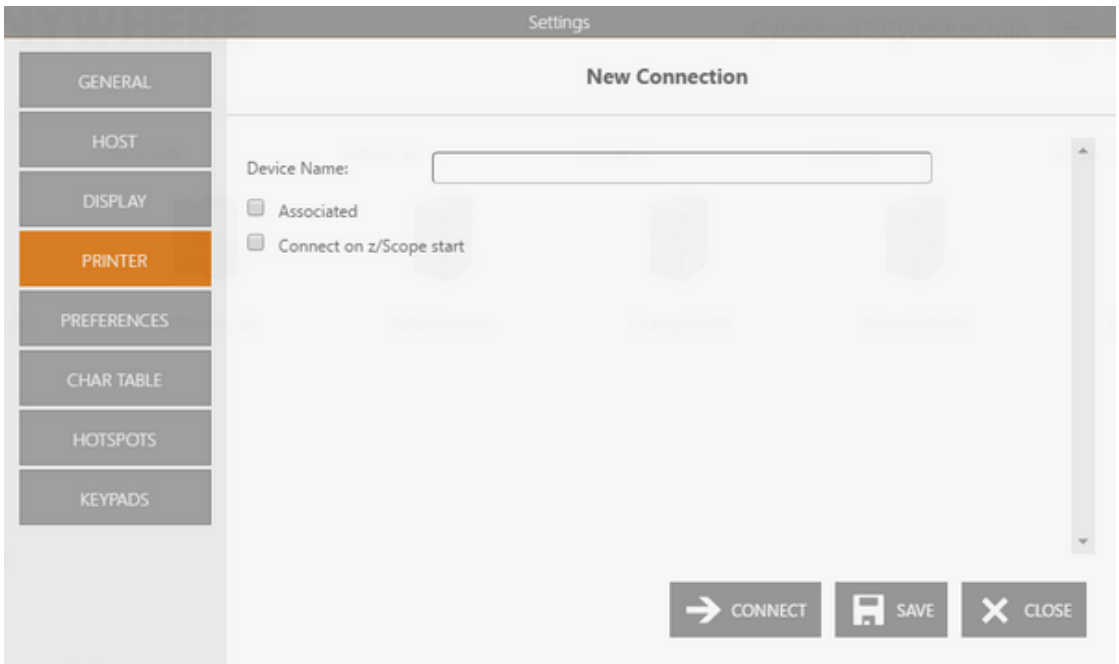
5250

These are the Display tab options for an AS/400 connection.



Printer

If you are creating a 'display' or 'both' (display and printer) type of connection, specify the device name.



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After that, click on 'Apply', 'Save' or 'Connect'.

Read More:

- Editing an IBM Mainframe or AS/400 Connection
- Creating a Connection

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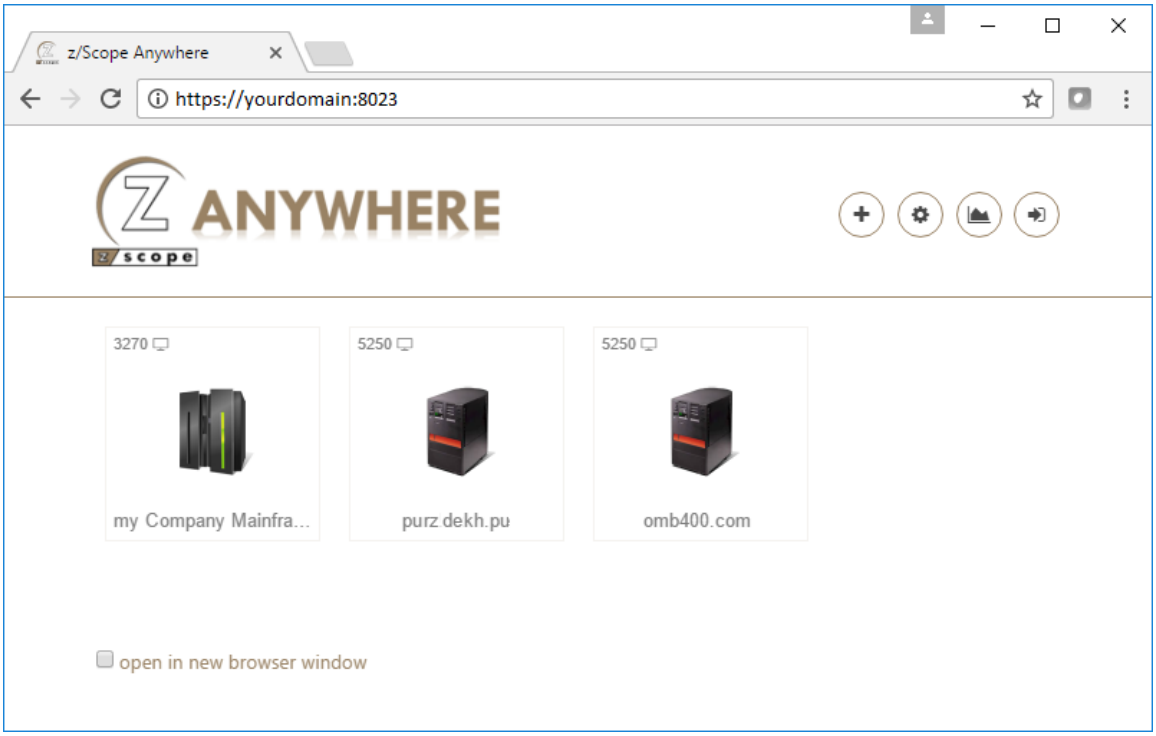
5.1.2 Customizing a Connection

If you wish to modify an existing connection from the web interface, click on the Settings button located in the start page view.



Choose your profile from the list on the top of the Connections settings screen.

The image below shows a shared connection, in which the connection parameters can't be modified. This kind of connection allows you to modify only your personal preferences (found in the Preferences, HotSpots and Keypads tabs).

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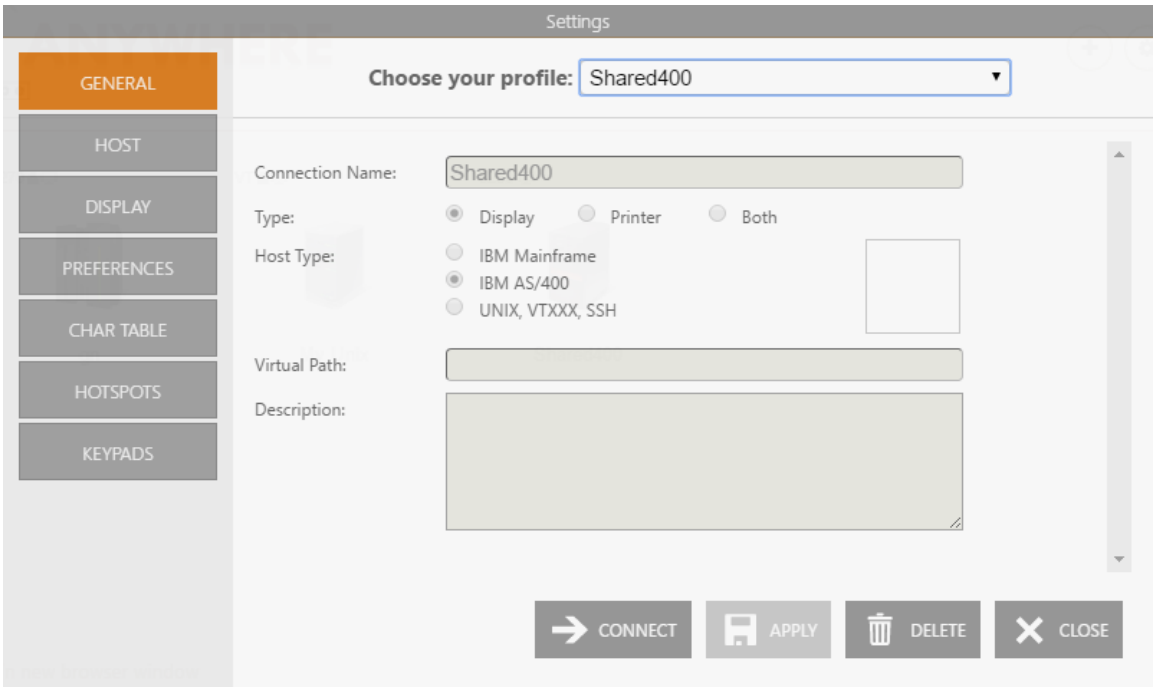
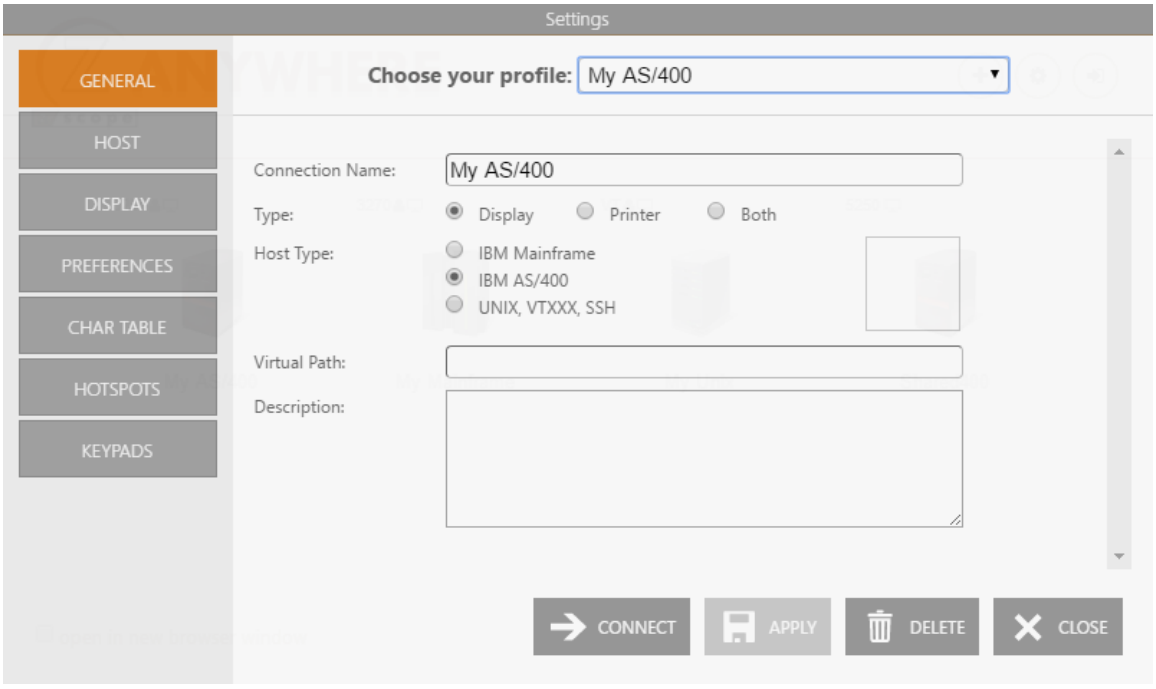


Right below you will see a private connection being edited. In this case, you will be able to modify all the parameters.



Remember to click on the 'Apply' button to save the changes.

Read More:

- Editing a UNIX/VT Connection

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- Editing an IBM Mainframe or AS/400 Connection

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5.1.2.1 Editing a Unix/VT Connection

For a detailed description of the parameters available when editing Unix/VT connections on the web interface, consult the following sections:

- General
- Host
- Backup
- Display
- Socks
- SSL
- SSH
- Preferences
- Options
- Char Table
- HotSpots

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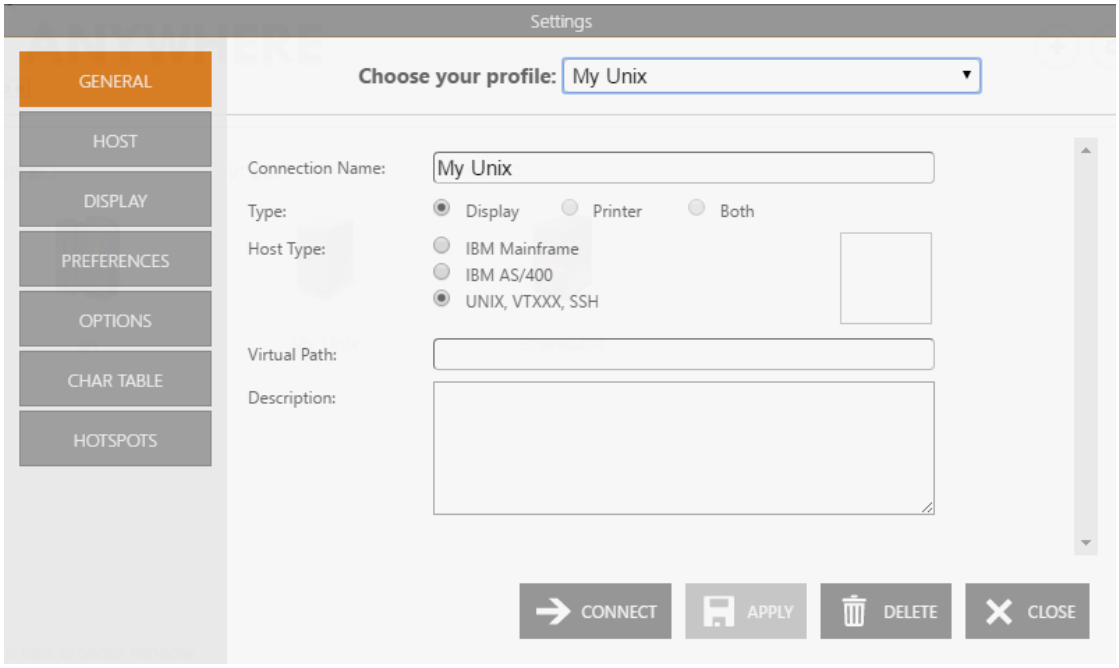
5.1.2.1.1 General

In the 'General' tab you will find the following parameters:



Connection Name
Enter a name to identify the connection. This field is mandatory.

Host Type
Select 'UNIX,VTXXX, SSH' as the host type.

Icon
You can choose a different icon for the connection by clicking on the square next to the Host Type options.

Virtual Path
The Virtual Path will create a unique URL address for this connection. The complete path will consist of: http(s)://YourDomain:port/VirtualPath/. The users can then create a web shortcut to this connection in particular and bypass the z/Scope Anywhere web interface.

Description
You can type a longer description for the connection in this field.

Read More:

- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)

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- Unix/VT Connections - SSL ettings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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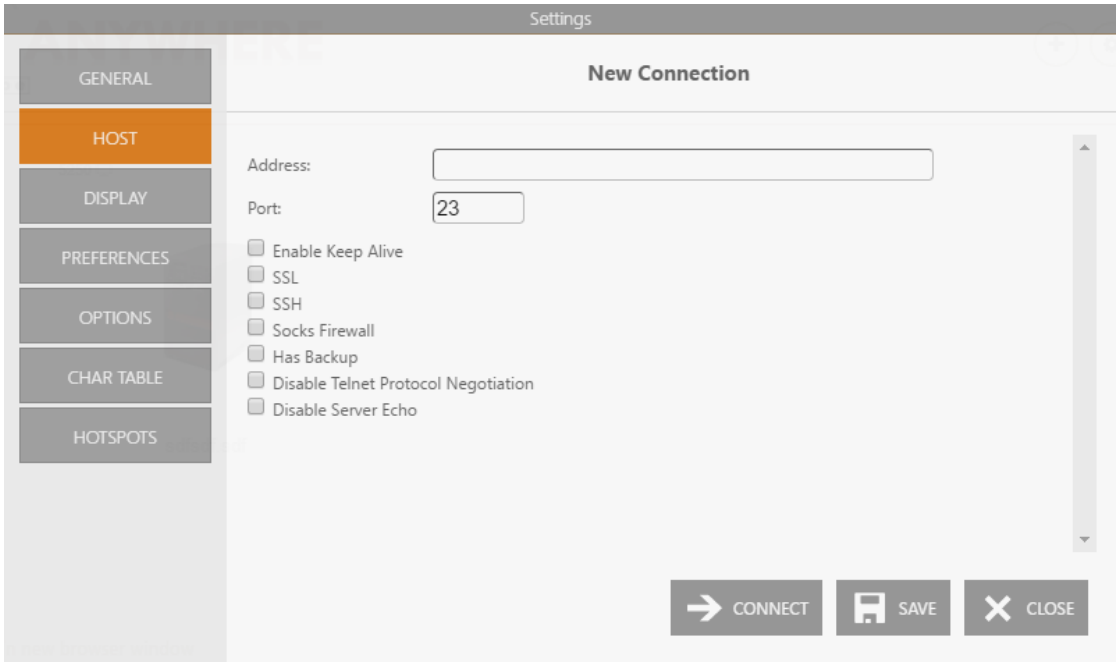
5.1.2.1.2 Host

In the 'Host' tab you will find the following parameters:



Address
URL or IP address of the host computer.

Port
TCP port defined at the host computer for Telnet access.

Default Telnet port number is 23.

Enable Keep Alive
Enables keep-alive mechanism, needed for some Telnet servers to prevent disconnections.

SSL
Enables the SSL (Secure Sockets Layer) protocol for the host.

When you check this option, the 'SSL' tab will automatically appear in the connection settings dialog. See Using SSL. The SSL and SSH options are mutually exclusive.

SSH
Enables the SSH protocol for the host.

When you check this option, the 'SSH' tab will automatically appear in the connection settings dialog. The SSH and SSL options are mutually exclusive.

Socks Firewall

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Enables support for Socks firewall.

When you check this option, the 'Socks' tab will automatically appear in the connection settings dialog.

Has Backup
Check this option if you would like to specify an alternate IP for this connection.

When you check this option, the 'Backup' tab will automatically appear in the connection settings dialog.

Disable Telnet Protocol Negotiation
Check this option if you want to omit the protocol negotiation when connecting.

Disable Server Echo
Check this option if you don't want the server to echo every character it receives.

Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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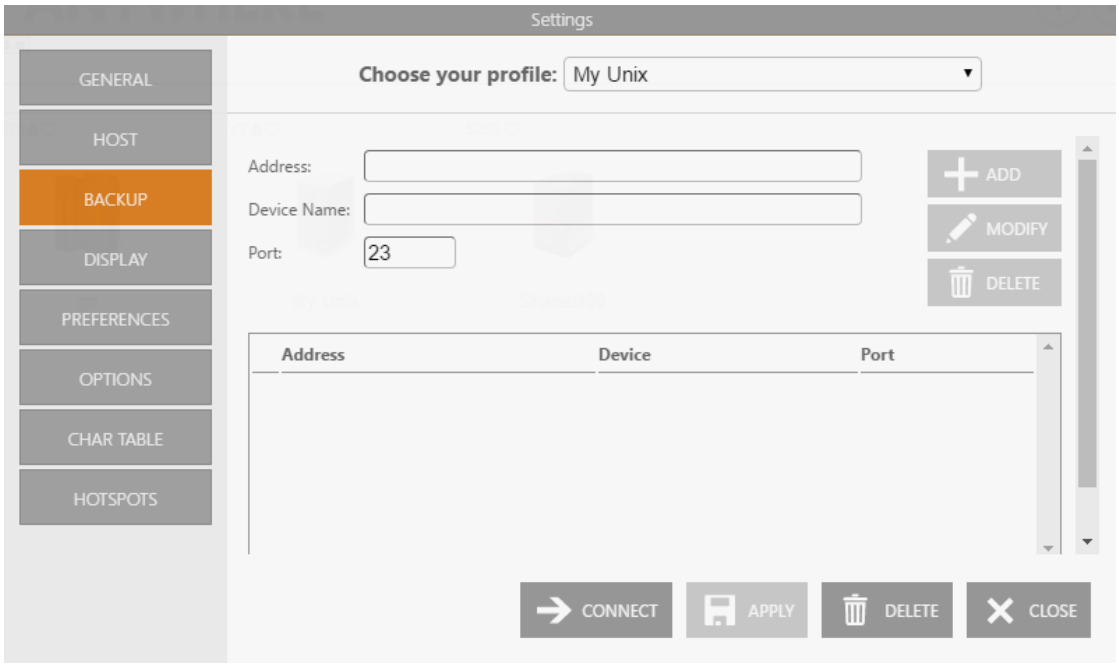
5.1.2.1.3 Backup

In the 'Backup' tab you will see a table showing the list of alternate hosts for the connection. If the connection fails, z/Scope will connect to an alternate host, starting with the first one in the list. If an alternate host fails, z/Scope will connect to the next one in the list, and so on.



This tab only becomes available when the 'Has Backup' option is checked in the 'Host' tab.

Address
IP address of the alternate host you would like to add for this connection

Device Name
Device Name for this alternate host.

Port
Port number for this alternate host.

Add
Press this button to add the Address, Device Name and Port information entered above as a new host in the list. New hosts will be added last in the list.

Modify
Select a backup connection from the list and press this button to replace the selected host with the information entered in the fields 'Address', 'Device Name' and 'Port'.

Delete
Select a backup connection from the list and press this button to delete it from the list.

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Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL ettings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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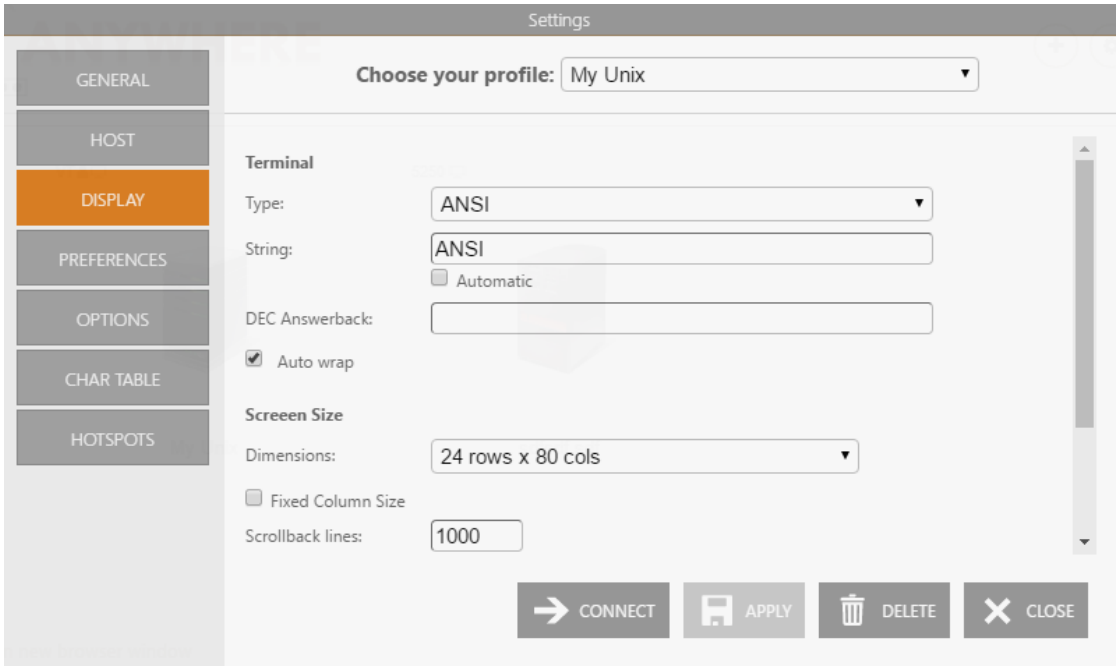
5.1.2.1.4 Display

In the 'Display' tab you will find the following parameters:



Terminal

Type / String
Specify the type of terminal to emulate, which is not necessarily the same that is informed to the server. To inform the server a different type of terminal than the one emulated, use the 'String' field. To automatically detect the type of terminal, check the 'Automatic' option.

DEC Answerback
Specify the DEC "Transmit answerback message" control character.

Auto Wrap
Check this option if you want the text lines to be wrapped when the terminal is resized.

Screen Size

Dimensions
Number of rows and columns to be displayed.

Fixed Column Size
Displays a horizontal scrollbar instead of resizing the font.

Scrollback lines

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Number of rows to keep in the buffer so they can be scrolled with the vertical scrollbar.

Scrolling

Mode
Select a scrolling method.

Jump Speed
Number of rows to be scrolled when the scrolling method is set to 'Jump'.

Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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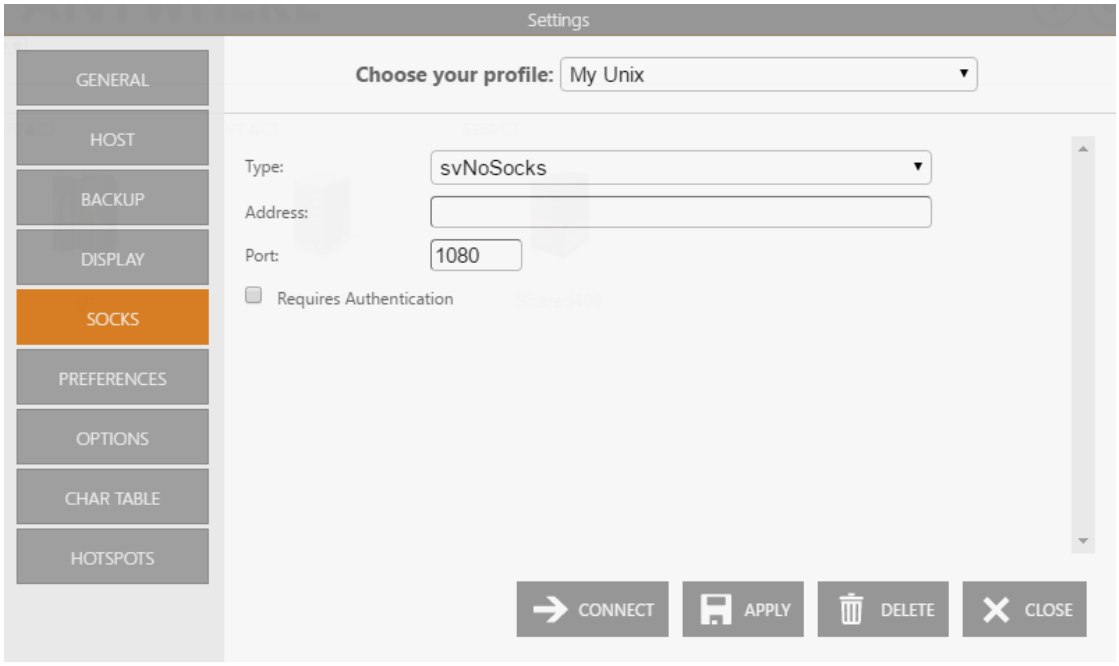
5.1.2.1.5 Socks

In the 'Socks' tab you will find the following parameters:



This tab only becomes available when the 'Socks' option is checked in the 'Host' tab.

Type
Indicates the type of Socks protocol you will be connecting to. z/Scope provides support for svSocks 4, 4A and 5 protocols.

Address
IP address of the Socks server.

Port
Port number of the Socks service at the host.

Requires Authentication
When connecting with svSocks4A protocol and higher, you have the option of providing a User ID and a Password for authentication.

User id
User ID.

Password
Password.

Read More:
- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)

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- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - SSL ettings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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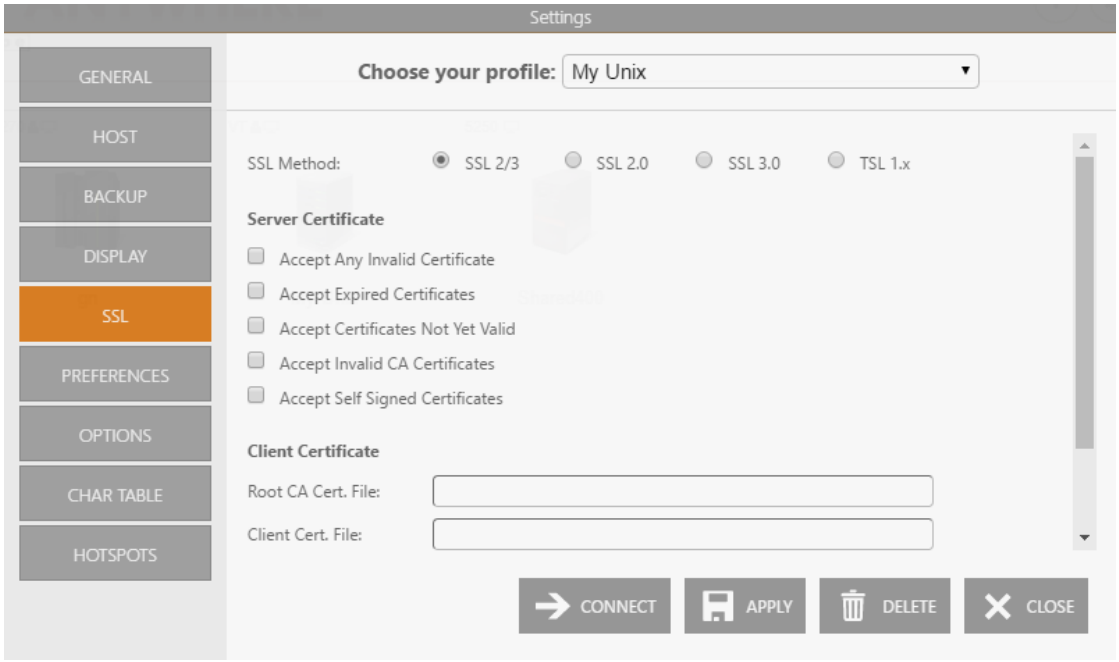
5.1.2.1.6 SSL

In the 'SSL' tab you will find the following parameters:



This tab only becomes available when the 'SSL' option is checked in the 'Host' tab.

SSL Method
Available methods: SSL 2/3, SSL 2.0, SSL 3.0, TLS 1.x.

Server Certificate
Specify what policy should the software adopt when dealing with certificates that do not meet certain security conditions.

Client Certificate
Enter the file name of the certificate files that you own.

Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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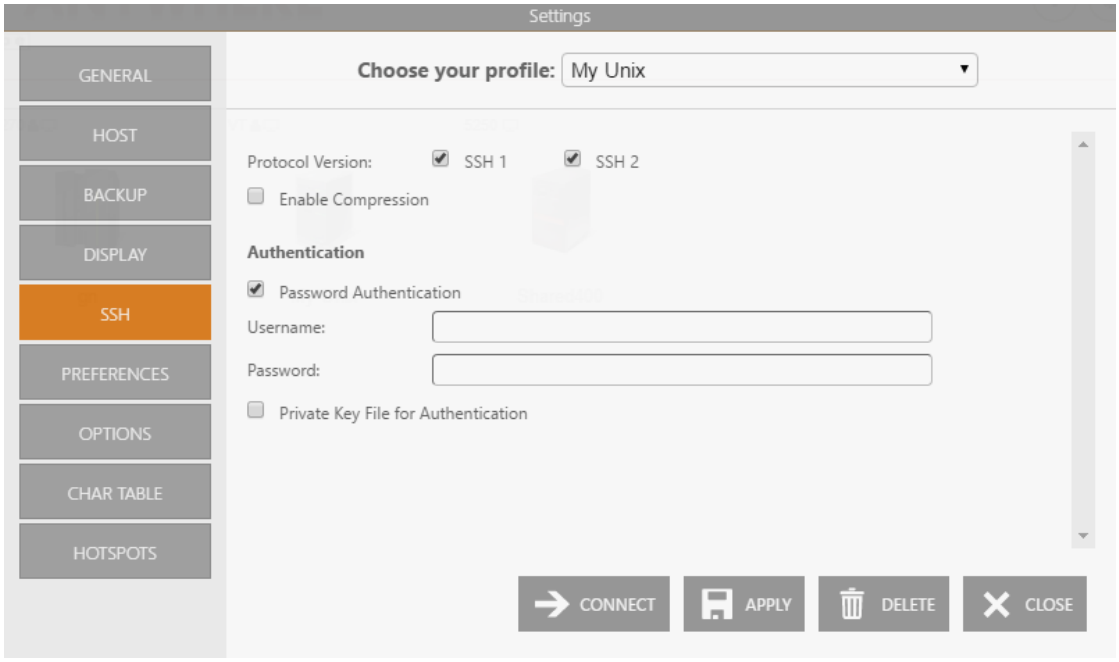
5.1.2.1.7 SSH

In the 'SSH' tab you will find the following parameters:



This tab only becomes available when the 'SSH' option is checked in the 'Host' tab.

Protocol Version
Available versions: SSH 1 or SSH 2.

Enable Compression
Enables compression for the SSH protocol.

Authentication

Username
User name with access to the host via the SSH protocol.

Password
Password for the specified user name.

Private Key File for Authentication
Check this option if you want to use a private key-file for the authentication process. You must enter the path of the file in the field below.

Read More:
- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)

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- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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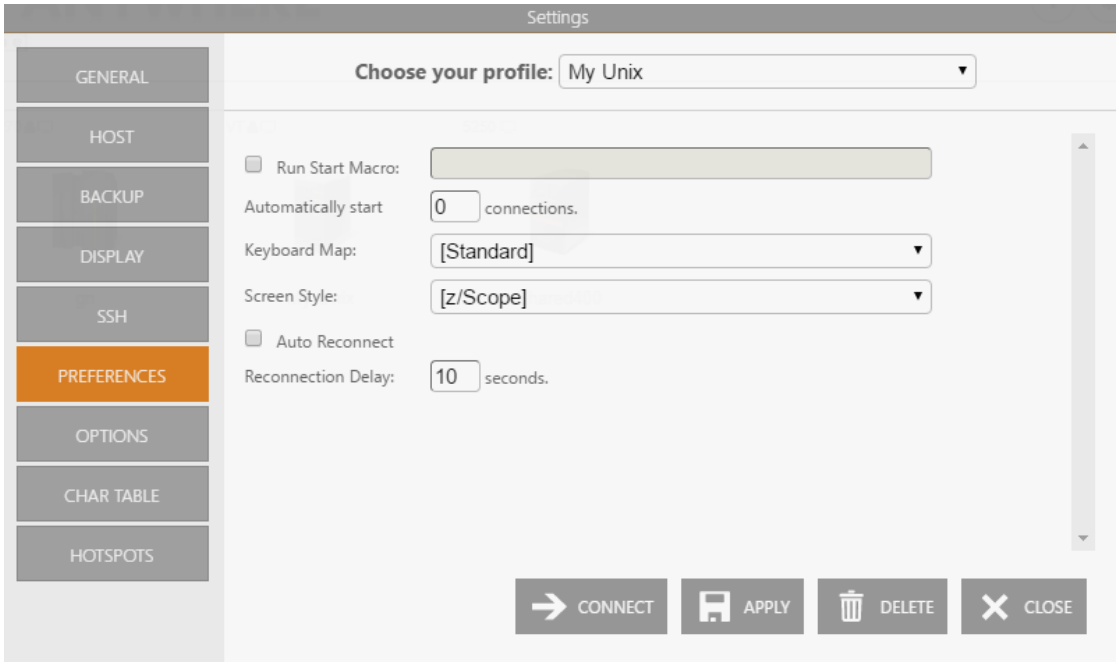
5.1.2.1.8 Preferences

In the 'Preferences' tab you will find the following parameters:



Run Start Macro
Check this option to run a macro upon connection and type the macro's name.

Automatically Start [*n*] Connections
Specify the number of this connection's sessions that will be automatically established upon z/Scope start.

Keyboard Map
Select the Keyboard map you want to use for this connection.

Screen Style
Allows you to select a default Screen Style for this connection.

Auto Reconnect
Check this option if you would like to automatically reconnect to the host after logging off.

Reconnection Delay
The amount of time (in seconds) that you would like the system to wait before auto reconnecting to the host.

Read More:
- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)

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- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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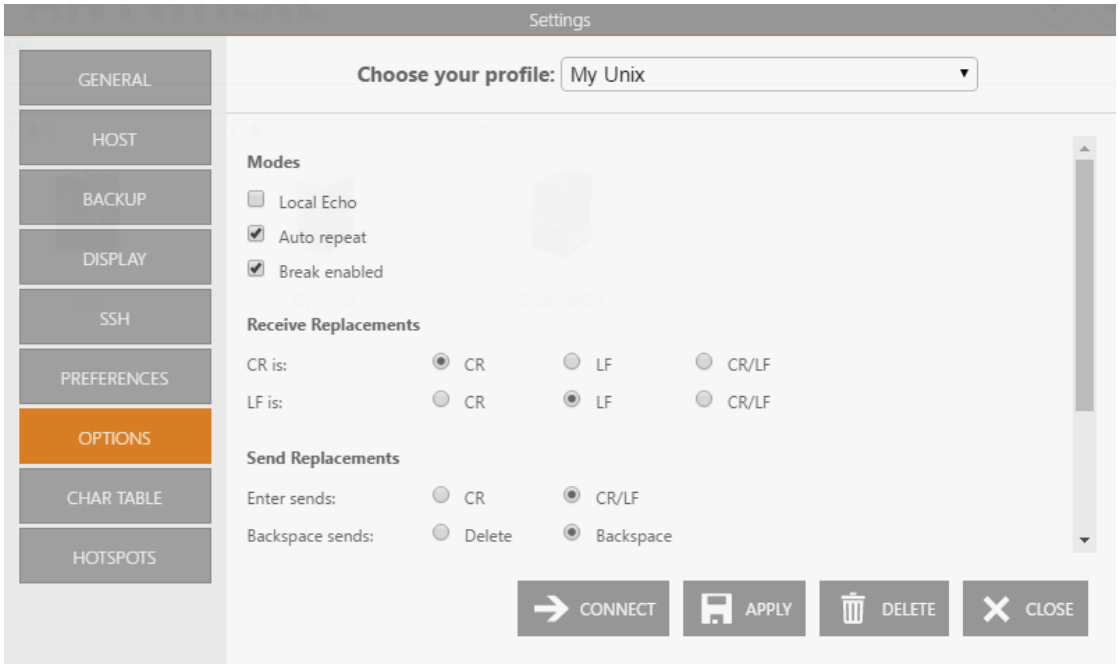
5.1.2.1.9 Options

In the 'Options' tab you will find the following parameters:



Modes

Local Echo
Allows local echoing of the characters when the server doesn't return echoes.

Auto Repeat
Enables the auto repeat feature for the keyboard.

Break Enabled
Enable to use the 'Break' command.

Receive Replacements

CR/LF is
Desired behaviour for the 'Carriage Return' (CR) and 'Line Feed' (LF) commands.

Send Replacements

Enter/Backspace Sends
Desired behaviour for the 'Enter' and 'Backspace' keys.

Cursor/Keypad Keys

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How the cursor and keypad keys are interpreted.

Line Mode

Mode
Indicate when LineMode will be activated from the options available in the combobox.

Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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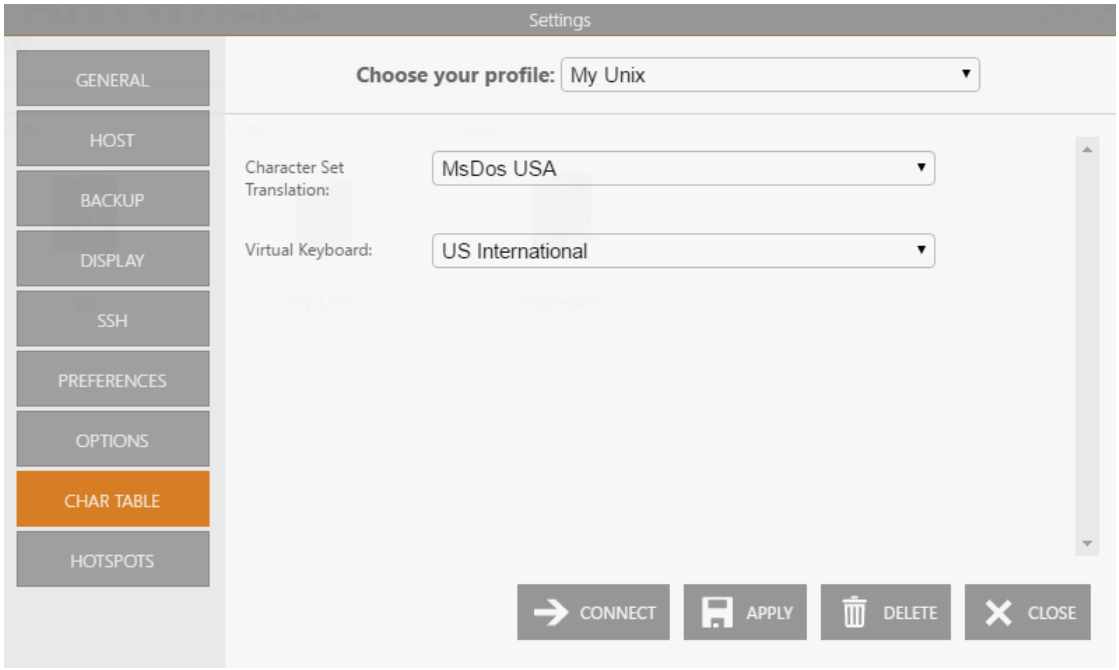
5.1.2.1.10 Char Table

In the 'Char Table' tab you will find the following parameters:



Character Set Translation
Character set that better suits your language needs.

Virtual Keyboard
Language/format to be used on mobile devices virtual keyboards.

Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - HotSpots Settings (Web Interface)

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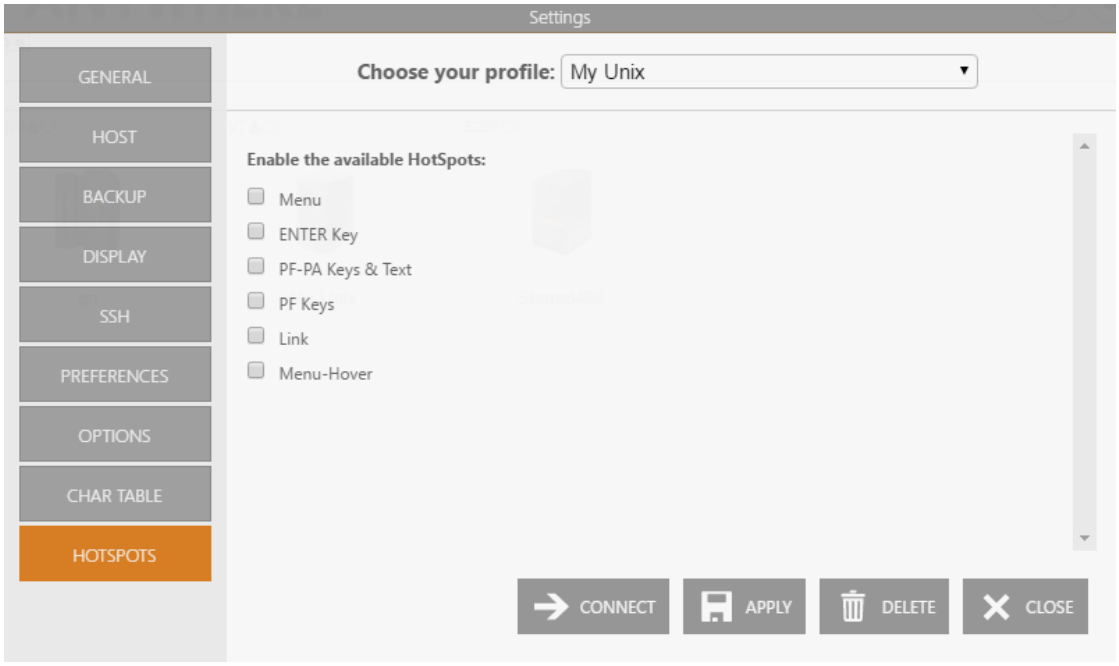
5.1.2.1.11 HotSpots

In the 'HotSpots' tab you can choose the HotSpots that will be available when working with the connection.



Read More:

- Unix/VT Connections - General Settings (Web Interface)
- Unix/VT Connections - Host Settings (Web Interface)
- Unix/VT Connections - Backup Settings (Web Interface)
- Unix/VT Connections - Display Settings (Web Interface)
- Unix/VT Connections - Socks Settings (Web Interface)
- Unix/VT Connections - SSL Settings (Web Interface)
- Unix/VT Connections - SSH Settings (Web Interface)
- Unix/VT Connections - Preference Settings (Web Interface)
- Unix/VT Connections - Options Settings (Web Interface)
- Unix/VT Connections - Char Table Settings (Web Interface)
- HotSpots Settings
- Using HotSpots

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5.1.2.2 Editing an IBM Mainframe or AS/400 Connection

For a detailed description of the parameters available when editing Mainframe/AS400 connections on the web interface, consult the following sections:

- General
- Host
- Backup
- Display
- Printer
- Socks
- SSL
- Preferences
- Char Table
- HotSpots
- Keypads

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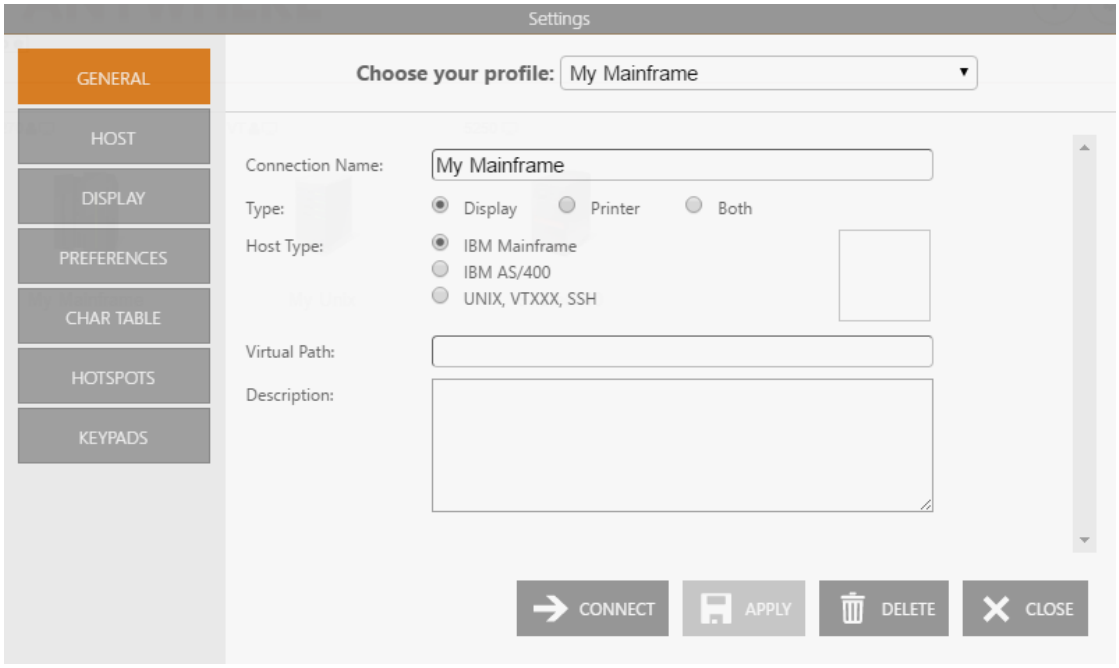
5.1.2.2.1 General

In the 'General' tab you will find the following parameters:



Connection Name
Enter a name to identify the connection. This field is mandatory.

Type
You can have a Display connection, a Printer connection or a 'Display and printer' connection to the same host in the same profile.

Host Type
Select 'IBM Mainframe' or 'IBM AS/400' as the host type.

Icon
Choose a different icon for the connection by clicking on the square next to the Host Type options.

Virtual Path
The Virtual Path will create a unique URL address for this connection. The complete path will consist of: http(s)://YourDomain:port/VirtualPath/. The users can then create a web shortcut to this connection in particular and bypass the z/Scope Anywhere web interface.

Description
You can type a longer description for the connection in this field.

Read More:

- Mainframe/AS400 Connections - Host Settings (Web Interface)

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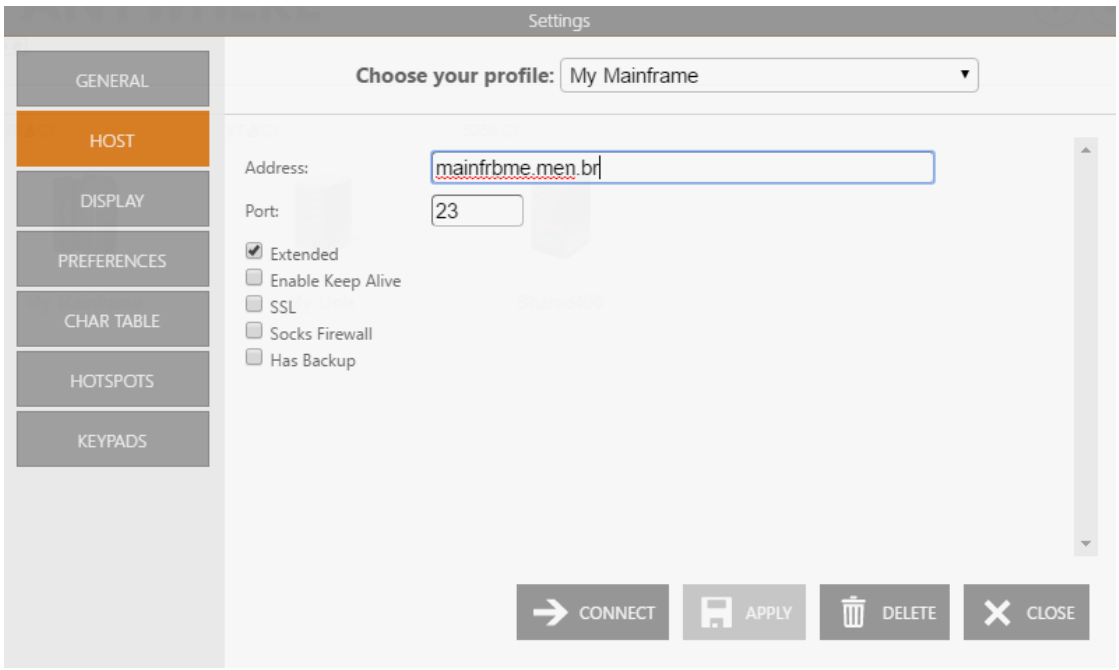
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.2 Host

In the 'Host' tab you will find the following parameters:



Address
URL or IP address of the host computer.

Port
TCP port defined at the host computer for Telnet access.

The Default Telnet port number is 23.

Extended
Enables Telnet Extended protocols (TN3270E or TN5250E). This setting enables 'User Id' and 'Password' input boxes for AS/400 connections.

Enable Keep Alive
Enables the keep-alive mechanism, needed for some Telnet servers to

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prevent disconnections.

SSL
Enables the SSL (Secure Sockets Layer) protocol for the host.

When you check this option, the 'SSL' tab will automatically appear in the connection settings dialog. See Using SSL. The SSL and SSH options are mutually exclusive.

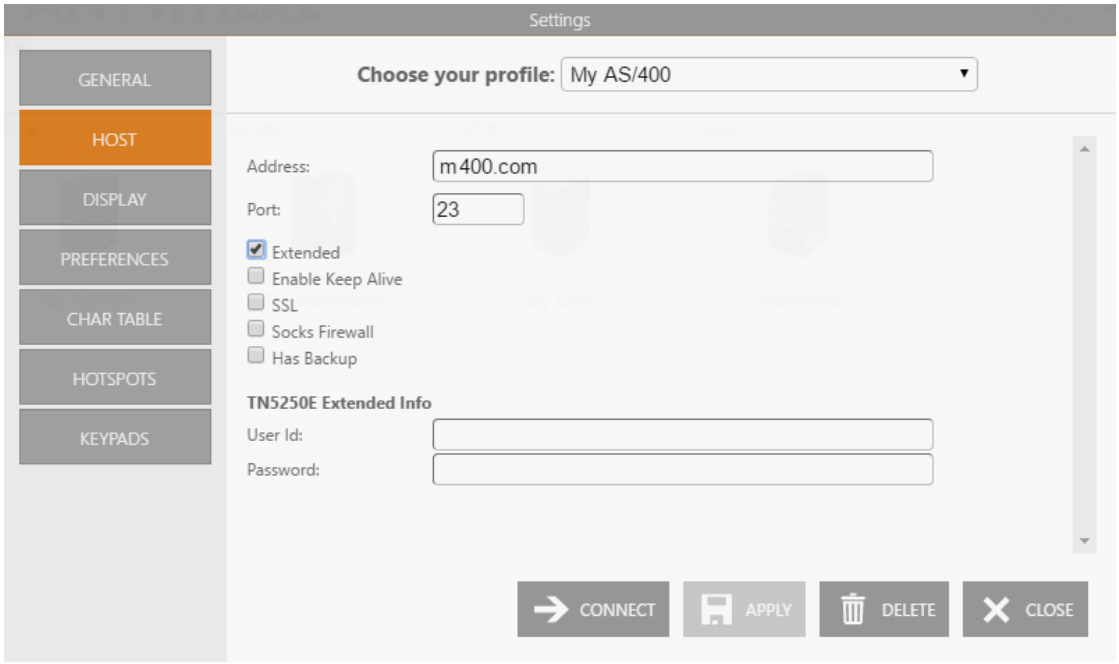
Socks Firewall
Enables support for Socks firewall.

When you check this option, the 'Socks' tab will automatically appear in the connection settings dialog.

Has Backup
Check this option if you would like to specify an alternate ip for this connection.

When you check this option, the 'Backup' tab will automatically appear in the connection settings dialog.

For AS/400 connections, you will also see these additional fields:



TN5250E Extended info
Specify User Id and Password for TN5250E extended connections.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)

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- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.3 Backup

In the 'Backup' tab you will see a table showing the list of alternate hosts for the connection. If the connection fails, z/Scope will connect to an alternate host, starting with the first one in the list. If an alternate host fails, z/Scope will connect to the next one in the list.

To configure these settings you will find the following parameters:

Address
IP address of the alternate host you would like to add for this connection

Device Name
Device Name with which you would like to connect to this alternate host.

Port
Port number for this alternate host.

Add
Adds the Address, Device Name and Port information entered above as a new host in the list. New hosts will be added last in the list.

Modify

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Select a backup connection from the list and press this button to replace the selected host with the information entered in the fields 'Address', 'Device Name' and 'Port'.

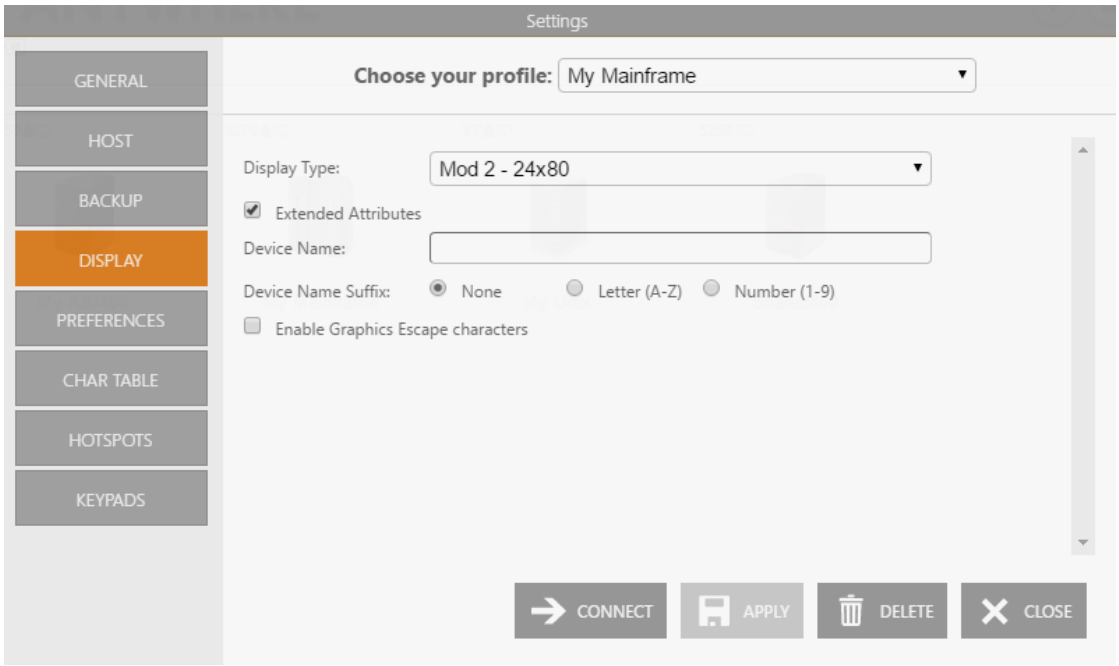
Delete
Select a backup connection from the list and press this button to delete it from the list.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.4 Display

In the 'Display' tab you will find the following parameters for IBM Mainframe connections (3270):



Display Type
Select the desired resolution for the host.

Available resolutions vary according to the type of host you are connecting to.

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Extended Attributes
Enables extended attributes for the connection.

Device Name
Specifies the logical unit or device name for the connection.

Device Name Suffix
Allows you to specify a suffix method to use for several connections.

Enable Graphics Escape character
Enables graphic characters on the connection.

For AS/400 connections (5250), you will find some additional setting options:

SYSREQ Command Dialog
Enables a command line for the SysReq function.

Treat Invalid Characters as Null
Substitutes invalid characters with null.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)

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- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.5 Printer

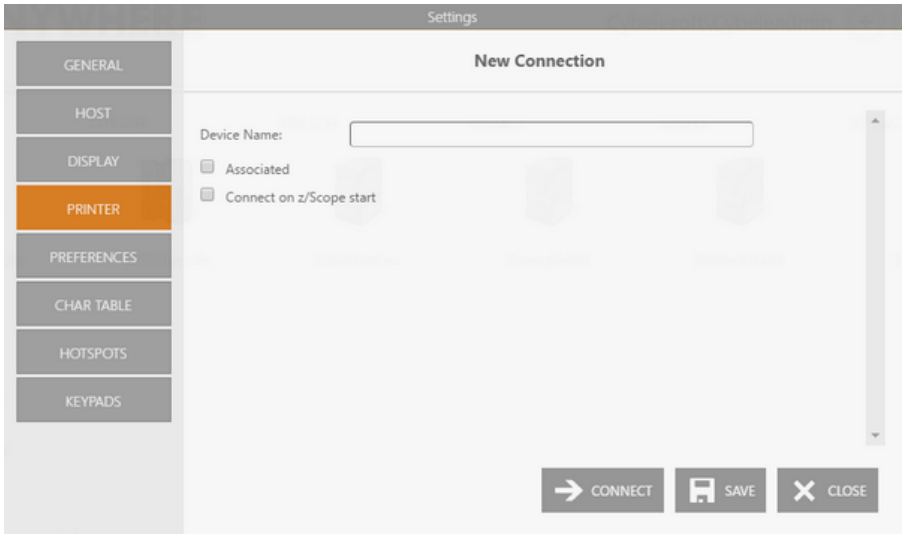
In the 'Printer' tab you will find the following parameters:

This tab only becomes available when 'Printer' or 'Both' are selected as types in the 'General' tab.

Device Name
Enter the host device name.

Connect on z/Scope Start
Check this option if you want the printer session to be started automatically when z/Scope starts independently of the display session.

IBM Mainframe Connections:



Associated
Check this option if you want the printer session to start whenever the display session is started.

IBM/AS400 Connections:

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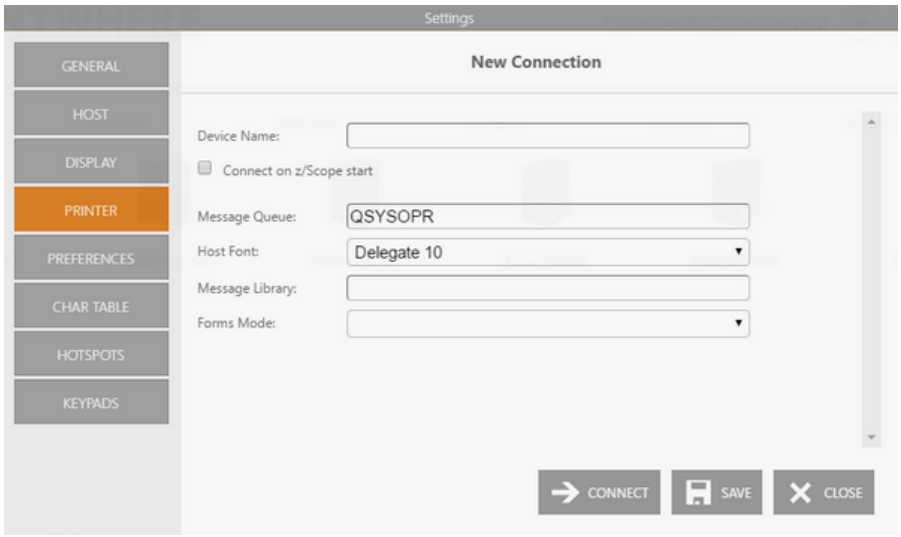

Message Queue
Enter the host's queue name.

Host Font
Select the host font.

Message Library
Host's library name.

Forms Mode
Select the desired forms mode.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.6 Socks

In the 'Socks' tab you will find the following parameters:

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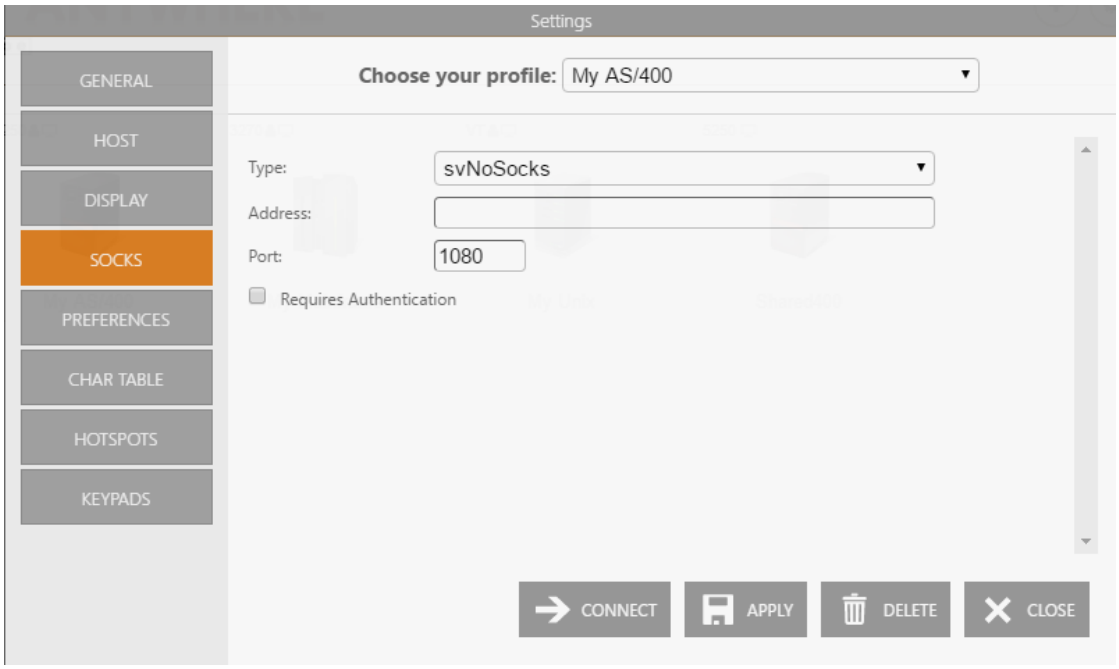

This tab only becomes available when the 'Socks' option is checked in the 'Host' tab.

Type
The type of Socks protocol you will be connecting to. z/Scope provides support for svSocks 4, 4A and 5 protocols.

Address
Enter the IP address of the Socks server.

Port
Enter the port number of the Socks service at the host.

Requires Authentication
When connecting with svSocks4A protocol and higher, you have the option of providing a User ID and a Password for authentication.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

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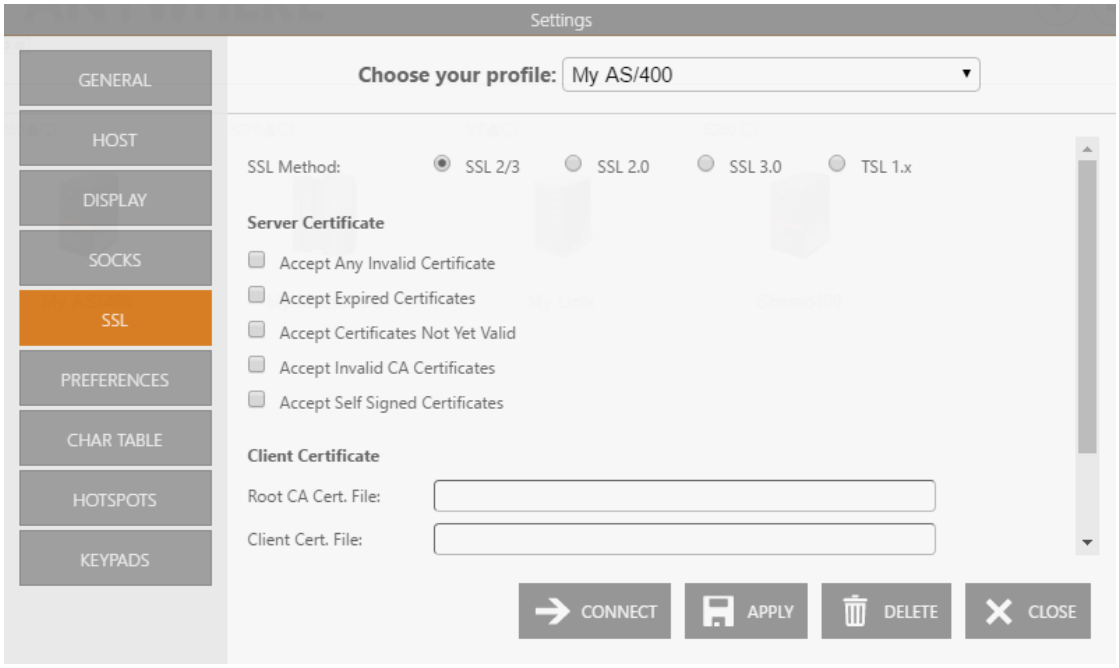
5.1.2.2.7 SSL

In the 'SSL' tab you will find the following parameters:



This tab only becomes available when the 'SSL' option is checked in the 'Host' tab.

SSL Method
Choose one of the available methods.

Server Certificate
The 'Display certificate' option controls whether to show the Certificate Info immediately after establishing the connection. The other options refer to the policy adopted when dealing with certificates that do not meet certain security conditions.

Client Certificate
Enter the file name of the certificate files that you own.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

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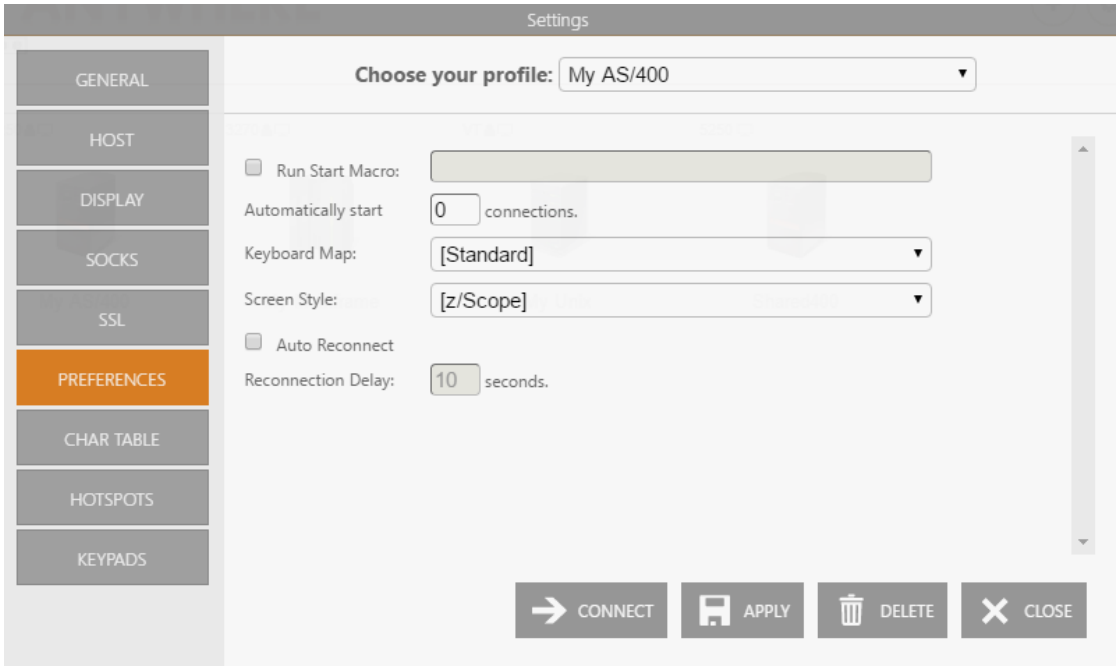
5.1.2.2.8 Preferences

In the 'Preferences' tab you will find the following parameters:



Run Start Macro
Check this option to run a macro upon connection and type the macro's name.

Automatically Start [*n*] Connections
Specify the number of this connection's sessions that will be automatically established upon z/Scope start.

Keyboard Map
Select the Keyboard map you want to use for this connection.

Screen Style
Allows you to select a default Screen Style for this connection.

Auto Reconnect
Check this option if you would like to automatically reconnect to the host after logging off.

Reconnection Delay
The amount of time (in seconds) that you would like the system to wait before auto reconnecting to the host.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)

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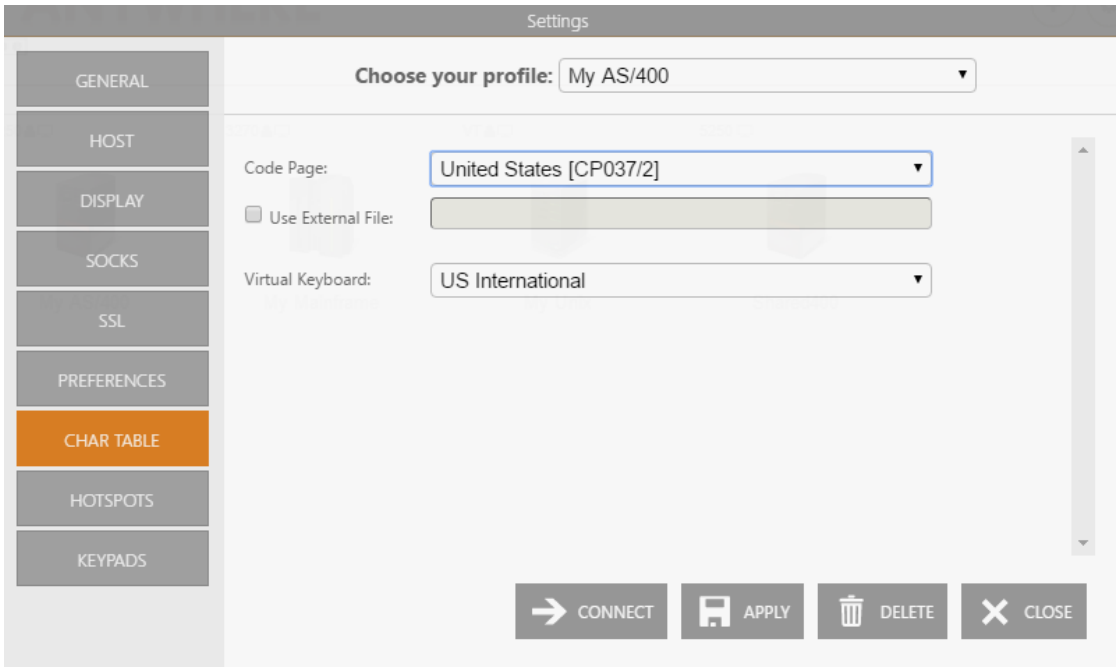
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.9 Char Table

In the 'Char Table' tab you will find the following parameters:



Code Page
Allows you to select an internal Character Conversion Table. See Internal Conversion Tables.

Use External File
Mark this option if you to additionally enter the file name (.ebc) of an external Character Conversion Table to be used for the connection.

Virtual Keyboard
Select the language/format to be used on mobile devices virtual keyboards.

Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)

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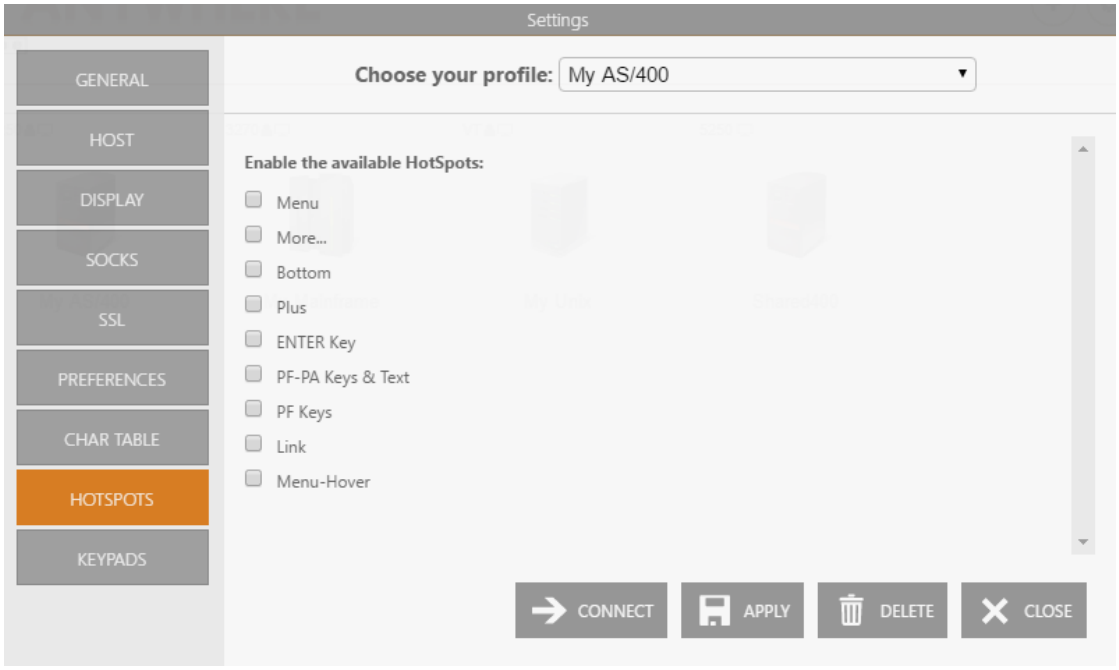
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)

5.1.2.2.10 HotSpots

In the 'HotSpots' tab you can choose the HotSpots that will be available when working with the connection.



Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - Keypads Settings (Web Interface)
- HotSpots Settings
- Using HotSpots

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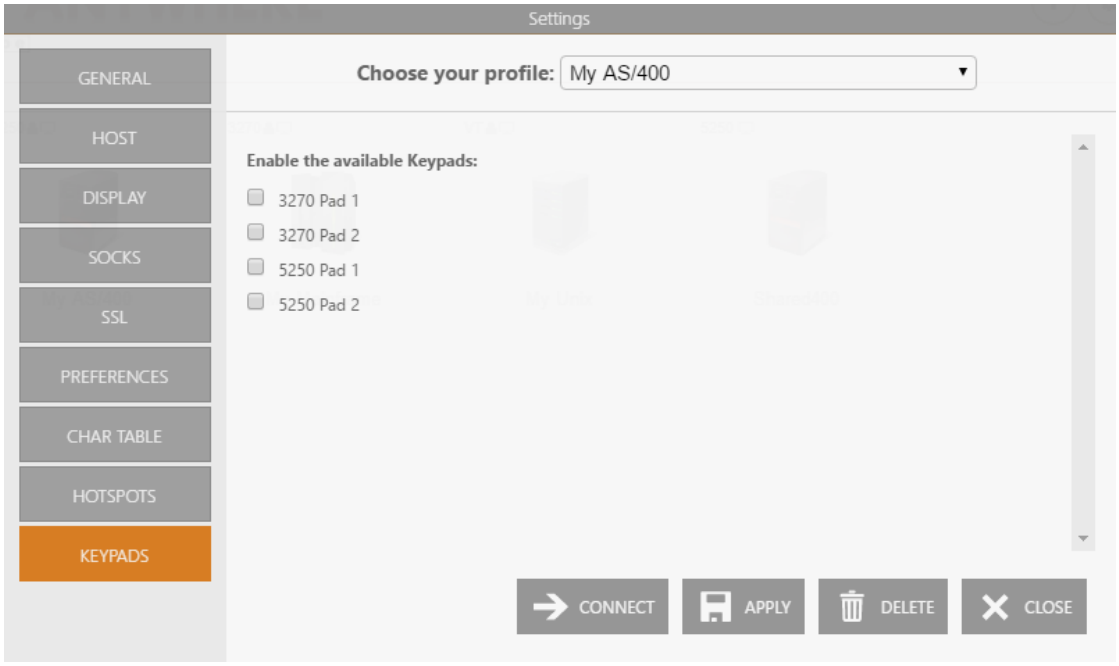
5.1.2.2.11 Keypads

In the 'Keypads' tab you can choose the Keypads that will be available when working with the connection.



Read More:

- Mainframe/AS400 Connections - General Settings (Web Interface)
- Mainframe/AS400 Connections - Host Settings (Web Interface)
- Mainframe/AS400 Connections - Backup Settings (Web Interface)
- Mainframe/AS400 Connections - Display Settings (Web Interface)
- Mainframe/AS400 Connections - Printer Settings (Web Interface)
- Mainframe/AS400 Connections - Socks Settings (Web Interface)
- Mainframe/AS400 Connections - SSL Settings (Web Interface)
- Mainframe/AS400 Connections - Preferences Settings (Web Interface)
- Mainframe/AS400 Connections - Char Table Settings (Web Interface)
- Mainframe/AS400 Connections - HotSpots Settings (Web Interface)
- Keypads Settings
- Using Keypads

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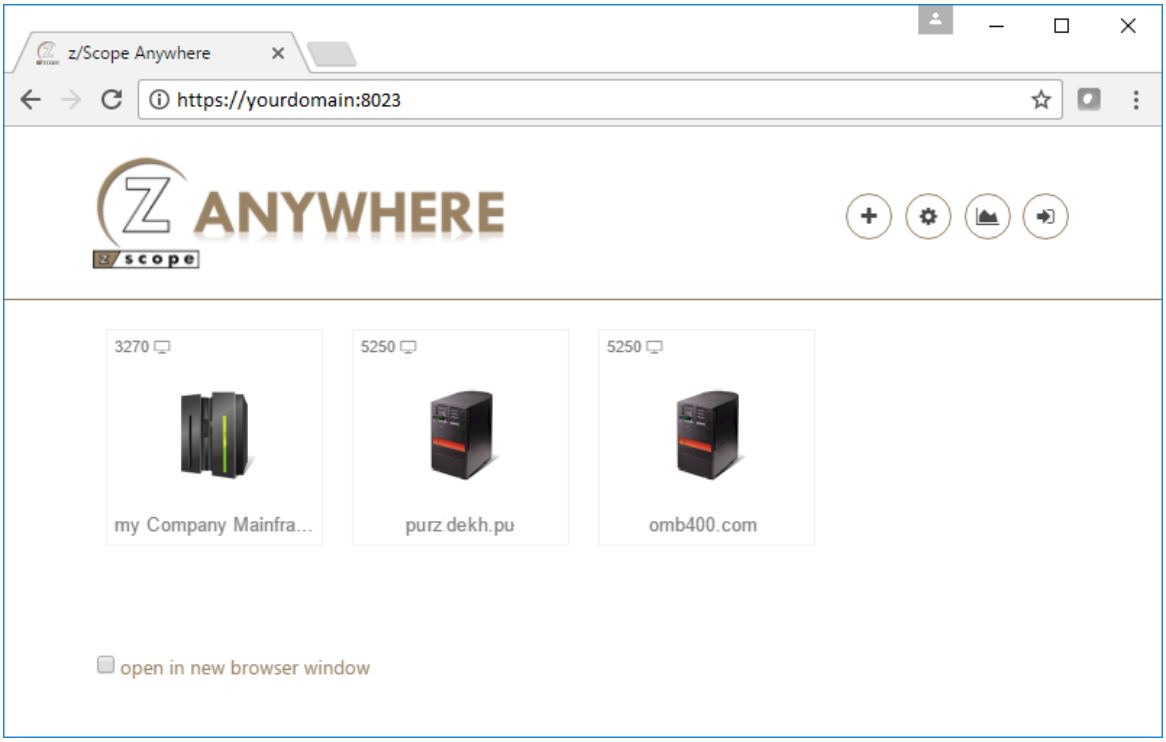
5.1.3 Connecting

Follow the next steps and learn how to establish new sessions using the connections available in the Start page:



1. Click on the connection buttons to connect.
2. If the configured parameters are right, the emulation will start.

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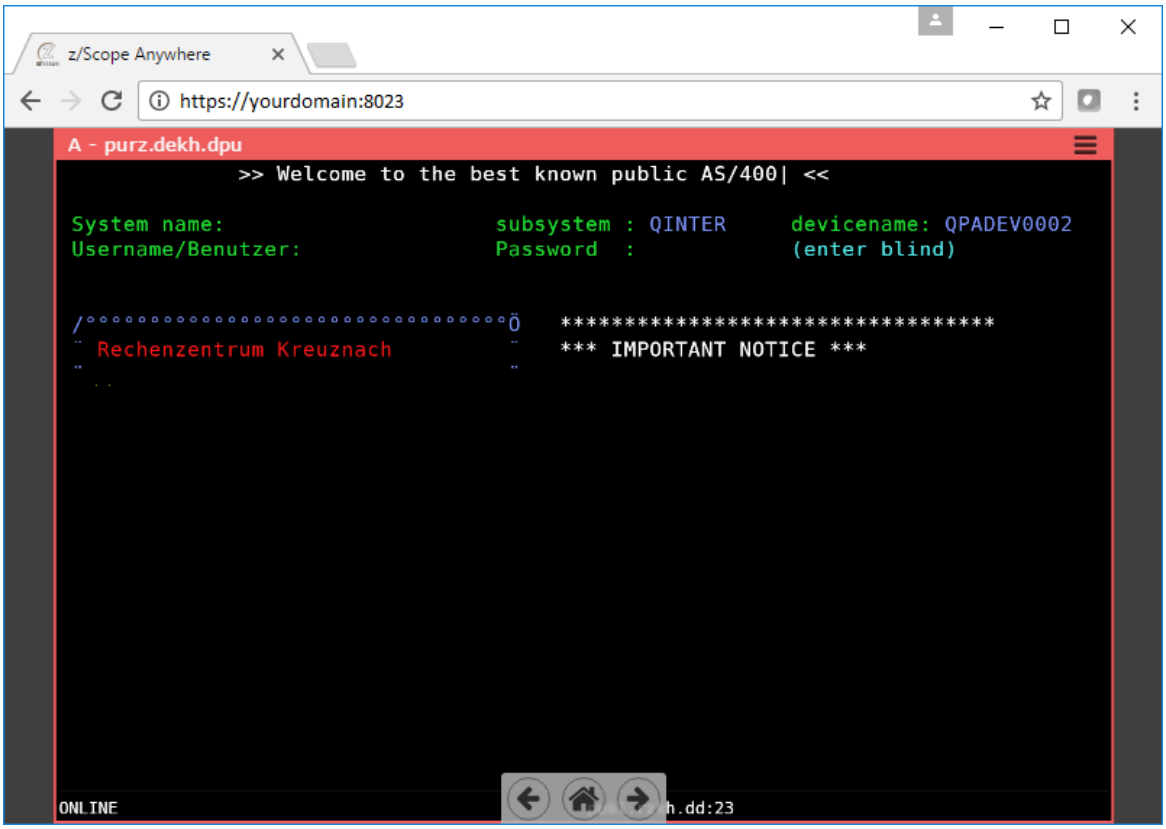

Learn how to set up a new private connection.

Read More:

- Customizing a Connection
- Connection Buttons

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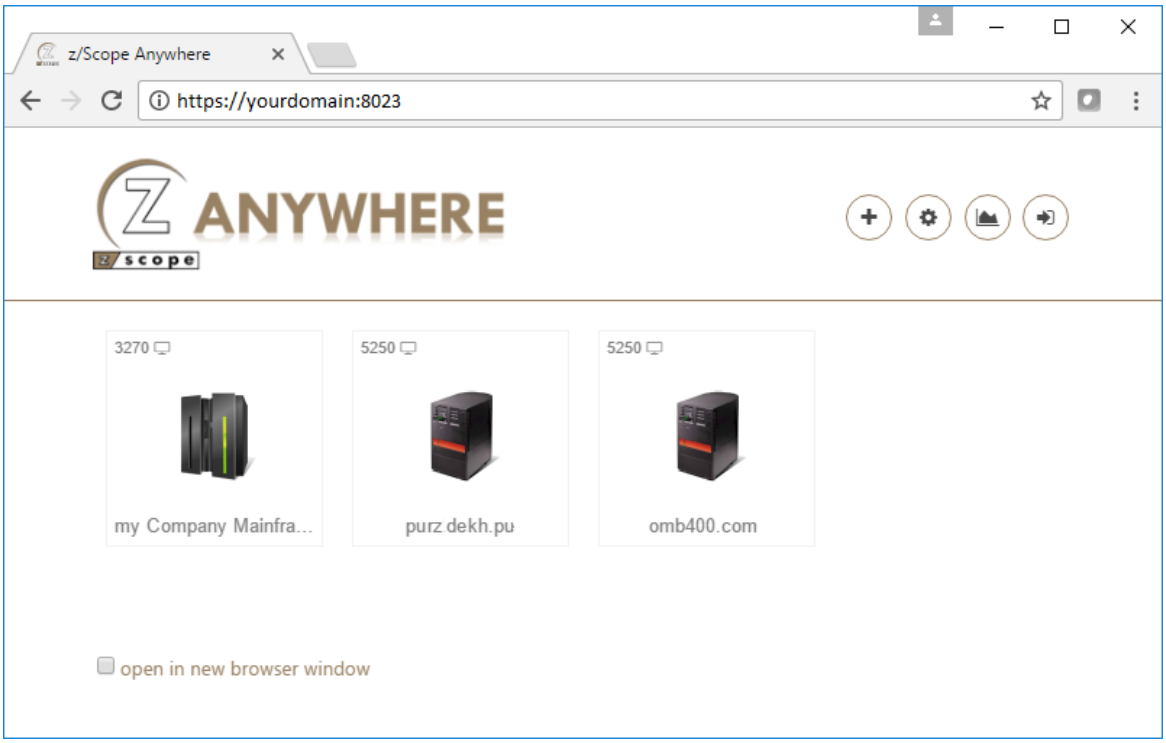
5.1.4 Deleting a Private Connection

To delete a private connection from the web interface, click on the 'settings' button, located in the start page. Only private connections can be deleted from the web interface. Shared connections can only be managed by the system administrator via the configuration manager.



Choose the private connection you want to delete (field 'Choose your profile') and click on the 'Delete' button.

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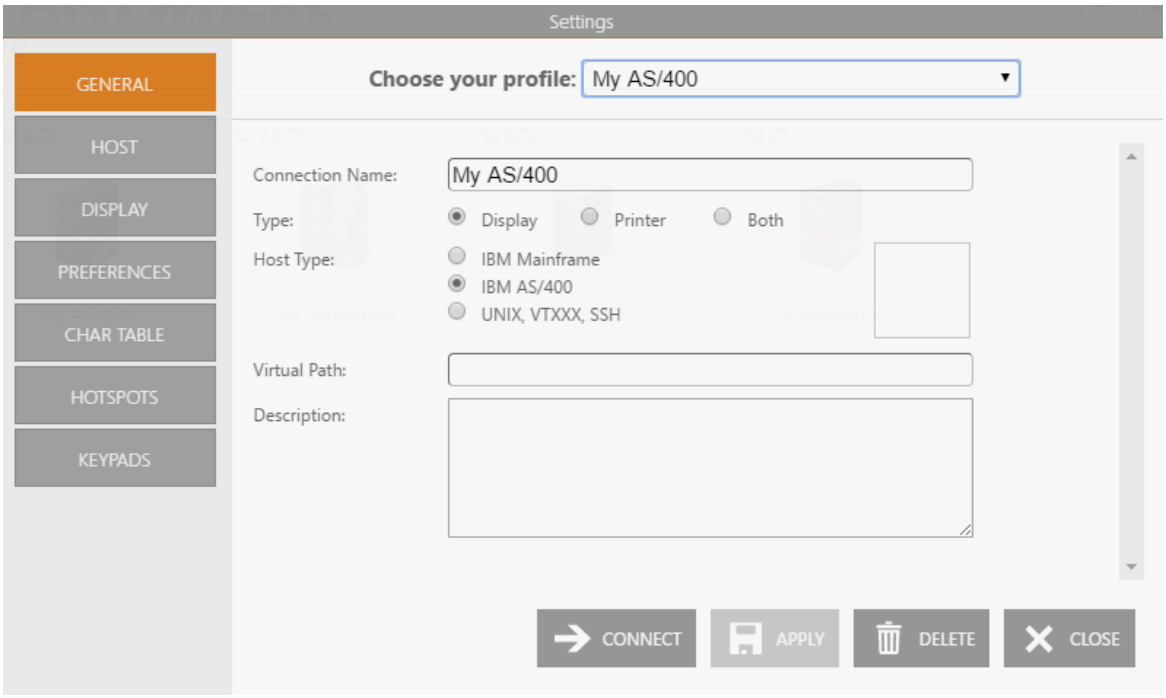

This operation is not undoable, which means that once you delete a particular connection, it will be permanently lost.

Read More:

- Editing a Unix/VT Connection
- Editing an IBM Mainframe or AS/400 Connection
- Connecting

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5.2 HotSpots

HotSpots are a very useful feature that allows the user to mouse-enable the emulation display by placing point-and-click controls that provide access to screen commands otherwise only accessible through keyboard commands.

z/Scope includes several predefined HotSpots, as well as an interface to create as many new user-defined HotSpots as required.

Read More:

- Using HotSpots
- Enabling HotSpots
- Create/Editing a HotSpot
- Hotspots Settings

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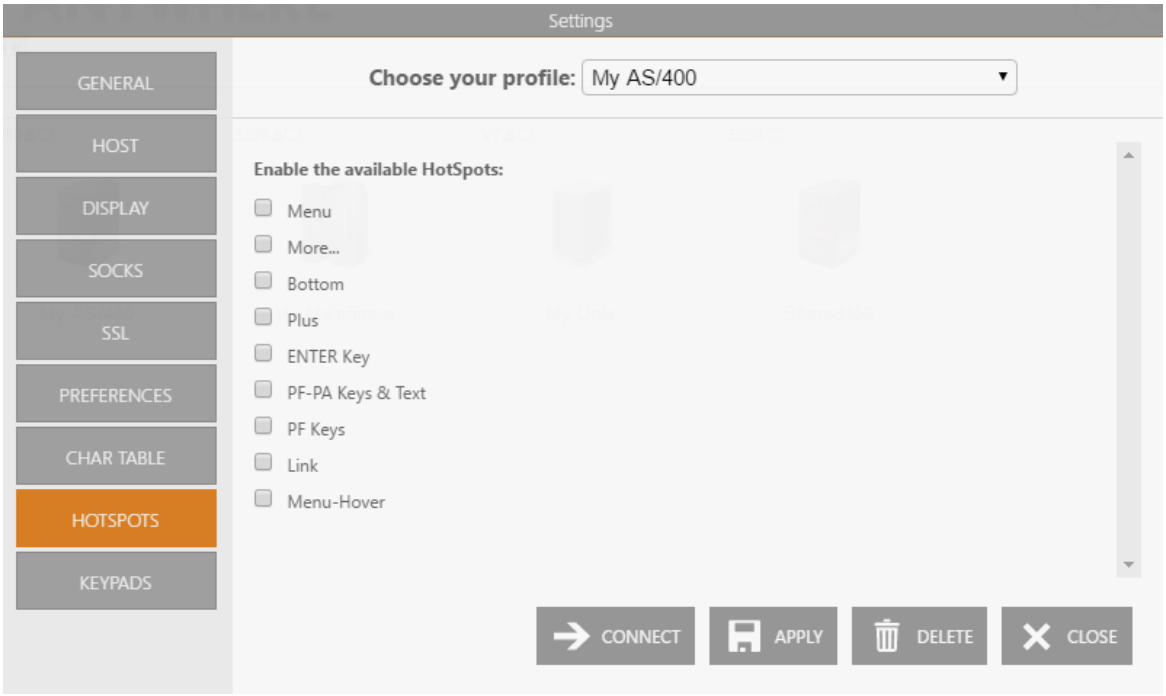
5.2.1 Enabling HotSpots

To enable HotSpots for a specific connection go to the Start Page and click on the Settings button.



1. Select the connection in the "Choose your profile" field.
2. Click on the 'HotSpots' tab.
3. Check the HotSpots you want to enable.
4. Click on 'Connect' or 'Apply' to save the changes.

Read More:

- Using HotSpots
- Hotspots Settings
- Creating/Editing a HotSpot

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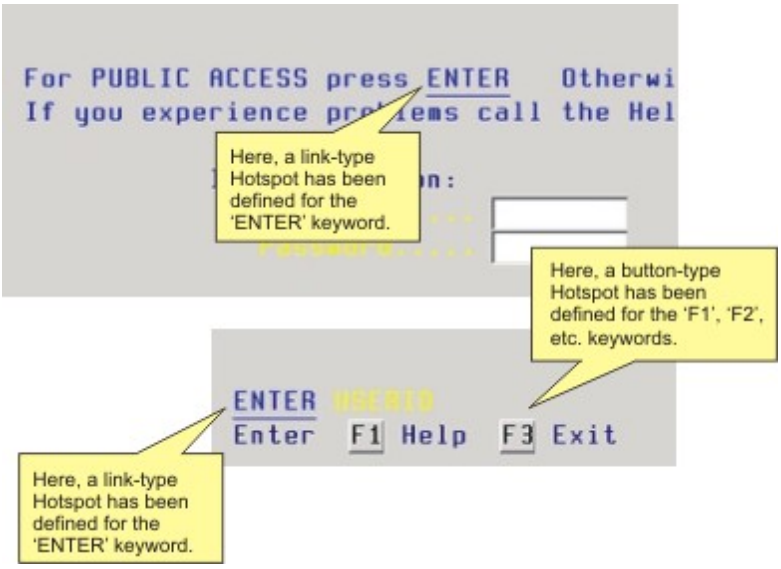
5.2.2 Using HotSpots

The HotSpots that you created for a particular screen will appear directly in-line on that screen:



The way HotSpots appear on the screen depends on the display format specified in the Style tab in HotSpot Settings.

In order to be able to use your HotSpot within a connection, you must first enable the HotSpot for that particular connection from the Settings Preferences Tab (3270, 5250) or Settings Preferences Tab (VT).

Read More:

- Enabling HotSpots
- Hotspots Settings
- Creating/Editing a HotSpot

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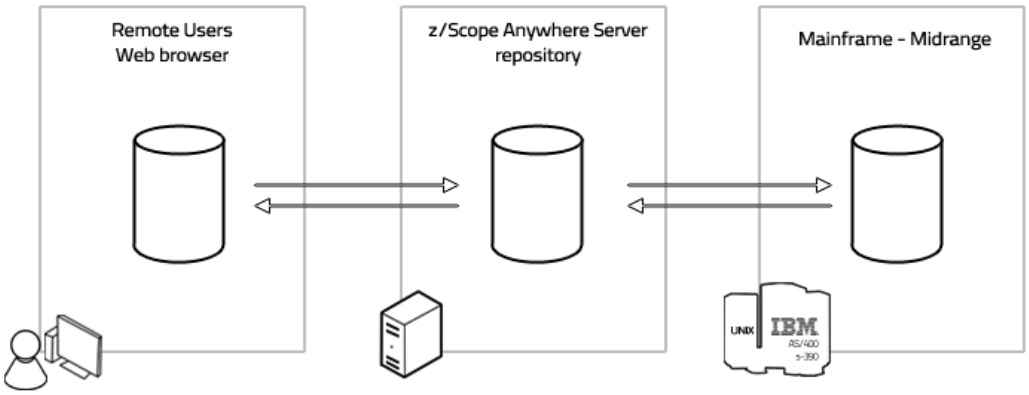
5.3 File Transfer

File Transfers are performed in two steps. In order to upload a file to the host, first upload it to z/Scope Anywhere Server. The same happens with the downloads, it is necessary to download the file from the host to z/Scope Anywhere Server and then download it to the Web Browser.



In the next topics you will get to know the File Transfer Manager and learn how to perform Downloads and Uploads:

- File Transfer Manager
  - Queue
  - Files
  - History
- Downloading
- Uploading

Read More:

- Permissions Settings

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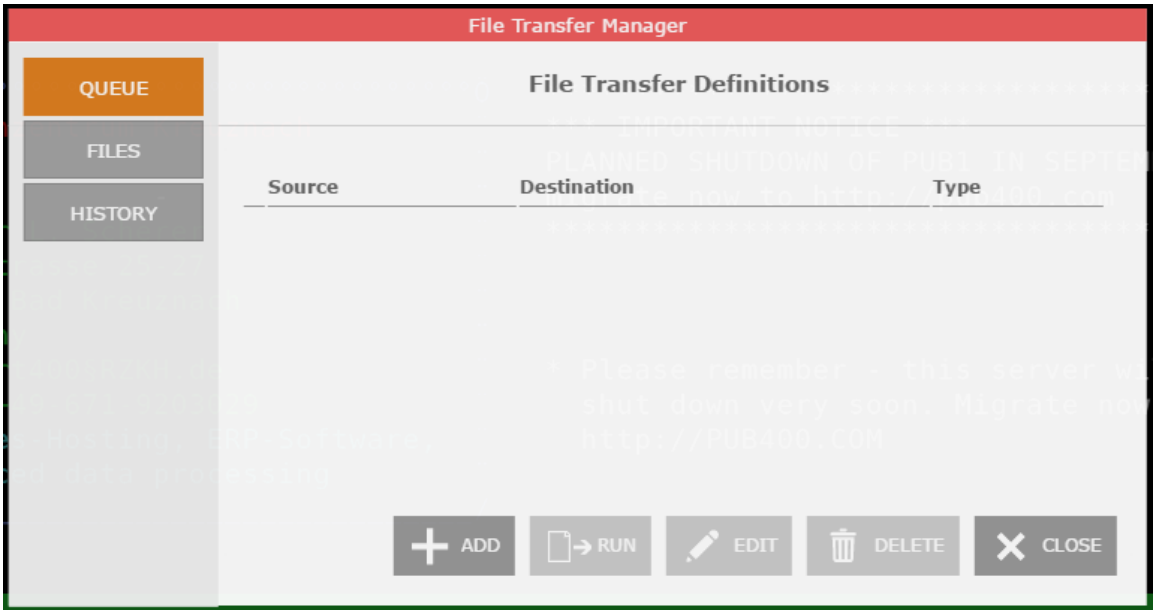
5.3.1 File Transfer Manager

To transfer a file in z/Scope Anywhere, first open a connection to the host that you want to exchange files with, and click on the connection menu "File Transfer" item.

File Transfer
Click on the 'File Transfer' option in the connection menu and the 'File Transfer Manager' will be presented.



The Queue tab allows you to exchange files with the host, by adding them into a queue and then running them to send them to the host.

On the Files tab, you can upload files to z/Scope Anywhere Server and download the existing files to the web browser.

The History tab will show you all the operations (uploads/downloads) performed with the host.

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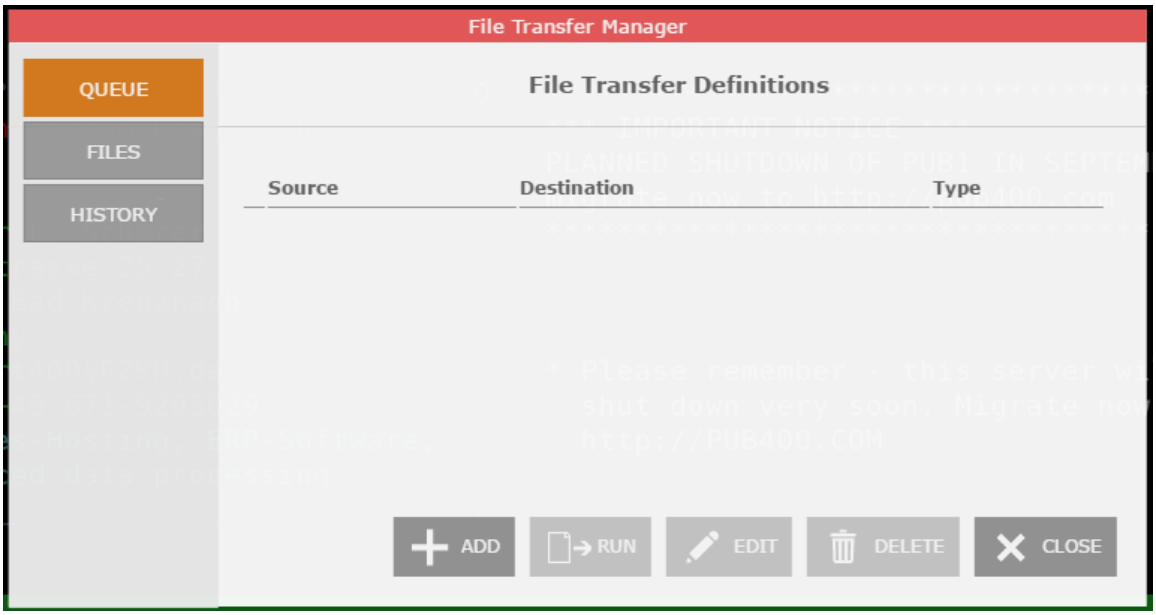
5.3.1.1 Queue

The File Transfer Manager allows you to transfer files using the FTP protocol.
It enables you to define the parameters for a particular file transfer job and then integrate that job into a Static Queue that contains all your previously defined file transfers jobs.
You can then easily mark the desired jobs from the Static Queue to the Interactive and start transferring them with a single click. The File Manager will automatically keep a History of all the transfers.



Add
Click on this button to add a new File Transfer Job to the Queue. Select the protocol you want to use to transfer the files.
The available parameters will vary according to the protocol you choose:

- FTP
- IND$FILE
- KERMIT
- X-MODEM
- Y-MODEM
- Z-MODEM

The new file transfer job will now appear in the Static Queue.

Run
Use this button to start transferring the files:

1. Select the files in the Static Queue.
2. Click on the 'Run' button.

The selected files will be transferred. To transfer all files listed, click on the 'Start All' button.

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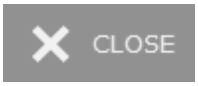
Edit
Select the Job you want to modify on the Static Queue and click on the 'Edit' button. The FTP topic explains each option of this protocol. The changes will be automatically applied to the queued item.

Delete
Select the Job you want to delete from the Static Queue and click on the 'Delete' button.



Close
Closes the 'File Transfer Manager' dialog.

Read More:

- FTP
- IND$FILE
- KERMIT
- X-MODEM
- Y-MODEM
- Z-MODEM

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5.3.1.1.1 FTP

To add a new FTP File Transfer Job to the Queue, follow these steps:

1. Open the Connection to the host.

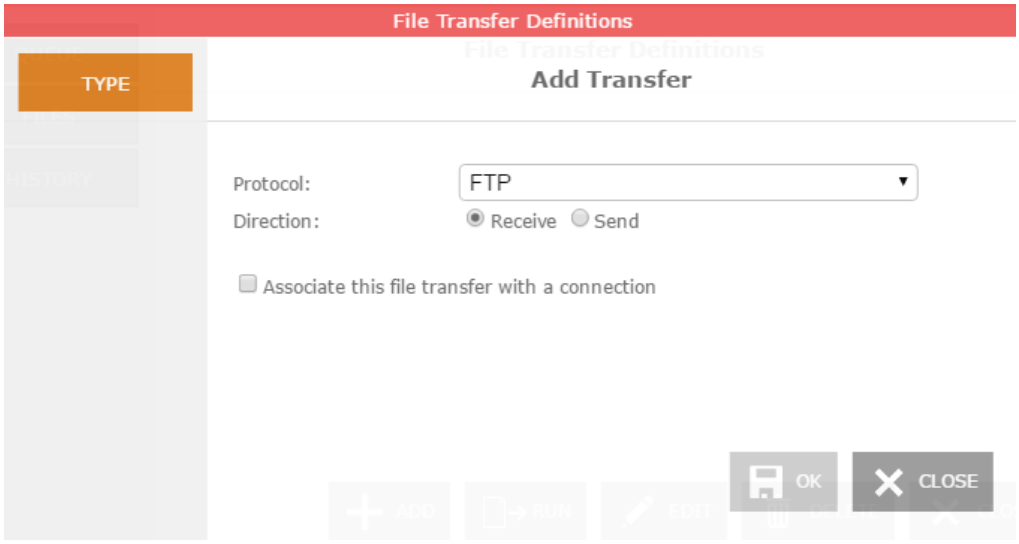
2. Click on the 'File Transfer' Connection View Menu option.

File Transfer
Opens the File Transfer Manager.

3. If you want to upload files to the server, remember to first upload the file to z/Scope Anywhere Server in the Files tab.

4. Go to the Queue tab and click on the 'Add' button.

Type tab:



Protocol
Select the FTP protocol.

Direction
Indicates if you will be downloading (Receive) from the host to z/Scope Anywhere Server, or uploading (Send) from z/Scope Anywhere Server to the host.

Associate this file transfer with a connection
This option allows you associate the File Transfer job with a specific connection. The job will only be shown on the selected connection.

Options Tab:

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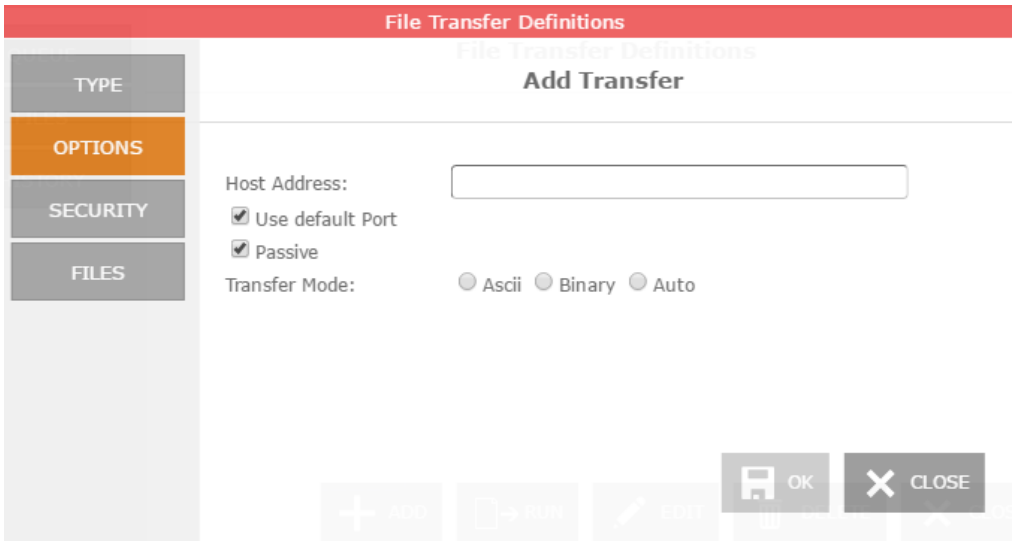

Host
URL or IP address of the host machine that will act as the FTP server.

Port
TCP port defined for FTP access at the remote computer.

Default FTP port number is 21.

Passive
If this option is checked, a PASV command will be sent to tell the host it is working in passive mode.

Transfer Mode
Select the appropriate transfer mode (ASCII/Binary/Auto). By default, all FTP connections will be set to 'Auto'.

Once you defined the file transfer options, you must enter the User Identification.

Security Tab:

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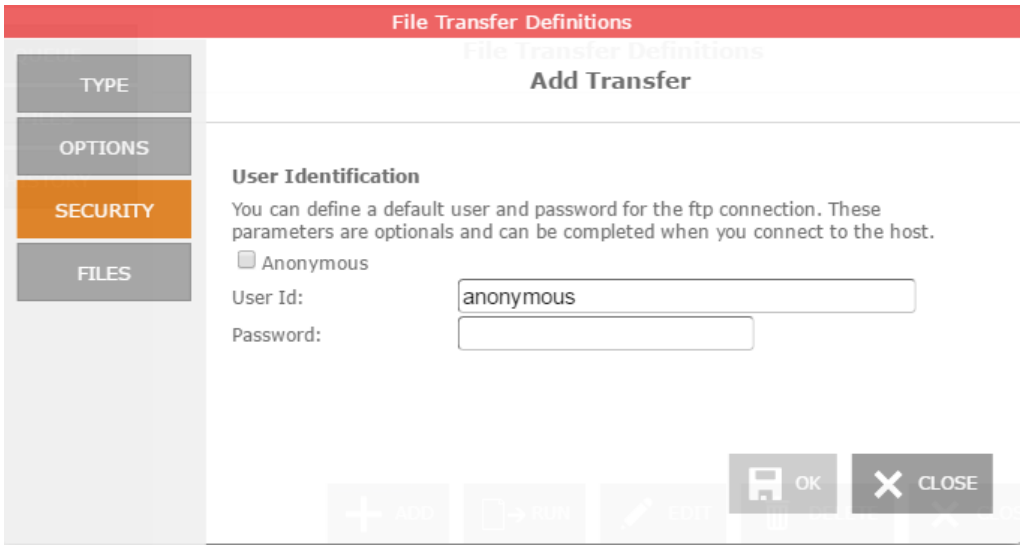


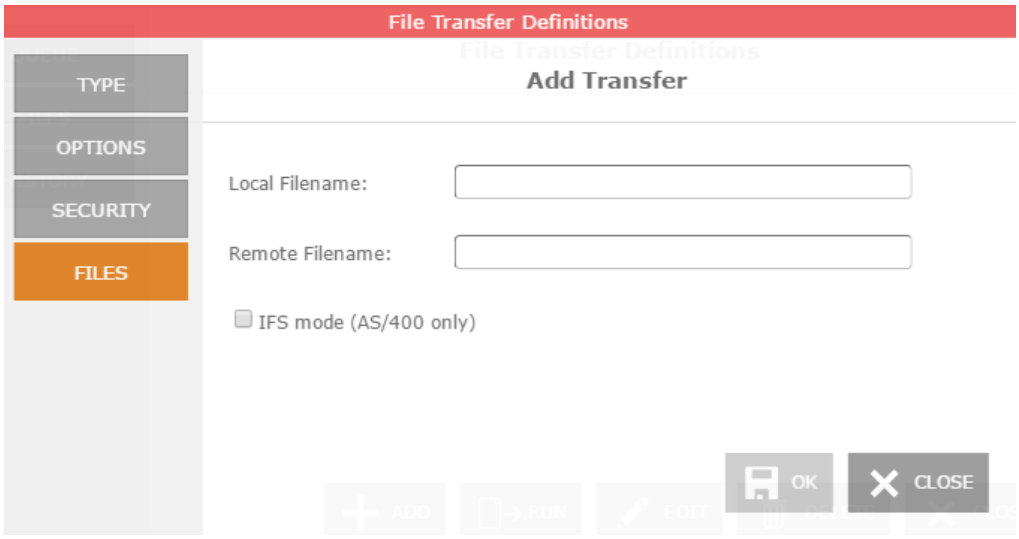
Anonymous
Check this option if you prefer to log in anonymously.

UserID
In this field you must enter your User ID.

Password
In this field you must enter your Password.

And finally you should inform the source and destination files.

Files Tab:



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Local Filename
Type a name for the file stored in the remote host.

Remote Filename
Type a name for the file stored in z/Scope Anywhere Server. All the available files are listed on the Files tab.

IFS Mode
This parameter only works for AS/400 connections.

Once you finish the configuration of the file transfer job, click on the 'OK' button and it will be shown in the Static Queue.
In the future, whenever you need to change the File Transfer settings you can select this job and click the Queue 'Edit' button.

Read More:
- File Transfer
- File Transfer Manager
- Queue
- IND$FILE
- KERMIT
- X-MODEM
- Y-MODEM
- Z-MODEM

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5.3.1.1.2 IND$FILE

To add a new IND$File File Transfer Job to the Queue, follow these steps:

1. Open the Connection to the host.

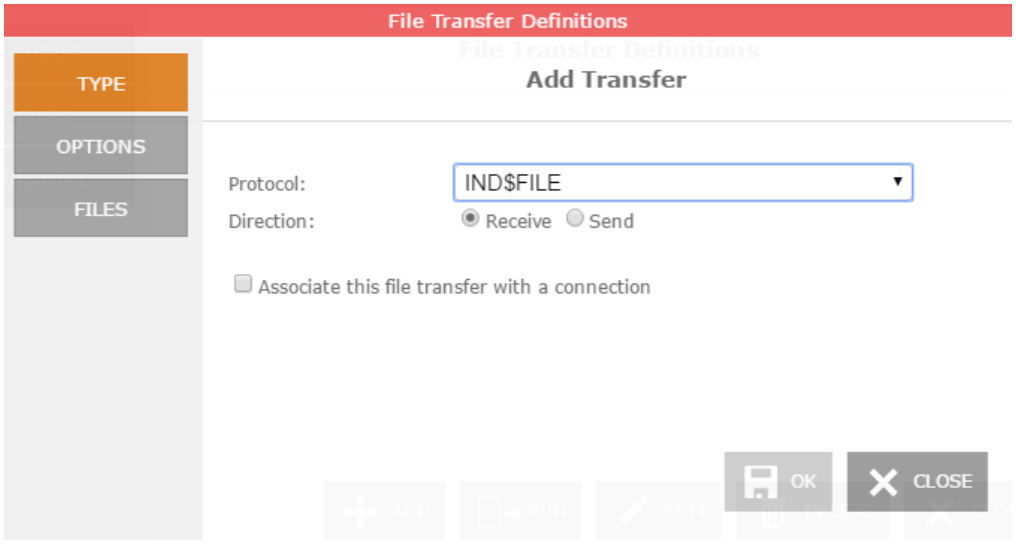
2. Click on the 'File Transfer' Connection View Menu option.

File Transfer
Opens the File Transfer Manager.

3. If you want to upload files to the server, remember to first upload the file to z/Scope Anywhere Server in the Files tab.

4. Go to the Queue tab and click on the 'Add' button.

Type Tab:



Protocol
Select the IND$File protocol.

Direction
Indicates if you will be downloading (Receive) from the host to z/Scope Anywhere Server, or uploading (Send) from z/Scope Anywhere Server to the host.

Associate this file transfer with a connection
This option allows you associate the File Transfer job with a specific connection. The job will only be shown on the selected connection.

Options Tab:

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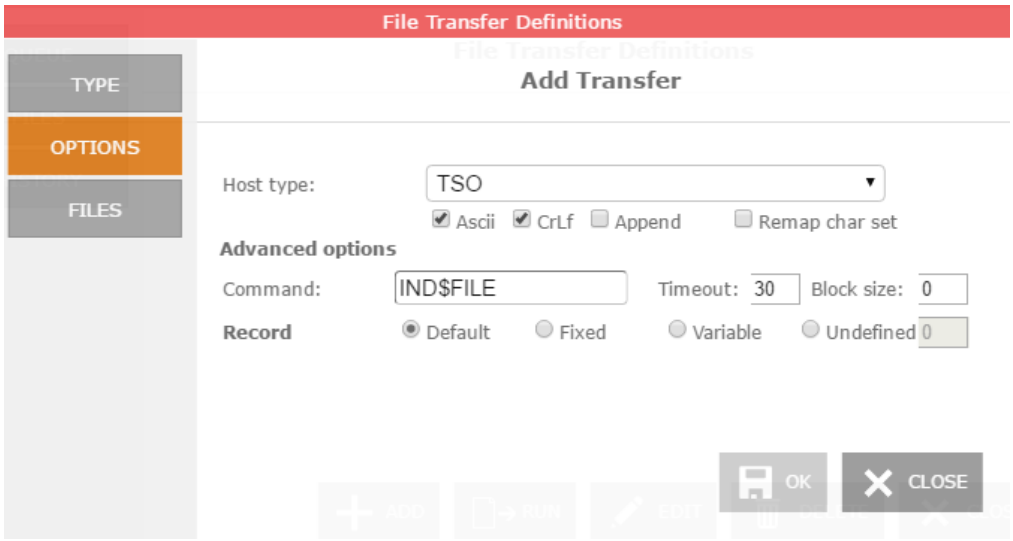

Host Type
Select the type of host you are transferring to/from: VM/CMS, TSO or CICS.

Ascii
Check this option to specify that the file stored on the local PC in ASCII form is to be converted to EBCDIC during transfer to the host, and converted from EBCDIC to ASCII during transfer to the PC (needed for all non-binary file transfers).

Crlf
Check this option to specify that carriage return/line feed should be recognized and deleted before the file is stored in the host. It also deletes trailing spaces and inserts carriage return/line feed characters as the last two characters in a line when a file is stored on the PC.

Append
Allows you to append a PC file to the end of an OS data set, or an OS data set to the end of a PC file. This option is available only when transferring to/from TSO hosts.

Remap Char Set
Remaps the character set.

Command
You can change the name of the File Transfer program as it is defined in the host machine.

Timeout
Amount of time (in seconds) that the program will attempt to connect.

Block Size
Specifies the block size of the TSO host data set. Enter the length of a data block in bytes.

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Record
Specifies the record format for the data set. Available options are:

- Default-length records.
- Fixed-length records (enter the length manually on the input field).
- Variable-length records.
- Undefined-length records.

Files Tab:

Local Filename
Type a name for the file stored in the remote host.

Remote Filename
Type a name for the file stored in z/Scope Anywhere Server. All the available files are listed on the Files tab.

Once you finish the configuration of the file transfer job, click on the 'OK' button and it will be shown in the Static Queue.
In the future, whenever you need to change the File Transfer settings you can select this job and click the Queue 'Edit' button.

Read More:

- File Transfer
- File Transfer Manager
- Queue
- FTP
- KERMIT
- X-MODEM
- Y-MODEM
- Z-MODEM

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5.3.1.1.3 KERMIT

To add a new KERMIT File Transfer Job to the Queue, follow these steps:

1. Open the Connection to the host.

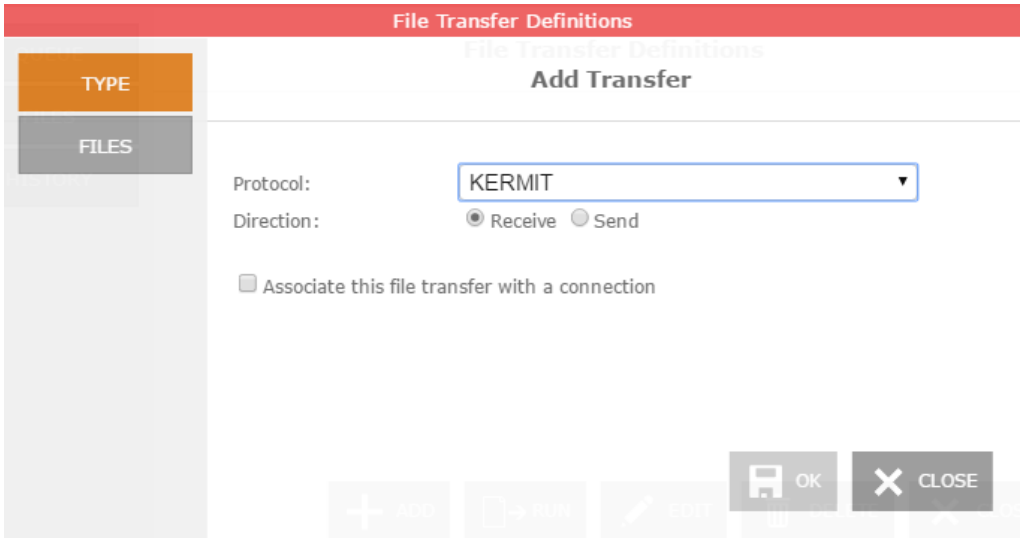
2. Click on the 'File Transfer' Connection View Menu option.

File Transfer
Opens the File Transfer Manager.

3. If you want to upload files to the server, remember to first upload the file to z/Scope Anywhere Server in the Files tab.

4. Go to the Queue tab and click on the 'Add' button.

Type Tab:



Protocol
Select the KERMIT protocol.

Direction
Indicates if you will be downloading (Receive) from the host to z/Scope Anywhere Server, or uploading (Send) from z/Scope Anywhere Server to the host.

Associate this file transfer with a connection
This option allows you associate the File Transfer job with a specific connection. The job will only be shown on the selected connection.

Files Tab:

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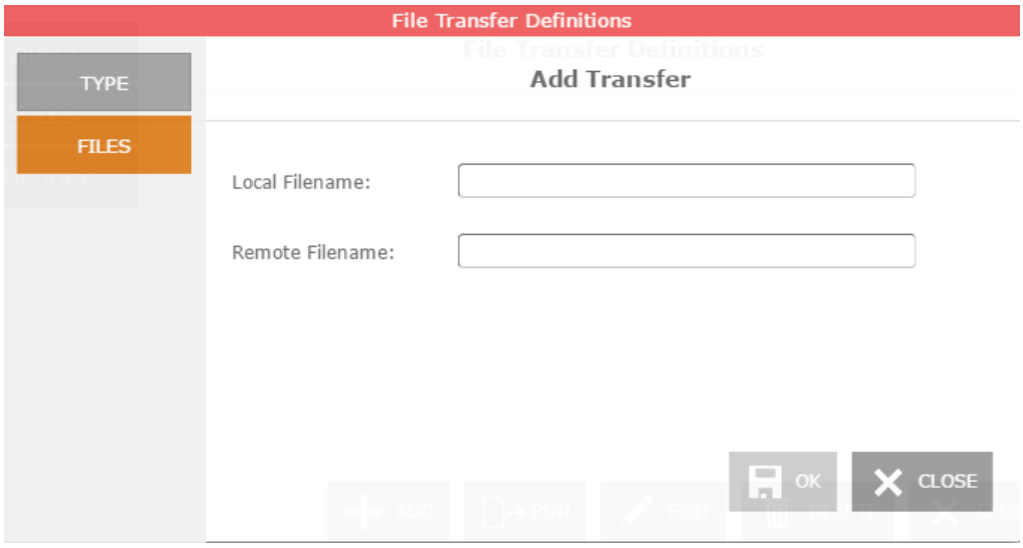

Local Filename
Type a name for the file stored in the remote host.

Remote Filename
Type a name for the file stored in z/Scope Anywhere Server. All the available files are listed on the Files tab.

Once you finish the configuration of the file transfer job, click on the 'OK' button and it will be shown in the Static Queue.
In the future, whenever you need to change the File Transfer settings you can select this job and click the Queue 'Edit' button.

Read More:

- File Transfer
- File Transfer Manager
- Queue
- FTP
- IND$FILE
- X-MODEM
- Y-MODEM
- Z-MODEM

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5.3.1.1.4 XMODEM

To add a new XMODEM File Transfer Job to the Queue, follow these steps:

1. Open the Connection to the host.

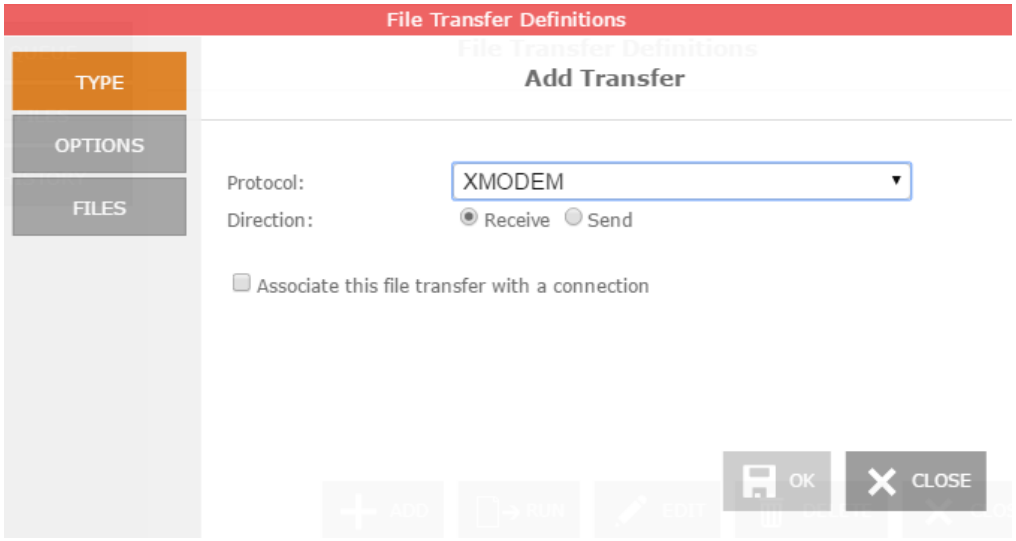
2. Click on the 'File Transfer' Connection View Menu option.

File Transfer
Opens the File Transfer Manager.

3. If you want to upload files to the server, remember to first upload the file to z/Scope Anywhere Server in the Files tab.

4. Go to the Queue tab and click on the 'Add' button.

Type Tab:



Protocol
Select the 'XMODEM' protocol.

Direction
Indicates if you will be downloading (Receive) from the host to z/Scope Anywhere Server, or uploading (Send) from z/Scope Anywhere Server to the host.

Associate this file transfer with a connection
This option allows you associate the File Transfer job with a specific connection. The job will only be shown on the selected connection.

Options Tab:

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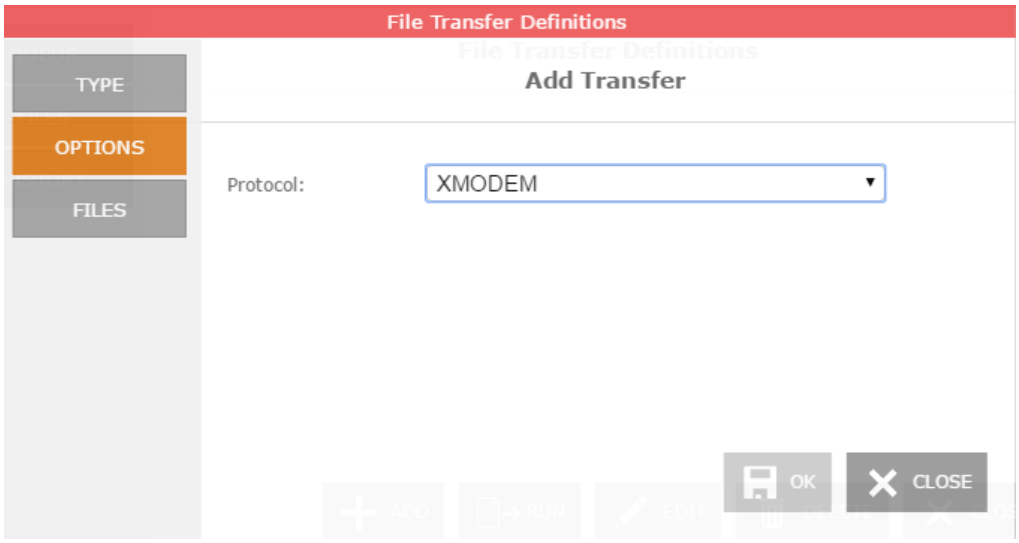

Protocol
Choose the specific X-MODEM protocol you need to use: XMODEM, XMODEM-CRC, XMODEM-1K, XMODEM-1K-G.

Files Tab:

Local Filename
Type a name for the file stored in the remote host.

Remote Filename
Type a name for the file stored in z/Scope Anywhere Server. All the available files are listed on the Files tab.

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Once you finish the configuration of the file transfer job, click on the 'OK' button and it will be shown in the Static Queue.
In the future, whenever you need to change the File Transfer settings you can select this job and click the Queue 'Edit' button.

Read More:

- File Transfer
- File Transfer Manager
- Queue
- FTP
- IND$FILE
- KERMIT
- Y-MODEM
- Z-MODEM

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5.3.1.1.5 YMODEM

To add a new YMODEM File Transfer Job to the Queue, follow these steps:

1. Open the Connection to the host.

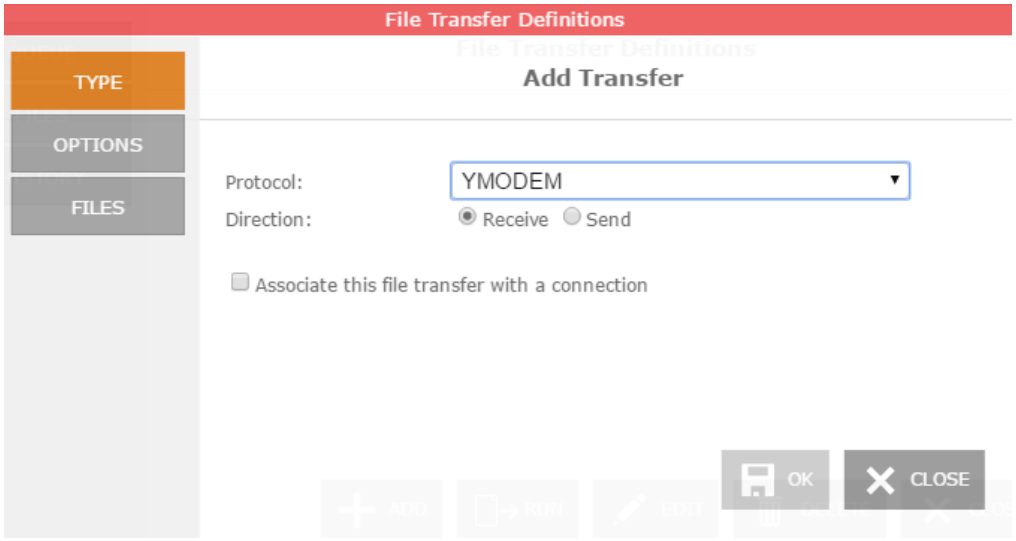
2. Click on the 'File Transfer' Connection View Menu option.

File Transfer
Opens the File Transfer Manager.

3. If you want to upload files to the server, remember to first upload the file to z/Scope Anywhere Server in the Files tab.

4. Go to the Queue tab and click on the 'Add' button.

Type Tab:



Protocol
Select the 'YMODEM' protocol.

Direction
Indicates if you will be downloading (Receive) from the host to z/Scope Anywhere Server, or uploading (Send) from z/Scope Anywhere Server to the host.

Associate this file transfer with a connection
This option allows you associate the File Transfer job with a specific connection. The job will only be shown on the selected connection.

Options Tab:

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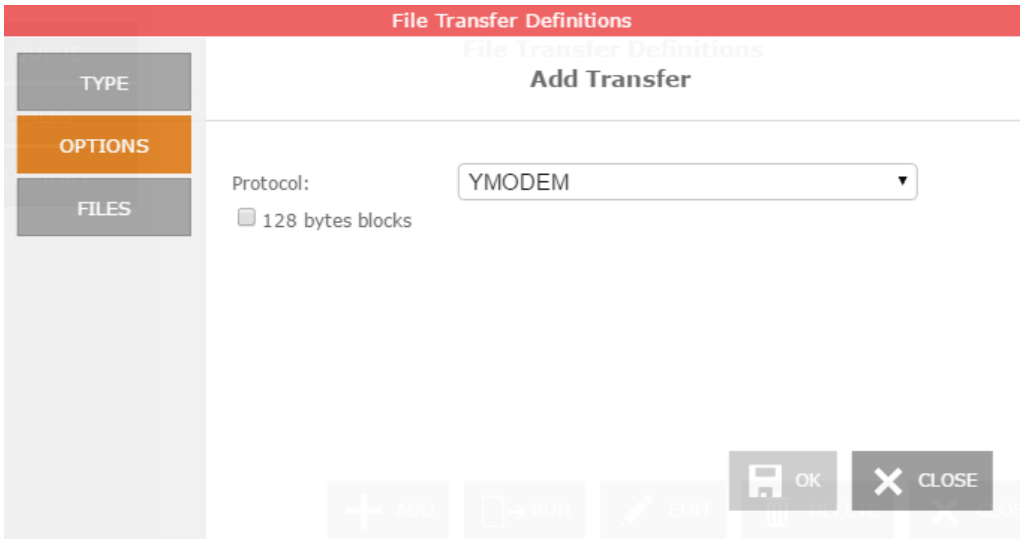
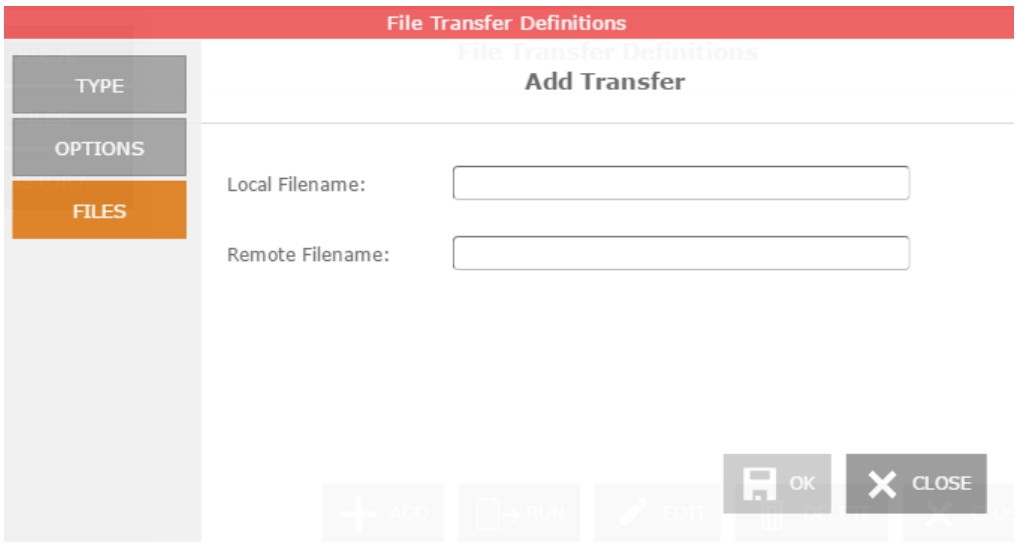


Protocol
Choose the specific Y-MODEM protocol you need to use: YMODEM or YMODEM-G.

128 bytes blocks
Enables the transfers using blocks of 128 bytes.

Files Tab:



Local Filename
Type a name for the file stored in the remote host.

Remote Filename
Type a name for the file stored in z/Scope Anywhere Server. All the available files are listed on the Files tab.

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Once you finish the configuration of the file transfer job, click on the 'OK' button and it will be shown in the Static Queue.
In the future, whenever you need to change the File Transfer settings you can select this job and click the Queue 'Edit' button.

Read More:

- File Transfer
- File Transfer Manager
- Queue
- FTP
- IND$FILE
- KERMIT
- X-MODEM
- Z-MODEM

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5.3.1.1.6 ZMODEM

To add a new ZMODEM File Transfer Job to the Queue, follow these steps:

1. Open the Connection to the host.

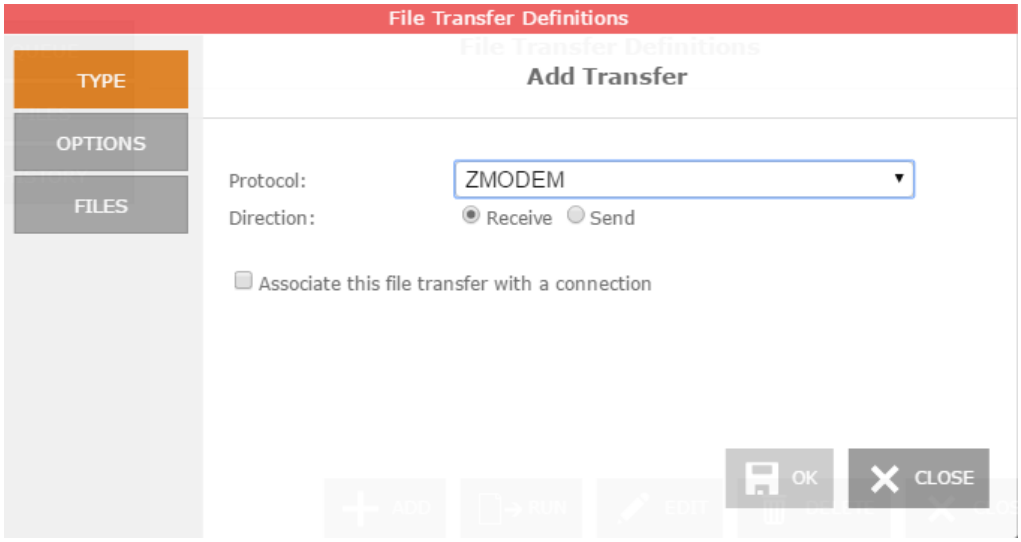
2. Click on the 'File Transfer' Connection View Menu option.

File Transfer
Opens the File Transfer Manager.

3. If you want to upload files to the server, remember to first upload the file to z/Scope Anywhere Server in the Files tab.

4. Go to the Queue tab and click on the 'Add' button.

Type Tab:



Direction
Indicates if you will be downloading (Receive) from the host to z/Scope Anywhere Server, or uploading (Send) from z/Scope Anywhere Server to the host.

Associate this file transfer with a connection
This option allows you associate the File Transfer job with a specific connection. The job will only be shown on the selected connection.

Options Tab:

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8K
Enables 8K blocks.

ESC control
Escapes all control chars. Unchecked, control chars will not be transformed but interpreted as part of the file.

Override file, if exists
Transferred file overwrites an existing file in case they have the same name.

Files Tab:

Local Filename
Type a name for the file stored in the remote host.

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Remote Filename
Type a name for the file stored in z/Scope Anywhere Server. All the available files are listed on the Files tab.

Once you finish the configuration of the file transfer job, click on the 'OK' button and it will be shown in the Static Queue.
In the future, whenever you need to change the File Transfer settings you can select this job and click the Queue 'Edit' button.

Read More:
- File Transfer
- File Transfer Manager
- Queue
- FTP
- IND$FILE
- KERMIT
- X-MODEM
- Y-MODEM

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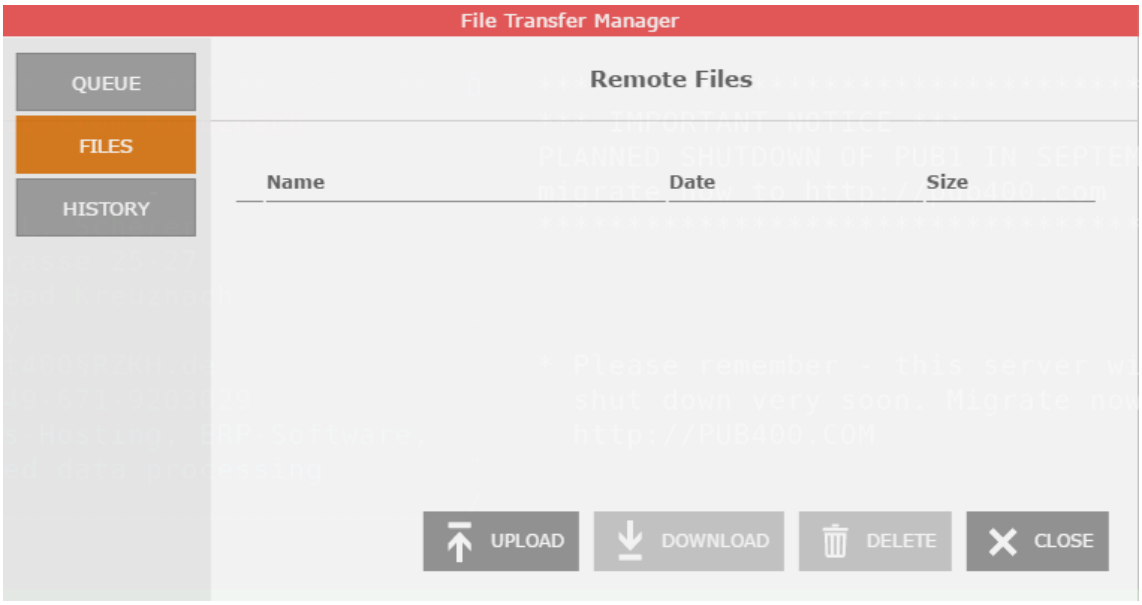
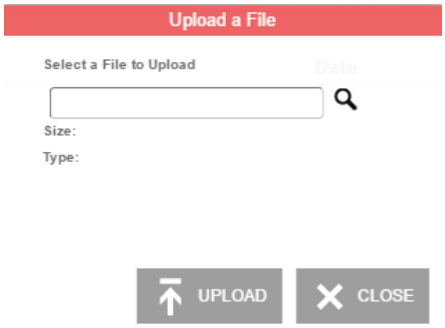
5.3.1.2 Files

The File Transfer Manager 'Files' tab shows you all the files that have been downloaded and uploaded into z/Scope Anywhere Server on a list called 'Remote Files'. You may upload new files from your web browser or also download the existing files.



Upload
Opens the 'upload' dialog:



Select the File to upload on the magnifier icon and press 'Upload'. The file will be listed on the 'Remote Files' list.

Download
Select one of the files and click on the 'Download' button. The selected file will be downloaded to the local device.

Delete
Select one of the files and click on the 'Delete' button in order to delete one of the remote files.

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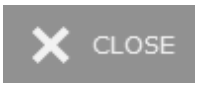

Close
Closes the 'File Transfer Manager' dialog.

Read More:
- File Transfer Manager Queue
- File Transfer Manager History

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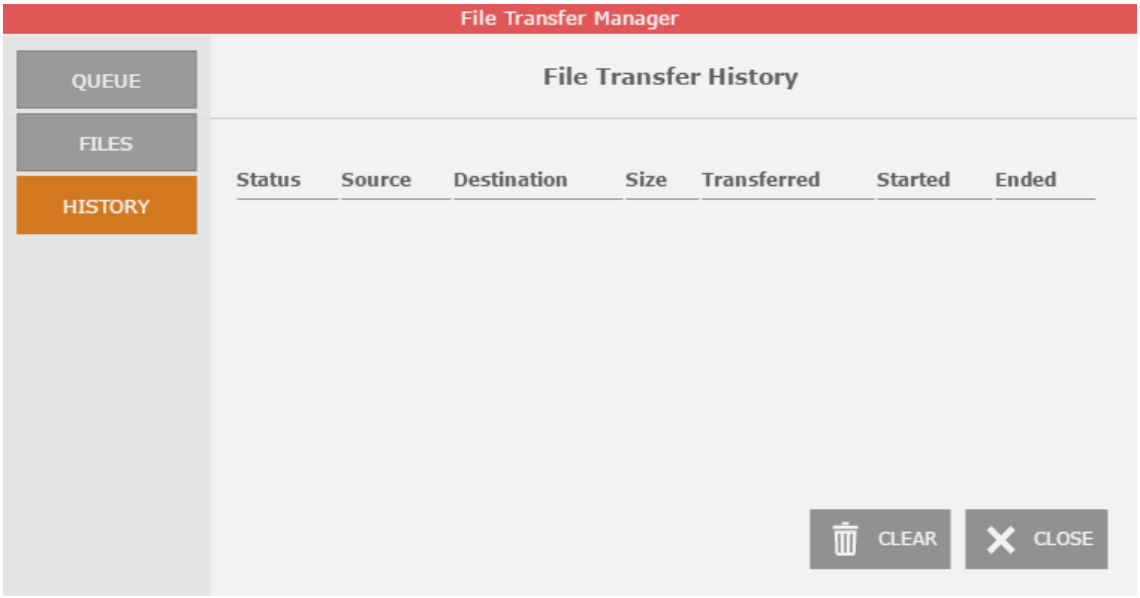
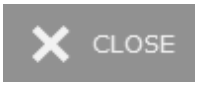
5.3.1.3 History

The File Transfer Manager 'History' tab shows you all the performed File Transfers with the hosts.



Clear
Press the 'Clear' button to erase all the File Transfer History.



Close
Closes the 'File Transfer Manager' dialog.

Read More:

- File Transfer Manager Queue
- File Transfer Manager Files

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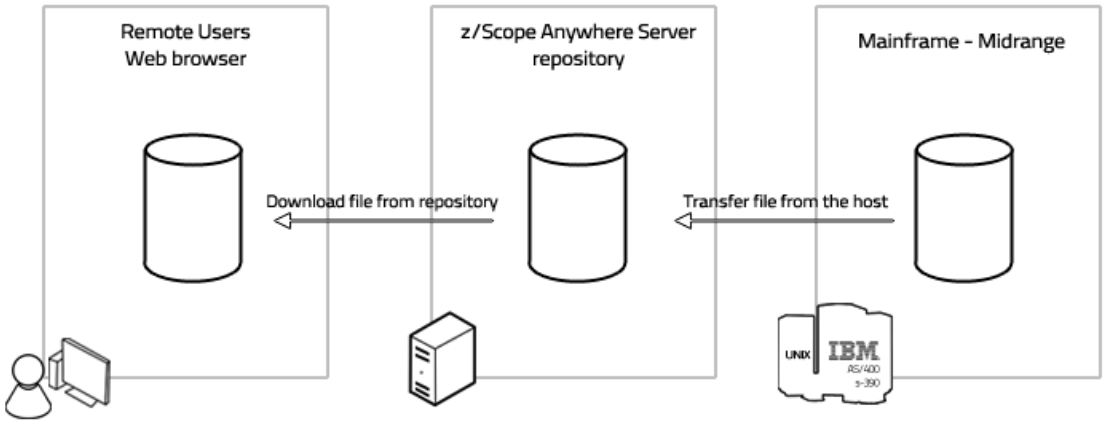
5.3.2 Downloading

A download from the host to your web browser should be done in two steps, as shown on the image below:



Download the File from the Host:

1. Open an existing connection on the Start Page.

2. Click on the File Transfer context menu item.

Click on the 'File Transfer' option in the connection menu and the 'File Transfer Manager' will be presented

3. On the Queue tab, click on the 'Add' button to create a new job. Set the direction to 'Receive'. Set up all the other parameters.

4. Select the created job and click on the bottom 'Run' button. The progress dialog will be shown:

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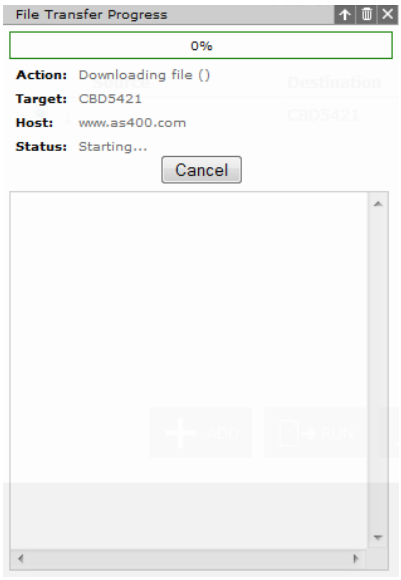

5. Once the File Transfer has finished, you will be redirected to the 'History' tab, where this job's status will be shown.

Download the File from z/Scope Anywhere Server:

1. If the file reception was successful, you can download it from the server to your web browser.

2. Go to the 'Files' tab and select the file just received from the host.

3. Click on the 'Download' button and the file will be downloaded to your local device.

Read More:

- File Transfer Manager
- Uploading Files

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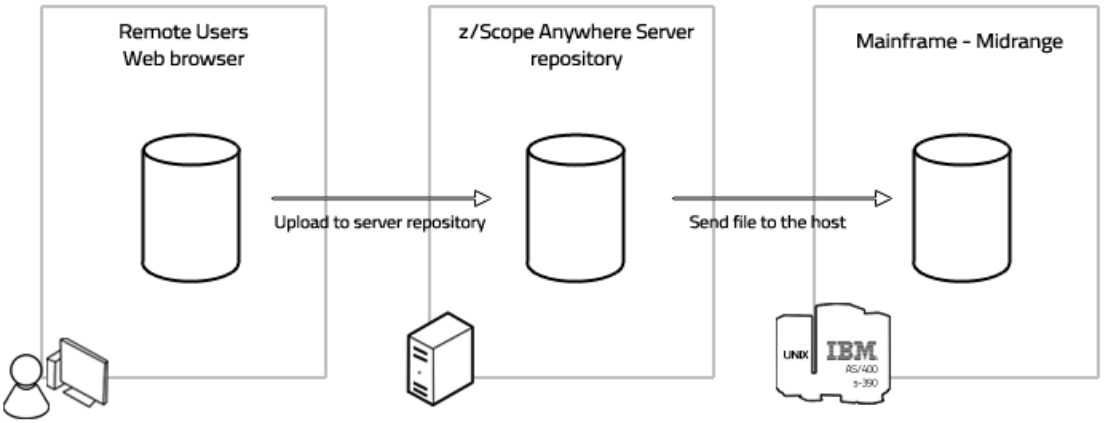
5.3.3 Uploading

An upload from your local device to the host should be done in two steps, as shown in the image below:



Upload the File to z/Scope Anywhere Server:

1. Open an existing connection in the Start Page.

2. Click on the File Transfer context menu item.

Click on the 'File Transfer' option in the connection menu and the 'File Transfer Manager' will be presented

3. Go to the the 'File' tab, and click on the 'Upload' button. Wait for the file to be completely uploaded into z/Scope Anywhere Server.

4. Observe that the file is now listed on the 'Remote Files' list.

Send File to the Host:

Once you have uploaded the file to z/Scope Anywhere Server you can send it to the host.

1. Go to the 'Queue' tab and click on the 'Add' button to create a new job. Set the direction to 'Send'. Set up all the other parameters.

4. Select the created job and click on the bottom 'Run' button. The progress dialog will be shown:

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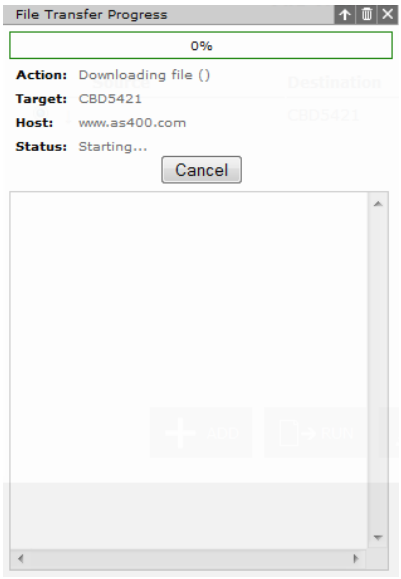

5. Once the File Transfer has finished, you will be redirected to the 'History' tab, where this job's status will be logged.

Read More:

- File Transfer Manager
- Downloading Files

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5.4 Keyboard Support

An important aspect of z/Scope Anywhere is its compatibility and support for a wide range of standard keyboards such as IBM, EXTRA, IRMA and RUMBA.

z/Scope Anywhere gives you full control and customization of the keyboard by allowing you to re-map virtually any key to new combination of different keys and even mouse clicks!

It also allows you to define keyboard shortcuts to z/Scope Anywhere's main features such as Macros.

- Selecting the Keyboard

Read More:

- Keyboard Settings
- IBM Mainframes preferences or Unix/VT/SSH Preferences

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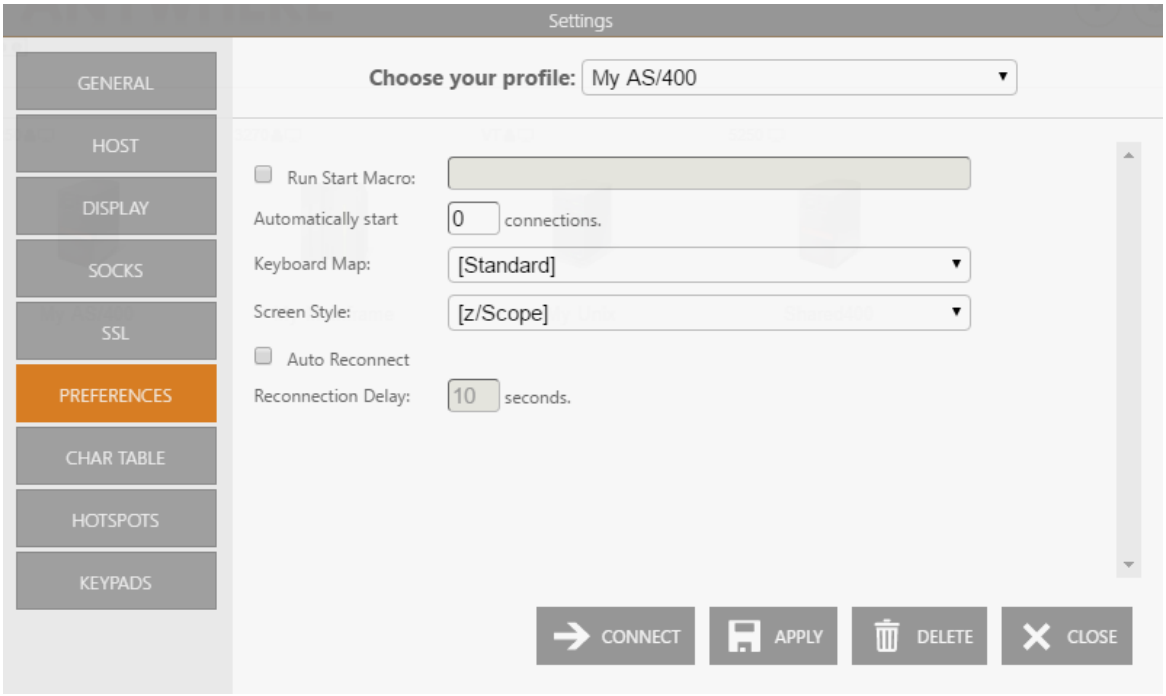
5.4.1 Selecting the Keyboard

To select the keyboard for a specific connection go to the Start Page and click on the Settings button.



1. Select the connection on the 'Choose your profile' field.
2. Click on the 'Preferences' tab.
3. Select the desired Keyboard on the 'Keyboard map' field.
4. Connect or Apply the changes:

Read More:

- Keyboard Settings
- IBM Mainframes Preferences or Unix/VT/SSH Preferences

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5.5 Keypads

Keypads are a useful tool that enables the user to substitute host commands with mouse clicks. Together with HotSpots, Keypads integrate a set of exciting features designed to bring you the most convenient mouse-enabled terminal emulation capabilities.

Read More:

- Using Keypads
- Enabling Keypads
- Create/Edit a Keypad
- Keypads Settings
- Permissions Settings

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5.5.1 Enabling Keypads

You may enable keypads for all connections from the Start Page or for a specific connection from the Connection View Menu.

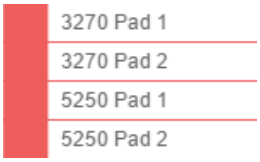
From the Connection View Menu

1. Open the Connection View Menu

Click the Connection View Menu button in the top right corner of the Display Connection View and a menu will be presented.

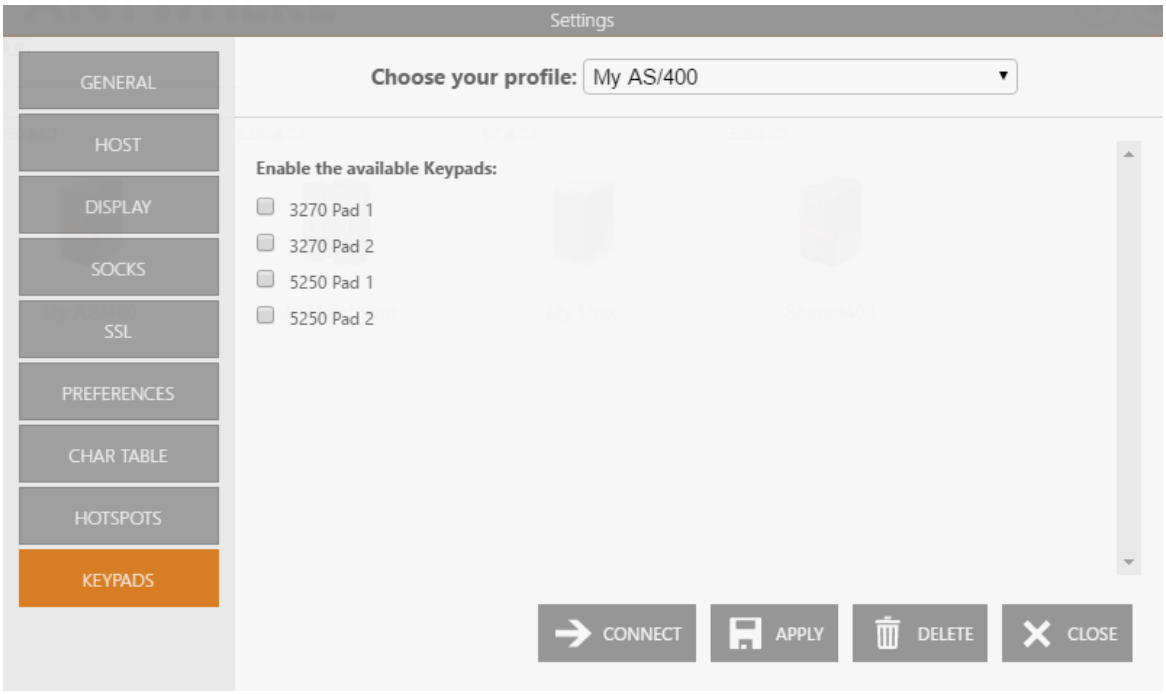
2. Keypads

a. Click on the 'Select Keypads' menu option to view the available Keypads:



b. Select the Keypads you want to enable.

From the Start Page



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1. Click on the Start Page Settings button.
2. Select the connection on the 'Choose your profile' field.
3. Click on the 'Keypads' tab.
4. Check the keypads you want to enable.
5. Apply the changes.

Read More:

- Using Keypads
- Keypads Settings

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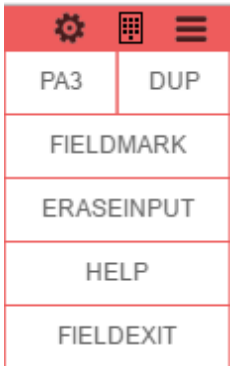
5.5.2 Using Keypads

Keypads that are available for a particular connection will be automatically shown under the Keypad Connection View Menu icon (Connection View).

Mouse Over
If the connection has keypads, the keypad icon will be shown in the top right corner of the connection view. Click or Mouse Over to see all enabled keypads, as shown in the image below.



Read More:

- Enabling Keypads
- Keypads Settings

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5.6 Macros

Macros are keystroke sequences sent to the host that are recorded so you can then reproduce them by a simple mouse click.
They are useful when you need to automate a sequence of commands so you don't have to re-type the same commands many times.

Read More:

- Creating a Macro
- Using a Macro
- Managing Macros
- Macros Settings
- Debugging a Macro
- Permissions Settings

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5.6.1 Creating a Macro

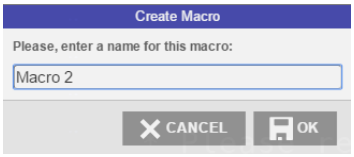
The Macro creation process is very simple. You can create it on an active connection through the Connection view Menu.

Creating a Macro

1. Open the Settings
Click the Settings button and a menu will be presented.

2. Record
Click on the "Record" button, execute the actions to be automated and send them to the host (enter key).

3. Save the Macro
Click on 'Save' button, also accessible through the settings button.



4. Name the Macro
No more actions will be recorded, and you will be prompted for a name to the new macro. Enter a name and click 'OK'.

Once pressed, the 'Record' button will be replaced by the 'Save' button.

All macros saved for a particular connection will be available by clicking on the Macro's toolbar button. See also: Using Macros.

To learn how to use and manage the macros you have created, see the next topics:

Read More:
- Managing Macros
- Using Macros
- Macros Settings

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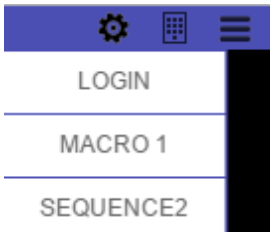
5.6.2 Using Macros

In order to run one of the available macros for the current connection, click on the Macro's icon present on the Connections View menu:



Click on the macro you want to execute (available macros in this example are: "LOGIN", "MACRO 1" and "SEQUENCE2") and the keystroke sequence contained in the macro will automatically be reproduced within the active screen. Keep in mind that macros can only be triggered within the connection they were created.

Read More:
- Creating a Macro
- Managing Macros

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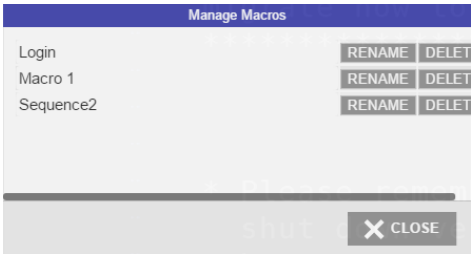
5.6.3 Managing Macros

You can rename and delete a macro from the through the the Connection view Menu.

Renaming a Macro

1. Open the Settings
Click the Settings button and a menu will be presented.

2. Manage
Click on the 'Manage' button to open the Macro Management Screen. The screen below will be presented to you:

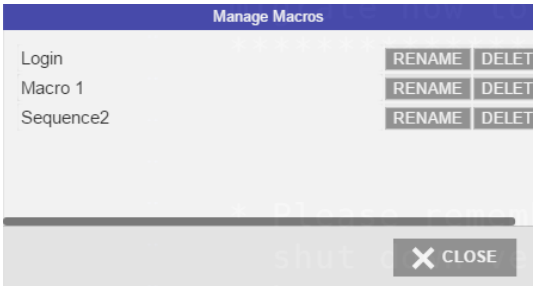


a. Change the Macro's name.
b. Click on the 'Rename' button.
c. Press 'OK' on the message.
d. Click on the 'Close' button.

Deleting a Macro

1. Open the Settings
Click the Settings button and a menu will be presented.

2. Manage
Click on the 'Manage' button to open the Macro Management Screen. The screen below will be presented to you:



a. Click on the 'Delete' button.

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c. Press 'Yes' on the message.
d. Click on the 'Close' button.

To learn how to use and create macros, read the next topics:

- Creating Macros
- Using Macros

Editing a Macro

On most of the cases you can create, manage and use macros directly following the instructions above. On ocassion, however, you might want to edit the macro's code. Learn all about the advanced configuration in the following topic:

- Macros Settings

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5.7 Screen Styles

Screen Styles give the user the possibility to freely modify the aspect of the emulation display. You can customize a wide variety of characteristics such as font format and size, cursor appearance and behaviour, color schemes, etc.

Read the next topic to learn how to change a Screen Style from the web interface and set it on a connection:

- Using Screen Styles

Read More:

- Screen Styles Settings

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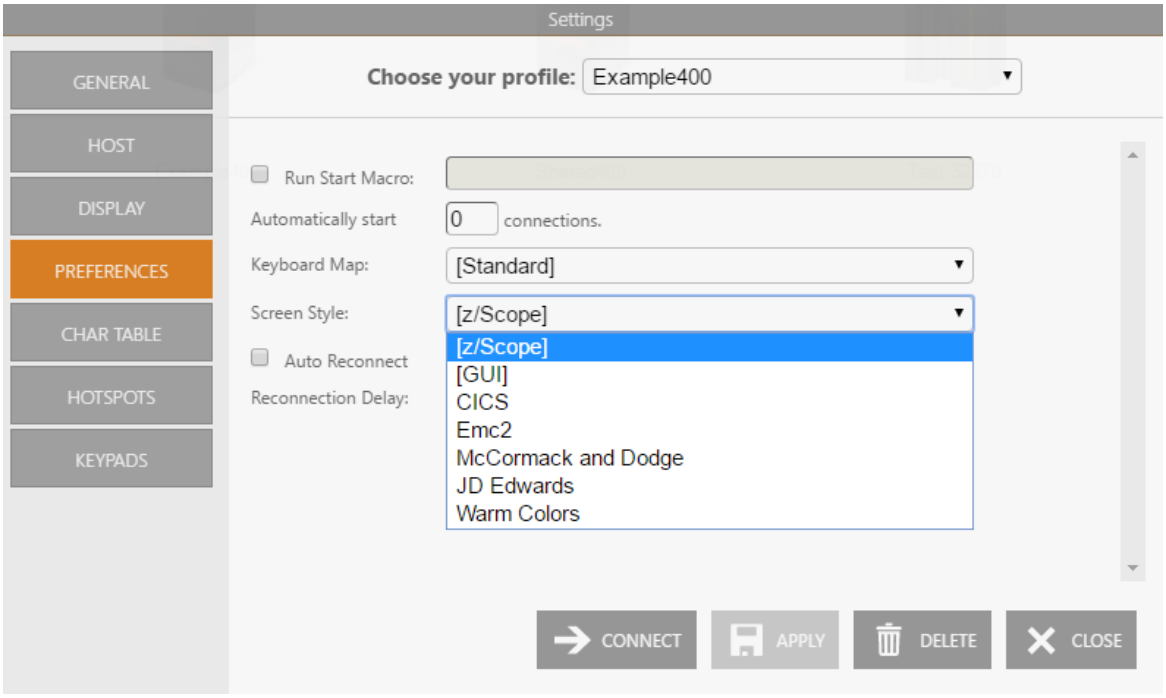
5.7.1 Using Screen Styles

To change the Screen Style for the current connection go to the Start Page and click on the Settings button.



1. Select the connection you in the 'Choose your profile' field.

2. Click on the 'Preferences' tab and select the desired screen style.

3. Apply the changes.

Read More:
- Screen Styles Settings

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5.8 Admin Control Panel

The Admin Control Panel allows assigned users to manage the active connections and sessions, and to view all their history in the system statistics (connections, sessions and browsers).

Start Page - Admin
Click on the Analytics button to open the Control Panel on a new browser tab.

The Admin panel has two tabs:

1. Connections Management: this tab allows assigned users to "disconnect" and "delete" active sessions.
2. Log & Statistics: this allows assigned users to view the connections, sessions and browsers history.

Read More:

- Permissions Settings

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5.8.1 Connections Management

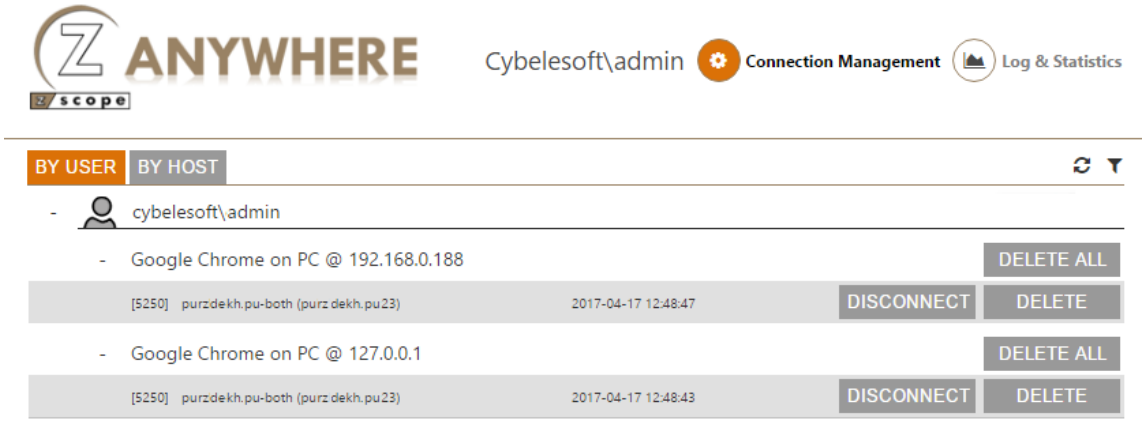
The Connection Management panel allows users with the appropriate permissions to administrate the connections by viewing, deleting and disconnecting its active sessions.

View Modes

The Connection Management panel features two view modes:

By User

The information on this view mode is grouped first by User, and all the active sessions are organized per Browser and the Source Computer. Each active session includes information regarding the host type, name and address and also the date and time the session was established.



By Host

The information on the 'By Host' view mode is grouped by Host and then all the active sessions are organized per Browser and Source Computer. Each active session presented will give you information regarding the application user and also the date and time the session was established.

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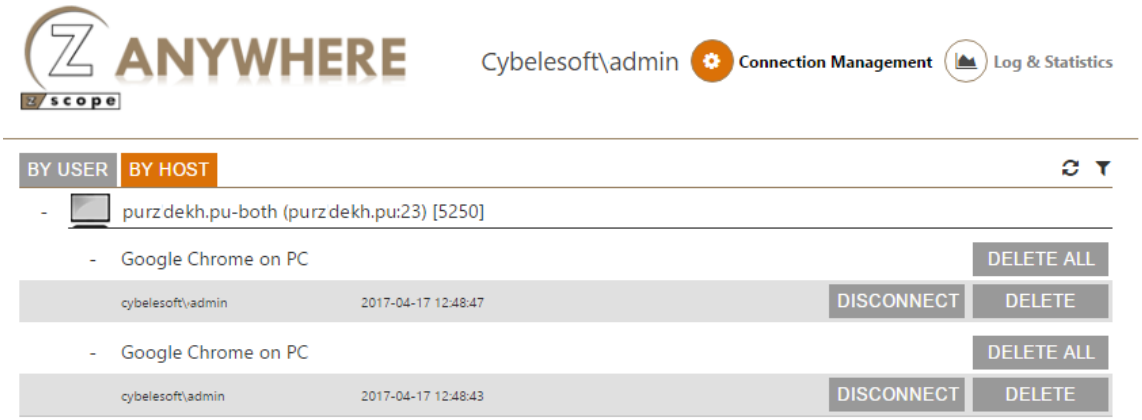

Managing Sessions

The user assigned to manage connections will be able to disconnect and delete active sessions.

Refresh
Refreshes the screen with updated connection data.

Filters
Opens the 'Filters' dialog.

DISCONNECT

Disconnect
The 'disconnect' button will disconnect the session from the host. After that, the session screen will be kept open to the user, so that they have the possibility to re-connect again.

DELETE

Delete
The 'delete' button will delete the selected session. This means that the session will be disconnected from the host and the user session screen will be closed. If the user is currently viewing this session screen, they will be redirected to the Start page.

DELETE ALL

Delete All
The 'delete all' button will perform the same action as the 'delete' button, but deleting all the existing sessions for a specific host or from a specific user, depending on the view mode (By User/By Host) selected at the moment.

Filters

The Filters dialog allows you to select only some active sessions, filtering by User and by Host.

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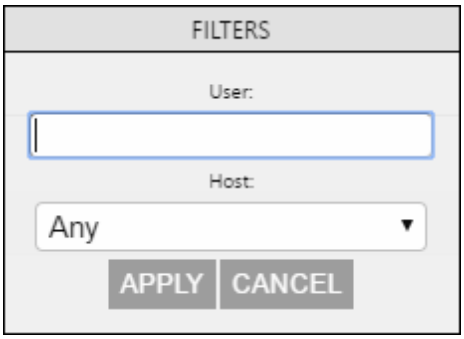

User
Type in the username or part of it, to restrict the sessions by this criteria.

Host
Select one of the listed hosts to have the sessions view restricted by one specific host.

Apply
Once you have entered the user or/and selected the host, press the Apply button and the sessions will be selected using the specified parameters.

Read More:

- Log & Statistics
- Permissions Settings

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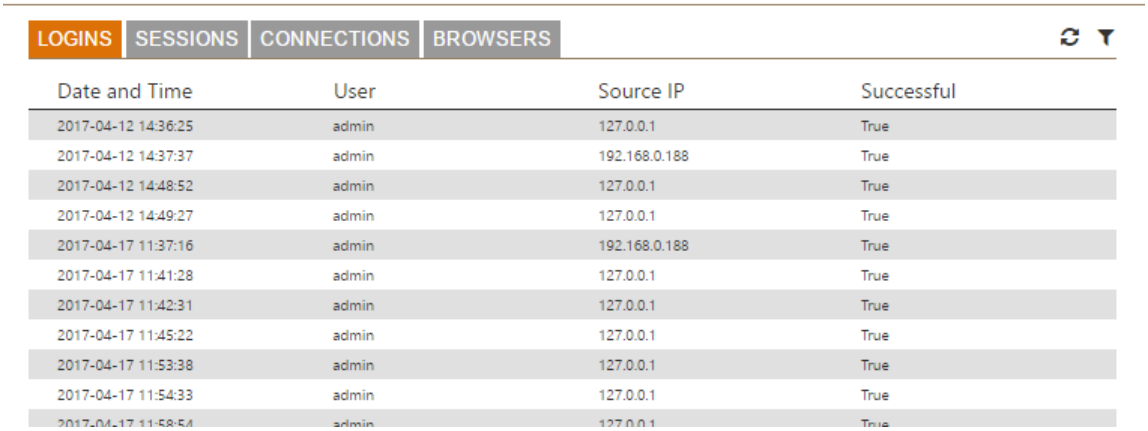
5.8.2 Log & Statistics

The Log and Statistics tab allows assigned users to view historical data regarding Sessions and Connections established within a period of time.

Logins

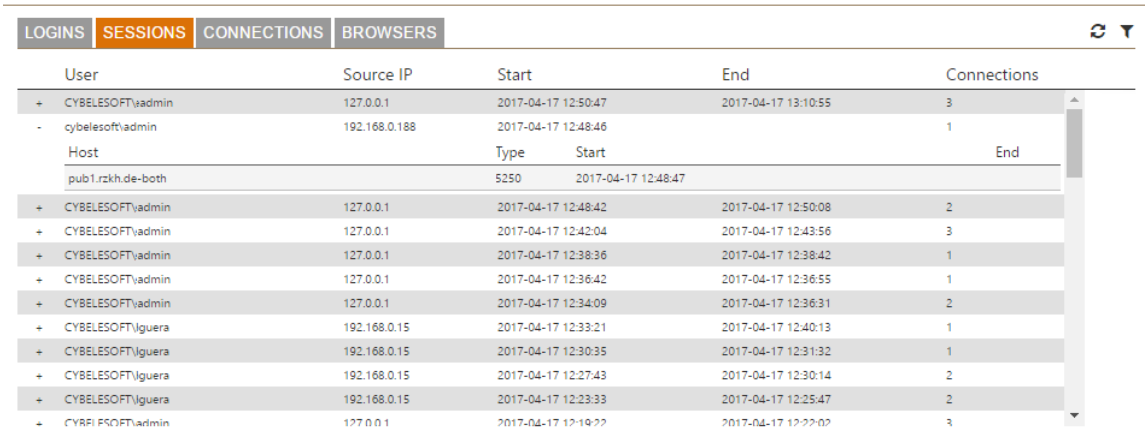
The Logins view mode shows all the sessions logins to the application within a determined period of time (default filter: Last hour).
The table shows: Date and Time (date that the session started), User (user that started the new session), Source IP (IP address from which the session was started), Successful (true if the connection was established).



Date and Time	User	Source IP	Successful
2017-04-12 14:36:25	admin	127.0.0.1	True
2017-04-12 14:37:37	admin	192.168.0.188	True
2017-04-12 14:48:52	admin	127.0.0.1	True
2017-04-12 14:49:27	admin	127.0.0.1	True
2017-04-17 11:37:16	admin	192.168.0.188	True
2017-04-17 11:41:28	admin	127.0.0.1	True
2017-04-17 11:42:31	admin	127.0.0.1	True
2017-04-17 11:45:22	admin	127.0.0.1	True
2017-04-17 11:53:38	admin	127.0.0.1	True
2017-04-17 11:54:33	admin	127.0.0.1	True
2017-04-17 11:58:54	admin	127.0.0.1	True

Sessions

The Sessions view mode shows all the sessions established within a determined period of time (default filter: Last hour).
The table shows: User (user that started the new session), Source IP (IP address from which the session was started), Start (date and time that the session started), End (date and time that the session ended) and Connections (counter for connections established within the Session).



	User	Source IP	Start	End	Connections
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:50:47	2017-04-17 13:10:55	3
-	cybelesoft\admin	192.168.0.188	2017-04-17 12:48:46		1
	Host	Type	Start	End	
	pub1.rzkh.de-both	5250	2017-04-17 12:48:47		
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:48:42	2017-04-17 12:50:08	2
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:42:04	2017-04-17 12:43:56	3
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:38:36	2017-04-17 12:38:42	1
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:36:42	2017-04-17 12:36:55	1
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:34:09	2017-04-17 12:36:31	2
+	CYBELESOFT\lguera	192.168.0.15	2017-04-17 12:33:21	2017-04-17 12:40:13	1
+	CYBELESOFT\lguera	192.168.0.15	2017-04-17 12:30:35	2017-04-17 12:31:32	1
+	CYBELESOFT\lguera	192.168.0.15	2017-04-17 12:27:43	2017-04-17 12:30:14	2
+	CYBELESOFT\lguera	192.168.0.15	2017-04-17 12:23:33	2017-04-17 12:25:47	2
+	CYBELESOFT\xadmin	127.0.0.1	2017-04-17 12:19:22	2017-04-17 12:22:02	3

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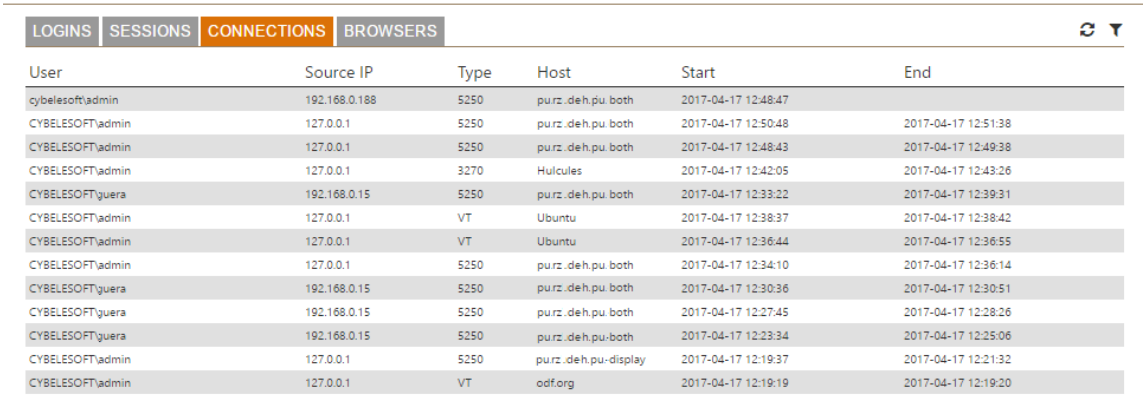
Connections

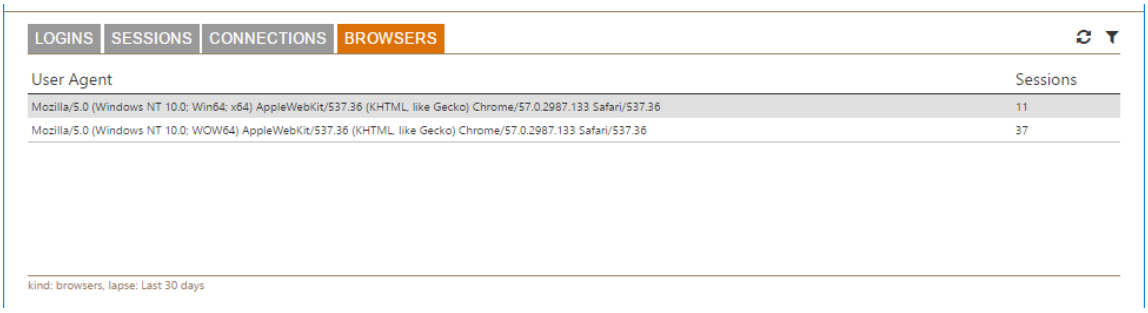
The Connection view mode shows all the connections established within a determined period of time (default filter: Last hour).
The table shows: User (user that established the connection), Source IP (IP address from which the connection was established), Type (host type), Host (host name), Start (date that the connection started) and End (date that the connection ended).



User	Source IP	Type	Host	Start	End
cybelesoft\admin	192.168.0.188	5250	pu.rz.deh.pu.both	2017-04-17 12:48:47	
CYBELESOFT\admin	127.0.0.1	5250	pu.rz.deh.pu.both	2017-04-17 12:50:48	2017-04-17 12:51:38
CYBELESOFT\admin	127.0.0.1	5250	pu.rz.deh.pu.both	2017-04-17 12:48:43	2017-04-17 12:49:38
CYBELESOFT\admin	127.0.0.1	3270	Hulcules	2017-04-17 12:42:05	2017-04-17 12:43:26
CYBELESOFT\guera	192.168.0.15	5250	pu.rz.deh.pu.both	2017-04-17 12:33:22	2017-04-17 12:39:31
CYBELESOFT\admin	127.0.0.1	VT	Ubuntu	2017-04-17 12:38:37	2017-04-17 12:38:42
CYBELESOFT\admin	127.0.0.1	VT	Ubuntu	2017-04-17 12:36:44	2017-04-17 12:36:55
CYBELESOFT\admin	127.0.0.1	5250	pu.rz.deh.pu.both	2017-04-17 12:34:10	2017-04-17 12:36:14
CYBELESOFT\guera	192.168.0.15	5250	pu.rz.deh.pu.both	2017-04-17 12:30:36	2017-04-17 12:30:51
CYBELESOFT\guera	192.168.0.15	5250	pu.rz.deh.pu.both	2017-04-17 12:27:45	2017-04-17 12:28:26
CYBELESOFT\guera	192.168.0.15	5250	pu.rz.deh.pu-both	2017-04-17 12:23:34	2017-04-17 12:25:06
CYBELESOFT\admin	127.0.0.1	5250	pu.rz.deh.pu-display	2017-04-17 12:19:37	2017-04-17 12:21:32
CYBELESOFT\admin	127.0.0.1	VT	odf.org	2017-04-17 12:19:19	2017-04-17 12:19:20

Browsers

The Browser view mode presents all the browsers used to connect to z/Scope Anywhere. The last column is a counter that shows how many sessions were established within the same browser model.



Managing statistic

The user assigned to manage connections will be able to disconnect and delete active sessions.

Refresh
Refreshes the screen with updated connection data.

Filters

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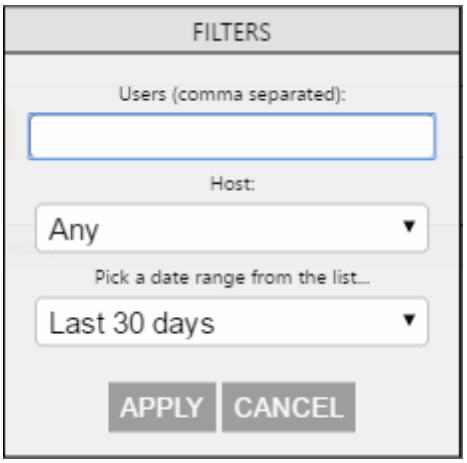
Opens the Filters dialog.

Filters

This dialog allows you to filter the historical data. You can select the data filtering by user, host and date range.



Users
Type in the usernames of the users you want filter, separated by commas.

Host
Select one of the listed hosts to have the results filtered for this host.

Pick a date range from the list
Select one of the date range options, or select "Custom Range" to inform the exact period you want to use to filter the data.

Apply
Once you have entered the user and/or selected the host and date range, press the Apply button and the sessions will be selected using the specified parameters.

Read more:

- Connections Management
- Permissions

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5.9 Security and Encryption

With z/Scope you can connect securely via the SSL protocol. SSL stands for Secure Sockets Layer and was originally developed by Netscape for transmitting private information and documents over the Internet.

SSL is based on a private key encryption system. Many web sites use this protocol to transmit confidential user information such as credit card numbers.

An SSL digital certificate is an electronic file that uniquely identifies individuals and servers. Digital certificates allow the client to authenticate against the server prior to establishing an SSL session.

Typically, digital certificates are signed by an independent and trusted third party to ensure their validity. The "signer" of a digital certificate is known as a Certification Authority (CA), such as VeriSign®.

For more information about how to work with SSL and SSH in z/Scope, read the following topics:

- Enabling SSL
- Enabling SSH

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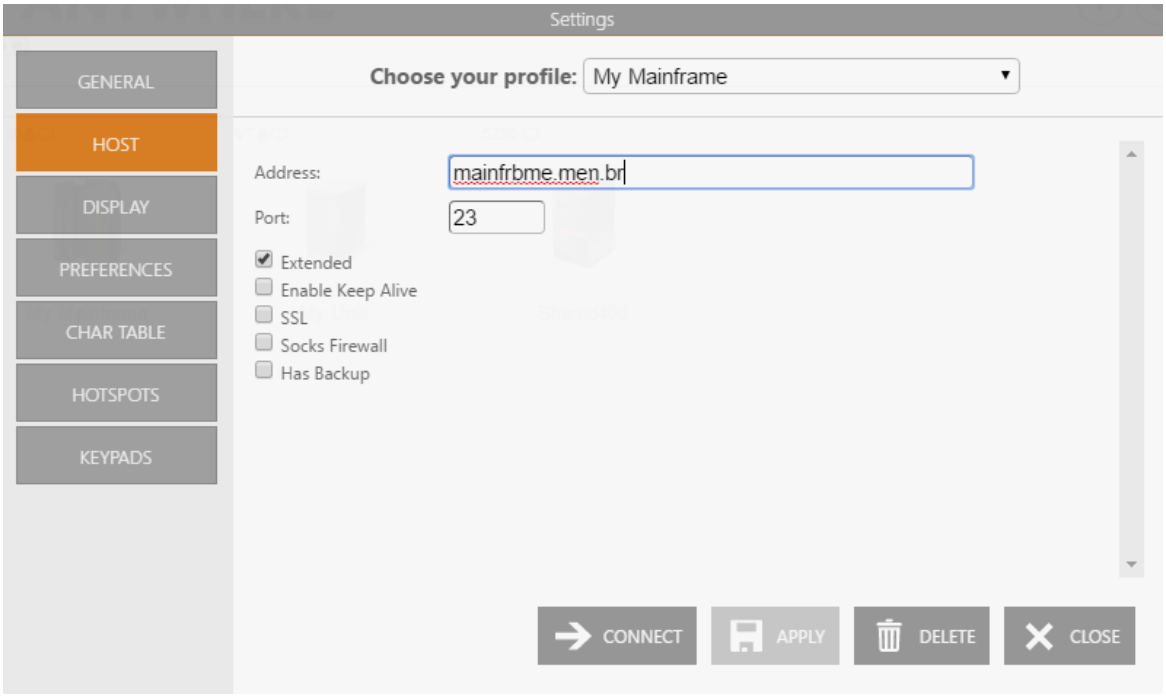
5.9.1 Enabling SSL

When connecting to a host that supports SSL, in order to take advantage of this technology you must activate the SSL option in the web Settings Host tab (Unix/VT Host tab or Mainframe or AS/400 Host tab). To achieve this, follow these steps:



1. Go to the Start Page and click on the Settings button.
2. Select the connection in the 'Choose your profile' field .
3. Click on the 'Host' tab.
4. Check the 'SSL' check option. The SSL tab will be enabled.
5. Customize the SSL settings on the SSL tab, if necessary:
   a. IBM Mainframe or AS/400 SSL Settings
   b. Unix/VT SSL Settings
6. Apply the changes.

Read More:

- Security and Encryption

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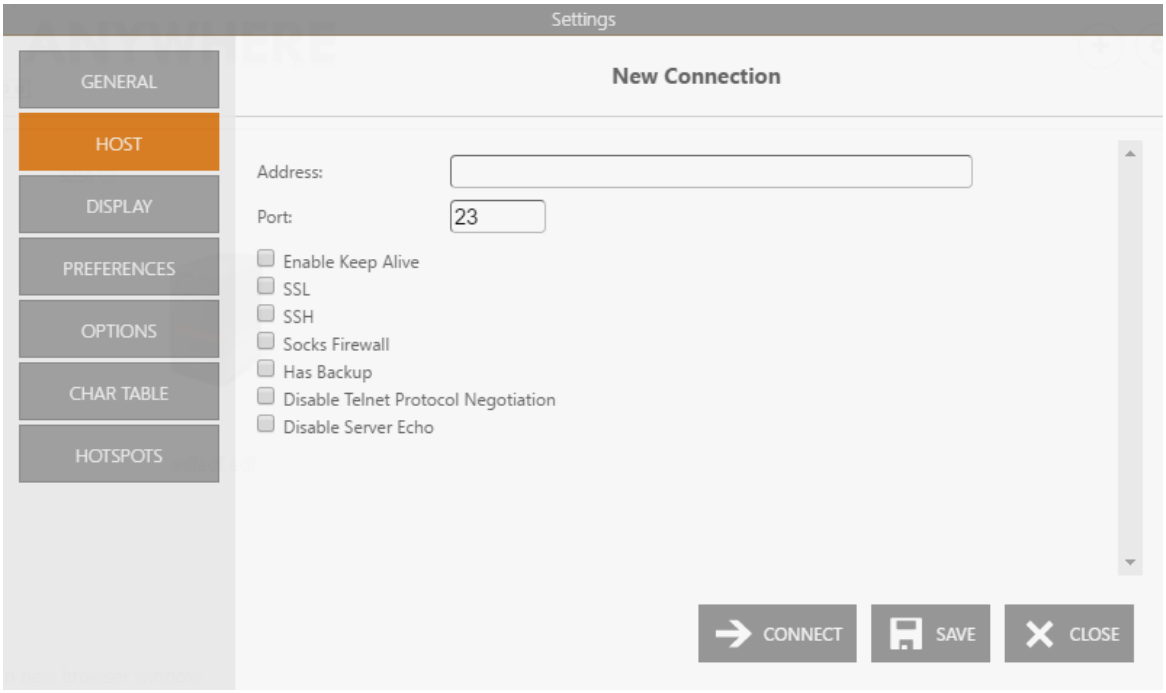
5.9.2 Enabling SSH

When connecting to a host that supports SSH, in order to take advantage of this technology you must activate the SSH option in the web Settings Host tab: Unix/VT Host tab.
To achieve this, follow these steps:



1. Go to the Start Page and click on the Settings button.
2. Select the connection on the 'Choose your profile' field.
3. Click on the 'Host' tab.
4. Check the 'SSH' check option. The SSH tab will be enabled.
5. Customize the SSH settings on the SSH tab, if necessary.
6. Apply the changes.

Read More:

- Security and Encryption

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5.10 Authentication modes

Authentication modes in z/Scope Anywhere include Active Directory, OAuth/2 (Google, Facebook, etc), and customizing the authentication process using a DLL. They are not mutually exclusive, you can enable more than one at the same time.

Active Directory

Users can always authenticate with their Active Directory accounts, as long as their credentials are registered in the Active Directory where z/Scope Server is deployed.
This Active Directory integration is configured automatically in z/Scope Anywhere and there is no need to configure any setting to make it work.

Desktop Mode

If you have selected 'Desktop mode' during the installation, the application will automatically authenticate using the active desktop logged in user.
On this mode, there will be only one set of personal preferences and any user who connects to this z/Scope installation will share the same personal settings.

Server Mode

If 'Server mode' was selected during the installation, the browser will always ask for new credentials.
This mode allows each user to have their personal preferences saved separately on the server. That way, users can connect to z/Scope Anywhere from many different places and have the environment whenever they go.

Other Logins

Other kind of authentications require the system administrator to configure a few settings on z/Scope Anywhere.

Read More:

- End-User Authentication
- Authentication Methods
- Configuration Manager - Authentication Settings
- Configuration Manager - Web Auth Provider Settings
- Configuration Manager - Profiles Settings

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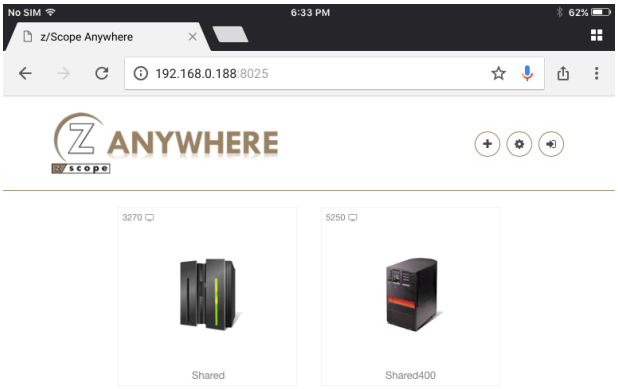
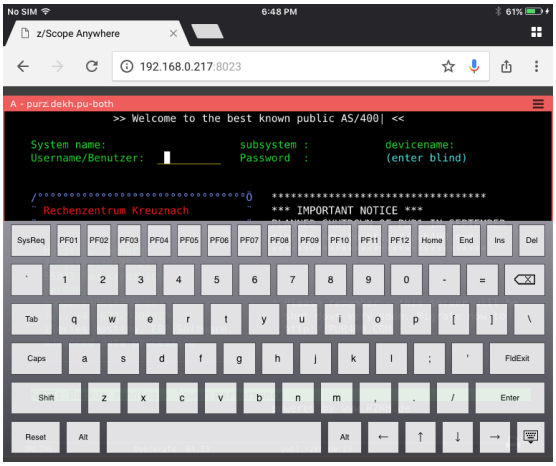
6 Mobile Devices

Z/Scope Anywhere is fully mobile ready. Its design and support for both touch and virtual keyboards provides a familiar experience to smart phones and tablets users.

Access the z/Scope Anywhere Server URL from a mobile or tablet web browser and you will have a fully adapted interface to make the connection easier, as well as good performance and usability options specially designed for mobile devices.





The special interface for mobile devices includes:

- Virtual Keyboards
- iOS Extension - Bluetooth Keyboard Plugin

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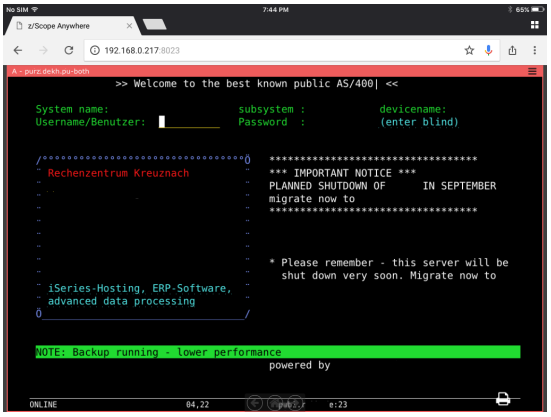
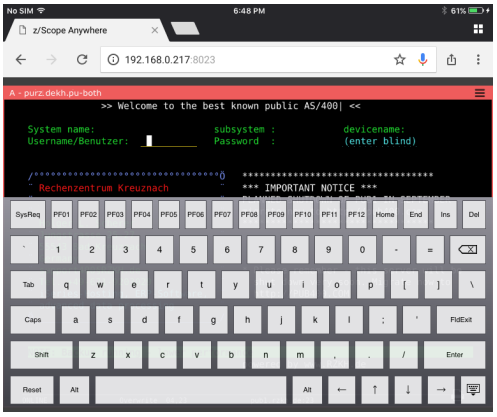
6.1 Virtual Keyboards

z/Scope Anywhere enables virtual keyboards when you establish connections through mobile devices.

Activate

The virtual keyboard will be activated automatically every time you get into a text field of the emulation screen.





Hide

In order to hide the virtual keyboard, you should press the keyboard 'hide' button, located in the bottom right corner.

Hide
Press this button and the keyboard will be hidden.

Change the Orientation

z/Scope Anywhere virtual keyboards adapt automatically to the device orientation.

Read More:

- Char Table for Unix/VT/SSH
- Char Table for IBM Mainframe and AS/400
- iOS Extension - Bluetooth Keyboard plugin

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6.2 iOS Extension - Bluetooth Keyboard plugin

The new z/Scope Anywhere app loads your z/Scope Anywhere without a standard browser intervention, enabling a better bluetooth keyboard control.

Follow these steps to install the z/Scope Anywhere app:

1. Go to the App Store
2. Search for the 'z/Scope Anywhere' app.
3. Download the application to your mobile device.
4. Open it.
5. You will see a screen asking for a z/Scope Anywhere URL:

6. Enter the your z/Scope Anywhere server's URL, formed by protocol://ip:port (e.g. https://192.168.0.2:8023). This is the same address that you would use to access z/Scope Anywhere directly from a browser.
7. Wait until the application is loaded.
8. Now you are ready to use the z/Scope Anywhere app!

Read More:

- Virtual Keyboard

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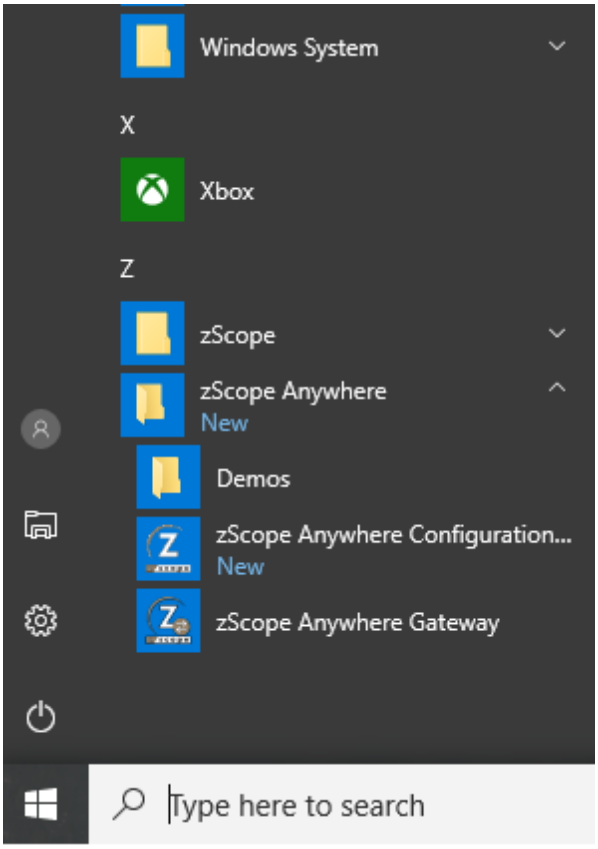
7 Advanced Settings

Z/Scope Anywhere settings and preferences are configured through the "Configuration Manager" tool. You can access it through the start menu "z/Scope Anywhere - Configuration Manager".



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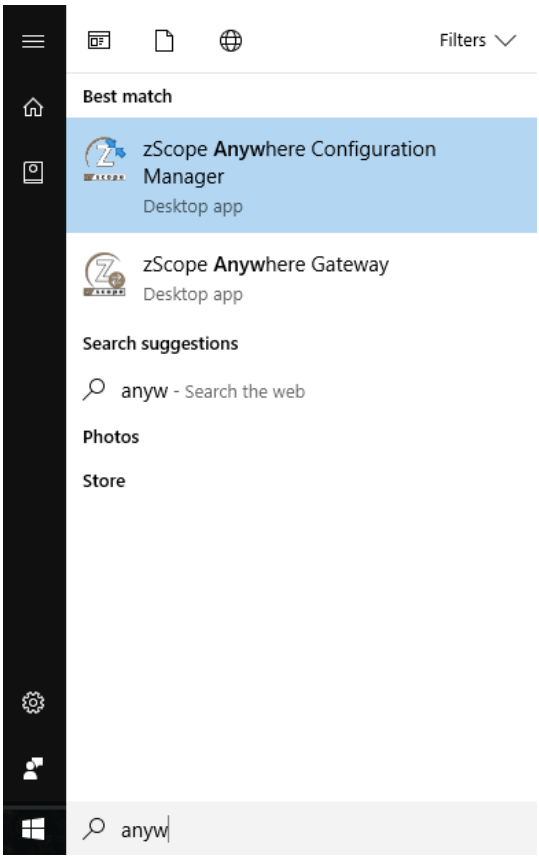
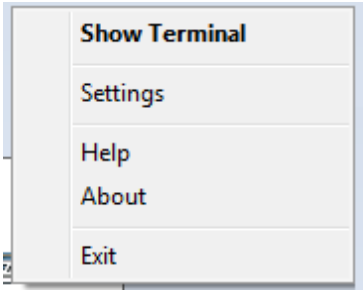


Alternatively, if you have installed the application user mode, you can access it from the tray icon bar, Settings menu:



Click on any of these categories to open the corresponding dialog. These dialogs will be explained in detail throughout the rest of this chapter.

Read More:

- Connections
- Screen Styles
- HotSpots
- Keyboard
- Macros
- Keypads
- Environment

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- Server Settings

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7.1 Configuration Manager

The Configuration Manager is a configuration tool to take care of connection profiles and other options.

Install z/Scope Anywhere and look for the 'z/Scope Anywhere Configuration Manager' shortcut in the Start Menu.

Read More:

- Connections (Shared Connection Profiles)
- Screen Styles
- HotSpots
- Keyboard
- Macros
- Keypads
- Environment
- Server Settings

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7.1.1 Shared Connections Profiles

Shared connections are managed in the 'Configuration Manager', by clicking on the 'Connections' button:

These are all the operations you can do over Shared Connections from the Configuration Manager:

- Creating/Editing
- Configuring Unix/VT shared connection parameters
- Configuring Mainframe / AS400 shared connection parameters
- Restric/Grant access through profiles
- Delete

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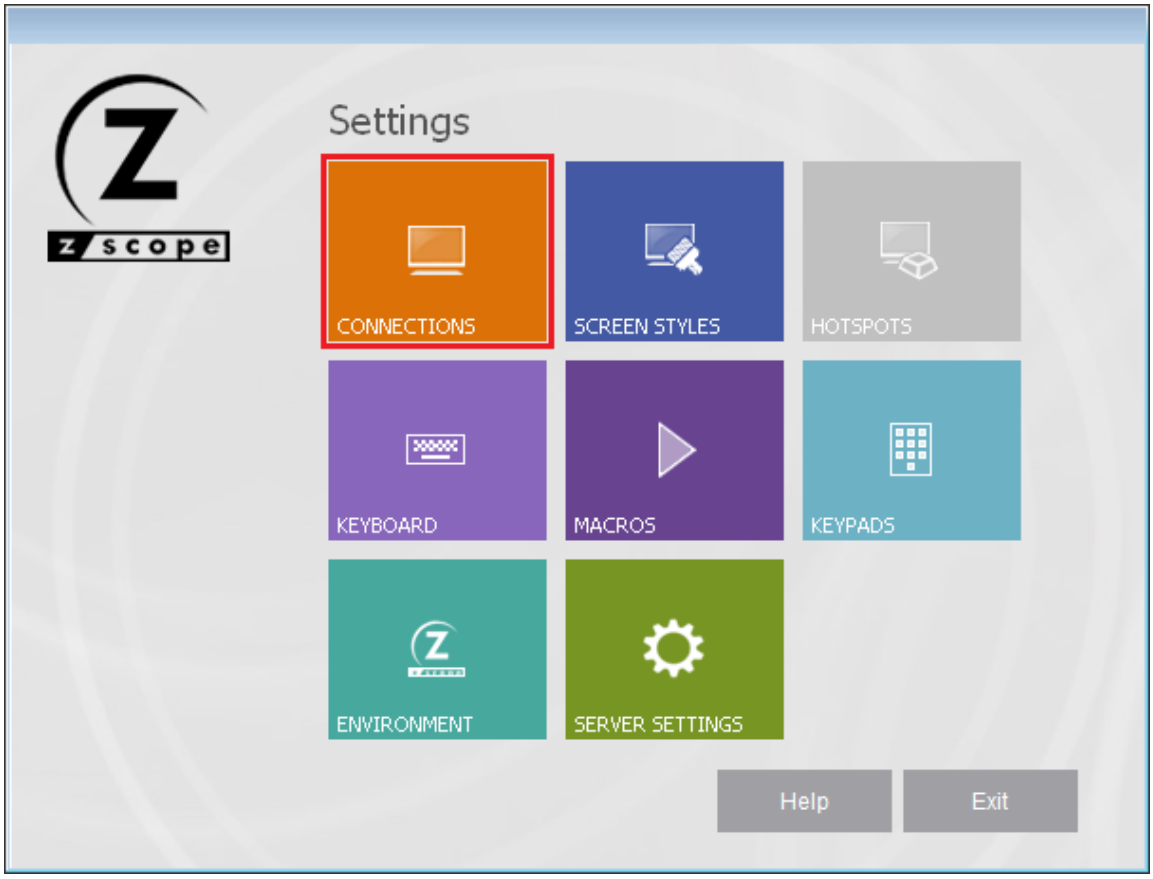
7.1.1.1 Creating/Editing Shared Connections

In order to create or edit a shared connection you have to open the Configuration Manager and click on the "Connections" button:



The Connections management dialog shows you a list of the existing Connections.

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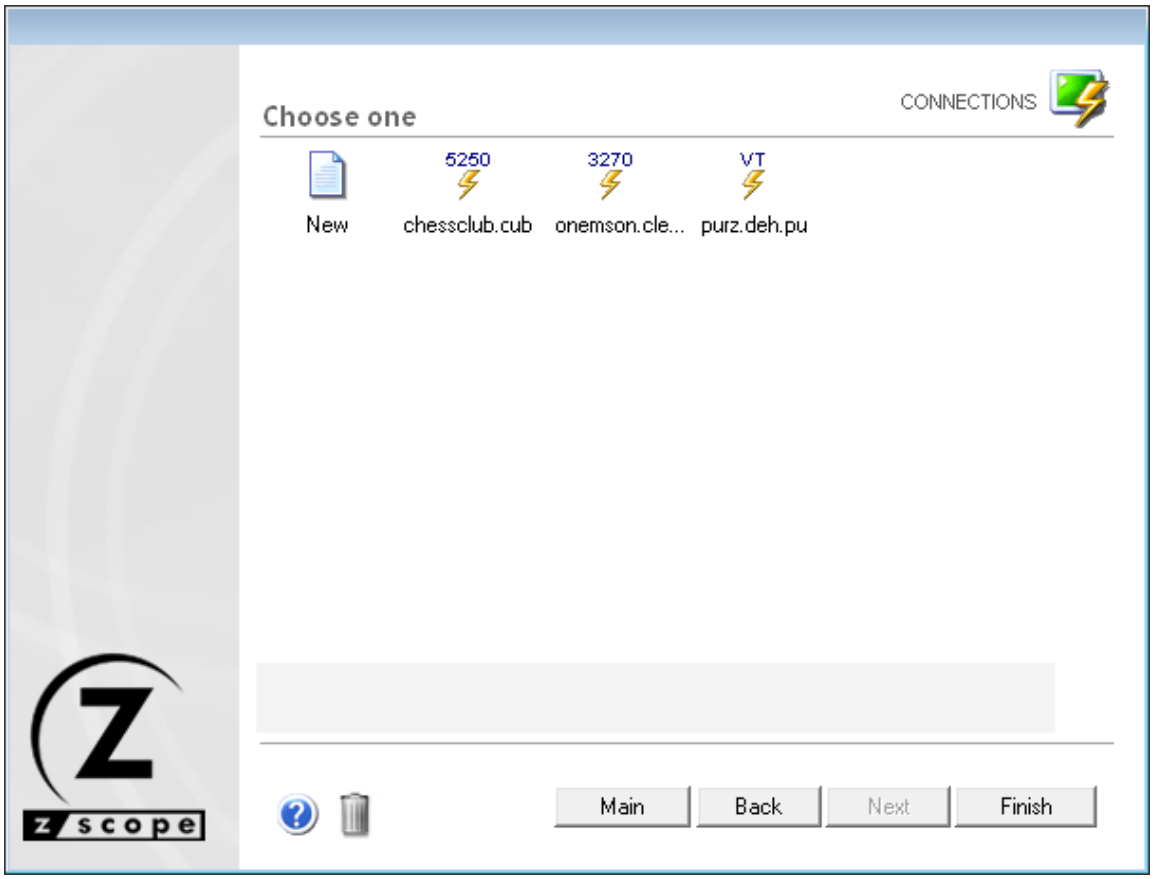

Creating a Shared Connection:

Use the 'New' icon to create a new Connection from scratch. Double-click on the 'New' icon and the Connection Wizard will be launched.

Modifying a Shared Connection:

To modify the attributes of a previously created Connection, select this connection using the mouse and then click on the bottom 'Next' button, or just simply double-click on it.
After you select a connection and click on 'Next', you will be presented with a dialog in which you will have access to all the attributes of the Connection you are editing.

For a detailed description each connection parameter, read the next topics:

- UNIX/VT Connections
- Mainframe/AS400 Connections

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7.1.1.2 Unix/VT Connections

For a detailed description of the parameters available when editing or creating Unix/VT connections in the Configuration Manager, consult the following sections:

- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

Read More:

- Mainframe/AS400 Connections Settings
- Creating a Connection in the Web Interface

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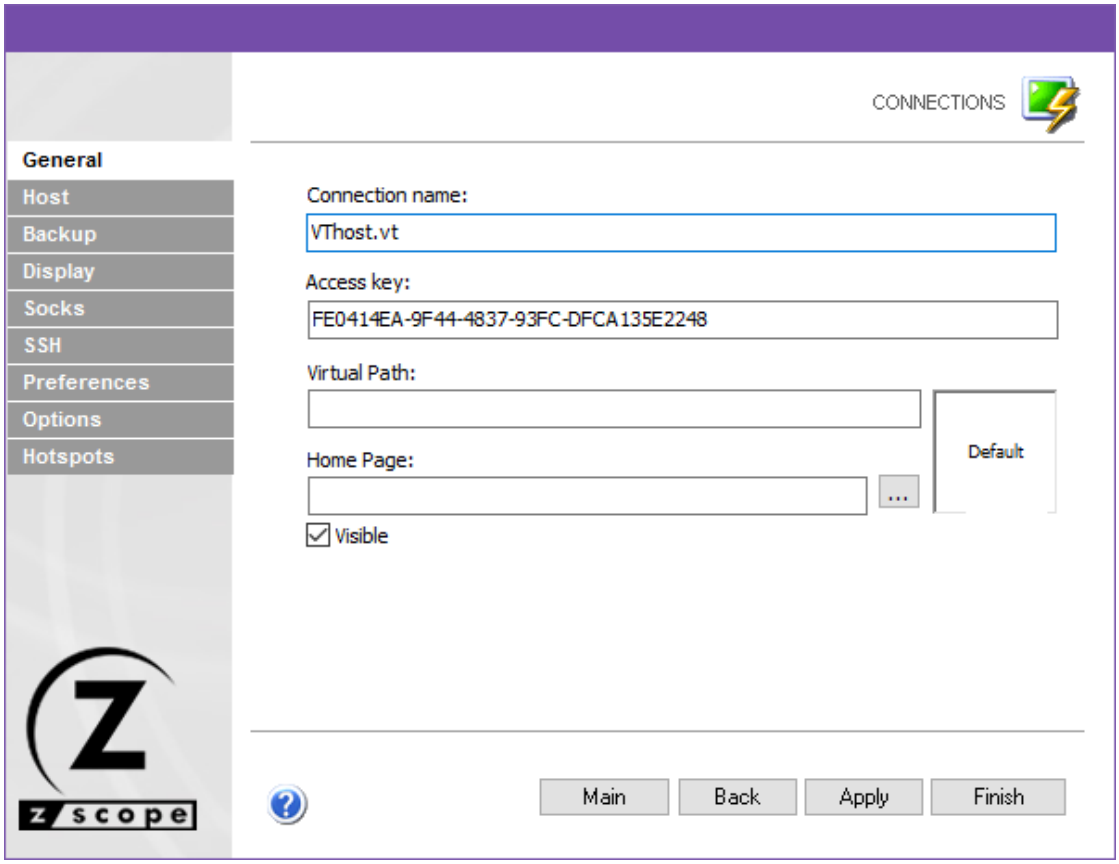
7.1.1.2.1 General

In the 'General' tab you will find the following parameters:



Connection Name
Enter a name to identify the connection.

Access Key
Use this key to access the profile programatically.

Virtual Path
The Virtual Path will create a unique URL address for this connection. The complete path will consist of: http(s)://YourDomain:port/VirtualPath/. The users can then create a web shortcut to this connection in particular and bypass the z/Scope Anywhere web interface.

Home Page
Choose the landing HTML page for the application and use it with the virtual path field to test its look.

Visible
Uncheck to hide the connection

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Icon
You can choose a different icon for the connection by clicking on the square to the right of the 'Virtual Path' and 'Home Page' fields.

Read More:
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

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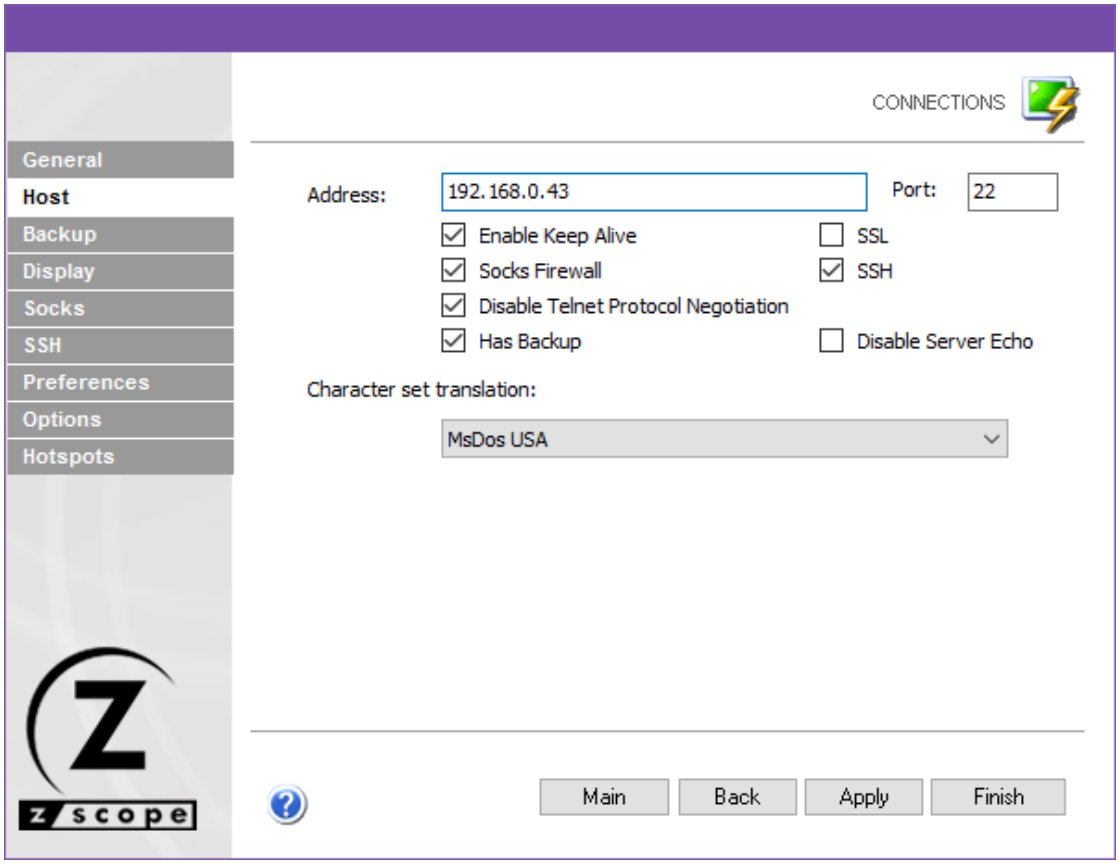
7.1.1.2.2 Host

In the 'Host' tab you will find the following parameters:



Address
URL or IP address of the host computer.

Port
TCP port defined at the host computer for Telnet access.

Default Telnet port number is 23.

Enable Keep alive
Enables keep-alive mechanism, needed for some Telnet servers to prevent disconnections.

Socks Firewall
Enables support for Socks firewall.

When you check this option, the 'Socks' tab will automatically appear in the connection settings dialog.

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Disable Telnet Protocol Negotiation
Check this option if you want to omit the protocol negotiation when connecting.

Has Backup
Check this option if you would like to specify an alternate ip for this connection.

When you check this option, the 'Backup' tab will automatically appear in the connection settings dialog.

SSL
Enables the SSL (Secure Sockets Layer) protocol for the host.

When you check this option, the 'SSL' tab will automatically appear in the connection settings dialog. See Using SSL. The SSL and SSH options are mutually exclusive.

SSH
Enables the SSH protocol for the host.

When you check this option, the 'SSH' tab will automatically appear in the connection settings dialog. The SSH and SSL options are mutually exclusive.

Disable Server Echo
Check this option if you don't want the server to echo every character it receives.

Character Set Translation
Select the character set that better suits your language needs.

When you select BiDi sets, a new option will be enabled so you can select the BiDi settings.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.3 Backup

In the 'Backup' tab you will see a table showing the list of alternate hosts for the connection. If the connection fails, z/Scope will connect to an alternate host, starting with the first one in the list. If an alternate host fails, z/Scope will connect to the next one in the list.

To configure these settings you will find the following parameters:

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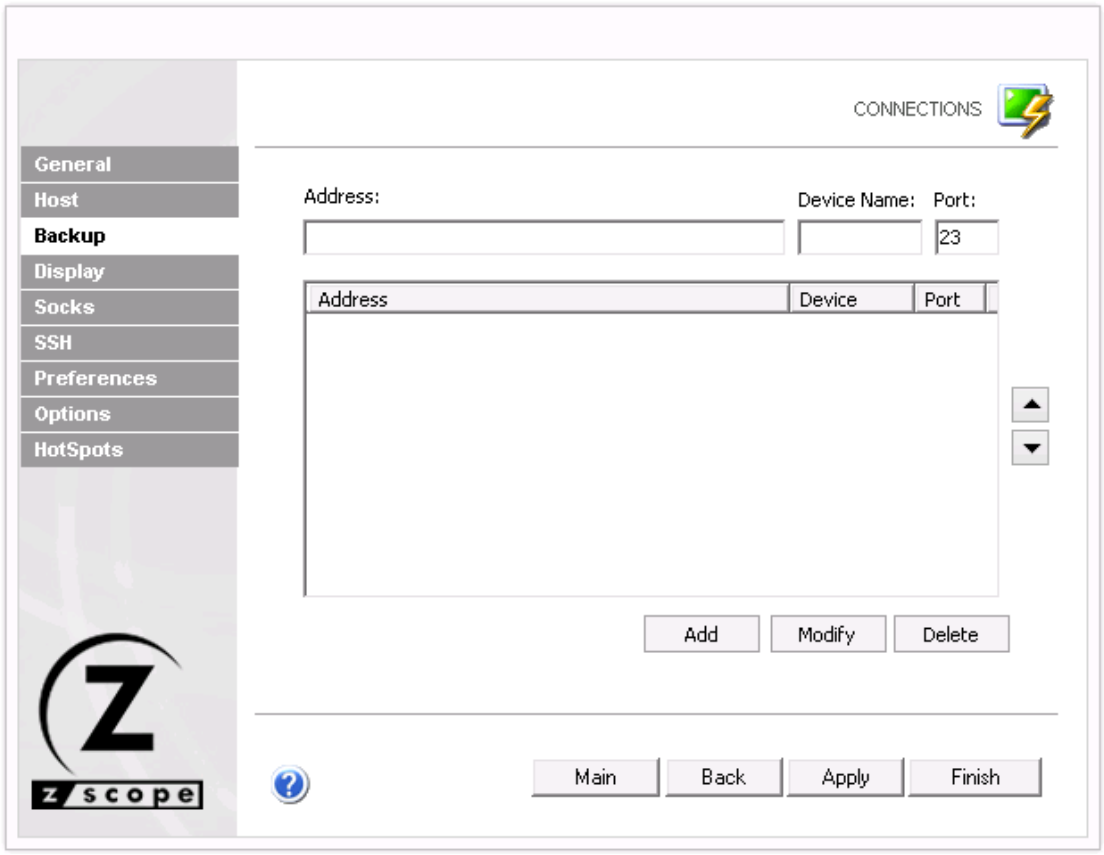

Address
Enter here the IP address of the alternate host you would like to add for this connection

Device Name
Enter here the Device Name with which you would like to connect to this alternate host.

Port
Enter here the port number for this alternate host.

Move Up
Select a backup connection from the list and use this button to move it above other backup connections in the list.

Move Down
Select a backup connection from the list and use this button to move it below other backup connections in the list.

Add
Press this button to add the Address, Device Name and Port information entered above as a new host in the list. New hosts will be added last in the list.

Modify

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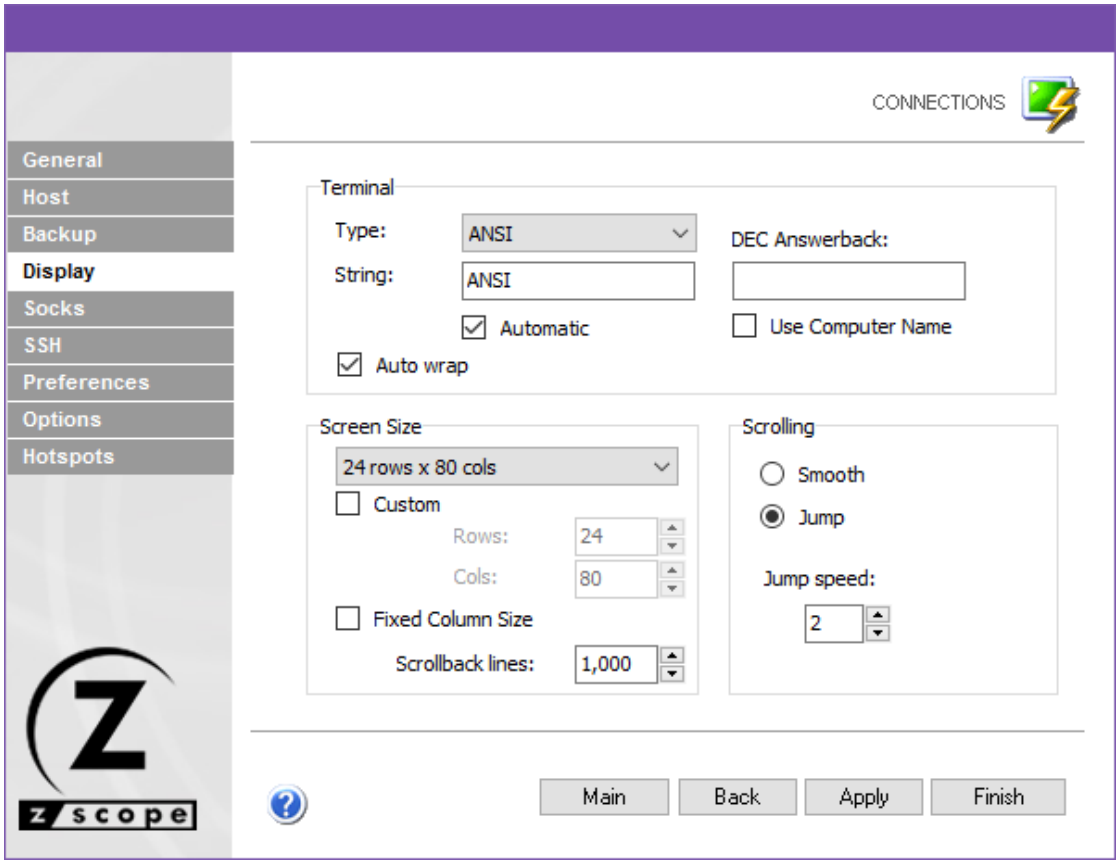
Select a backup connection from the list and press this button to replace the selected host with the information entered in the fields 'Address', 'Device Name' and 'Port'.

Delete
Select a backup connection from the list and press this button to delete it from the list.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.4 Display

In the 'Display' tab you will find the following parameters:



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Terminal

Type / String
Specify the type of terminal to emulate, which is not necessarily the same that is informed to the server. To inform the server a different type of terminal than the one emulated, use the 'String' field. To automatically detect the type of terminal, check the 'Automatic' option.

DEC Answerback
Here you can specify the DEC 'Transmit answerback message' control character. Check the 'Use Computer Name' Checkbox to assign the computer's name to the DEC Answerback field.

Auto Wrap
Check this option if you want the text lines to be wrapped when the terminal is resized.

Screen Size

Rows/Cols
Specify the number of rows and columns to de displayed. Choose from the options provided or check the 'Custom' option and type in the numbers.

Fixed Column Size
Check this option to display a horizontal scrollbar instead of resizing the font.

Scrollback lines
Specify the number of rows to keep in the buffer so they can be scrolled with the vertical scrollbar.

Scrolling

Smooth/Jump
Select a method for scrolling.

Jump speed
Specify the number of rows to be scrolled when the scrolling method is set to 'Jump'.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

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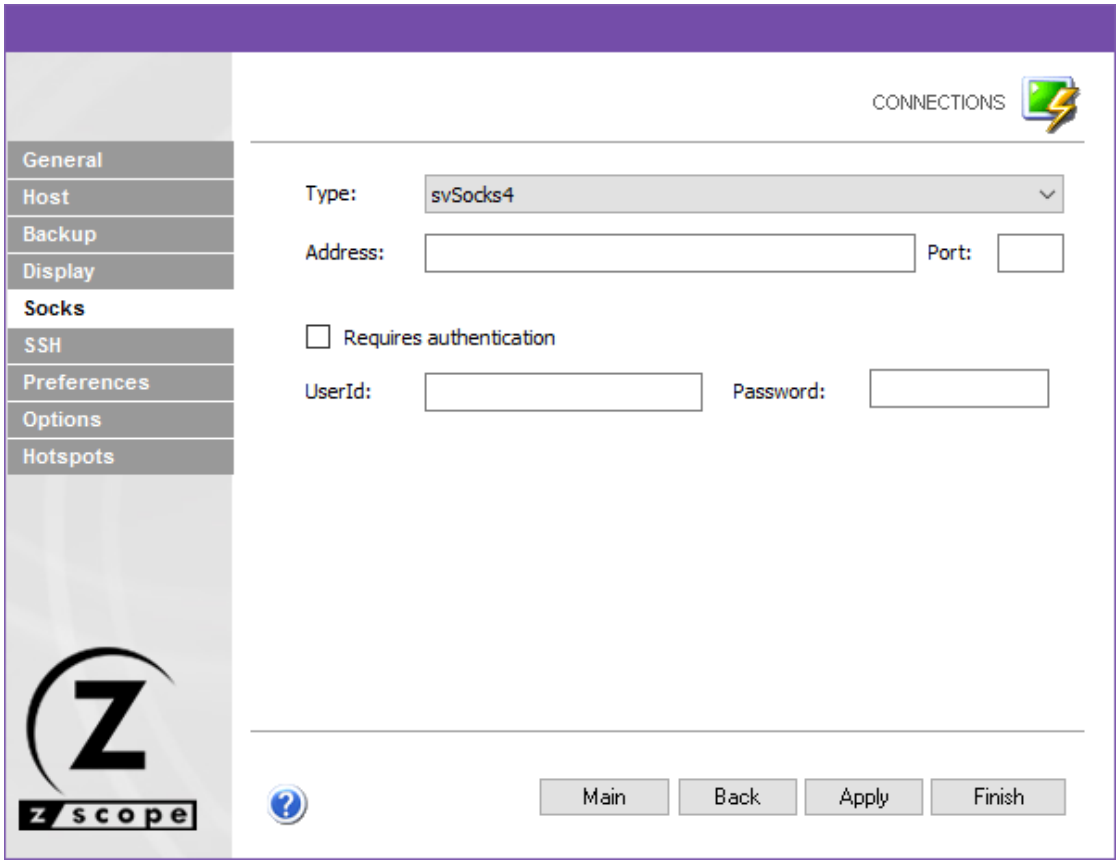
7.1.1.2.5 Socks

In the 'Socks' tab you will find the following parameters:



This tab only becomes available when the 'Socks' option is checked in the 'Host' tab.

Type
Indicates the type of Socks protocol you will be connecting to. z/Scope provides support for svSocks 4, 4A and 5 protocols.

Address
In this field you must enter the IP address of the Socks server.

Port
In this field you must enter the port number of the Socks service at the host.

Requires Authentication
When connecting with svSocks4A protocol and higher, you have the option of providing a User ID and a Password for authentication.

UserId
In this field you must enter your User ID.

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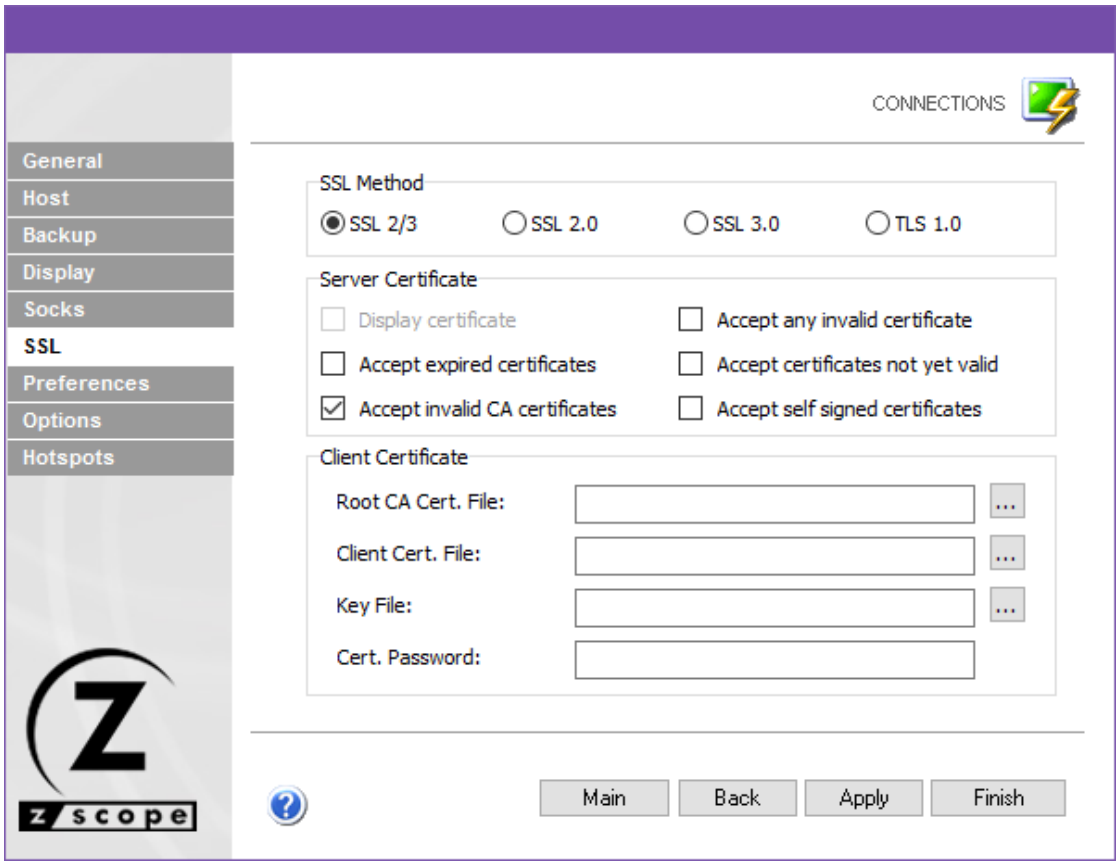
Password
In this field you must enter your Password.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.6 SSL

In the 'SSL' tab you will find the following parameters:



This tab only becomes available when the 'SSL' option is checked in the 'Host' tab.

SSL Method
Choose one of the available methods shown: SSL 2/3, SSL 2.0, SSL 3.0 or TLS 1.0.

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Server Certificate
The 'Display certificate' option controls whether to show the Certificate Info immediately after establishing the connection. The other options refer to the policy adopted when dealing with certificates that do not meet certain security conditions.

Client Certificate
Enter the file name of the certificate files that you own.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.7 SSH

In the 'SSH' tab you will find the following parameters:

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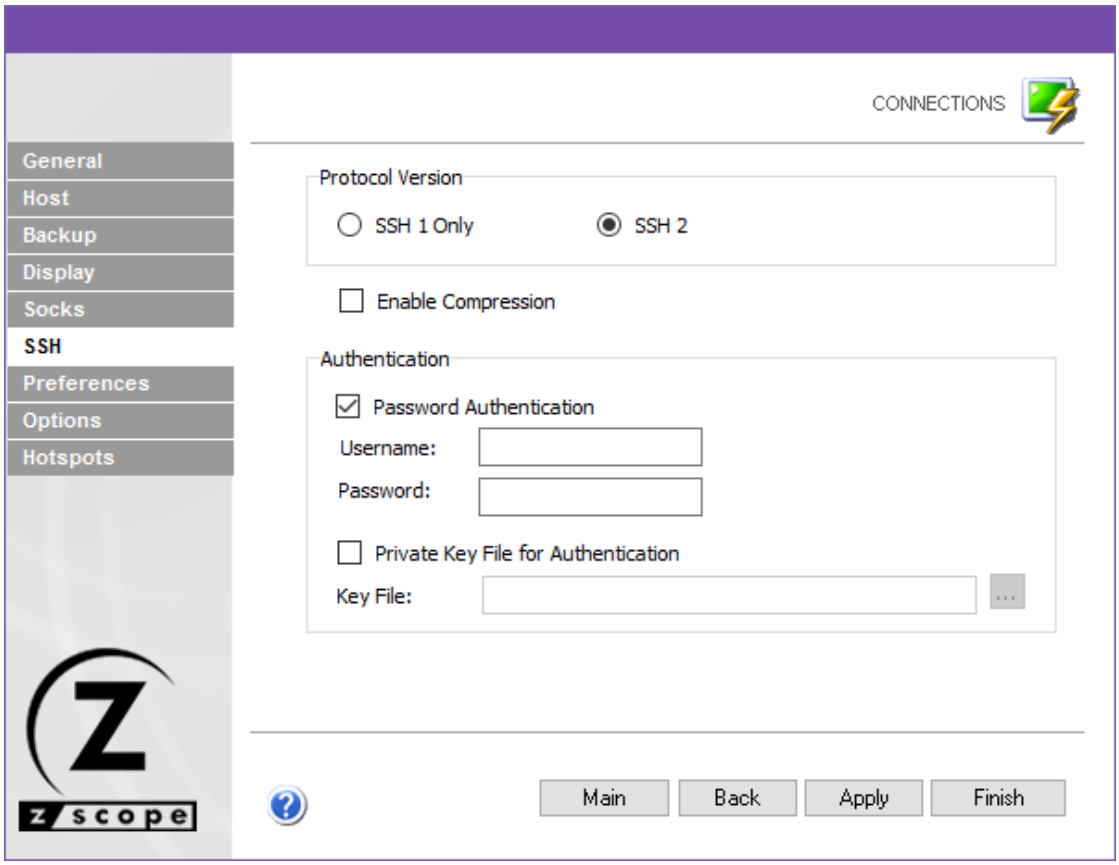

This tab only becomes available when the 'SSH' option is checked in the 'Host' tab.

SSH Protocol Version
Choose one of the available versions: SSH 1 Only, or SSH 2.

Enable Compression
Check this option to enable compression for the SSH protocol.

Authentication

Password Authentication
Uncheck this option if you don't want to use Password Authentication for SSH.

Username
Enter an user name with access to the host via the SSH protocol.

Password
Enter the password for the specified user name.

Private Key File for Authentication
Check this option if you want to use a private key-file for the authentication process. You must enter the path of the file in the field below.

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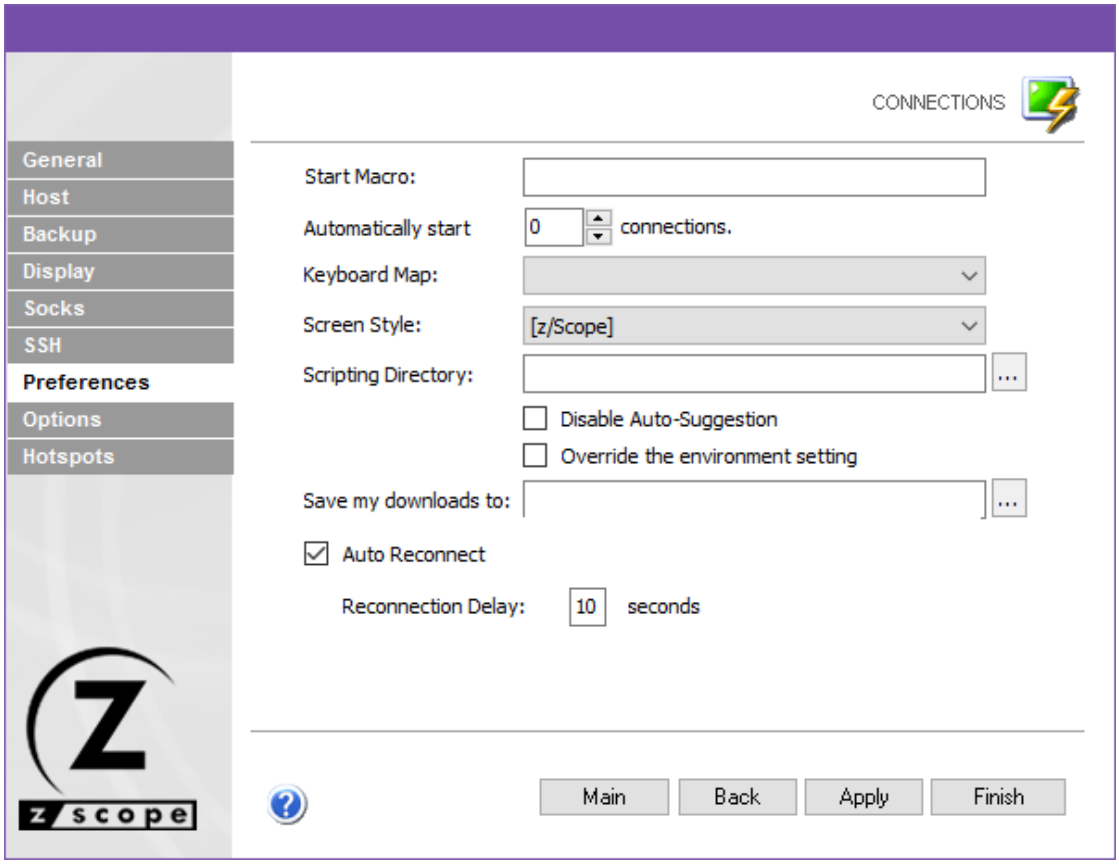
Read More:

- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.8 Preferences

In the 'Preferences' tab you will find the following parameters:



Start Macro
Select a Macro or to start automatically when connecting

Automatically Start [*n*] Connections
Allows you to specify the number of sessions of this connection that will be automatically established upon z/Scope start.

Keyboard Map

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Select a keyboard map for this connection.

Screen Style
Allows you to select a default Screen Style for this connection.

Scripting Directory
Specify the folder on your local computer where script files will be stored.

Disable Auto-Suggestion
Check this option to have the Auto-Suggestion feature disabled by default for this connection.

Override the Environment Setting
Check this option to override environment settings with the connection's settings.

Auto Reconnect
Check this option if you would like to automatically reconnect to the host after logging off.

Reconnection Delay
Specify in this field the amount of time (in seconds) that you would like the system to take before auto reconnecting to the host.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.9 Options

In the 'Options' tab you will find the following parameters:

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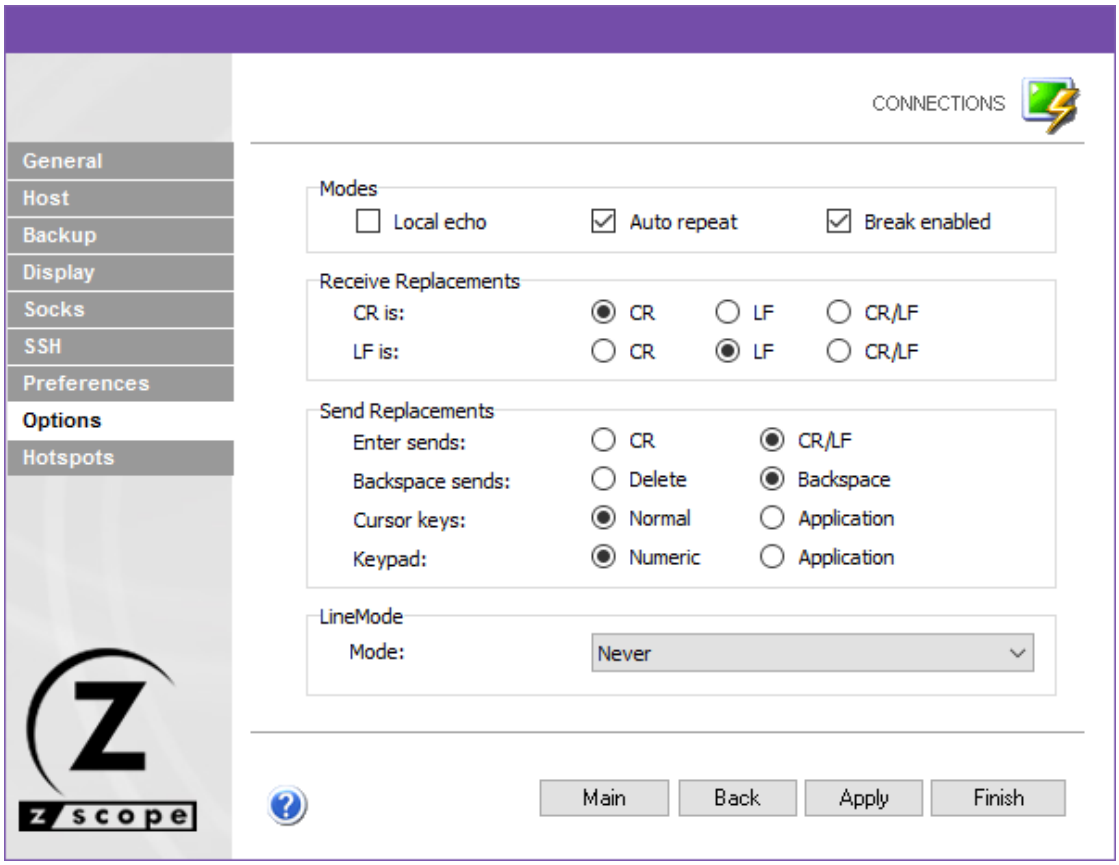

Modes

Local Echo
Check this option to allow local echoing of the characters when the server does not return echoes.

Auto Repeat
Check this option to enable the auto repeat feature for the keyboard.

Break Enabled
Check this option to be able to use the break command.

Receive Replacements

CR/LF Is
Select the desired behaviour for the 'Carriage Return' (CR) and 'Line Feed' (LF) commands.

Send Replacements

Enter/Backspace Sends
Select the desired behaviour for the 'Enter' and 'Backspace' keys.

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Cursor/Keypad Keys
Specify how the cursor and keypad keys are interpreted.

Line Mode

Mode
Indicate when LineMode will be activated from the options available in the combobox.

Read More:
- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

7.1.1.2.10 HotSpots

In the 'HotSpots' tab you can choose the HotSpots that will be available when working with the connection.

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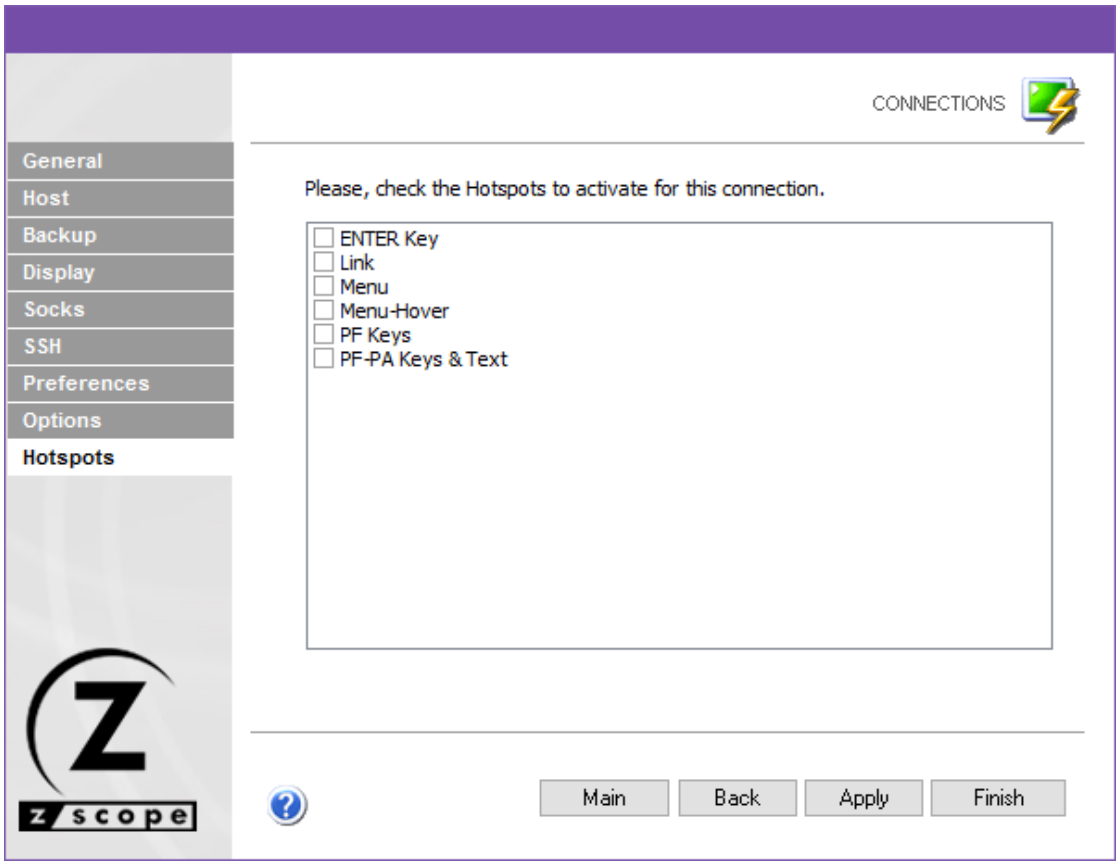

Read More:

- Configuration Manager - Connections - Unix/VT - General Settings
- Configuration Manager - Connections - Unix/VT - Host Settings
- Configuration Manager - Connections - Unix/VT - Backup Settings
- Configuration Manager - Connections - Unix/VT - Display Settings
- Configuration Manager - Connections - Unix/VT - Socks Settings
- Configuration Manager - Connections - Unix/VT - SSL Settings
- Configuration Manager - Connections - Unix/VT - SSH Settings
- Configuration Manager - Connections - Unix/VT - Preferences Settings
- Configuration Manager - Connections - Unix/VT - Options Settings
- Configuration Manager - Connections - Unix/VT - HotSpots Settings

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7.1.1.3 Mainframe/AS400 Connections

For a detailed description of the parameters available when editing or creating Mainframe/AS400 connectionsin the Configuration Manager, consult the following sections:

- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

Read More:

- Unix/VT Connections Settings
- Creating a Connection in the Web Interface

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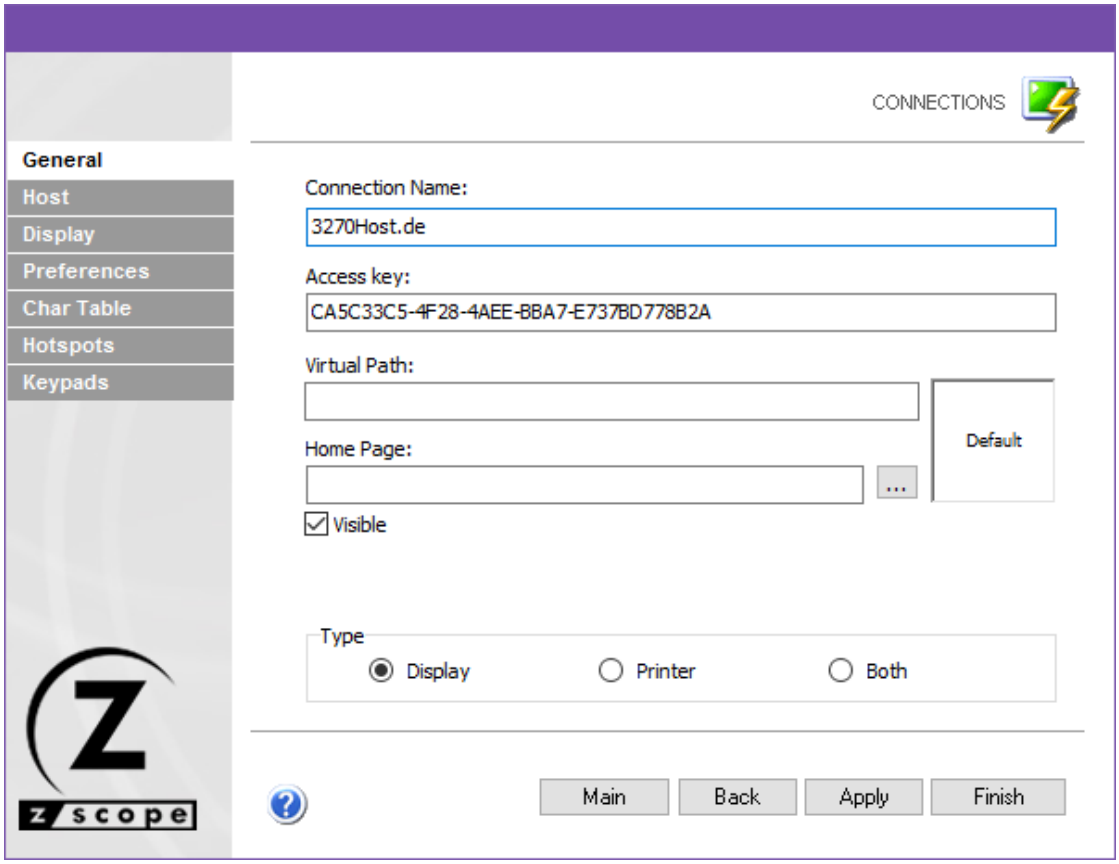
7.1.1.3.1 General

In the 'General' tab you will find the following parameters:



Connection Name
In this field you must enter a name for the connection.

Access Key
Use this key to access the profile programatically.

Virtual Path
The Virtual Path will create a unique URL address for this connection. The complete path will consist of: http(s)://YourDomain:port/VirtualPath/. The users can then create a web shortcut to this connection in particular and bypass the z/Scope Anywhere web interface.

Home Page
Choose the landing HTML page for the application and use it with the virtual path field to test its look.

Visible
Uncheck to hide the connection

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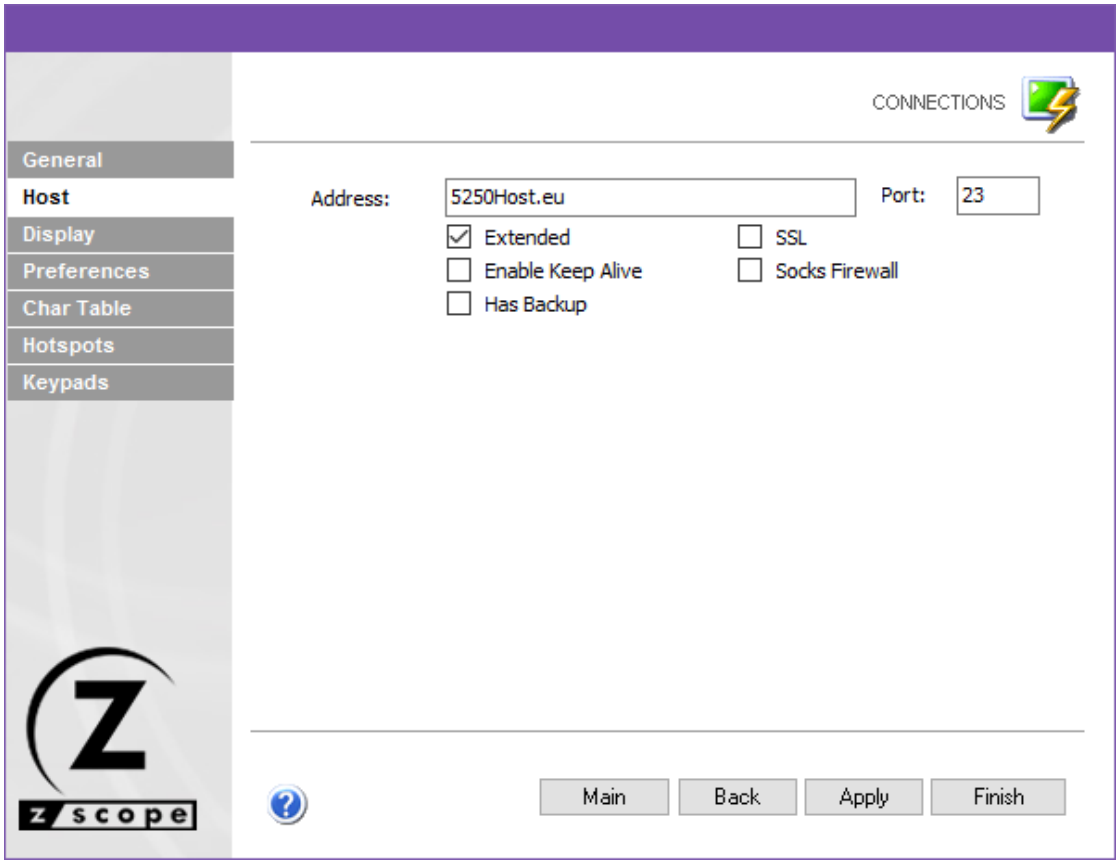
Icon
You can choose a different icon for the connection by clicking on the square to the right of the 'Virtual Path' and 'Home Page' fields.

Type
Choose between a Display, Printer, or Display and Printer connection type.

Read More:
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.2 Host

In the 'Host' tab you will find the following parameters:



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Address
URL or IP address of the host computer.

Port
TCP port defined at the host computer for Telnet access.

Default Telnet port number is 23.

Extended
Enables Telnet Extended protocols (TN3270E or TN5250E). This enables 'User Id' and 'Password' input boxes for AS/400 connections.

Enable Keep Alive
Enables keep-alive mechanism, needed for some Telnet servers.

Has Backup
Check this option if you would like to specify an alternate ip for this connection.

When you check this option, the 'Backup' tab will automatically appear in the connection settings dialog.

SSL
Enables the SSL (Secure Sockets Layer) protocol for the host.

When you check this option, the 'SSL' tab will automatically appear in the connection settings dialog. See 'SSL' Tab. The SSL and Gateway options are mutually exclusive.

Socks Firewall
Enables support for Socks firewall.

When you check this option, the 'Socks' tab will automatically appear in the connection settings dialog. See 'Socks' tab.

TN5250E Extended Info
These options, only available for TN5250 connections, provide the user with an enhanced security method defined by the TN5250E norm.

Read More:
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.3 Backup

In the 'Backup' tab you will see a table showing the list of alternate hosts for the connection. If the connection fails, z/Scope will connect to an alternate host, starting

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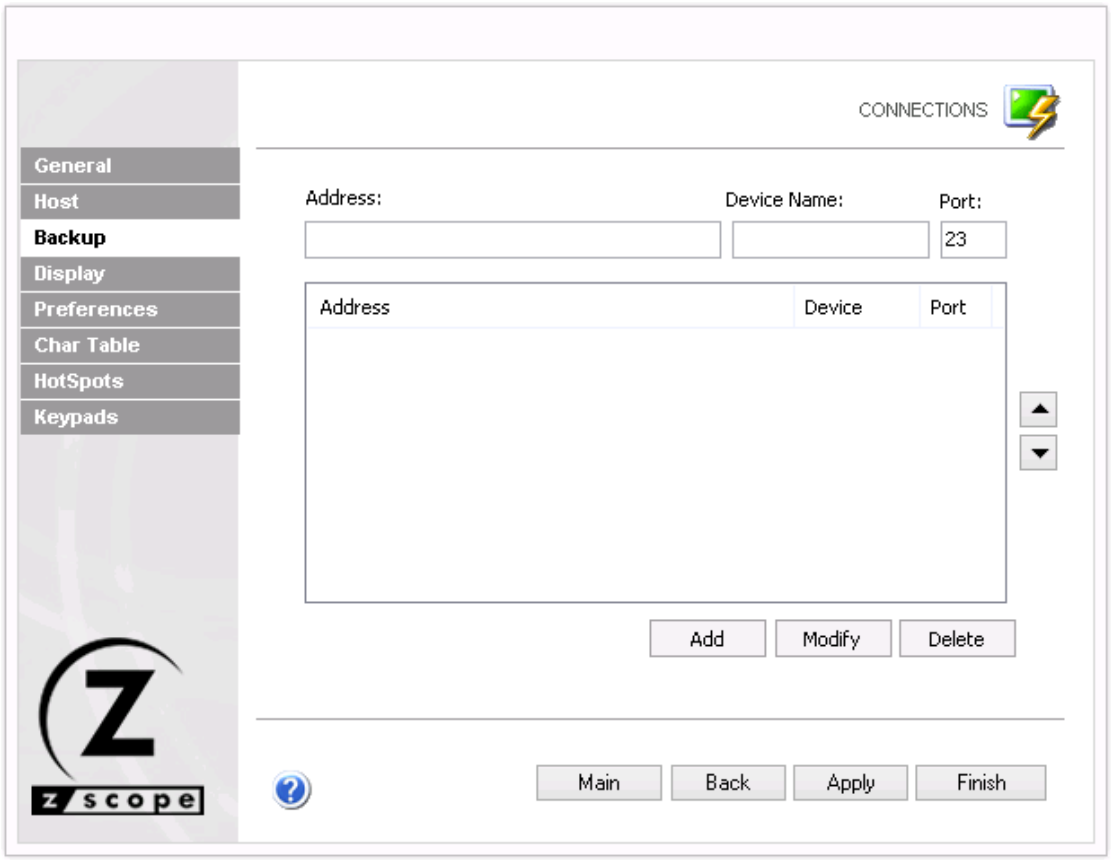
with the first one in the list. If an alternate host fails, z/Scope will connect to the next one in the list.

To configure these settings you will find the following parameters:



Address
Enter here the IP address of the alternate host you would like to add for this connection

Device Name
Enter here the Device Name with which you would like to connect to this alternate host.

Port
Enter here the port number for this alternate host.

Move Up
Select a backup connection from the list and use this button to move it above other backup connections in the list.

Move Down
Select a backup connection from the list and use this button to move it below other backup connections in the list.

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Add
Press this button to add the Address, Device Name and Port information entered above as a new host in the list. New hosts will be added last in the list.

Modify
Select a backup connection from the list and press this button to replace the selected host with the information entered in the fields 'Address', 'Device Name' and 'Port'.

Delete
Select a backup connection from the list and press this button to delete it from the list.

Read More:
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.4 Display

In the 'Display' tab you will find the following parameters:

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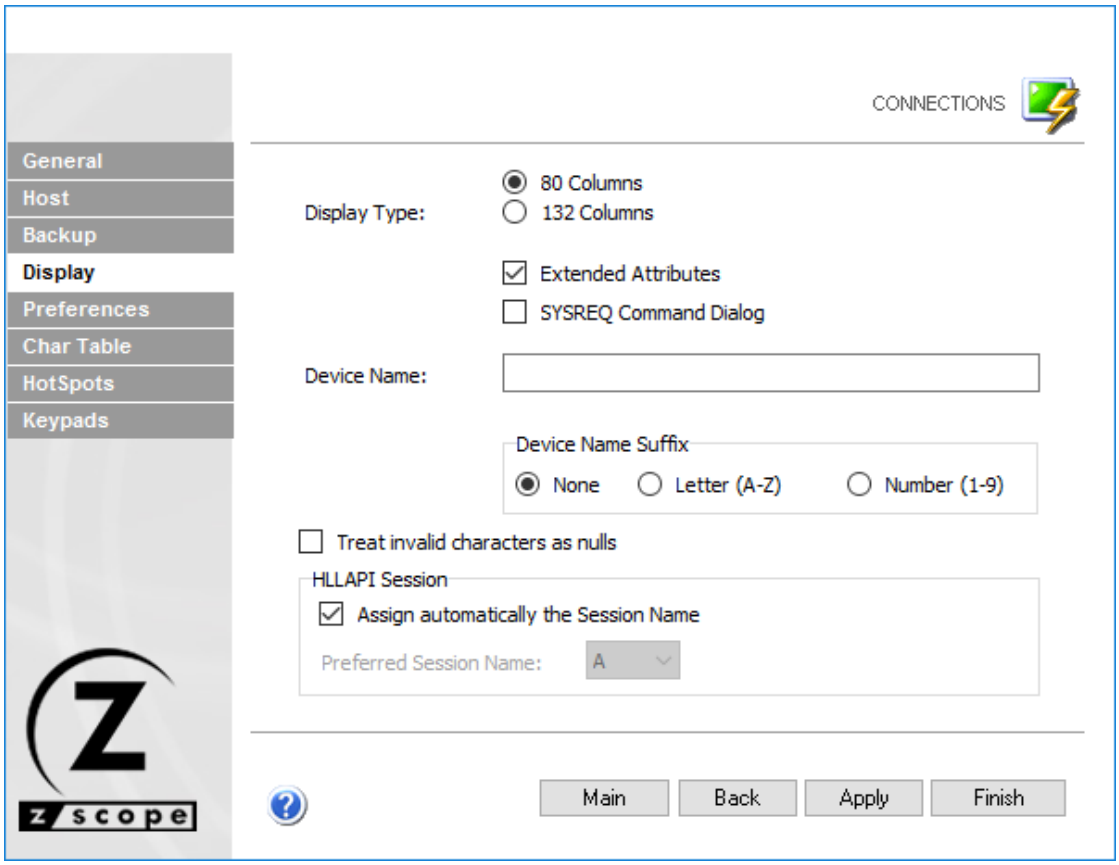

Display Type
Select the desired resolution for the host.

Available resolutions vary according to the type of host you are connecting to.

Extended Attributes
Enables extended attributes for the connection.

SYSREQ Command Dialog
Only for AS/400 connections: enables a command line for the SysReq function.

Device Name
Specifies the logical unit or device name for the connection.

Device Name Suffix
Allows you to specify a suffix method to use for several connections.

Read More:
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings

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- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.5 Printer

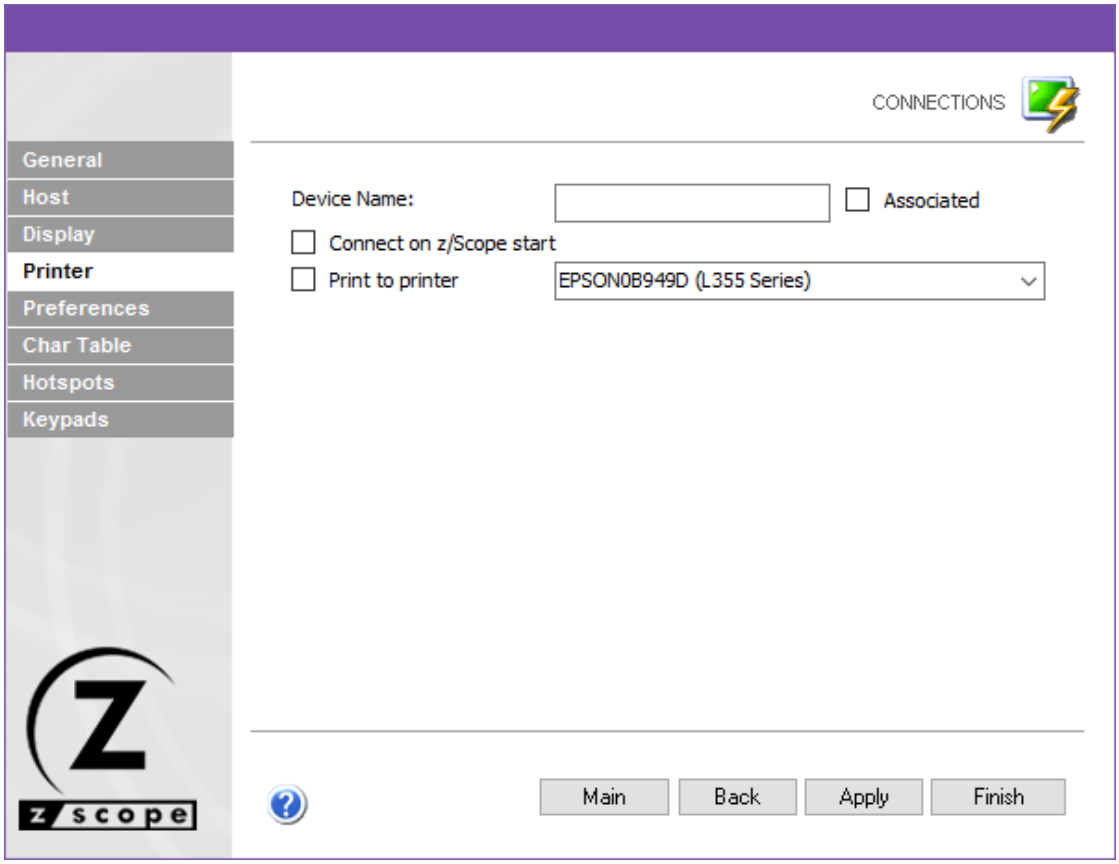
In the 'Printer' tab you will find the following parameters:

> This tab only becomes available for Printer or Display and Printer ("both") type connections - configure this in the 'Host' tab.

Device Name
Enter the host device name.

Connect on z/Scope Start
Check this option if you want the printer session to be started automatically when z/Scope starts independently of the display session.

IBM Mainframe Connections:



Associated

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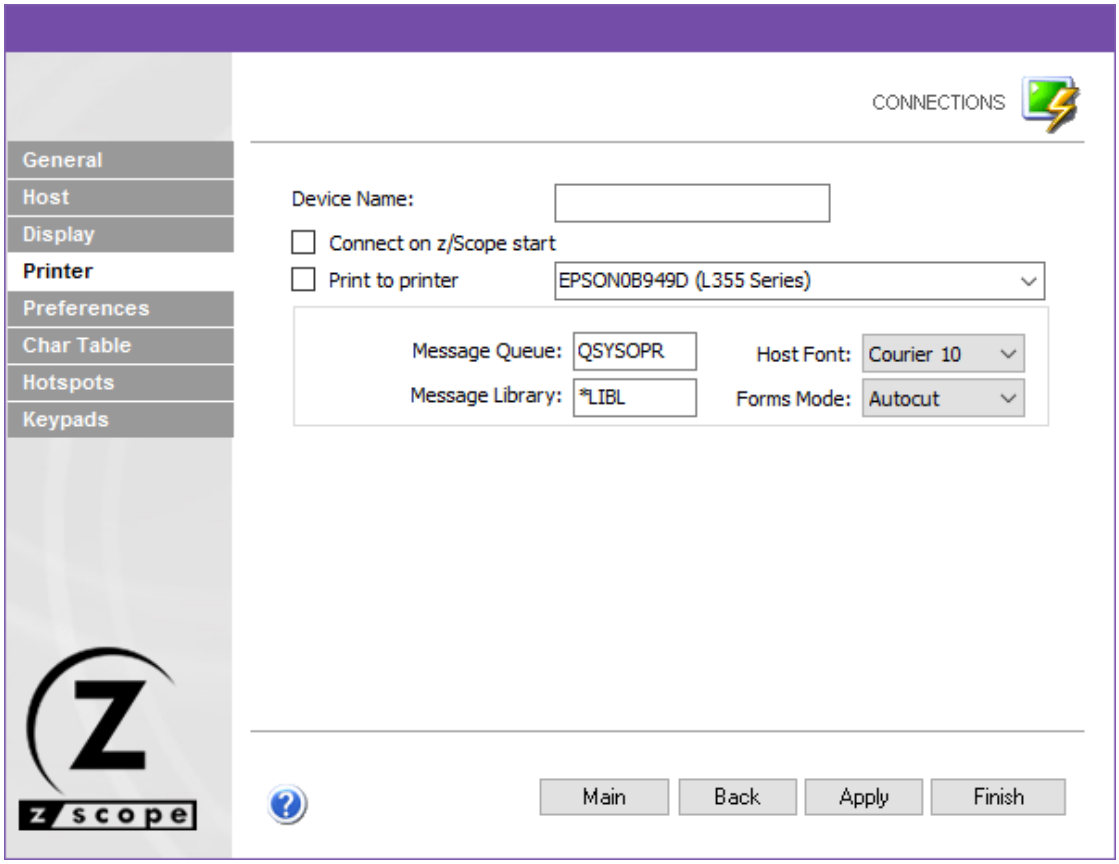
Check this option if you want the printer session to start whenever the display session is started.

IBM/AS400 Connections:



Print to Printer
Check this option to redirect the printing output to a local printer and choose the printer from the combobox.

Message Queue
Enter the host's queue name.

Host Font
Select the host font.

Message Library
Enter the host's library name.

Forms Mode
Select the desired forms mode.

Read More:

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- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

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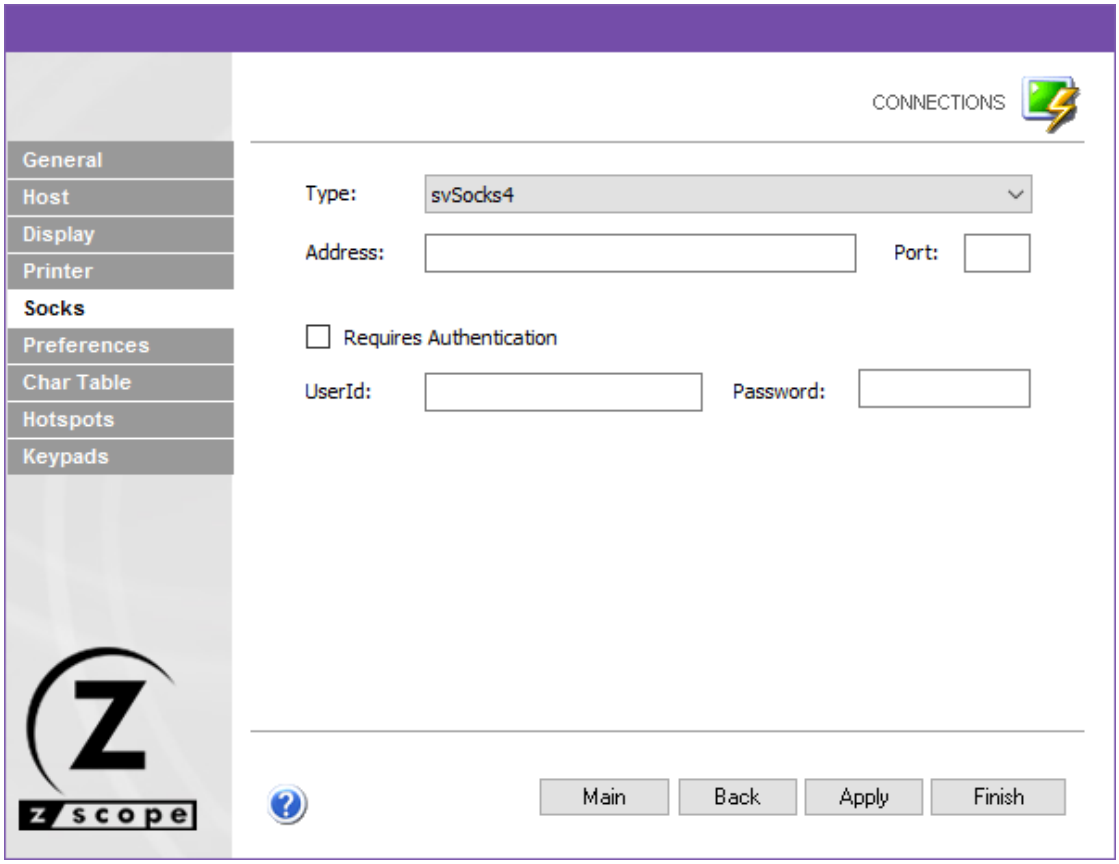
7.1.1.3.6 Socks

In the 'Socks' tab you will find the following parameters:



This tab only becomes available when the 'Socks' option is checked in the 'Host' tab.

Type
Indicates the type of Socks protocol you will be connecting to. z/Scope provides support for svSocks 4, 4A and 5 protocols.

Address
In this field you must enter the IP address of the Socks server.

Port
In this field you must enter the port number of the Socks service at the host.

Requires Authentication
When connecting with the svSocks4A protocol and higher, you have the option of providing a User ID and a Password for authentication.

UserId
User ID.

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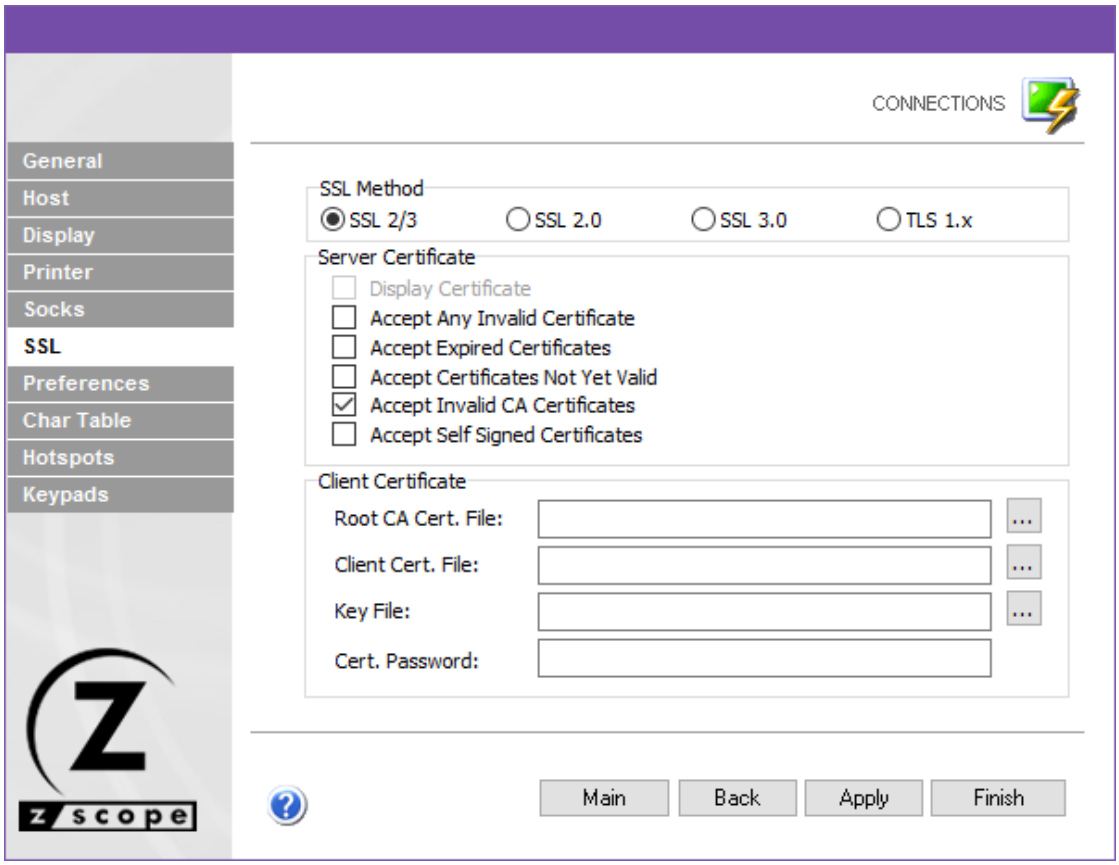
Password
Password.

Read More:

- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.7 SSL

In the 'SSL' tab you will find the following parameters:



This tab only becomes available when the 'SSL' option is checked in the 'Host' tab.

SSL Method

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Choose one of the available methods shown: SSL 2.0, SSL 3.0 or TLS 1.0.

Server Certificate
The 'Display certificate' option controls whether to show the Certificate Info immediately after establishing the connection. The other options refer to the policy adopted when dealing with certificates that do not meet certain security conditions.

Client Certificate
Enter the file name of the certificate files that you own.

Read More:
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.8 Preferences

In the 'Preferences' tab you will find the following parameters:

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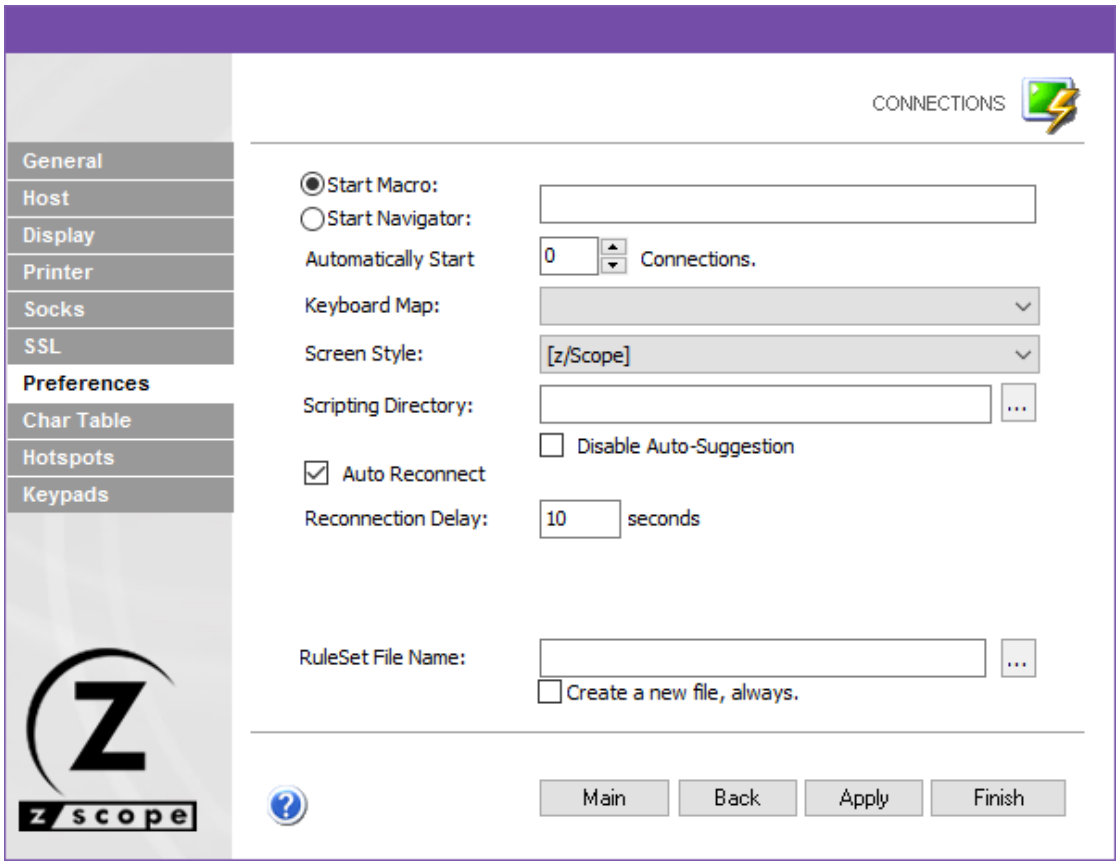

Start Macro/Navigator
Select a Macro or a Navigator to start automatically when connecting.

Automatically Start [*n*] Connections
Allows you to specify the number of sessions of this connection that will be automatically established upon z/Scope start.

Keyboard Map
Select a keyboard map for this connection.

Screen Style
Allows you to select a default Screen Style for this connection.

Scripting Directory
Specify the folder on your local computer where script files will be stored.

Disable Auto-Suggestion
Check this option to have the Auto-Suggestion feature disabled by default for this connection.

Auto Reconnect
Check this option if you would like to automatically reconnect to the host after logging off.

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Reconnection Delay
Specify in this field the amount of time (in seconds) that you would like the system to take before auto reconnecting to the host.

RuleSet File Name
Set here the file name and location of the *.xsm XML file that establishes the rules for saving and auto completing variables in the screen.

Create a New File, Always
Use this checkbox to generate your first ruleset file automatically for the connection. Uncheck this option to edit the file, or leave the checkmark to have it regenerate each time you run z/Scope.

Read More:
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

7.1.1.3.9 Char Table

In the 'Char Table' tab you will find the following parameters:

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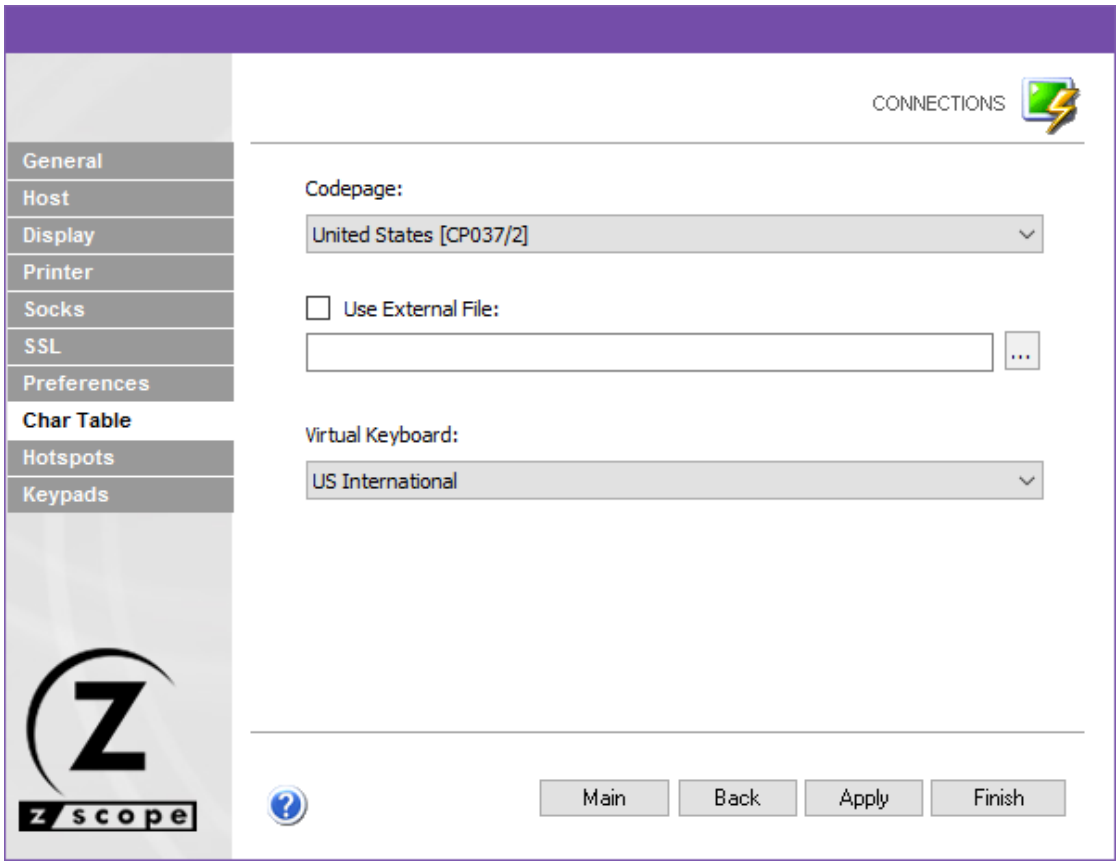

Codepage
Allows you to select an internal Character Conversion Table. See Internal Conversion Tables.

Use External File
Mark this option if you to additionally enter the file name (.ebc) of an external Character Conversion Table to be used for the connection.

Virtual Keyboard
Select the language/format to be used on mobile devices virtual keyboards.

Read More:
- Internal Conversion Tables
- Using an External Character Table
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings

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- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

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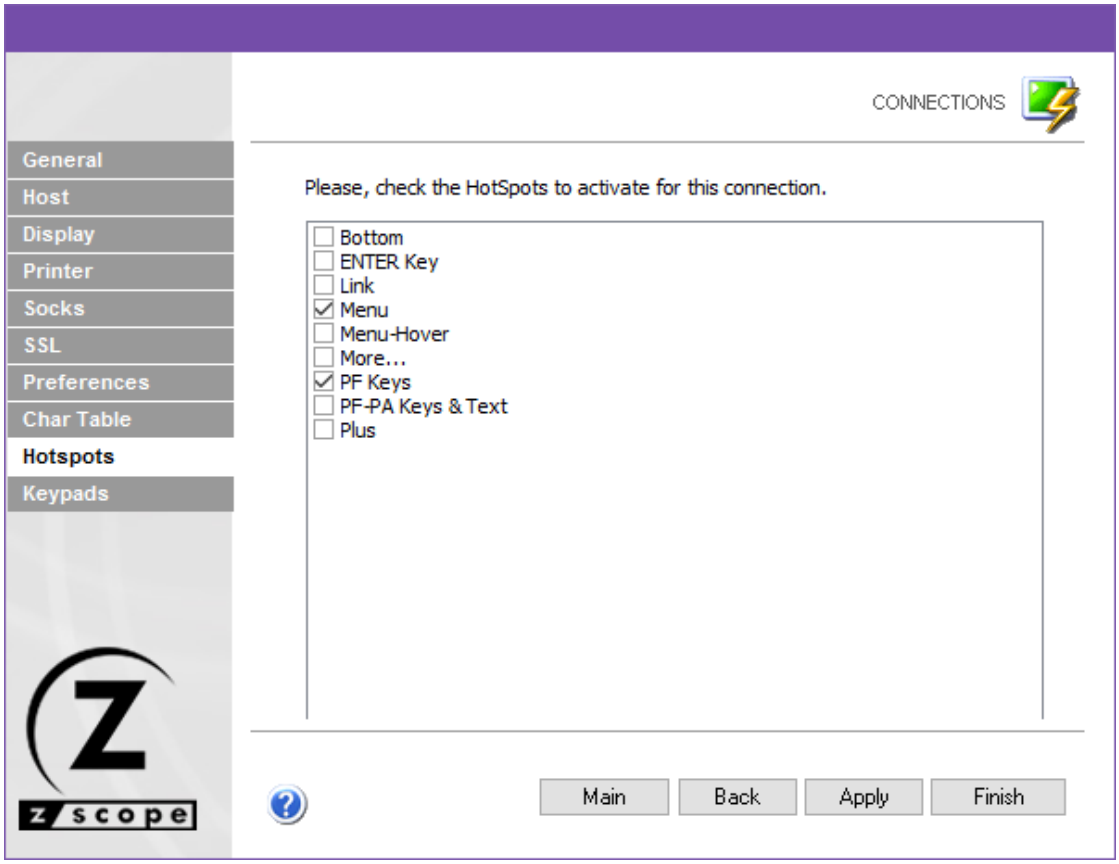
7.1.1.3.10 HotSpots

In the 'HotSpots' tab you can choose the HotSpots that will be available when working with the connection.



Read More:

- HotSpots Settings
- Using HotSpots
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

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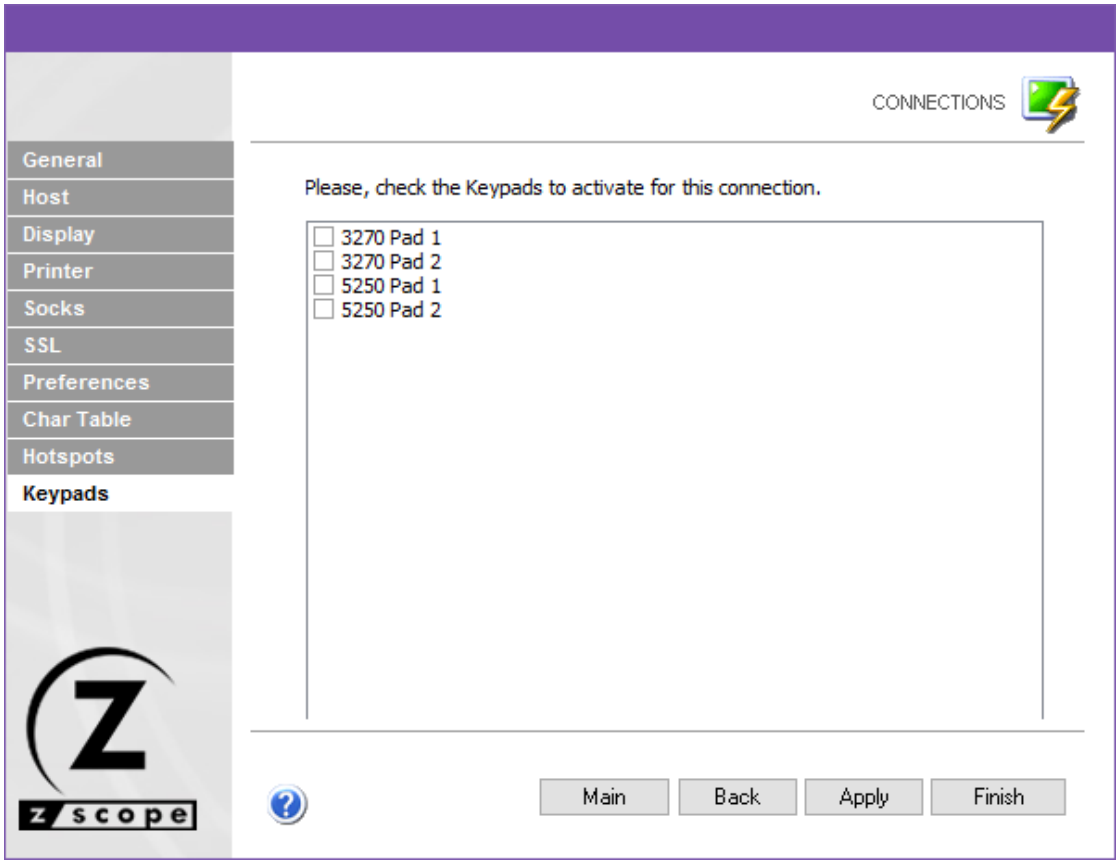
7.1.1.3.11 Keypads

In the 'Keypads' tab you can choose the Keypads that will be available when working with the connection.



Read More:

- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings
- Configuration Manager - Connections - Mainframe/AS400 - General Settings
- Configuration Manager - Connections - Mainframe/AS400 - Host Settings
- Configuration Manager - Connections - Mainframe/AS400 - Backup Settings
- Configuration Manager - Connections - Mainframe/AS400 - Display Settings
- Configuration Manager - Connections - Mainframe/AS400 - Printer Settings
- Configuration Manager - Connections - Mainframe/AS400 - Socks Settings
- Configuration Manager - Connections - Mainframe/AS400 - SSL Settings
- Configuration Manager - Connections - Mainframe/AS400 - Preferences Settings
- Configuration Manager - Connections - Mainframe/AS400 - Char Table Settings
- Configuration Manager - Connections - Mainframe/AS400 - HotSpots Settings
- Configuration Manager - Connections - Mainframe/AS400 - Keypads Settings

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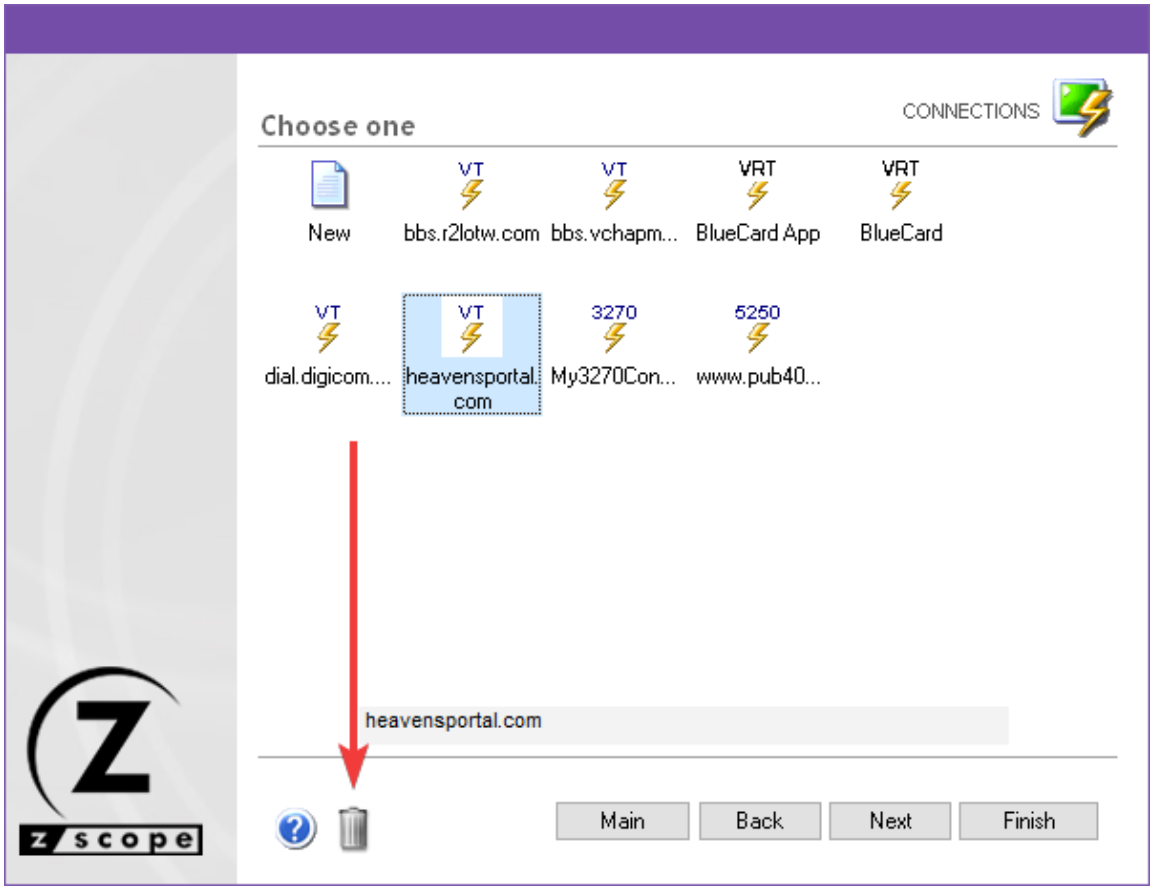
7.1.1.4 Deleting a Connection

To delete a connection, first select it and then click on the trash can icon. You can also drag and drop the connection you want to delete on the trash can icon.



Connection deletion is not undoable, which means that once you delete a particular connection, it will be permanently lost.

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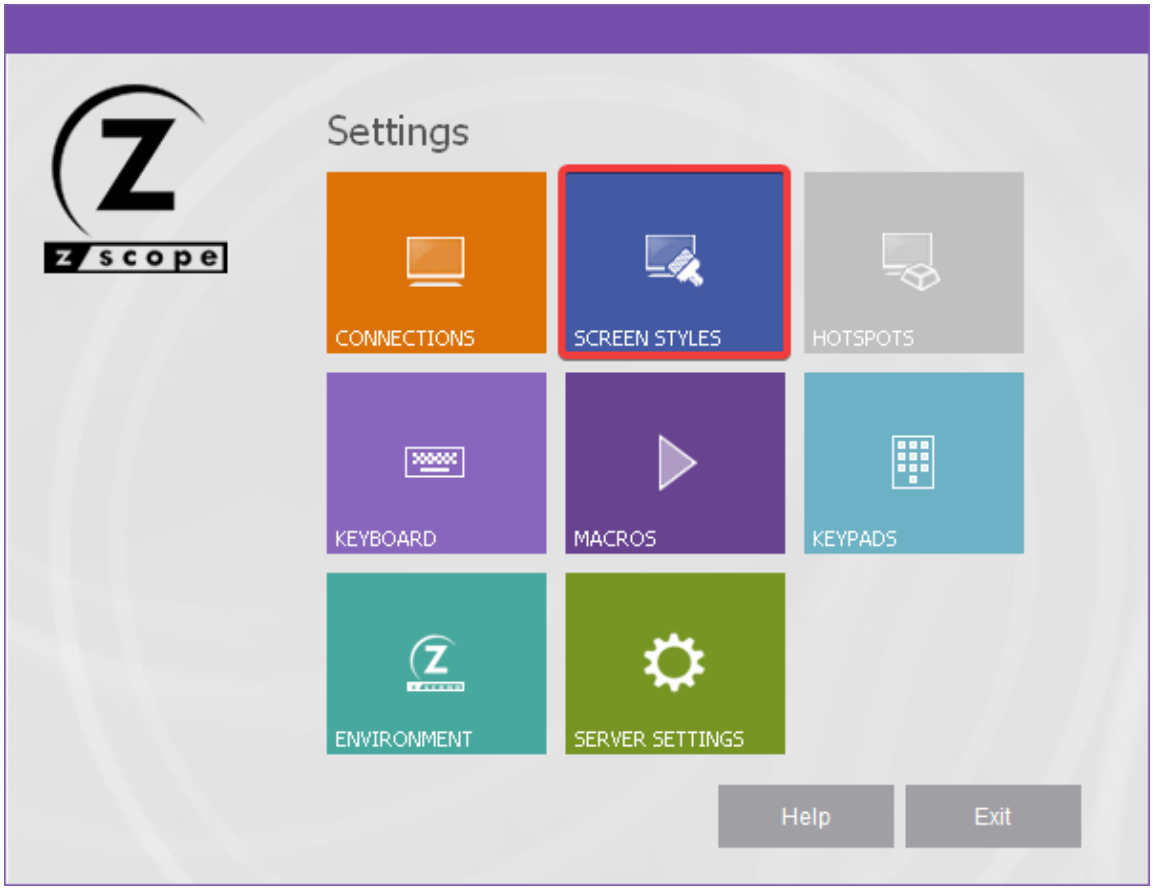
7.1.2 Screen Styles

Screen Styles are managed on the 'Configuration Manager' through the 'Screen Styles' icon.



Read More:

- Creating/Editing Screen Styles
- Deleting Screen Styles

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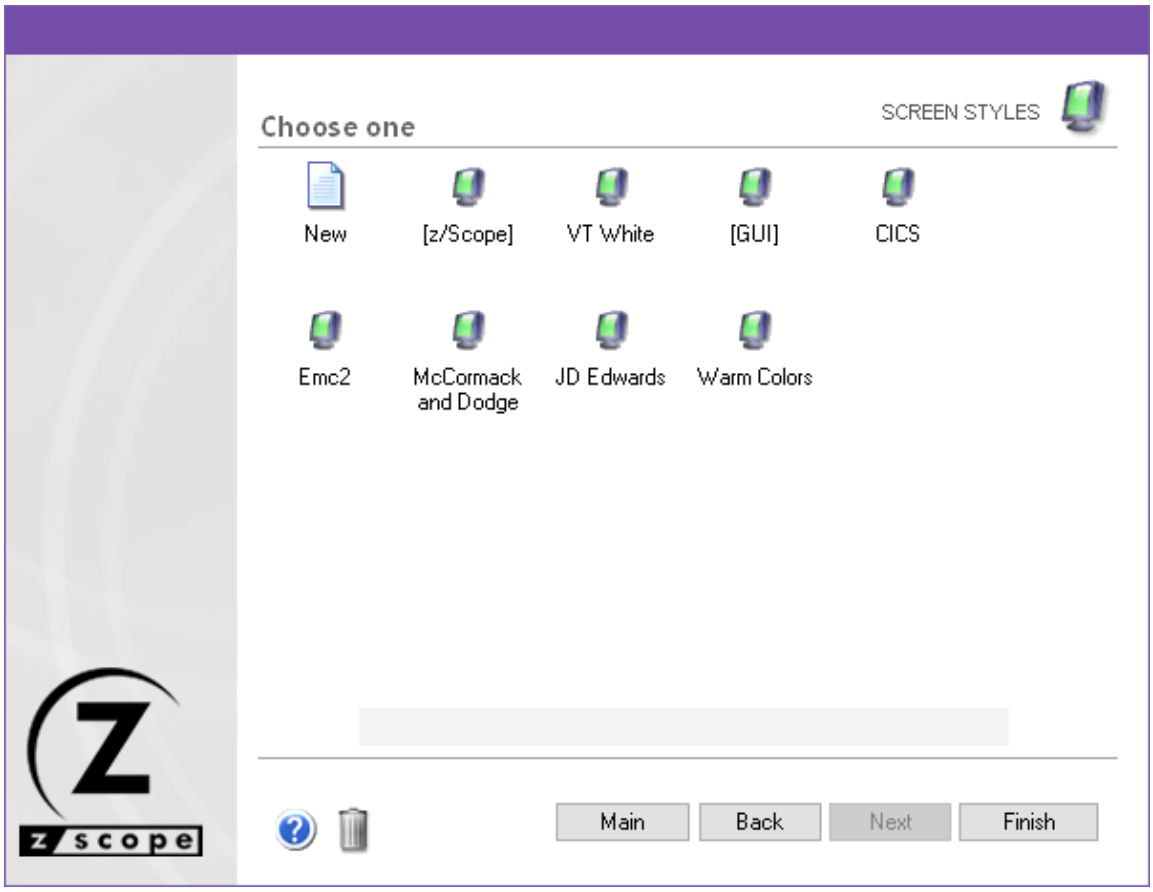
7.1.2.1 Creating/Editing Screen Styles

In the Screen Styles management dialog you will find a list of the existing Screen Styles. You will also find the 'New' icon which you can use to create a new Screen Style step by step.

If you want to modify the attributes of a previously created Screen Style, select it using the mouse and then click on 'Next', or just simply double-click on it.



After you click on 'Next', you will be presented with a dialog in which you will have access to all the attributes of the Screen Style you are creating or editing.

Read More:

- Configuration Manager - Screen Styles - General Settings
- Configuration Manager - Screen Styles - Cursor Settings
- Configuration Manager - Screen Styles - Field Options Settings
- Configuration Manager - Screen Styles - Color Mapping Settings
- Configuration Manager - Screen Styles - 5250 Attributes Settings
- Configuration Manager - Screen Styles - VT Defaults Settings

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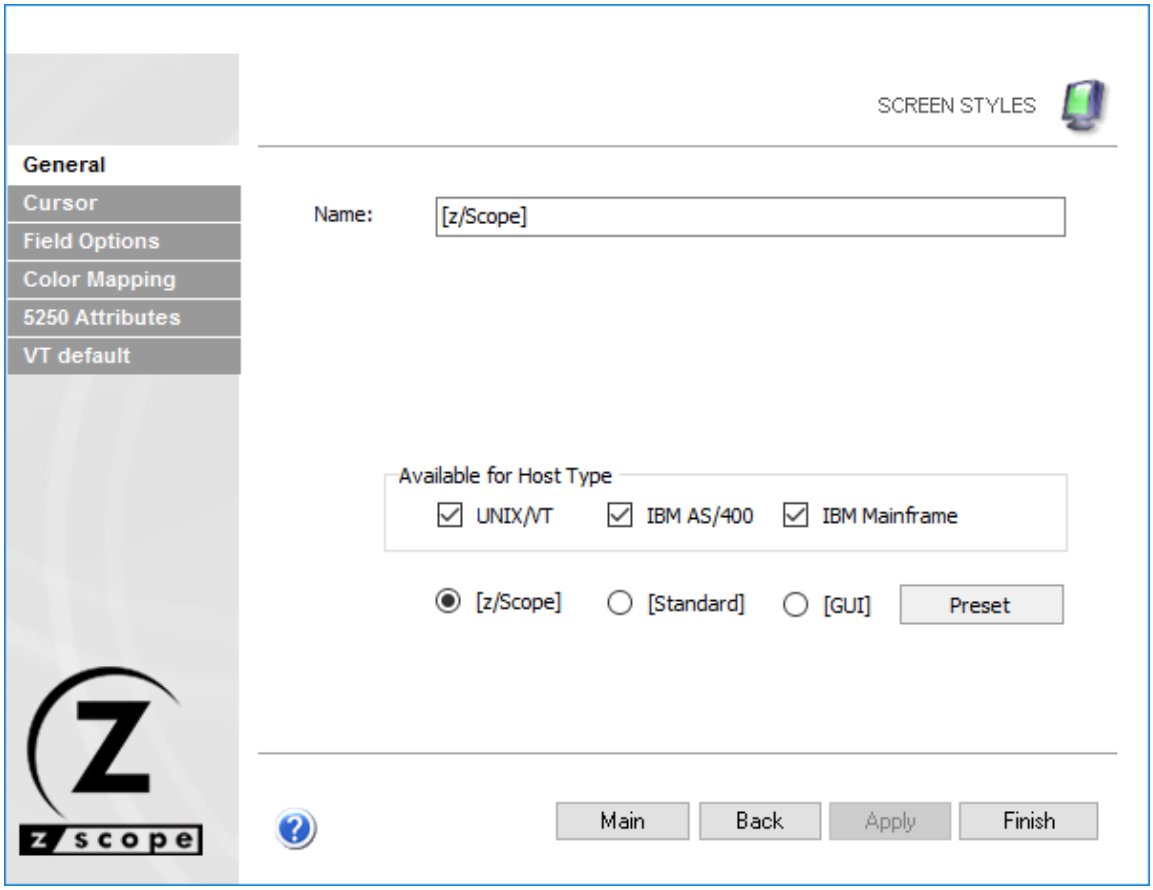
7.1.2.1.1 General

In the 'General' tab you will find the following parameters:



Name
In this field you must enter a name for the Screen Style.

Available for Host Type
Make your Screen Style available for different type of hosts by marking the options below.

Preset
Select a base Screen Style to inherit its attributes to the new Screen Style.

Read More:

- Configuration Manager - Screen Styles - Cursor Settings
- Configuration Manager - Screen Styles - Field Options Settings
- Configuration Manager - Screen Styles - Color Mapping Settings
- Configuration Manager - Screen Styles - 5250 Attributes Settings
- Configuration Manager - Screen Styles - VT Defaults Settings

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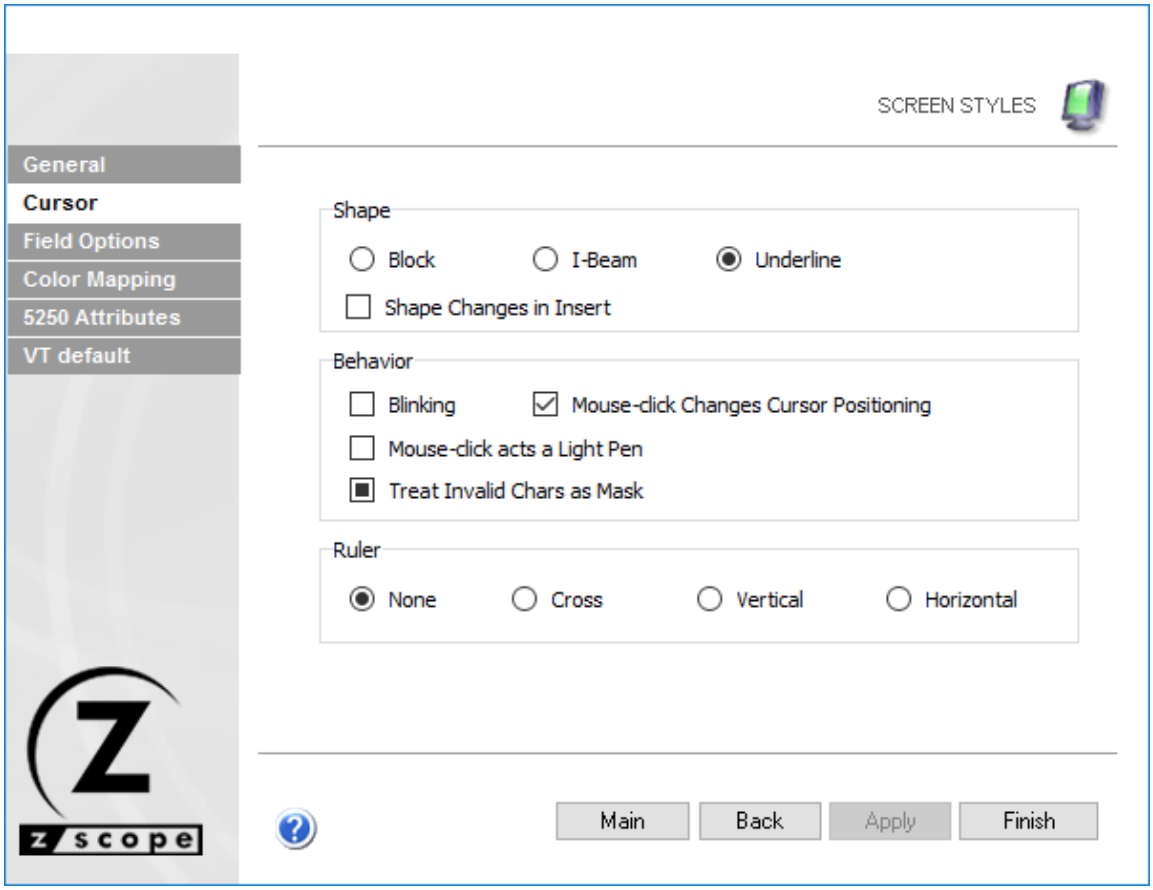
7.1.2.1.2 Cursor

In the 'Cursor' tab you will find the following parameters:



Shape
Choose between three different cursor shapes: *Block*, *I-Beam* or *Underline*.

Shape Changes in Insert
Have the cursor shape change when you are in insert mode. This is useful to remember if you are inserting or overwriting.

Behavior
Check the *Blinking* option to make the cursor blink.
Check the *Mouse-click changes cursor positioning* option if you want to be able to change the current cursor position on the screen using the mouse.
Check the *Mouse-click acts as a Light Pen* option to treat mouse-clicks as a Light Pen input.
Check the *Treat Invalid Chars as Mask* option to treat the invalid characters as a mask. In some screens, the host indicates characters that were invalid for the field type (such as an alphabetic character in a numeric field) and they cannot be edited or deleted. When the *Treat Invalid Chars as Mask* option is checked, those characters are treated as a mask and they don't produce this error. When it is unchecked, they are treated as

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errors (and can't be edited). When it's grayed, it means that the default value will apply.

Ruler
Specify if you want guidelines indicating the cursor's position on the screen. You can choose to display vertical, horizontal, or both (cross) guidelines. If you don't want to show guidelines, select the *None* option.

Read More:
- Configuration Manager - Screen Styles - General Settings
- Configuration Manager - Screen Styles - Field Options Settings
- Configuration Manager - Screen Styles - Color Mapping Settings
- Configuration Manager - Screen Styles - 5250 Attributes Settings
- Configuration Manager - Screen Styles - VT Defaults Settings

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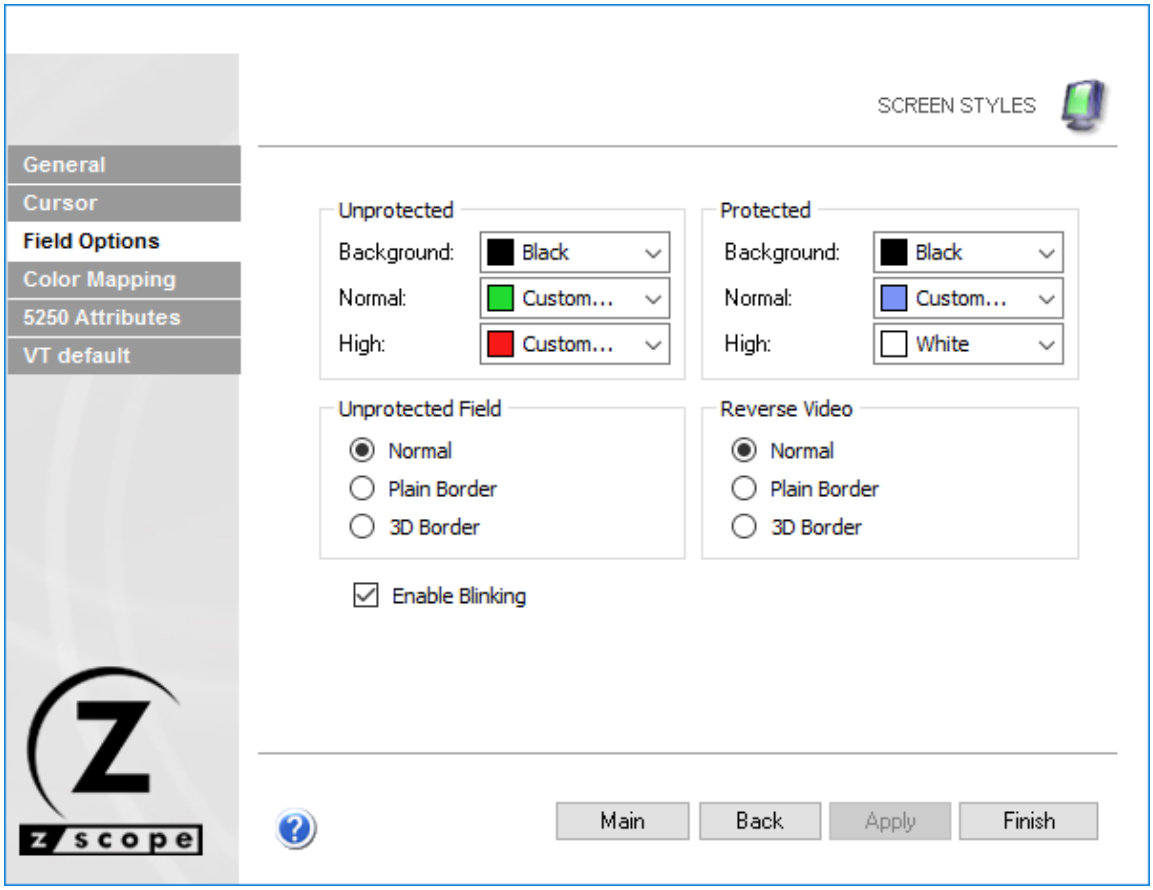
7.1.2.1.3 Field Options

In the 'Field Options' tab you will find the following parameters:



Unprotected
Allows to specify the background color and the foreground color for normal and high intensity unprotected fields.

Protected
Allows to specify the background color and the foreground color for normal and high intensity protected fields.

Unprotected Field
Sets normal, plain border or 3D style for unprotected (input) fields.

Reverse Video
Sets normal, plain border or 3D style for reverse video attribute in the display emulation.

Enable Blinking
Check this option if you want the cursor to blink when positioned in an input field.

Read More:

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- Configuration Manager - Screen Styles - General Settings
- Configuration Manager - Screen Styles - Cursor Settings
- Configuration Manager - Screen Styles - Color Mapping Settings
- Configuration Manager - Screen Styles - 5250 Attributes Settings
- Configuration Manager - Screen Styles - VT Defaults Settings

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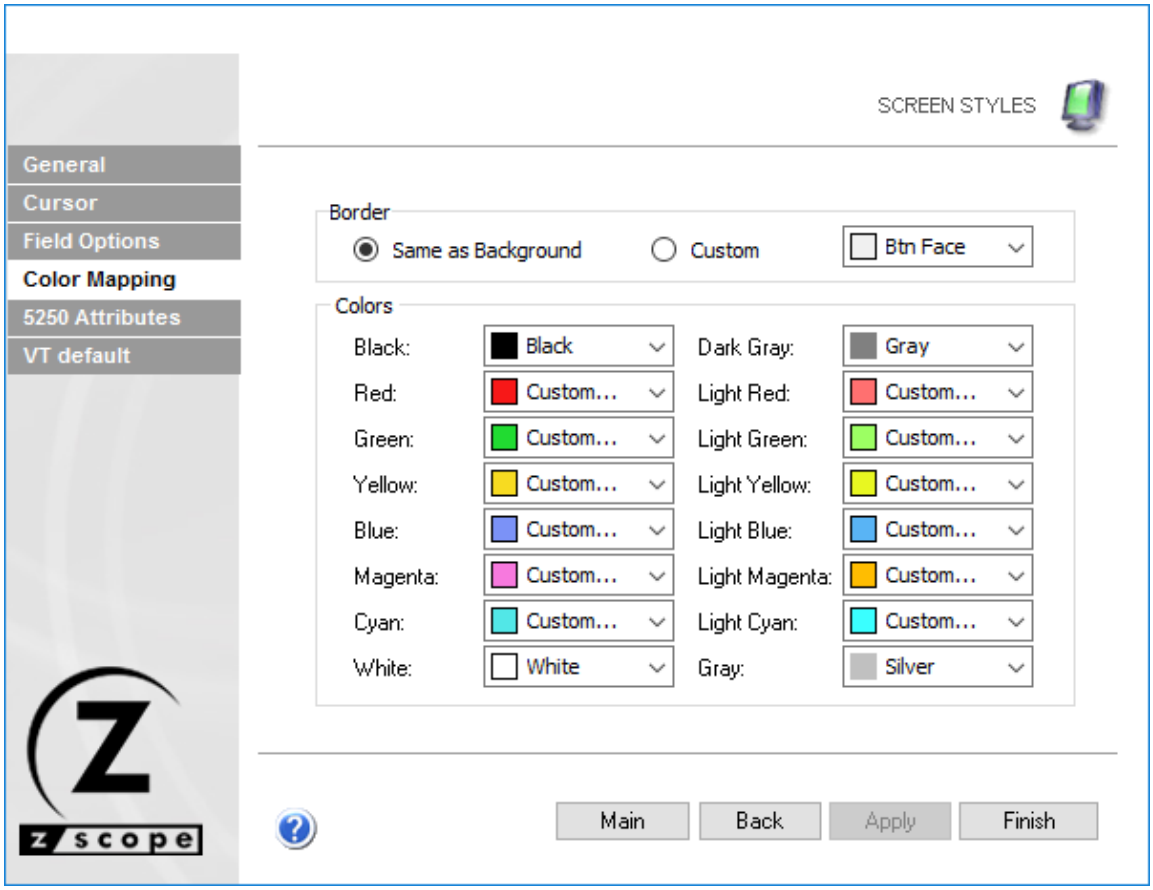
7.1.2.1.4 Color Mapping

In the 'Color Mapping' tab you will find the following parameters:



Border
Specifies whether the border color will match the background ('Same as Background') or will have the color specified in the following combobox ('Custom').

Colors
Allows to remap the colors used for 3270 and 5250 extended attributes and VT/ANSI emulation.

Read More:

- Configuration Manager - Screen Styles - General Settings
- Configuration Manager - Screen Styles - Cursor Settings
- Configuration Manager - Screen Styles - Field Options Settings
- Configuration Manager - Screen Styles - 5250 Attributes Settings
- Configuration Manager - Screen Styles - VT Defaults Settings

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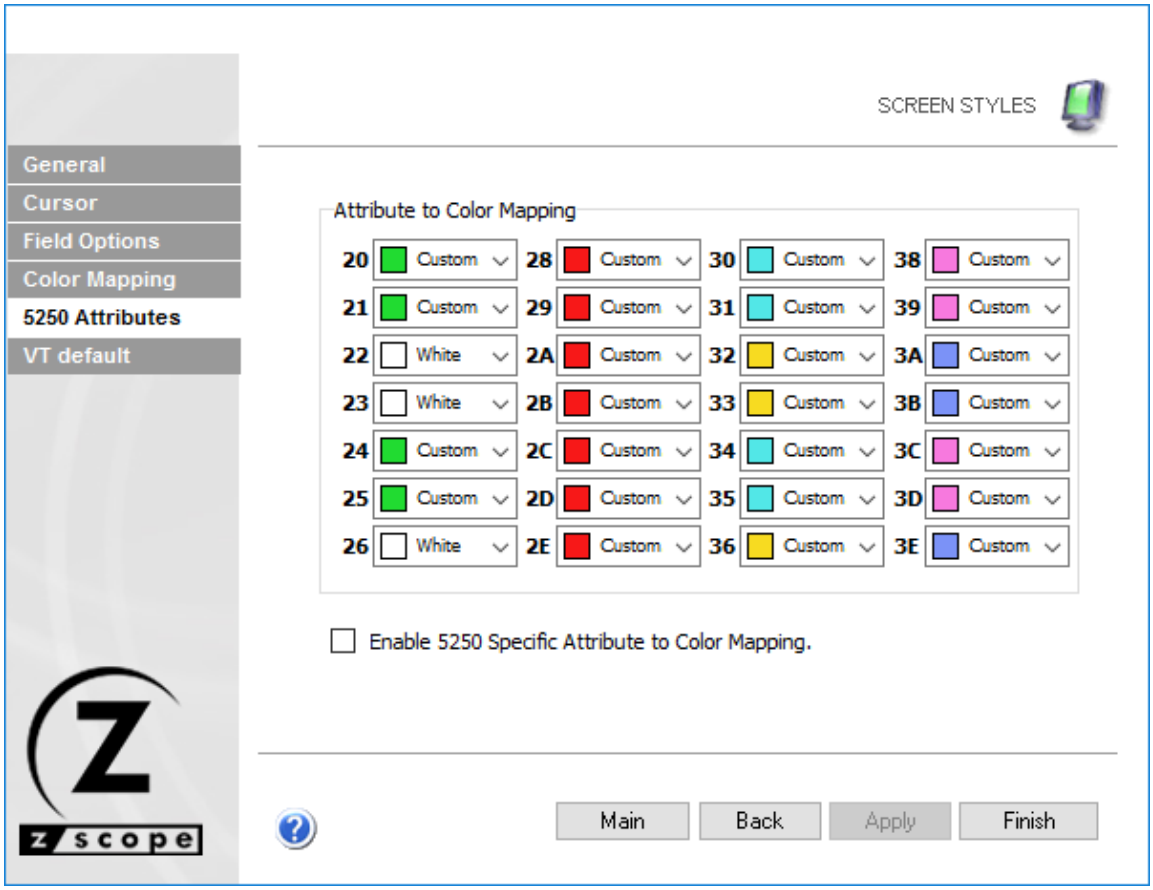
7.1.2.1.5 5250 Attributes

In the '5250 Attributes' tab you will find the following parameters:



Attribute to Color Mapping
Allows you to map 5250 protocol specific attributes to a color. In order to be able to change these settings, the *Enable 5250 specific attributes to color mapping* option must be checked.

Read More:

- Configuration Manager - Screen Styles - General Settings
- Configuration Manager - Screen Styles - Cursor Settings
- Configuration Manager - Screen Styles - Field Options Settings
- Configuration Manager - Screen Styles - Color Mapping Settings
- Configuration Manager - Screen Styles - VT Defaults Settings

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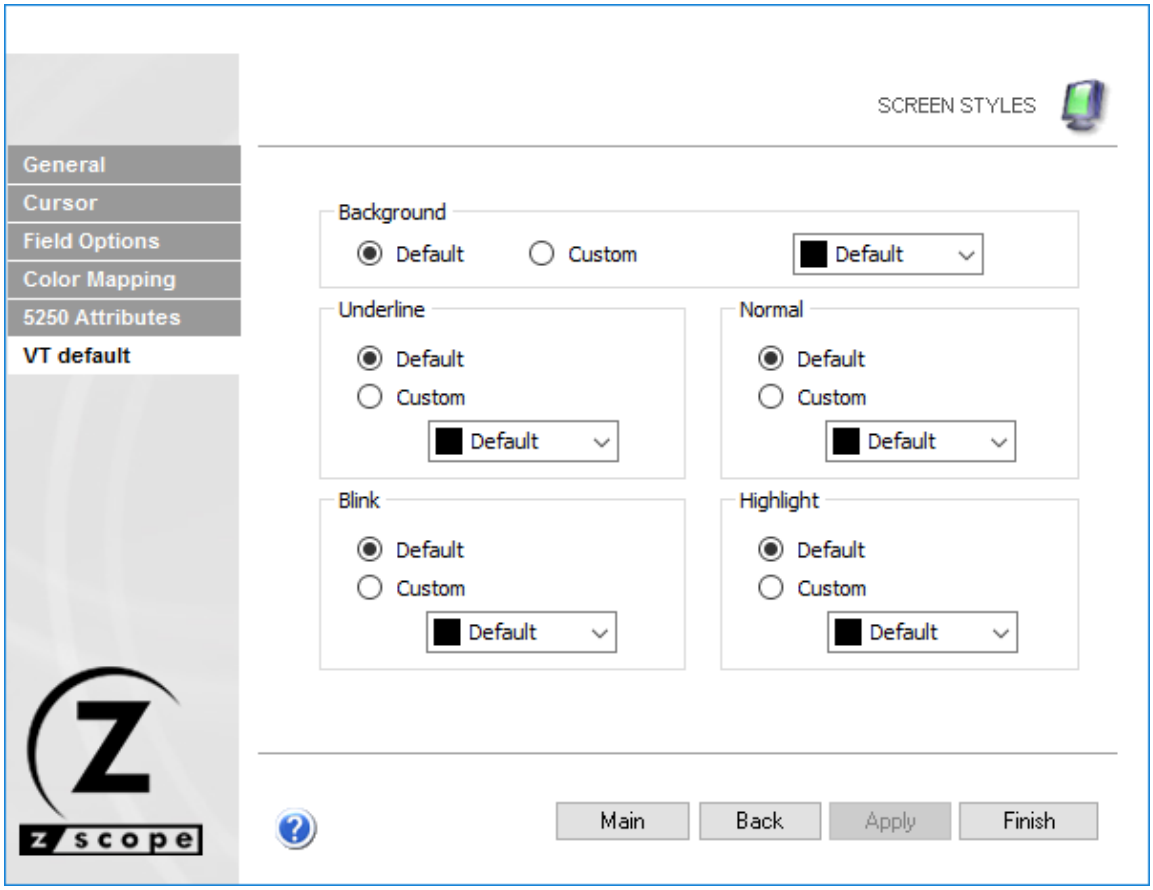
7.1.2.1.6 VT Defaults

In the 'VT Defaults' tab you will find the following parameters:



Background
Specifies the background color for VT terminal emulation. Default is black.

Underline
Specifies the foreground color assigned to underlined characters when no color attribute is specified by the VT host.

Normal
Specifies the foreground color assigned to low intensity characters when no color attribute is specified by the VT host.

Blink
Specifies the foreground color assigned to blinking characters when no color attribute is specified by the VT host.

Higlight
Specifies the foreground color assigned to high intensity characters when no color attribute is specified by the VT host.

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Read More:

- Configuration Manager - Screen Styles - General Settings
- Configuration Manager - Screen Styles - Cursor Settings
- Configuration Manager - Screen Styles - Field Options Settings
- Configuration Manager - Screen Styles - Color Mapping Settings
- Configuration Manager - Screen Styles - 5250 Attributes Settings

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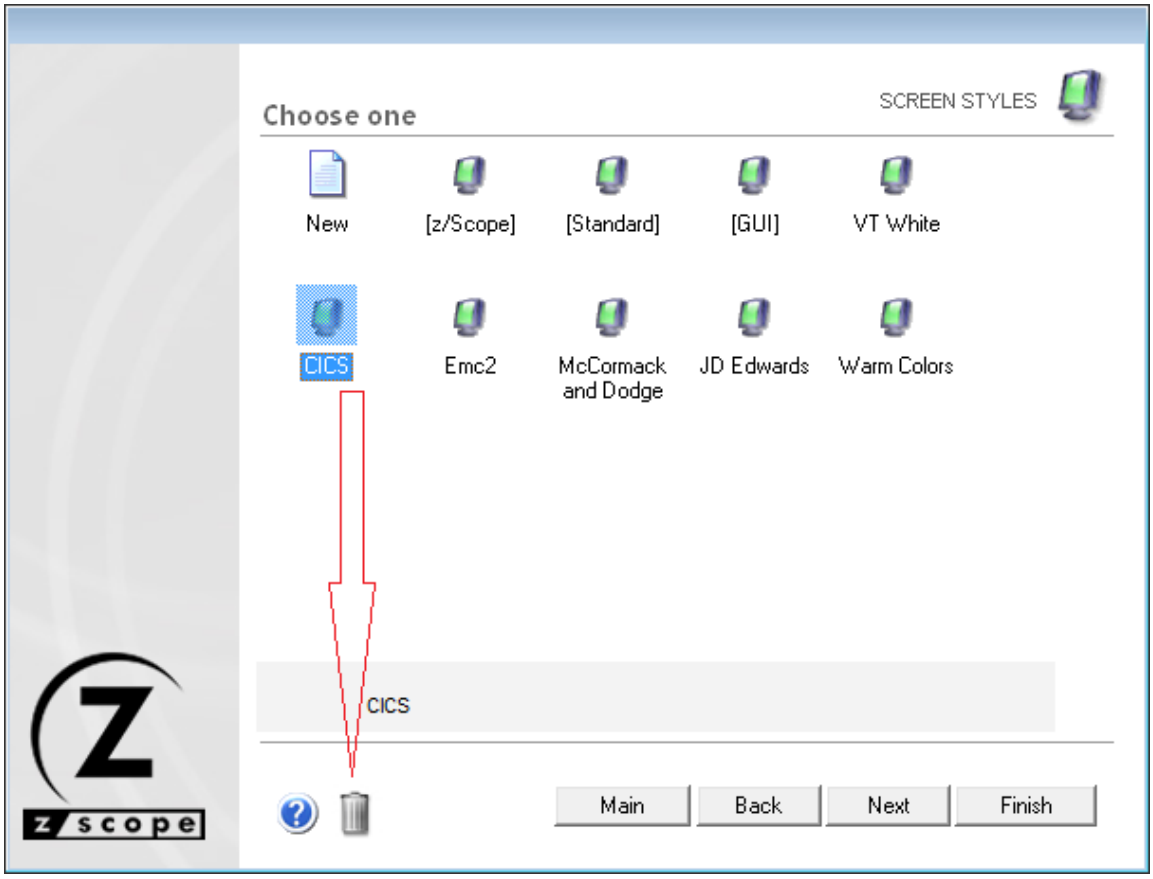
7.1.2.2 Deleting Screen Styles

To delete a Screen Style, first select it and then click on the trash can icon. You can also drag and drop the Screen Style you want to delete on the trash can icon.



Screen Styles deletion is not undoable, which means that once you delete a particular Screen Style, it will be permanently lost.

Read More:

- Creating and Editing Screen Styles

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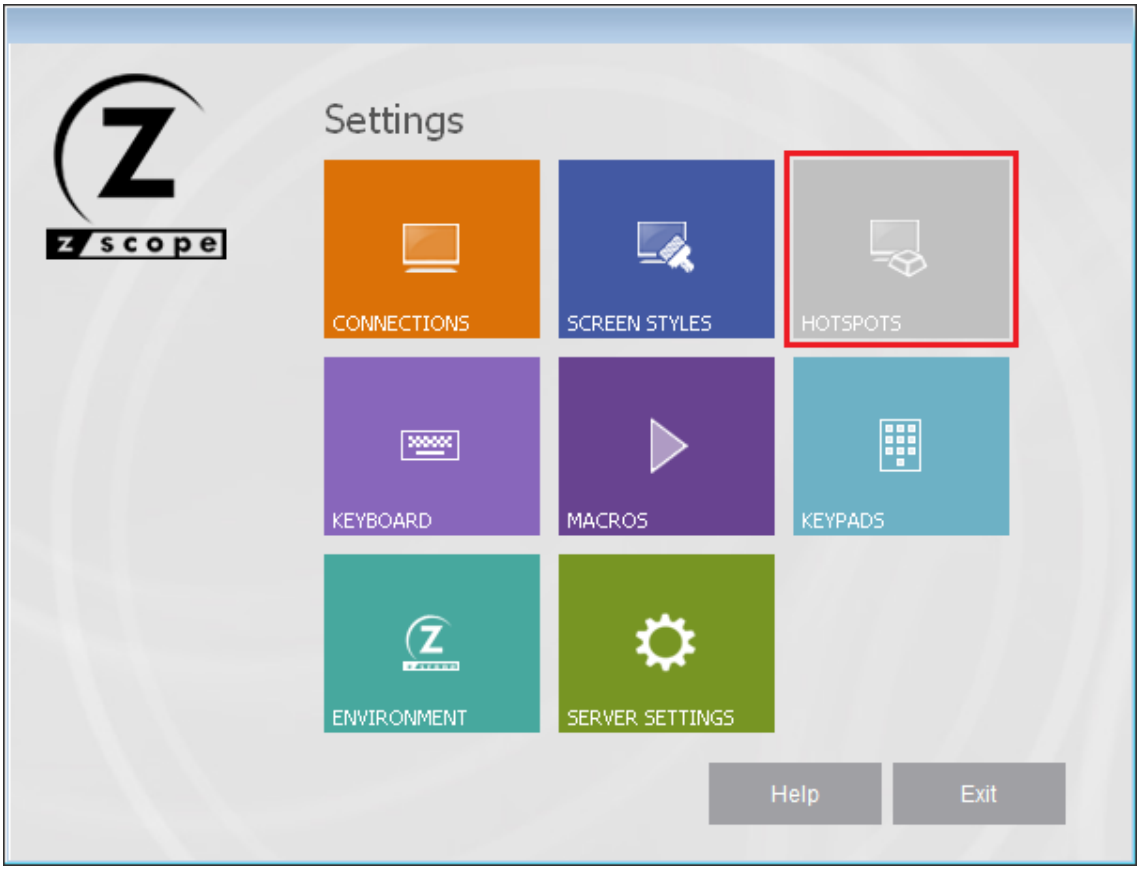
7.1.3 HotSpots

HotSpots are managed on the 'Configuration Manager' through the 'Screen Styles' icon.



Read More:

- Creating/Editing a HotSpot
- Deleting a HotSpot

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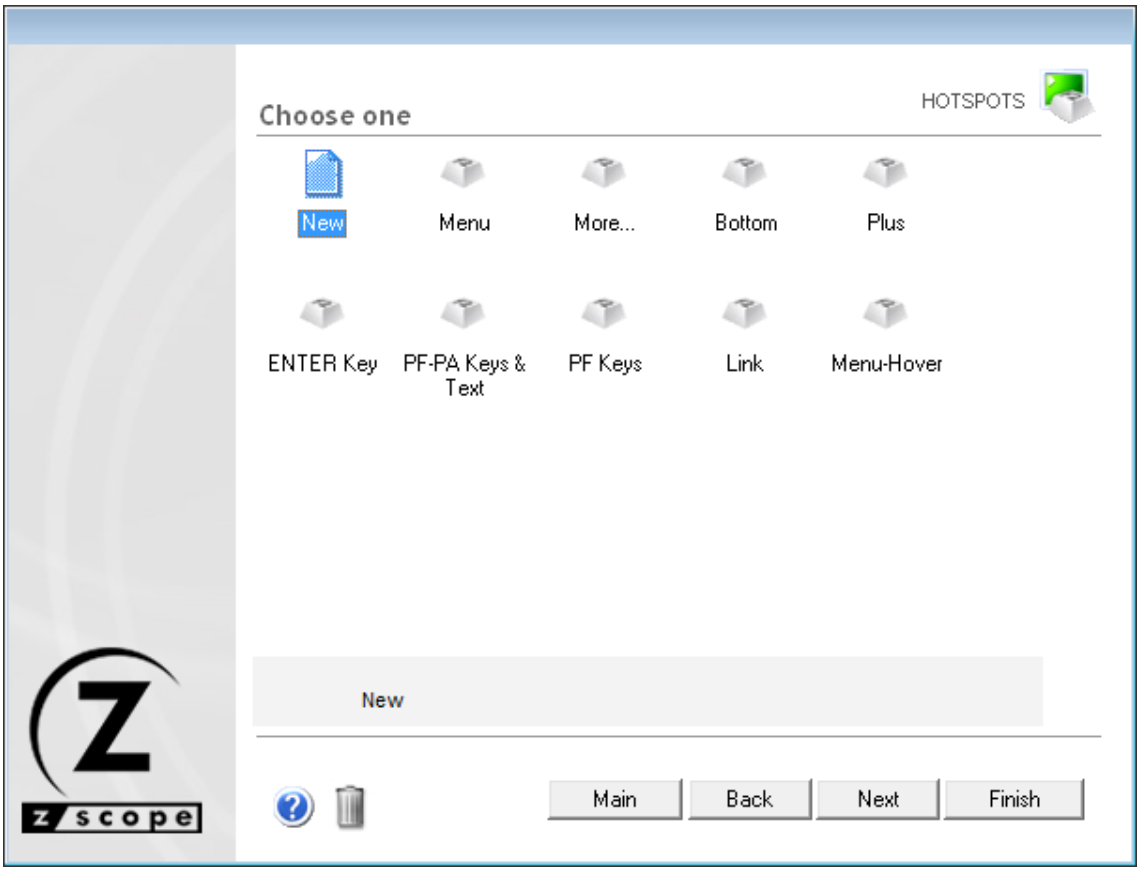
7.1.3.1 Creating/Editing a HotSpot

In the HotSpots management dialog you will find a list of the existing Hotspots. You will also find the 'New' icon, which you can use to create a new HotSpot.

If you want to modify the attributes of a previously created HotSpot, select it using the mouse and then click on 'Next', or just simply double-click on it.



After you click on 'Next', you will be presented with a dialog in which you will have access to all the attributes of the HotSpot you are creating or editing.

Read More:

- Configuration Manager - HotSpots - General Settings
- Configuration Manager - HotSpots - Rules Settings
- Configuration Manager - HotSpots - Style Settings

> In order to be able to use your Hotspot within a Connection, you must first enable the Hotspot for that particular connection from the Connections Settings dialog.

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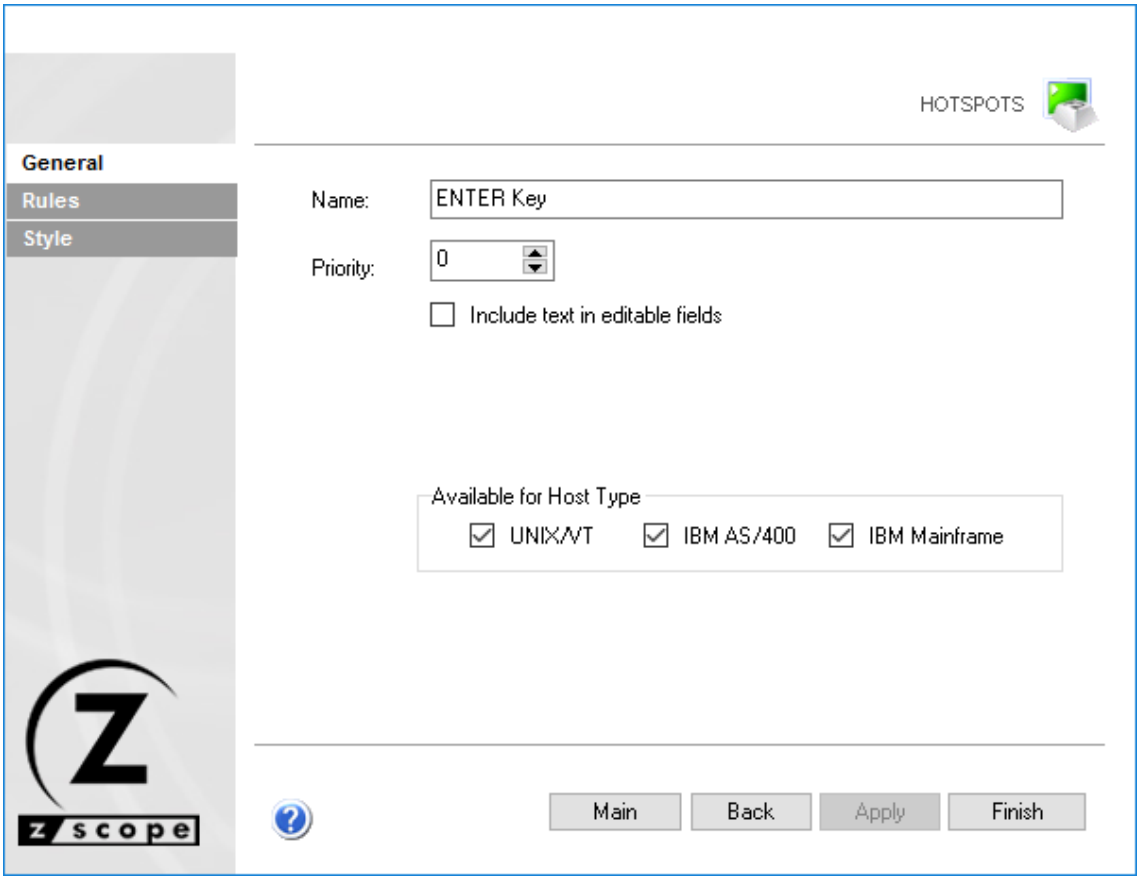
7.1.3.1.1 General

In the 'General' tab you will find the following parameters:



Name
In this field you must enter a name for your Hotspot.

Priority
Select the priority for this hotspot. This setting will help z/Scope Anywhere prioritize in situations where the same text is configured to become more than one hotspot.

Include text in editable fields
Select this option if you would like the Hotspot to be formed over text written in the host's editable fields.

Available for Host Type
Make your Screen Style available for different type of hosts by marking the options below.

Read More:
- HotSpots - Rules Settings
- HotSpots - Style Settings

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- Deleting a HotSpot

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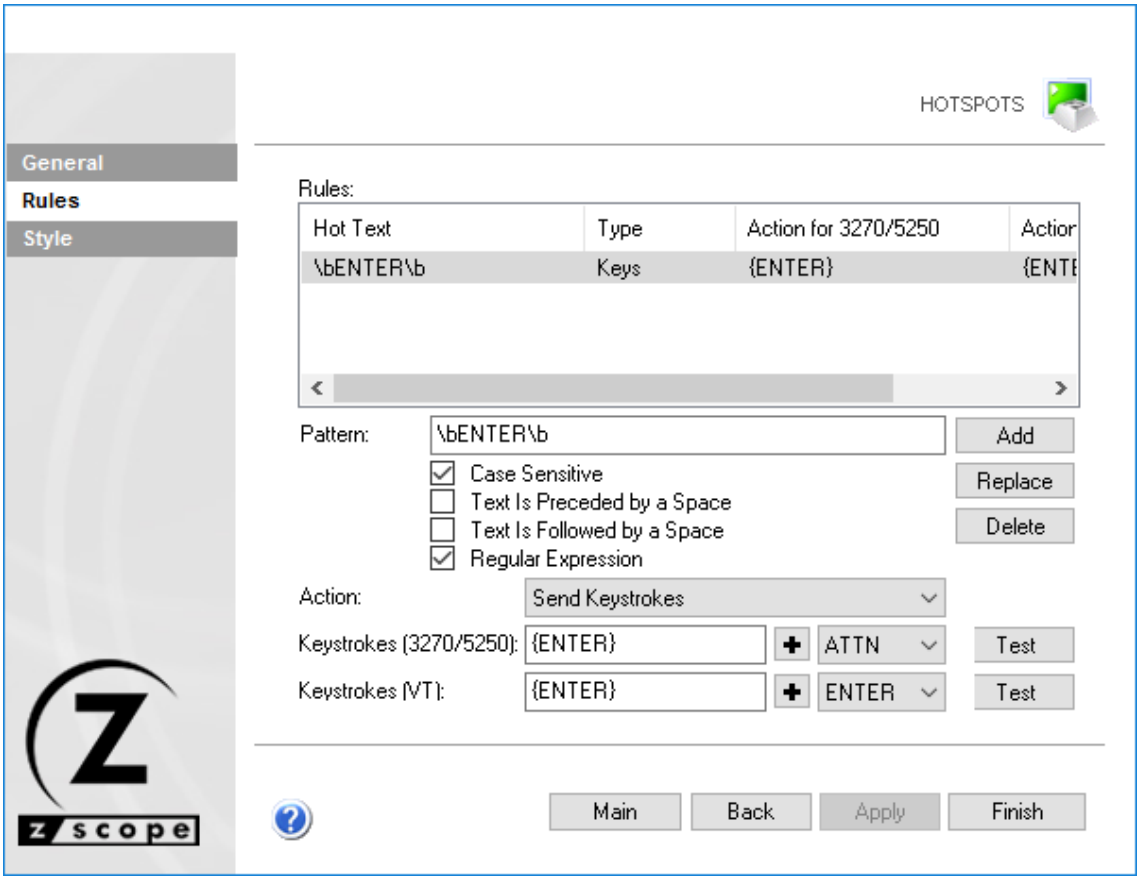
7.1.3.1.2 Rules

In the 'Rules' tab you will find the following parameters:



Rules grid
This grid contains the currently defined rules for the selected HotSpot.

Pattern
In this field you must type a rule in the form of a Regular Expression to match the screen string you want to turn into a HotSpot. If you are not familiar with Regular Expressions, see Appendix B.

Case sensitive
Check this option if you want to consider the case when matching the Hot text.

Text is followed/preceded by a space
Check this options to specify that the pattern will be matched only if preceded and/or followed by a blank character.

Regular Expression
Check this option to enable regular expressions in the Pattern field.

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Action
This field specifies the action to be performed by the HotSpot when it is clicked by the user. Available options are:

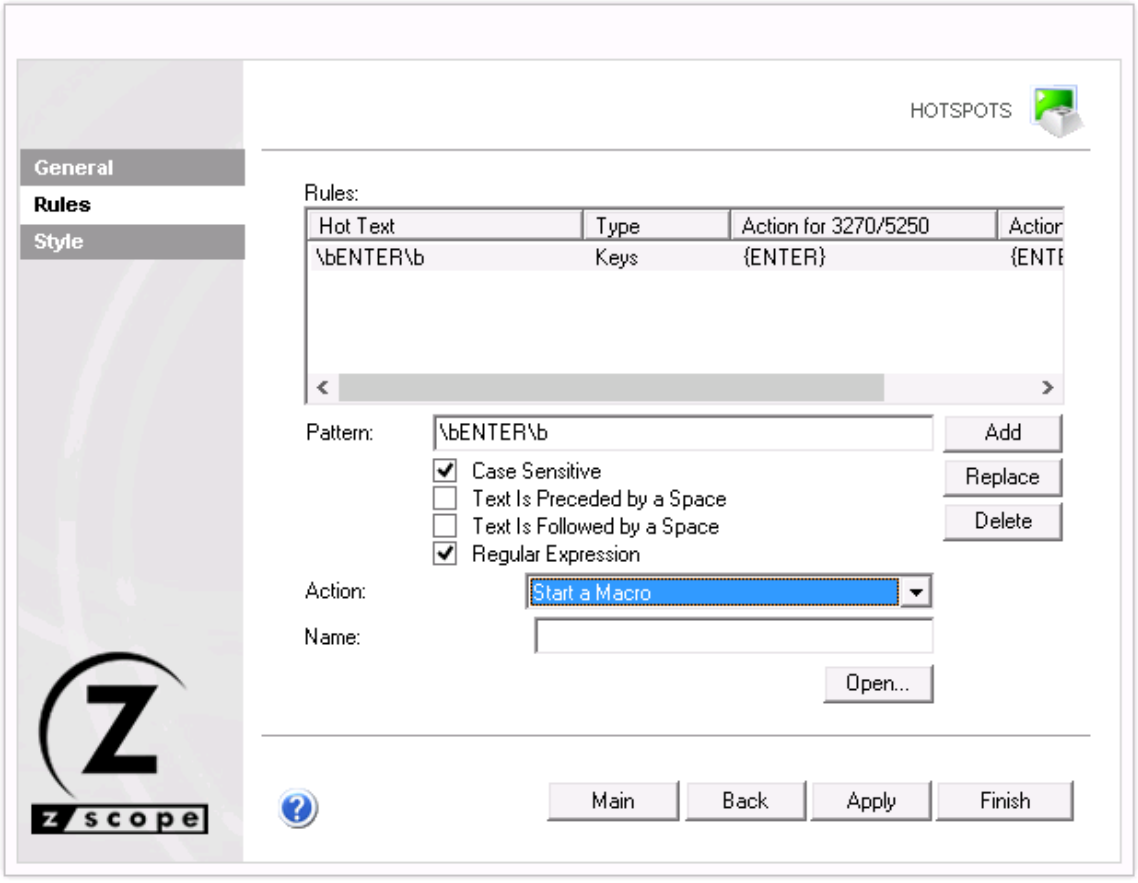
- Send keystrokes: Select this option if you want to specify keystrokes to be sent in response to the HotSpot activation.
- Start a Macro: Select this option if you want to specify a Macro to be started in response to the HotSpot activation.

Keystrokes
In this field you can type the text that you want to be sent as keystrokes. You can also specify keys to be pressed; just select a key from the list and press the '+' button.

Note that keys must be enclosed in brackets (ie. {ENTER}).

This option is only available if the 'Send keystrokes' option was selected in the 'Action' field.

This is what the 'Rules' tab looks like when you select the 'start a macro' option:



Name
In this field you can type the name of a Macro to be started in response to the HotSpot activation. You can use the 'Open' button to select a macro from the

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configuration directory.

This option is only available if the 'Start a macro' option was selected in the 'Action' field.

- To add a new Rule to the grid, follow these steps:

1. In the 'Pattern' field, enter a Regular Expression to match the string you want to turn into a HotSpot, along with the adequate case and blank options.
2. Select the action to be performed by the HotSpot when it is clicked by the user. Either choose the 'Send Keystrokes' or the 'Start a macro' option.
3. Type the keystrokes or the name of a macro according to the action selected before.

To add a key, select it from the key list and press the 'Add' button next to it. Keys can also be entered manually by enclosing them in brackets (ie. {ENTER}).

4. Click on the 'Add' button.

The new Rule you defined will now appear in the Rules grid.

- To modify an already defined Rule, do the following:

1. Select the Rule you want to modify from the Rules grid.
2. Modify the already defined 'Pattern' and 'Action' parameters as desired.
3. Click on the 'Replace' button to apply the changes to the Rule.

- To delete a Rule from the Rules grid, proceed this way:

1. Select the Rule that you want to delete from the Rules grid.
2. Click on the 'Delete' button.

The Rule you selected will be removed from the Rules grid.

- To test the results of a simulated screen text string, follow this steps:

1. Click on the 'Test' button. The 'Test HotSpot Rule' dialog will be displayed.

2. In the 'Text string' field, type the screen text simulation to be evaluated.

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3. Click on the 'Test' Button. If the string you typed matches the current rule specified for the HotSpot, a message informing the action to be performed in response to the HotSpot activation will be displayed.
4. Click on the 'Exit' button to close this dialog and return to the 'Rules' tab.

This option is only available if the 'Send Keystrokes' option was selected in the 'Action' field.

Read More:

- Appendix B - Regular Expressions
- HotSpots - General Settings
- HotSpots - Style Settings
- Deleting a HotSpot

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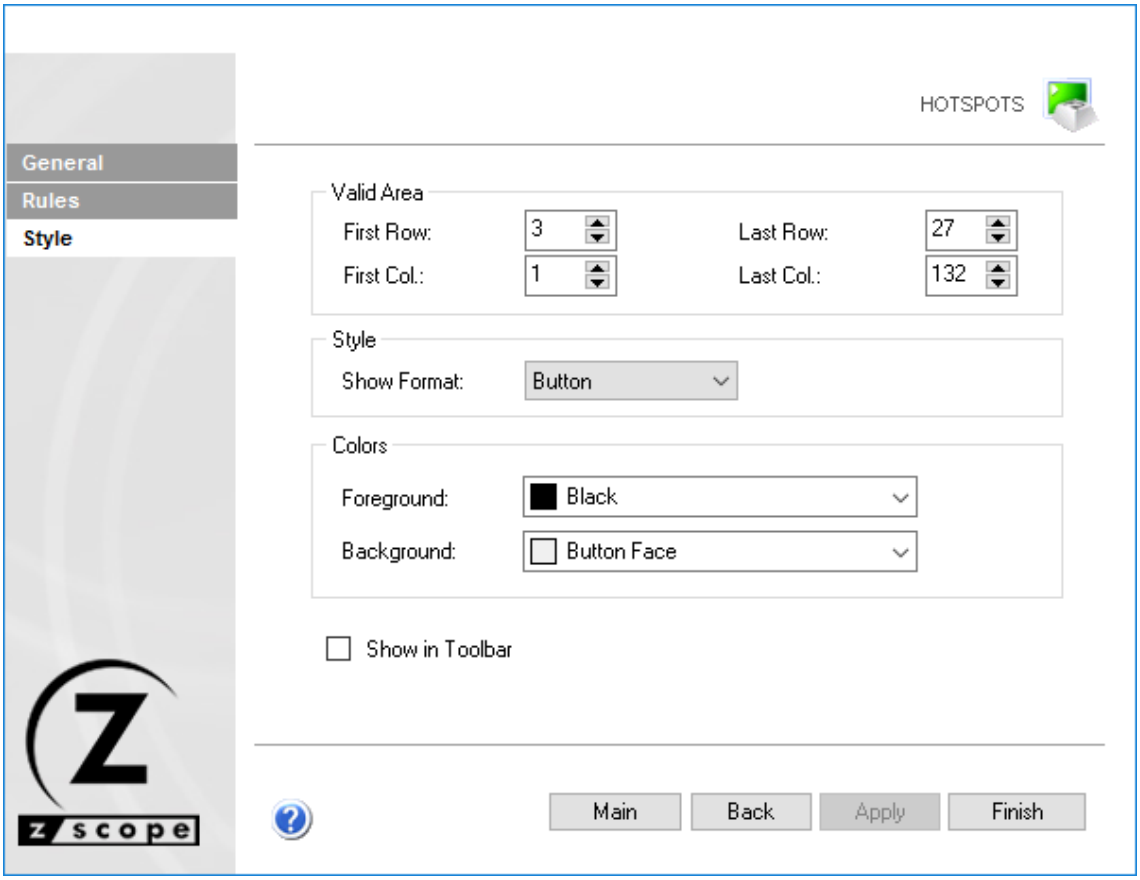
7.1.3.1.3 Style

In the 'Style' tab you will find the following parameters:



Valid Area
Specify the screen coordinates for the area that you want the HotSpot to work in.

Style
Choose among several display formats for the HotSpot from the drop-down list:

- None: The target string is left unaltered.
- Plain: The target string is replaced with a labeled plain button.
- Link: The target string is underlined web-link style.
- Button: The target string is replaced with a labeled 3D button.
- Hover: This works similarly to the 'Link' format, only that the target string is only underlined when the mouse pointer is dragged over it.

Colors
Choose a foreground an a background color for the HotSpot.

Show in Toolbar
Check this option if you want HotSpots to appear in a dynamic toolbar in the Emulation Display. See Using HotSpots.

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Read More:

- HotSpots - General Settings
- HotSpots - Rules Settings
- Deleting a HotSpot

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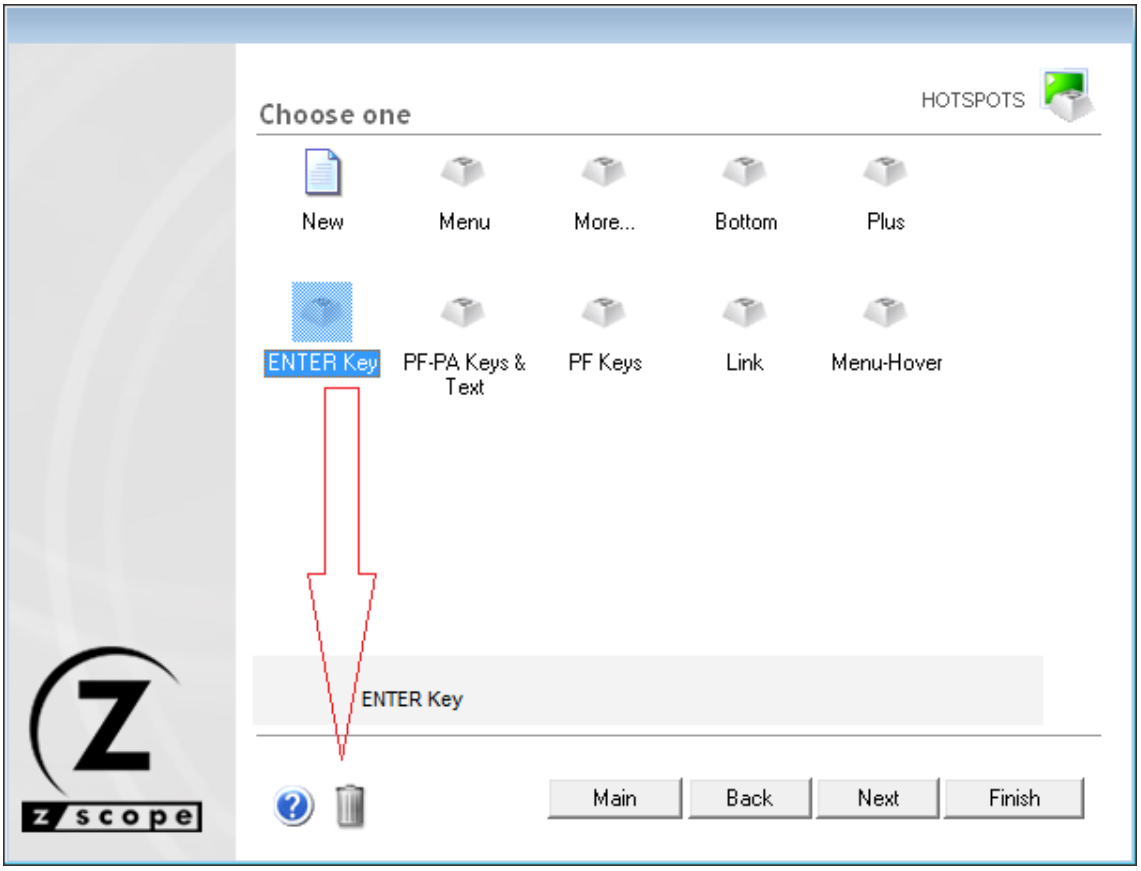
7.1.3.2 Deleting a HotSpot

To delete a Hotspot, first select it and then click on the trash can icon. You can also drag and drop the Hotspot you want to delete on the trash can icon.



Hotspot deletion is not undoable, which means that once you delete a particular Hotspot, it will be permanently lost.

Read More:

- Creating and Editing a HotSpot

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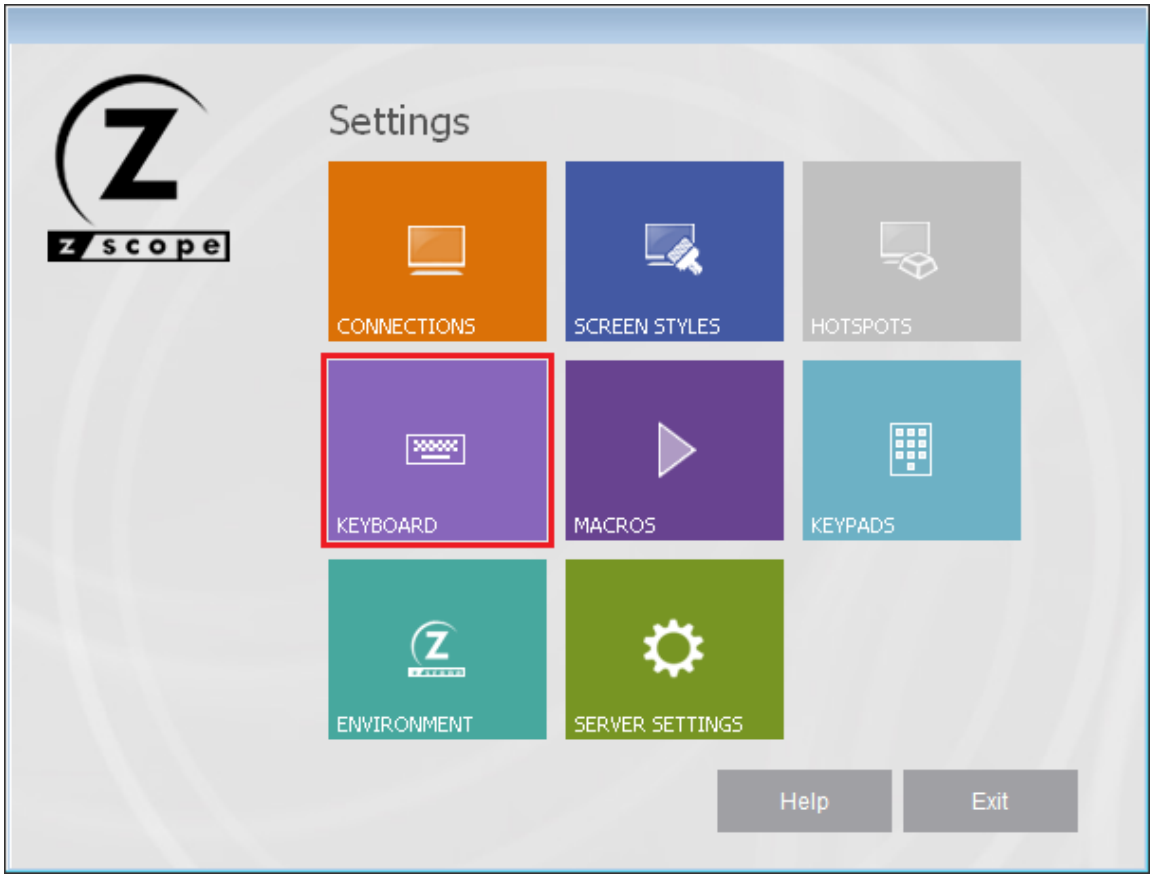
7.1.4 Keyboard

Keyboards are managed on the 'Configuration Manager' through the 'Keyboard' icon.



Read More:

- Configuration Manager - Keyboard - Base Settings
- Configuration Manager - Keyboard - Host Settings
- Configuration Manager - Keyboard - Edition Settings
- Configuration Manager - Keyboard - Char Settings
- Configuration Manager - Keyboard - Custom Settings
- Configuration Manager - Keyboard - Keyboards Settings

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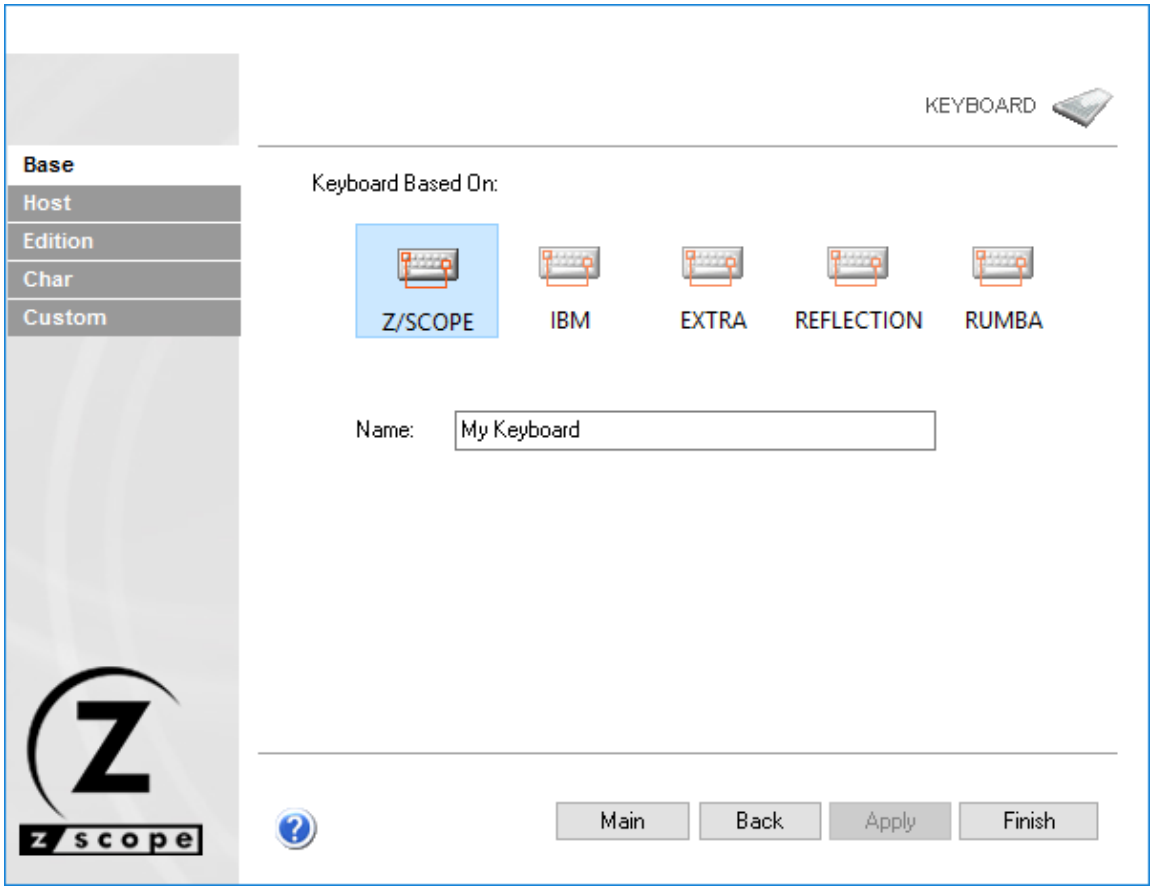
7.1.4.1 Base

In the 'Base' tab you will find the following parameters:



Keyboard Based On
Select the keyboard layout that best matches the one you have.

To select the most appropriate default keyboard, visit the following sections:

- z/Scope Keyboard Map
- IBM Keyboard Map
- EXTRA Keyboard Map
- IRMA Keyboard Map
- RUMBA Keyboard Map

Name
Choose a name for your keyboard.

Read More:
- Configuration Manager - Keyboard - Host Settings

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- Configuration Manager - Keyboard - Edition Settings
- Configuration Manager - Keyboard - Char Settings
- Configuration Manager - Keyboard - Custom Settings

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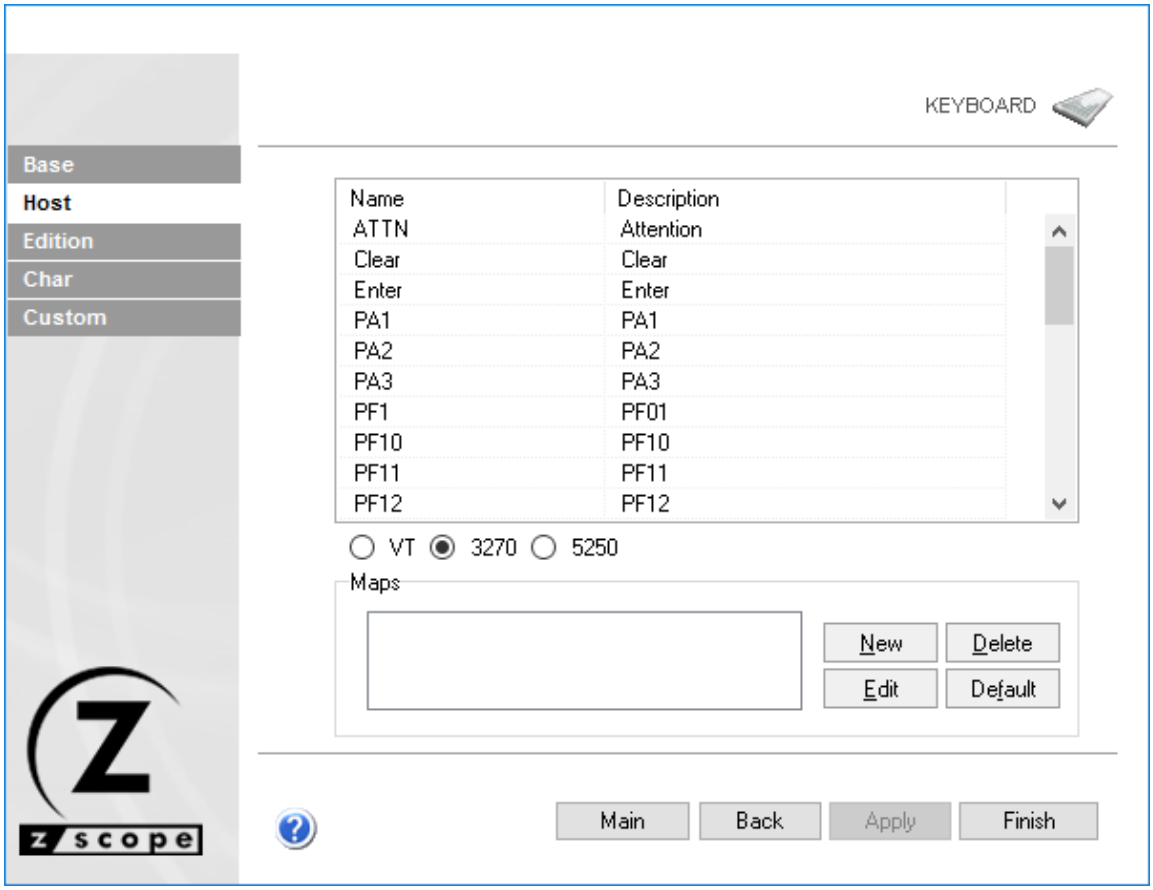
7.1.4.2 Host

In the 'Host' tab you will find the following parameters:



Grid
The grid contains a list of all host functions available for mapping. Those that appear in red mean their default mapping has been modified.

Maps
This list contains all keys mapped to the selected function. To map a new key to the selected function, click on the 'New' button to display the on-screen keyboard where you can easily choose a key combination.

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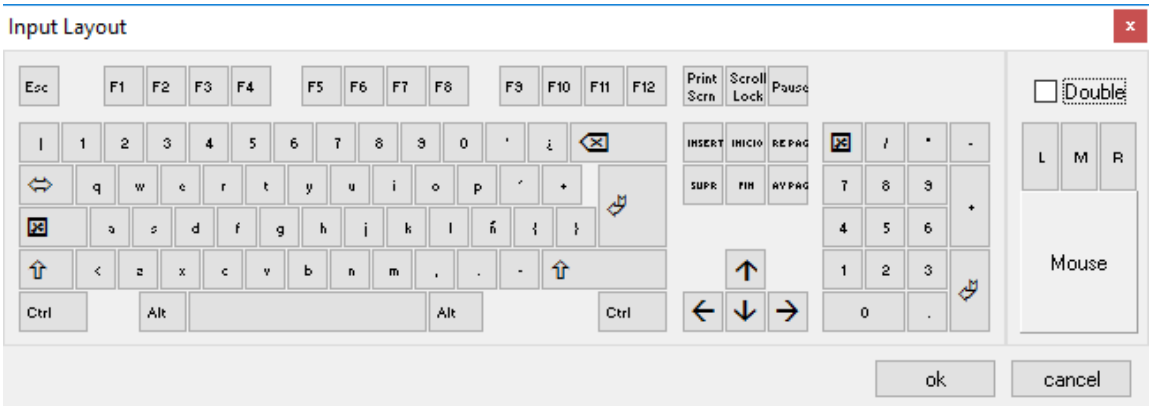

Click 'Ok' when done. The selected key/s will be added to the list.

If you want to change previously assigned keys, select the key you want to modify from the list and then click on the 'Edit' button. Use the on-screen keyboard to select a new key and then click 'Ok'.

To delete previously mapped keys, select a key from the list and then click on the 'Delete' Button.

To restore the default mapping for the selected function, click on the 'Default' button.

3270/5250/VT filter
You can specify different maps for each host type.

Read More:

- Configuration Manager - Keyboard - Base Settings
- Configuration Manager - Keyboard - Edition Settings
- Configuration Manager - Keyboard - Char Settings
- Configuration Manager - Keyboard - Custom Settings

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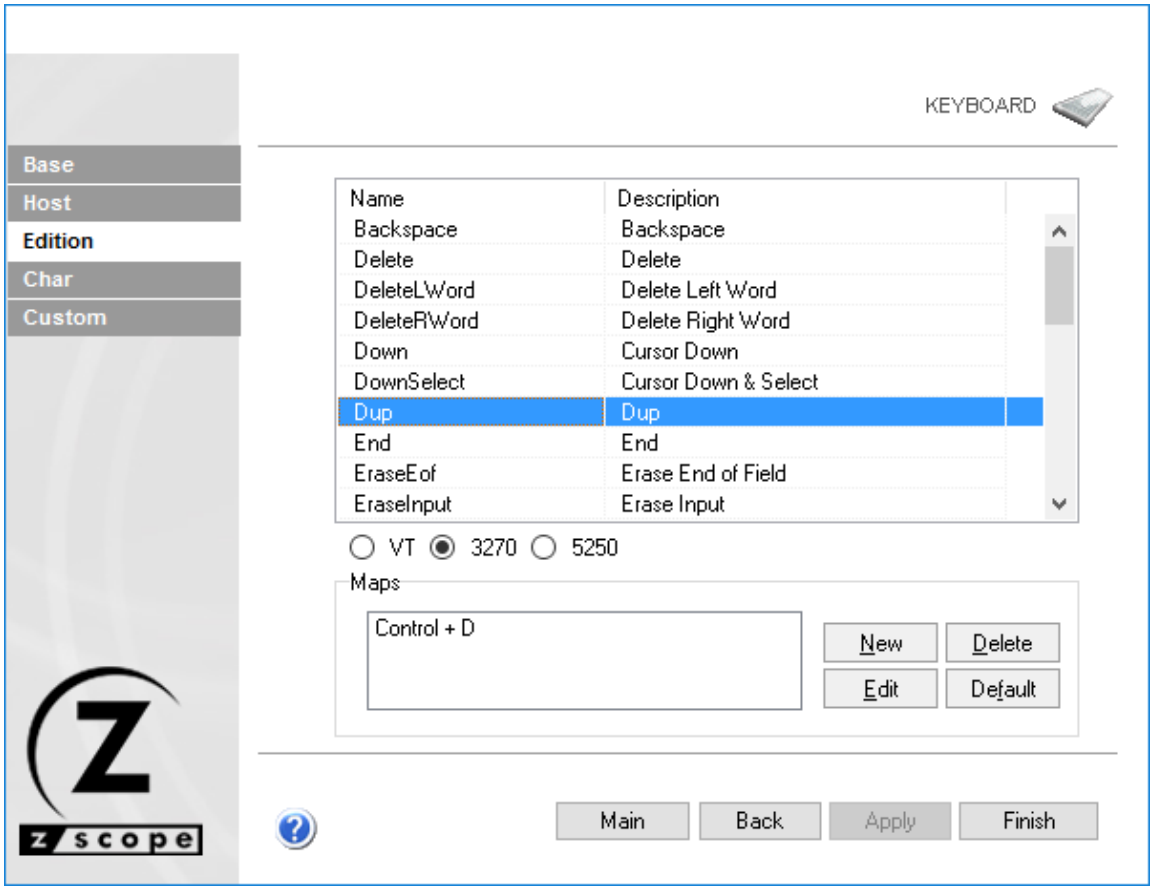
7.1.4.3 Edition

In the 'Edition' tab you will find the following parameters:



Grid
The grid contains a list of all edition functions available for mapping. Those that appear in red mean their default mapping has been modified.

Maps
This list contains all keys mapped to the selected function. To map a new key to the selected function, click on the 'New' button to display the on-screen keyboard where you can easily choose a key combination.

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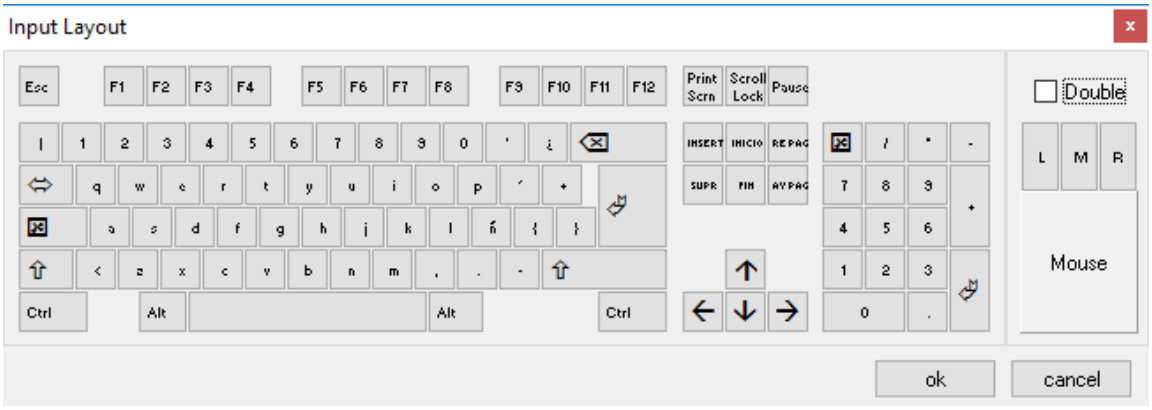

Click 'Ok' when you're done. The selected key/s will be added to the list.

If you want to change previously assigned keys, select the key you want to modify from the list and then click on the 'Edit' button. Use the on-screen keyboard to select a new key and then click 'Ok'.

To delete previously mapped keys, select a key from the list and then click on the 'Delete' Button.

To restore the default mapping for the selected function, click on the 'Default' button.

3270/5250/VT filter
You can specify different maps for each host type.

Read More:

- Configuration Manager - Keyboard - Base Settings
- Configuration Manager - Keyboard - Host Settings
- Configuration Manager - Keyboard - Char Settings
- Configuration Manager - Keyboard - Custom Settings
- Configuration Manager - Default Keyboard Mapping

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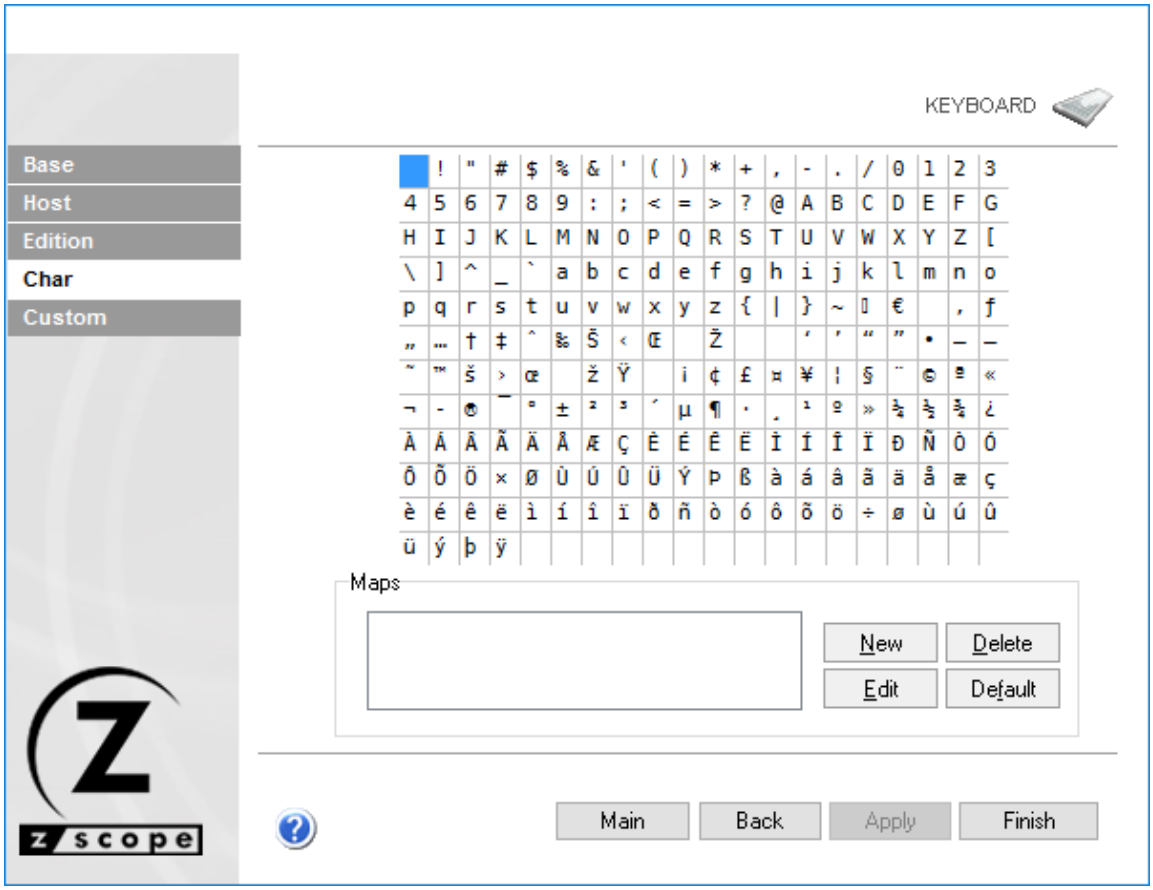
7.1.4.4 Char

In the 'Char' tab you will find the following parameters:



Character Grid
This is the entire character set. Choose the character you want to re-map.

Maps
This list contains all keys mapped to the selected character. To map a new key to the selected character, click on the 'New' button to display the on-screen keyboard where you can easily choose a key combination.

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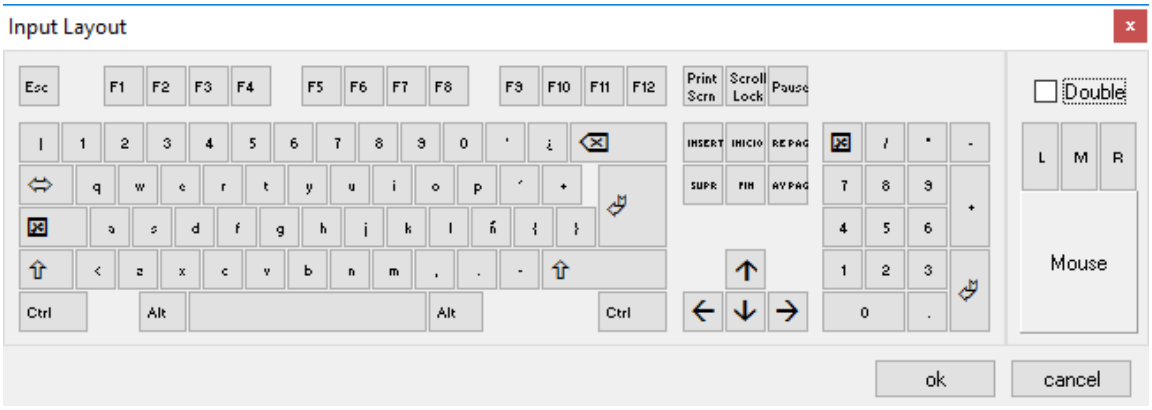

Click 'Ok' when done. The selected key/s will be added to the list.

If you want to change previously mapped keys, select the key you want to modify from the list and then click on the 'Edit' button. Use the on-screen keyboard to select a new key and then click 'Ok'.

To delete previously mapped keys, select a key from the list and then click on the 'Delete' Button.

To restore the default mapping for the selected key, click on the 'Default' button.

Read More:

- Configuration Manager - Keyboard - Base Settings
- Configuration Manager - Keyboard - Host Settings
- Configuration Manager - Keyboard - Edition Settings
- Configuration Manager - Keyboard - Custom Settings
- Configuration Manager - Character Conversion Tables

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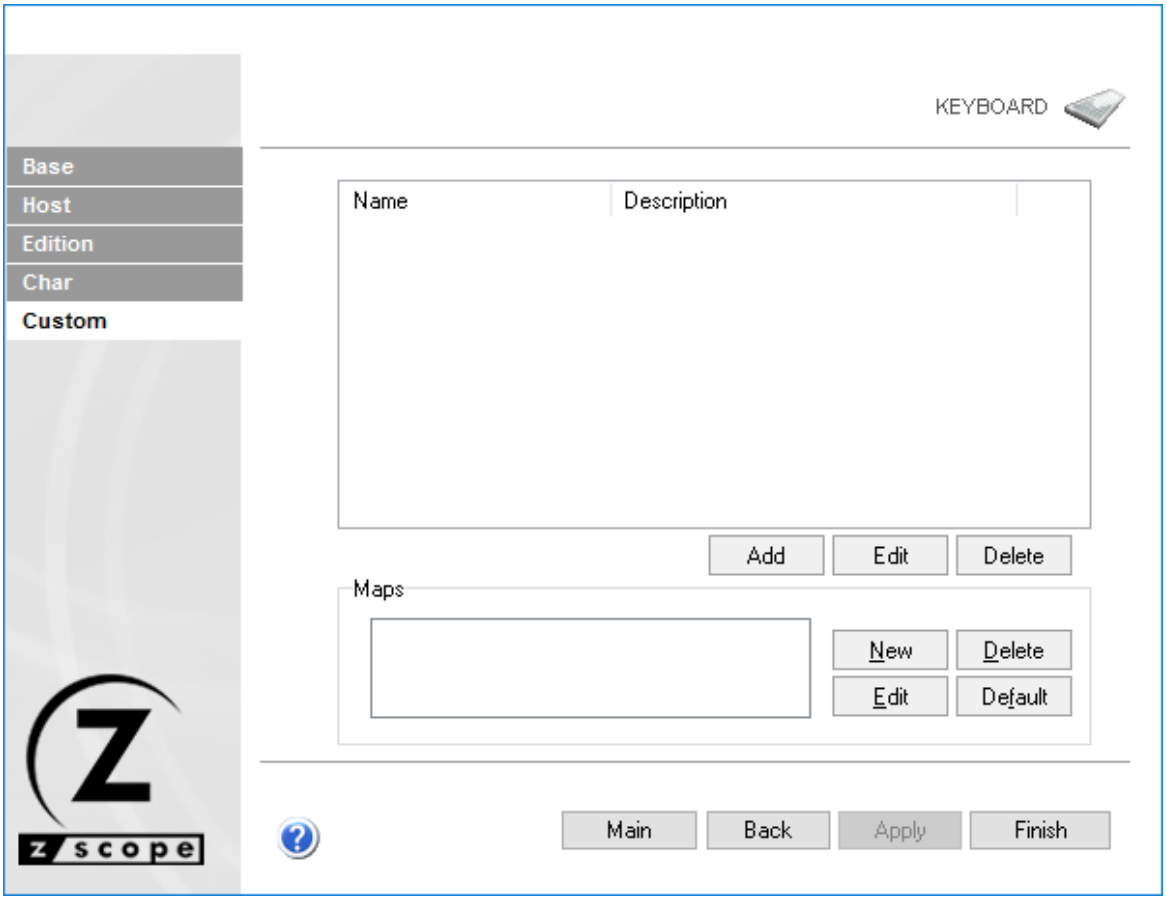
7.1.4.5 Custom

In the 'Custom' tab you will find the following parameters:



Add
Press this button to add a new custom function. It will display the Keyboard Function dialog, which is explained below.

Edit
Select a function from the list and press this button to change any of the options for the function except its name.

Delete
Select a function from the list and press this button to delete it from the custom functions list.

Maps

New
Select a function from the list and press this button to add a map for the selected function. It will display the Input Layout dialog box where you can easily choose a

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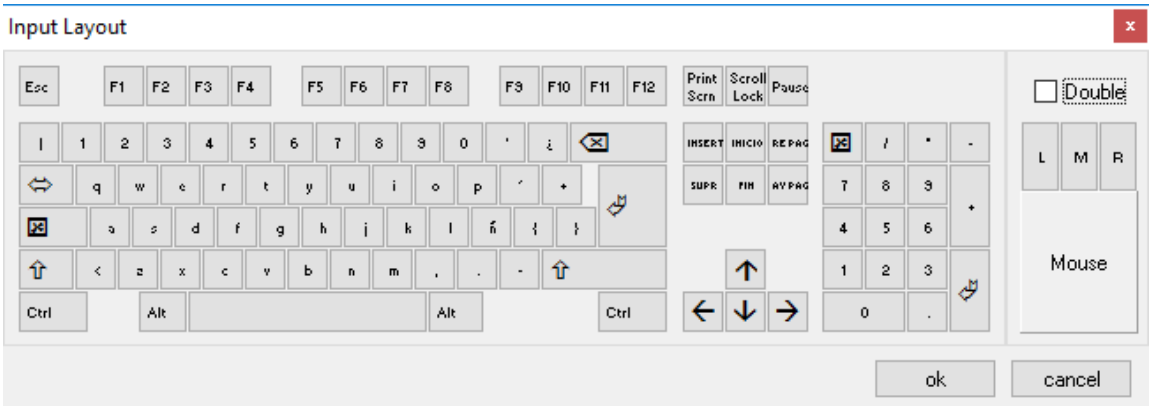
key combination.



Click 'Ok' when done. The selected key/s will be added to the list.

Delete
Select a function from the list and then a map for the selected function and press this button to delete the map.

Edit
Select a function from the list and then a map for the selected function and press this button to change the map for a different one. The Input Layout dialog box will display and the map you select will replace the previous one.

Default
Select a function from the list and then a map for the selected function and press this button to change the map for the default one. In the Custom tab, the default map for all the functions is none, so pressing this button will delete all maps for the selected function.

Keyboard Function Dialog:

This dialog box is invoked by the 'Add' or 'Edit' buttons in the custom tab. If invoked from the 'Add' button, all the fields will appear blank and you can use it to add a new custom function. If invoked from the 'Edit' button, the fields will be completed with the information of the selected function and you can use it to change this information.
You willl find the following parameters:

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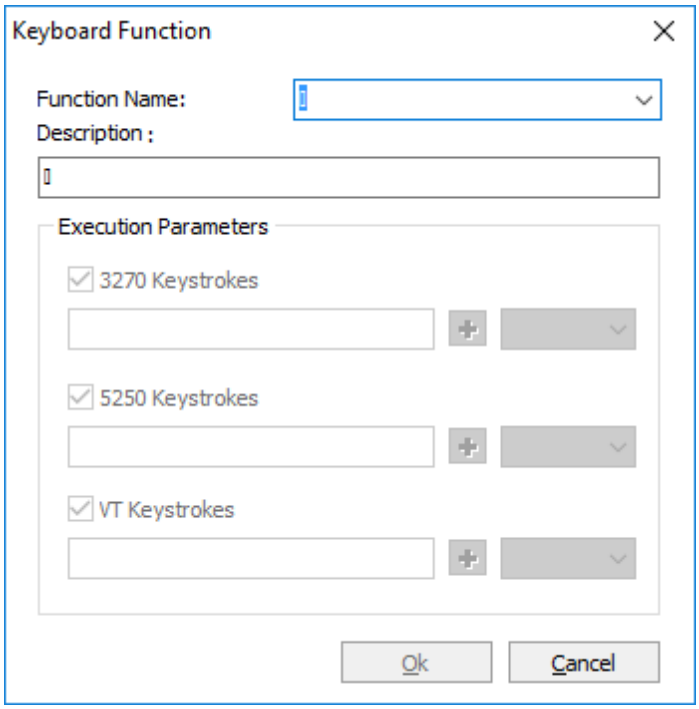

Function Name
Enter here the function name. You can type a new name, or choose existing functions from the combobox.

Description
Enter a description for the custom function.

Execution parameters
Mark the hosts for which you want this function activated (3270, 5250, VT). Under each of them, type the series of keystrokes you want the system to send for each one. The combobox in the right holds a list of common keyboard functions, that you can add using the '+' button.

Ok
Press this button to Add the new function or confirm changes to the edition of an existing function.

Cancel
Press this button to discard the whole procedure.

Read More:
- Configuration Manager -Keyboard - Base Settings
- Configuration Manager - Keyboard - Host Settings
- Configuration Manager - Keyboard - Edition Settings
- Configuration Manager - Keyboard - Char Settings
- Configuration Manager - Keyboard - Custom Settings

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7.1.4.6 Keyboards

This section shows the keyboards available as templates in z/Scope Anywhere.

z/Scope Keyboard Map

IBM Keyboard Map

EXTRA Keyboard Map

IRMA Keyboard Map

RUMBA Keyboard Map

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7.1.4.6.1 z/Scope Keyboard Map

3270 Keyboard

Aids	Mapped keys
PF01 .. PF12	F1 .. F12
PF13 .. PF24	Shift + F1 .. Shift + F12
PA01 .. PA10	Left Control + F1 .. Left Control + F10
Attention	Left Control + Shift + A
Clear	Pause Shift + Pause Left Ctrl + Shift + Z
Enter	Enter Shift + Enter
Erase Input	Left Alt + End
Reset	Left Control Left Control + R
System Request	Left Alt + PrintScreen Left Alt + Multiply
Test Request	Left Alt + Pause

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

5250 Keyboard

Aids	Mapped keys
PF01 .. PF12	F1 .. F12
PF13 .. PF24	Shift + F1 .. Shift + F12
PA01 .. PA03	Left Control + F1 .. Left Control + F3
Attention	Escape
Clear	Pause Shift + Pause
Enter	Enter
Erase EOF	End
Erase EOL	Left Alt + Home
Erase Input	Left Alt + End
Field - (minus)	Minus Left Shift + Minus
Field + (plus)	Plus Shift + Plus
Help	Scroll Lock Shift + Scroll Lock
New Line	Shift + Enter
Reset	Left Control
System Request	Left Alt + Print Screen Left Alt + Multiply
Test Request	Left Alt + Pause

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If your keyboard does not distinguish keys then left keys are equivalent to right keys.

Read More:

- IBM Keyboard Map
- EXTRA Keyboard Map
- IRMA Keyboard Map
- RUMBA Keyboard Map

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7.1.4.6.2 IBM Keyboard Map

IBM 3270 Keyboard Map

Function Key	Mapped keys
Attn	Esc
Back Space	Backspace
Back Tab	Left Shift + Tab Right Shift + Tab
Clear	Pause
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Home Right Control + Home
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Shift + Insert Right Shift + Insert
End	End Num 1
Enter	Num Enter Right Control + Right Ctrl
Erase Eof	Left Control + End Right Control + End
Erase Input	Left Alt + End Right Alt + End
Field Mark	Left Shift + Home Right Shift + Home
Home	Home

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	Num 7
Insert	Num 0 Insert
New Line	Enter
PA1	Left Alt + Insert Right Alt + Insert
PA2	Left Alt + Home Right Alt + Home
PA3	Left Shift + Page Up Right Shift + Page Up
PF01	F1
PF02	F2
PF03	F3

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

IBM 5250 Keyboard Map

Function Key	Mapped keys
Attn	Esc
Back Space	Backspace
Back Tab	Right Shift + Tab Left Shift + Tab
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Home Right Control + Home
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up Right Shift + Num 8

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Delete	Delete Num Del
Dup	Left Shift + Insert Right Shift + Insert
End	End
Enter	Right Control + Right Ctrl
Erase Eof	Right Control + End Left Control + End
Erase Input	Left Alt + End Right Alt + End
Field -	Num - Left Shift + Num - Right Shift + Num - Left Alt + Num - Right Alt + Num -
Field +	Num Enter Left Shift + Num Enter Right Shift + Num Enter Num + Right Shift + Num + Left Shift + Num +
Field Mark	Left Shift + Home Right Shift + Home
Help	Left Alt + F1 Right Alt + F1
Home	Home Num 7
Home	Home Num 7
Insert	Insert Num 0
New Line	Enter
PA1	Left Alt + Insert Right Alt + Insert
PA2	Left Alt + Home Right Alt + Home
PA3	Left Shift + Page Up Right Shift + Page Up

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

Read more:

- z/Scope Keyboard Map
- EXTRA Keyboard Map
- IRMA Keyboard Map
- RUMBA Keyboard Map

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7.1.4.6.3 EXTRA Keyboard Map

EXTRA 3270 Keyboard Map

Function Key	Mapped keys
Attn	Left Shift + Esc Right Shift + Esc
Back Space	Backspace
Back Tab	Left Shift + Tab Right Shift + Tab
Clear	Pause
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Num 7 Right Control + Num 7
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Shift + Insert Right Shift + Insert
End	End
Enter	Num Enter Enter
Erase Eof	Num 1 End
Erase Input	Left Alt + End Right Alt + End
Field Mark	Left Shift + Home Right Shift + Home
Home	Home

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	Num 7
Insert	Insert Num 0
New Line	Right Control + Right Ctrl
PA1	Num 9 Page Up
PA2	Num 3 Page Down
PA3	Left Shift + Page Down Right Shift + Page Down
PF01	F1
PF02	F2
PF03	F3

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

EXTRA 5250 Keyboard Map

Function Key	Mapped keys
Attn	Left Shift + Esc Right Shift + Esc
Back Space	Backspace
Back Tab	Right Shift + Tab Left Shift + Tab
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Num 7 Right Control + Num 7
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up

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	Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Shift + Insert Right Shift + Insert
End	End
Enter	Enter Num Enter
Erase Eof	Num 1 End
Erase Input	Left Alt + End Right Alt + End
Field -	Num -
Field +	Num + Left Shift + Num + Right Shift + Num +
Field Mark	Left Shift + Home Right Shift + Home
Help	Left Alt + Pause Right Alt + Pause
Home	Num 7 Home
Home	Home Num 7
Insert	Insert Num 0
New Line	Right Control + Right Ctrl
PA1	Left Alt + Insert Right Alt + Insert
PA2	Left Alt + Home Right Alt + Home
PA3	Left Shift + Page Down Right Shift + Page Down Left Alt + Page Up Right Alt + Page Up

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

Read more:

- z/Scope Keyboard Map
- IBM Keyboard Map
- IRMA Keyboard Map
- RUMBA Keyboard Map

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7.1.4.6.4 IRMA Keyboard Map

IRMA 3270 Keyboard Map

Function Key	Mapped Keys
Attn	F1
Back Space	Backspace
Back Tab	Left Shift + Tab Right Shift + Tab
Clear	F2
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Home Right Control + Home
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Control + G Right Control + G
End	End Num 1
Enter	Enter Num Enter
Erase Eof	F6
Erase Input	F4
Field Mark	Left Control + H Right Control + H
Home	Home Num 7

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Insert	Num 0 Insert
New Line	Left Control + Enter Right Control + Enter
PA1	Left Control + J Right Control + J
PA2	Left Control + K Right Control + K
PA3	Left Control + L Right Control + L
PF01	Left Alt + 1 Right Alt + 1
PF02	Left Alt + 2 Right Alt + 2
PF03	Left Alt + 3 Right Alt + 3

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

IRMA 5250 Keyboard Map

Function Key	Mapped keys
Attn	Esc
Back Space	Backspace
Back Tab	Right Shift + Tab Left Shift + Tab
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Home Right Control + Home
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up

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	Left Shift + Num 8 Right Shift + Up Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Shift + Right Control + Insert Right Shift + Insert
End	End
Enter	Enter
Erase Eof	Left Control + End
Erase Input	Left Alt + End
Field -	Num - Left Shift + Num - Right Shift + Num - Left Alt + Num - Right Alt + Num -
Field +	Num Enter Left Shift + Num Enter Right Shift + Num Enter Num + Left Control + Num + Left Alt + Num + Right Control + Num + Right Alt + Num +
Field Mark	Left Shift + Home Right Shift + Home
Help	Left Alt + F1 Right Alt + F1
Home	Num 7 Home
Home	Home Num 7
Insert	Insert Num 0
New Line	Enter
PA1	Left Alt + Insert
PA2	Right Control + Left Alt + Home
PA3	Right Alt + Page Up Right Control + L

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

Read more:

- z/Scope Keyboard Map
- IBM Keyboard Map
- EXTRA Keyboard Map
- RUMBA Keyboard Map

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7.1.4.6.5 RUMBA Keyboard Map

RUMBA 3270 Keyboard Map

Function Key	Mapped keys
Attn	Left Shift + Left Control + A Right Shift + Left Control + A Left Shift + Right Control + A Right Shift + Right Control + A
Back Space	Left Shift + Backspace Right Shift + Backspace Backspace
Back Tab	Left Shift + Tab Right Shift + Tab
Clear	Left Shift + Left Control + Z Right Shift + Left Control + Z Right Shift + Right Control + Z Left Shift + Right Control + Z
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6
Cursor Ruler	Left Control + Home
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Control + D Right Control + D
End	End
Enter	Enter Num Enter
Erase Eof	End

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Erase Input	Left Control + T Right Control + T
Field Mark	Left Shift + Home Right Shift + Home
Home	Home Num 7
Insert	Insert Num 0
New Line	Left Control + Enter
PA1	Left Control + F1 Right Control + F1
PA2	Left Control + F2 Right Control + F2
PA3	Left Control + F3 Right Control + F3
PF01	F1
PF02	F2
PF03	F3

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

RUMBA 5250 Keyboard Map

Function Key	Mapped keys
Attn	Esc
Back Space	Backspace Left Shift + Backspace Right Shift + Backspace
Back Tab	Right Shift + Tab Left Shift + Tab
Cursor Down	Down Num 2
Cursor Down & Select	Left Shift + Down Left Shift + Num 2 Right Shift + Down Right Shift + Num 2
Cursor Left	Left Num 4
Cursor Left & Select	Left Shift + Left Left Shift + Num 4 Right Shift + Left Right Shift + Num 4
Cursor Right	Right Num 6
Cursor Right & Select	Left Shift + Right Left Shift + Num 6 Right Shift + Right Right Shift + Num 6

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Cursor Ruler	Left Alt + Page Down Right Alt + Page Down
Cursor Up	Up Num 8
Cursor Up & Select	Left Shift + Up Left Shift + Num 8 Right Shift + Up Right Shift + Num 8
Delete	Delete Num Del
Dup	Left Shift + Insert Right Shift + Insert
End	End
Enter	Enter
Erase Eof	Left Control + End Right Control + End
Erase Input	Left Alt + End Right Alt + End
Field -	Num - Left Shift + Num - Right Shift + Num -
Field +	Right Control + Right Ctrl Num +
Field Mark	Left Shift + Home Right Shift + Home
Help	Scroll Lock
Home	Home Num 7
Insert	Insert Num 0
New Line	Left Shift + Enter Right Shift + Enter
PA1	Left Control + F1 Right Control + F1
PA2	Left Control + F2 Right Control + F2
PA3	Left Control + F3 Right Control + F3

If your keyboard does not distinguish keys then left keys are equivalent to right keys.

Read more:

- z/Scope Keyboard Map
- IBM Keyboard Map
- EXTRA Keyboard Map
- IRMA Keyboard Map

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7.1.5 Macros

Macros are created by recording a behaviour during a session with the host. At this point, they are only available for the user that created it, or for anonymous users if the user wasn't logged in at the moment. To make macros available for all the users connecting to a certain host, they have to be copied to a different folder.

The macros will be stored in C:\ProgramData\Cybele Software\zScope7\[UserName]

1. Inside this directory there will be subdirectories for each existing connection. Their name stands for the connection ID and will have a format that looks like this: "EB088A84-C46D-4882-90B3-15BD0A6A26D0C"

2. Open these connections folders and look for a file that has the same name as the macro you are looking for

3. If the macro's name were "Navigation" for example, the file name would be "Navigation.js".

To make these macros available for any user that connects to this host, copy the connection folder with the macros inside, to the 'zScope7' folder in Windows Program Data:
C:\ProgramData\Cybele Software\zScope7\3FD21D8F-B934-4471-ADCE-4723AB48B698

Afterwards, those macros can be managed on the 'Configuration Manager' through the 'Macros' icon.

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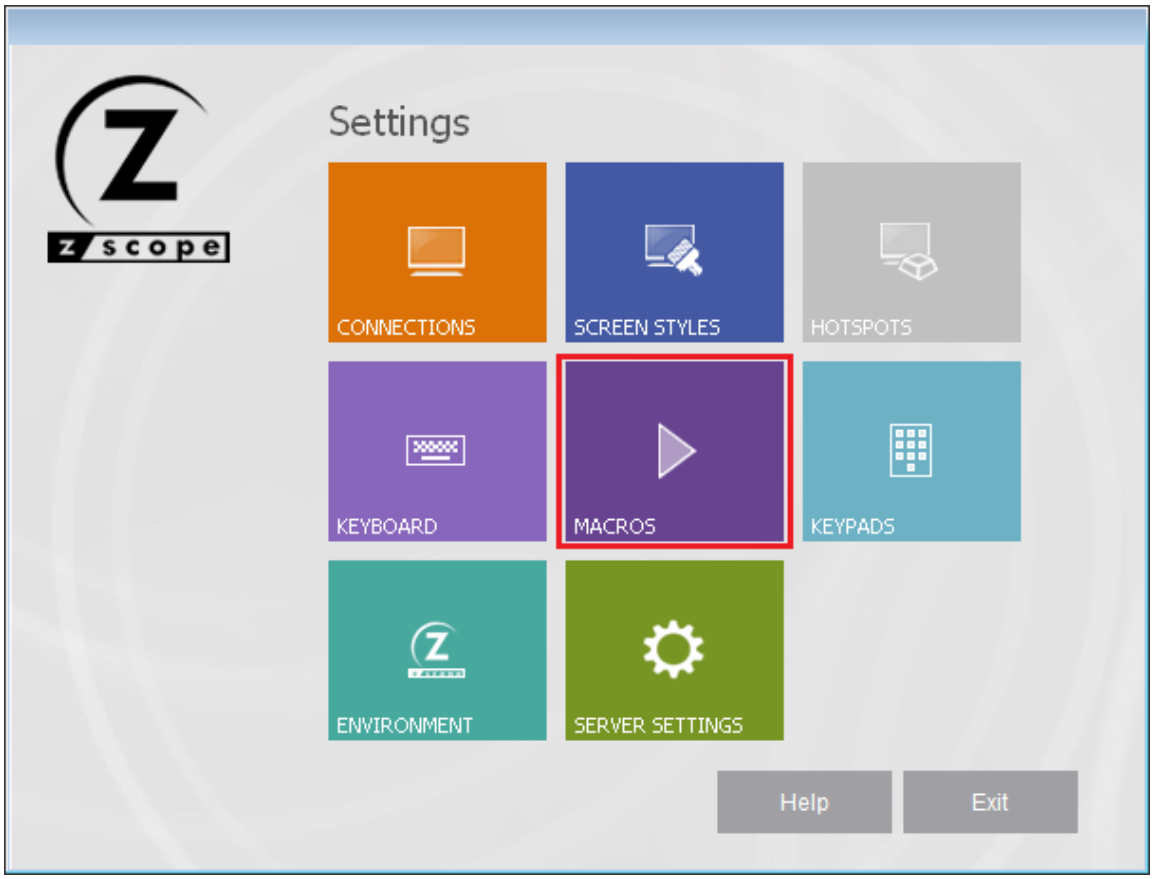

For more information about how to manage Macros, consult the following sections:

- Editing Macros
- Deleting Macros
- Programming Reference for Macros

If you want to learn the simple steps to creating a macro from scratch and run it, please read this topic:

- Using Macros

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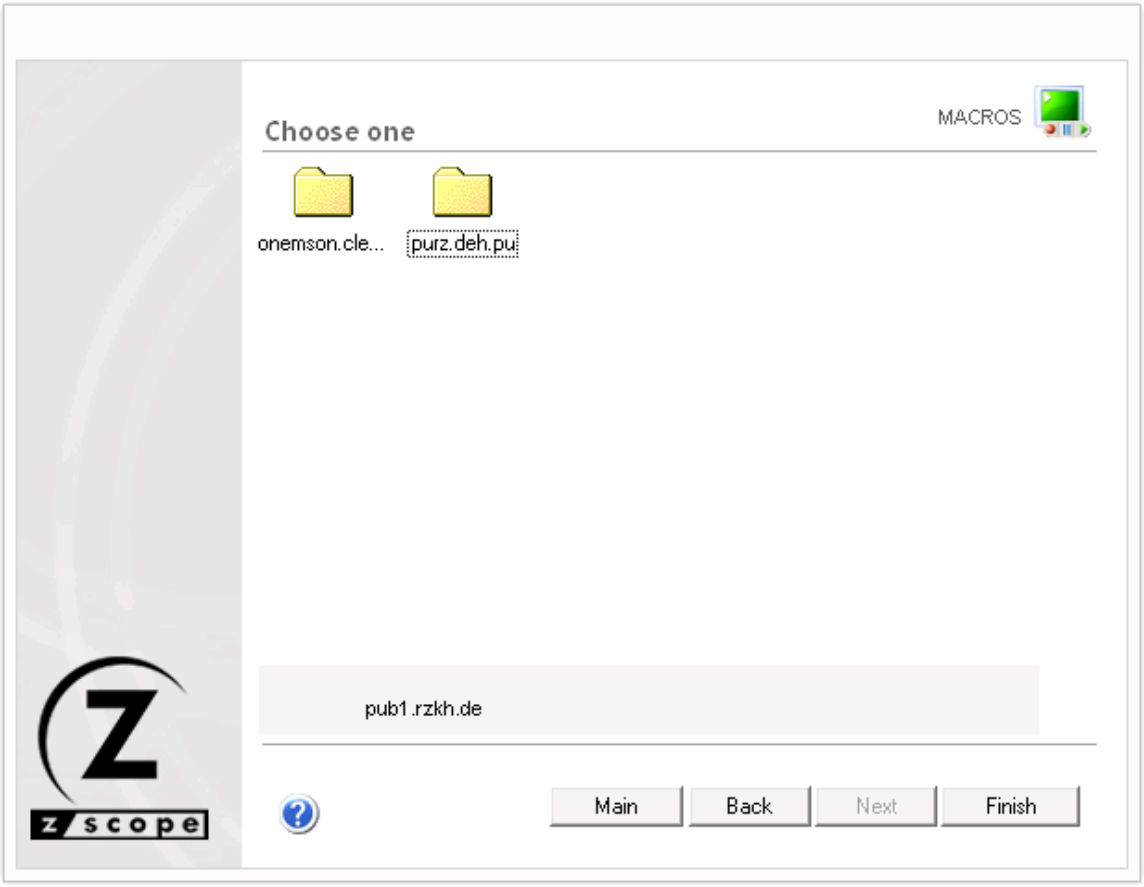
7.1.5.1 Editing Macros

In the 'Macros Management' dialog, you will find a list of the existing connections.



Select a connection and then click on 'Next' to see all Macros defined for that particular connection.

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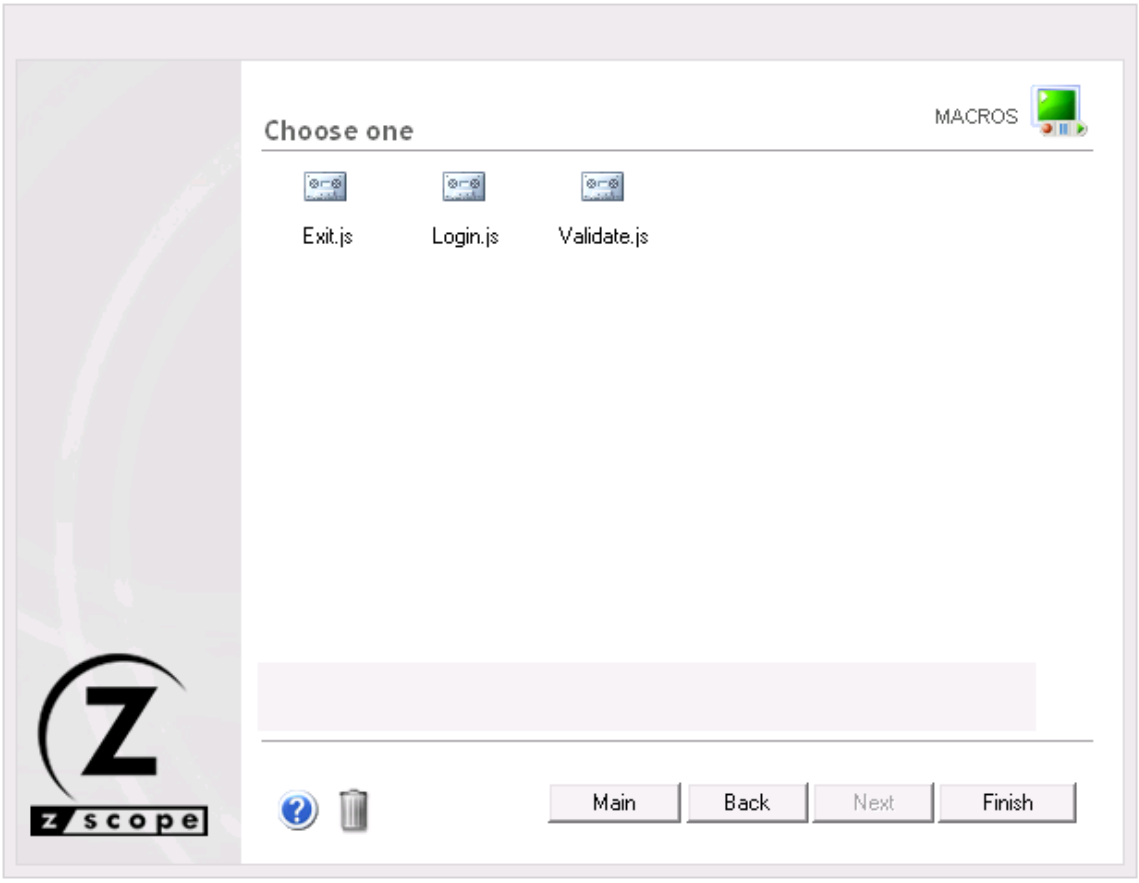

If you want to modify a previously created Macro, select it and then click on 'Next'. You will see the 'Active Script' window which you can use to modify the Macro's code.

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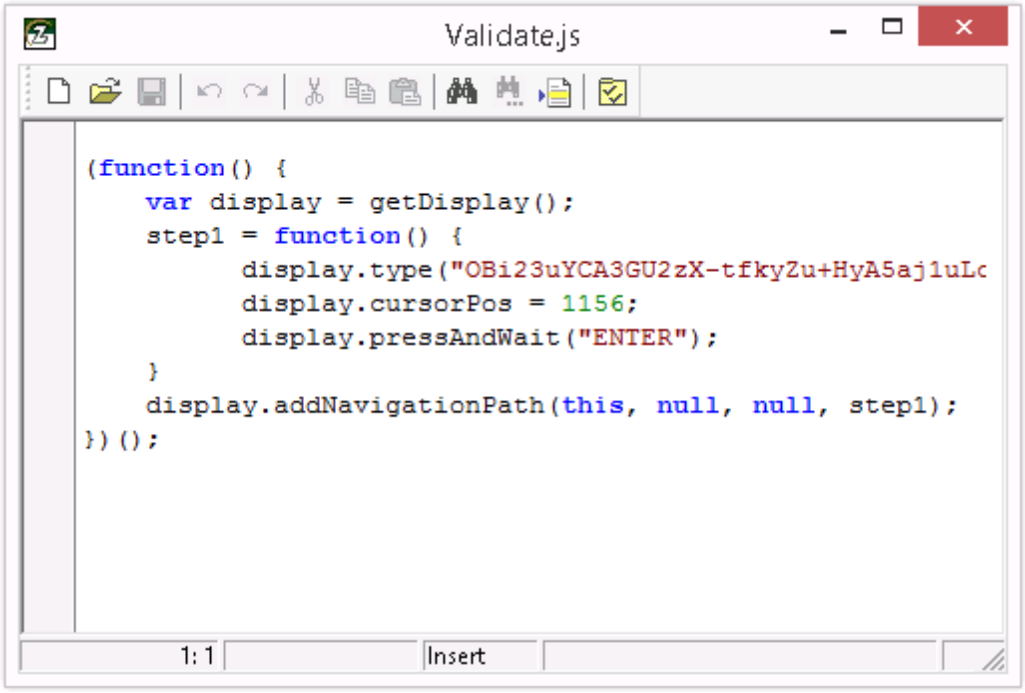

New Macro
Use this button to code a new macro from scratch.

Open Macro
Use this button to open an existing macro file (.zsm).

Save Macro
Use this button to save the changes you have made to the macro code. If you are creating a new macro, you will be prompted for a name for the macro file to be saved.

Undo Changes
Use this button to rollback the last changes you have made to the macro code.

Redo Changes
Use this button to recover changes previously discarded with the 'Undo' button.

Cut
Use this button to cut the selected text-area.

Copy
Use this button to copy the selected text-area into the clipboard buffer.

Paste
Use this button to paste text from the clipboard into the screen at the cursor position.

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Find Text
Use this button to open the 'Find Text' window to search for a particular text string in your code.

Find Next
Use this button after the first matching string of your search has been found to find subsequent matching strings in your code.

Go To Line Number
Use this button to go to a specific line number in your code.

Properties
This button opens the 'Properties' window where you can customize several aspects of the Macro Editor.

Read More:
- Using Macros
- Deleting Macros

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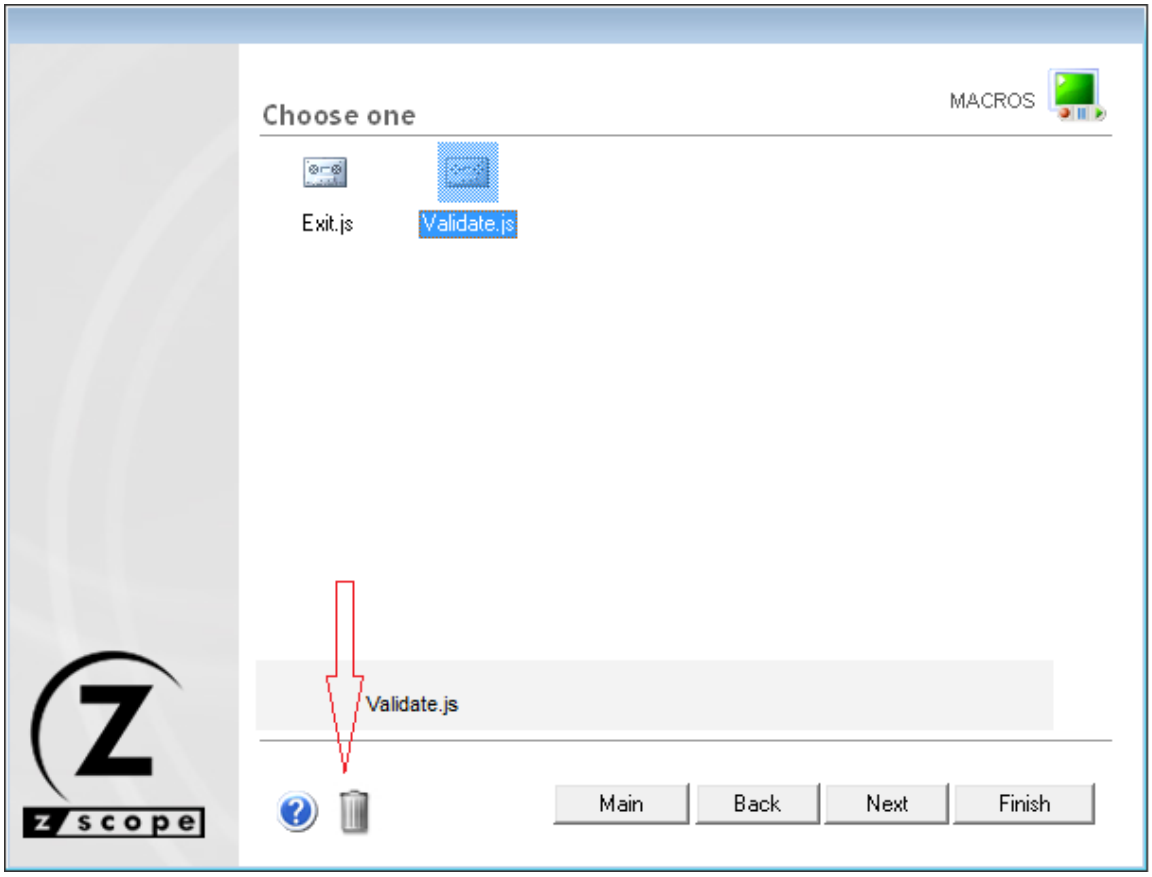
7.1.5.2 Deleting Macros

To delete a Macro, first select it and then click on the trash can icon. You can also drag and drop the Macro you want to delete on the trash can icon.



Macros deletion is not undoable, which means that once you delete a particular Macro, it will be permanently lost.

Read More:

- Editing Macros
- Using Macros

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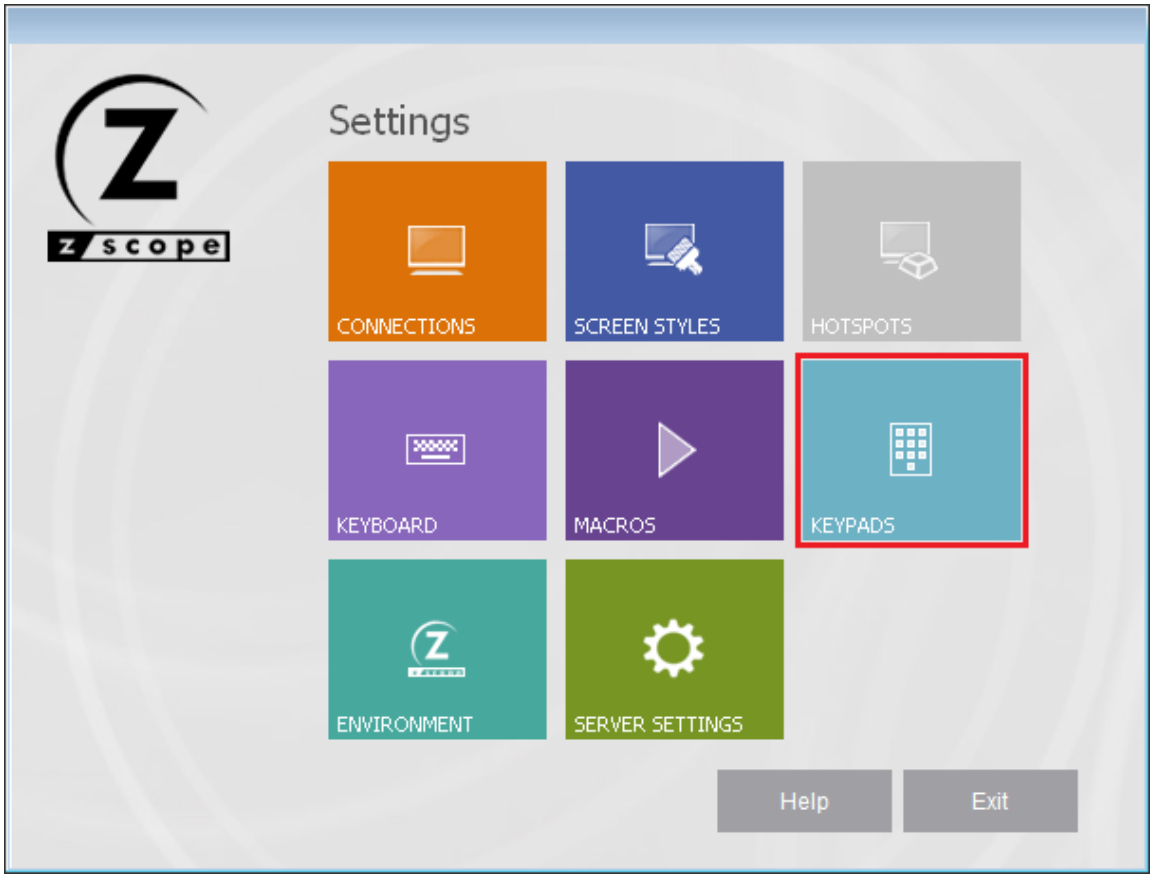
7.1.6 Keypads

Keypads are managed on the 'Configuration Manager' through the 'Keypad' icon.



For more information on managing Keypads, read the following sections:

- Creating/Editing a Keypad
- Deleting a Keypad

> In order to be able to use your Keypad within a Connection, you must first enable the Keypad for that particular connection in the Connections Settings dialog.

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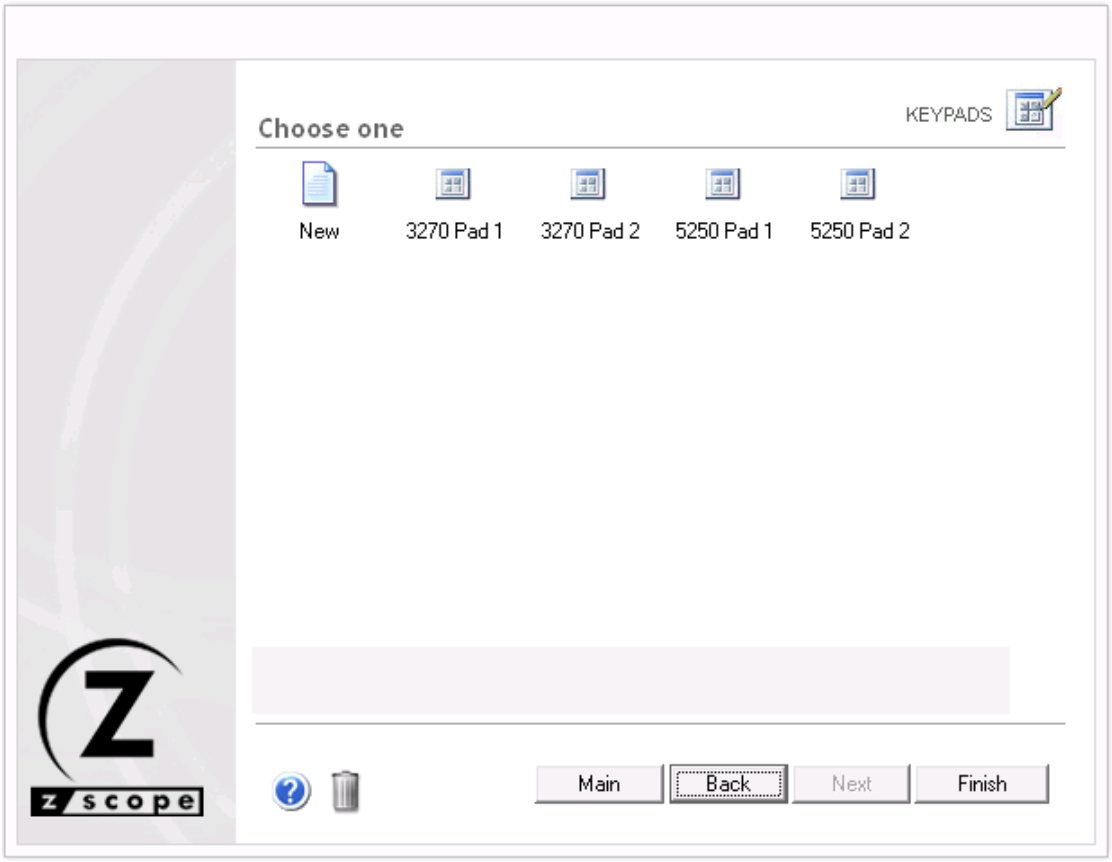
7.1.6.1 Creating/Editing a Keypad

In the Keypads management dialog you will find a list of the existing Keypads. You will also find the 'New' icon which you can use to create a new Keypad from scratch.

If you want to modify the attributes of a previously created Keypad, select it using the mouse and then click on 'Next', or just simply double-click on it.



In order to be able to use your Keypad within a Connection, you must first enable the Keypad for that particular connection in the Connections Settings dialog.

Adding a keypad
Select the 'New' icon and after you click on 'Next', you will be presented with the 'Keypad Creation' dialog.

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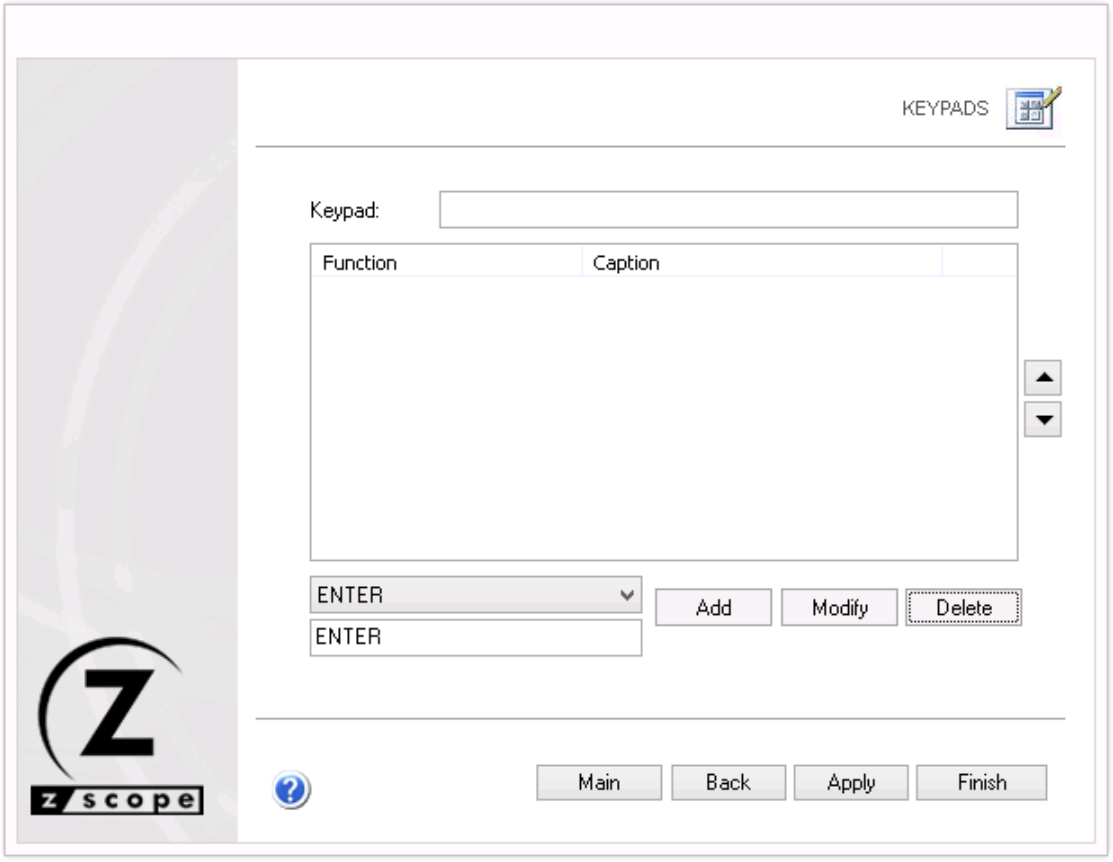

To add a new key to the Keypad, follow these steps:

1. Select a function to assign to the new key from the drop-down list.
2. Type a caption for the new key.
3. Click on the 'Add' button.

The new key you defined will now appear in the Keypad's key list. To modify the key's position within the Keypad, select it from the list and move it to the desired position using the key order selectors.

Modifying a keypad

To modify an already defined key, do the following:

1. Select the key you want to modify from the Keypad's key list.
2. Change the function and/or caption of the key.
3. Click on the 'Modify' button to apply the changes to the key.

Deleting a keypad

To delete a key from the Keypad, proceed this way:

1. Select the key you want to delete from the Keypad's key list.
2. Click on the 'Delete' button.

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The key you selected will be removed from the Keypad's key list.

Read More

- Deleting a Keypad

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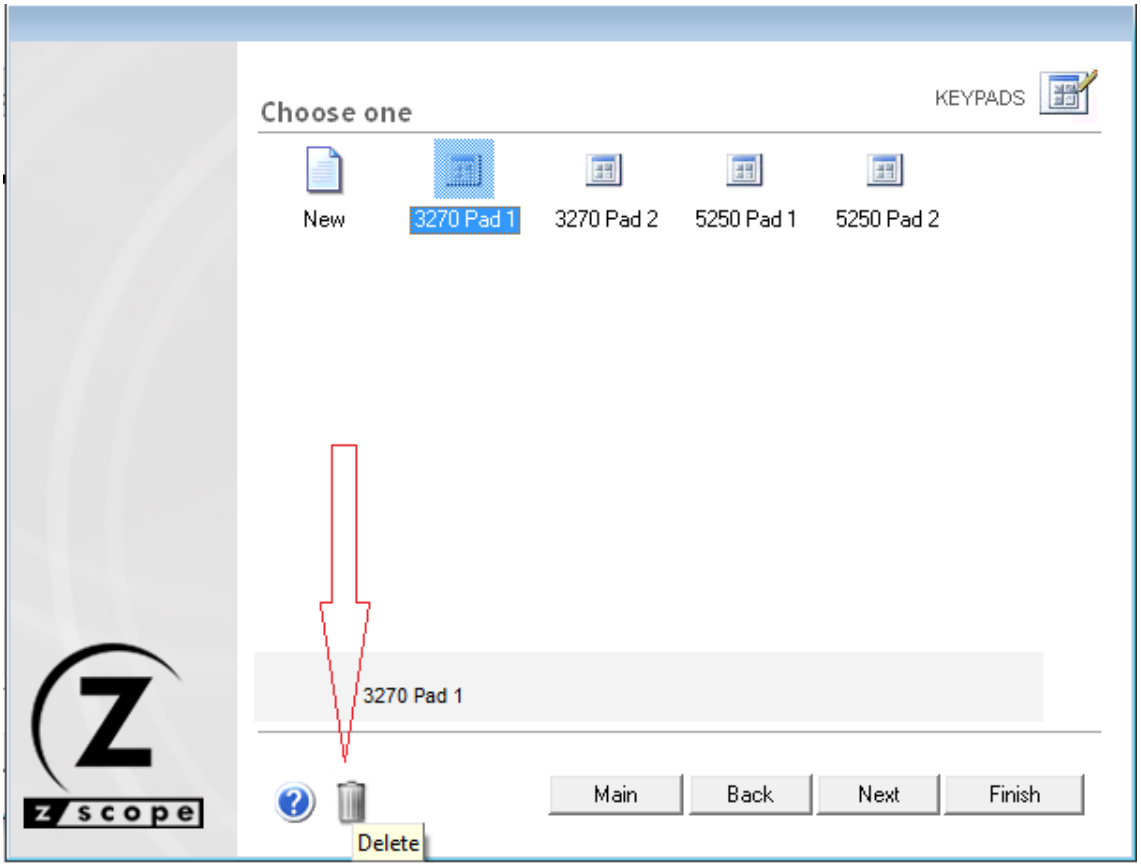
7.1.6.2 Deleting a Keypad

To delete a Keypad, first select it and then click on the trash can icon. You can also drag and drop the Keypad you want to delete on the trash can icon.



Keypad deletion is not undoable, which means that once you delete a particular Keypad, it will be permanently lost.

Read More

- Creating/Editing a Keypad

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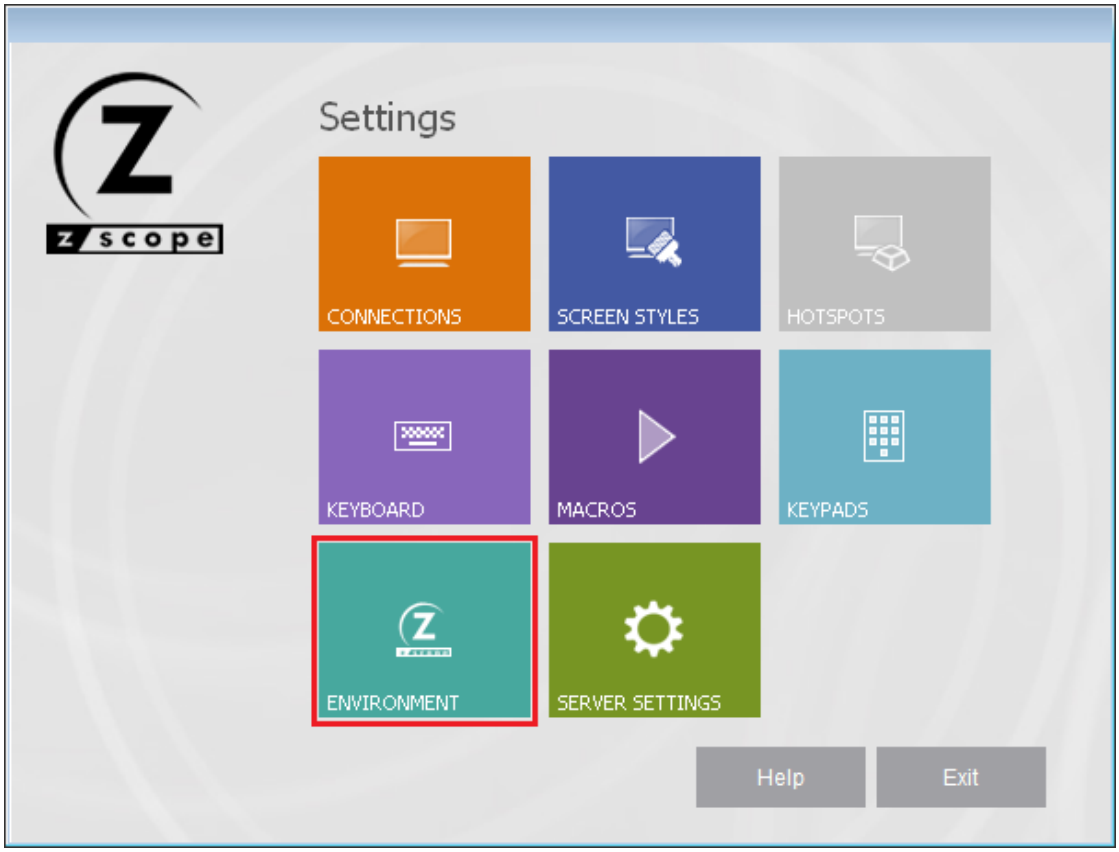
7.1.7 Environment

The Environment is managed on the 'Configuration Manager' through the 'Environment' icon.



Read More:

- Configuration Manager - Environment - Edit Settings
- Configuration Manager - Environment - Printer Settings
- Configuration Manager - Environment - Misc Settings
- Configuration Manager - Environment - Debug Settings
- Configuration Manager - Environment - Config Setup Settings

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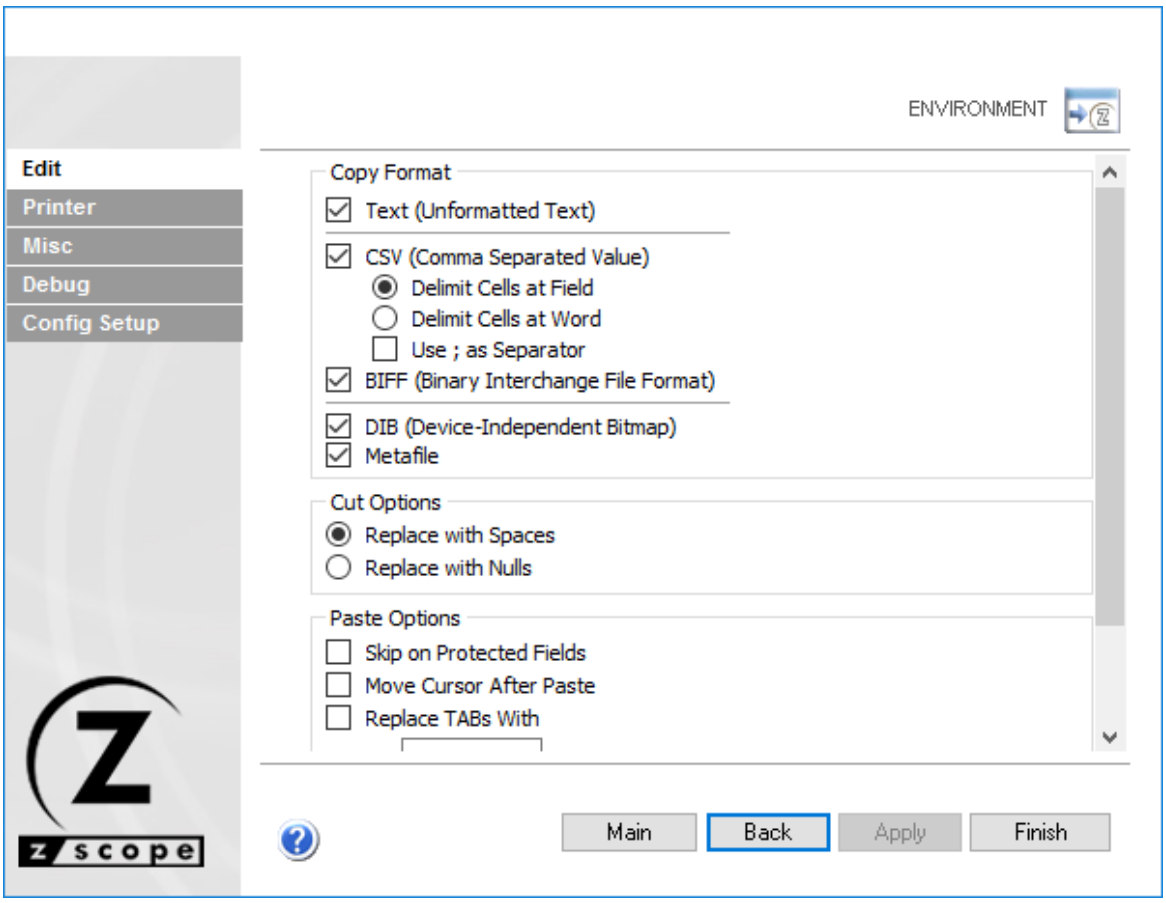
7.1.7.1 Edit

In the 'Edit' tab you will find the following parameters:



Copy Format

Text (Unformatted Text)
Check this option if you want to copy text into the clipboard unformatted.

CSV (Comma Separated Value)
Check this option if you want to copy text into the clipboard as comma-separated values. You can also specify if cells are to be delimited as fields or at words. Instead of a comma (,), you can use the semi-colon.

BIFF (Binary Interchange File Format)
Check this option if you want to copy text into the clipboard in BIFF format.

DIB (Device-Independent Bitmap)
Check this option if you want to copy text into the clipboard in DIB format.

Metafile
Check this option if you want to copy text into the clipboard in Metafile format.

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Cut Options

Choose whether spaces or nulls will be placed when you perform a cut operation.

Paste Options

Skip on Protected Fields
Check this option if you want paste operation to skip on protected fields.

Move Cursor After Paste
Check this option if you want the cursor to move automatically to the end of the pasted end after pasting.

Replace TABs With
Check this option if you want to replace TAB chars with text when pasting. Specify the text in the field below.

Word Wrap Options

Enable Word Wrap in Multiline Fields
Check this option to have the text wrap in the available space when there is a multiline field.

Read More:

- Configuration Manager - Environment - Printer Settings
- Configuration Manager - Environment - Misc Settings
- Configuration Manager - Environment - Debug Settings
- Configuration Manager - Environment - Config Setup Settings

7.1.7.2 Printer

In the 'Printer' tab you will find the following parameters:

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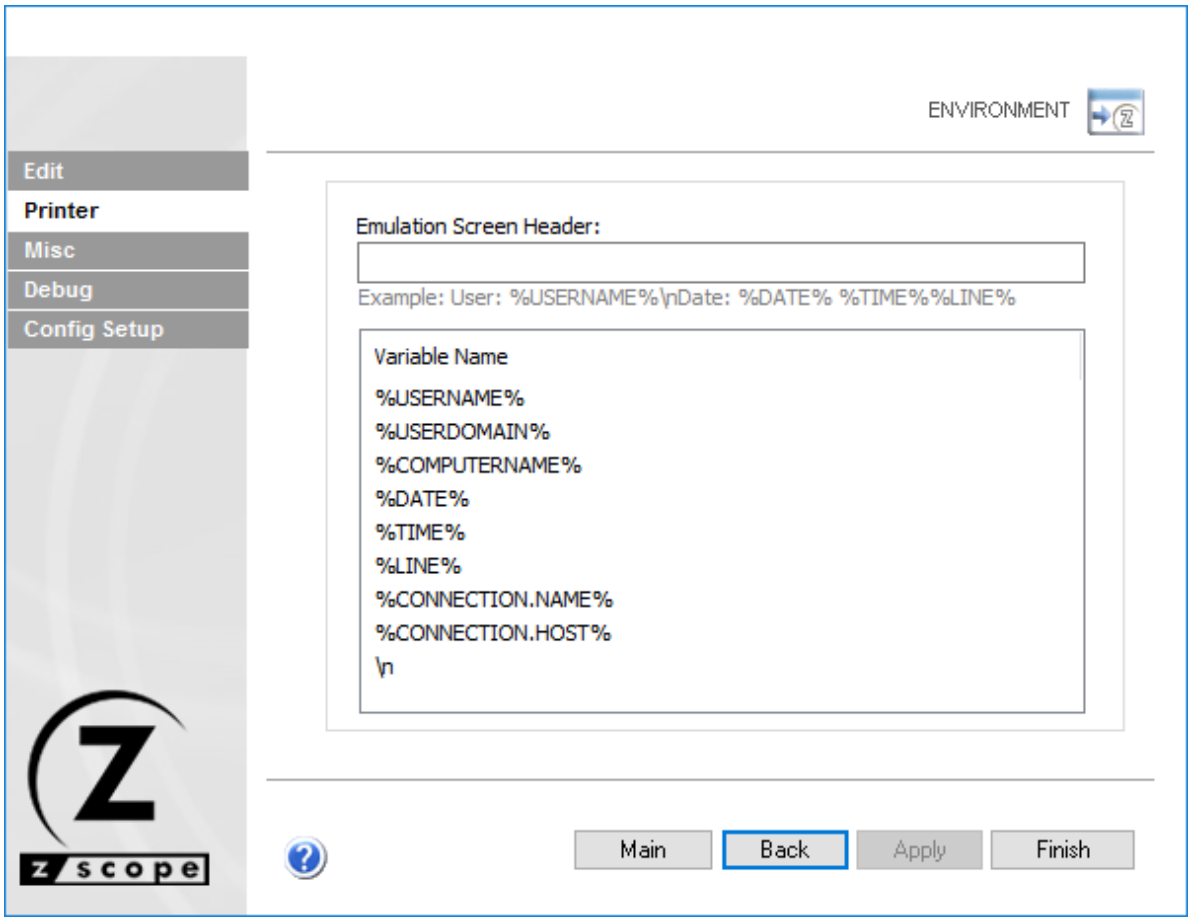

Emulation Screen Header
Type a sentence that will show as a header of all the host's print screens. Use the variables listed below: "Print screen taken by %USERNAME% in %COMPUTERNAME% at %TIME%"

Variable Name
A list of variables that you can use in the emulation screen header.

Read More:
- Configuration Manager - Environment - Edit Settings
- Configuration Manager - Environment - Misc Settings
- Configuration Manager - Environment - Debug Settings
- Configuration Manager - Environment - Config Setup Settings
- Print Screen Button in Connection Toolbar Options

7.1.7.3 Misc

In the 'Misc' tab you will find the following parameters:

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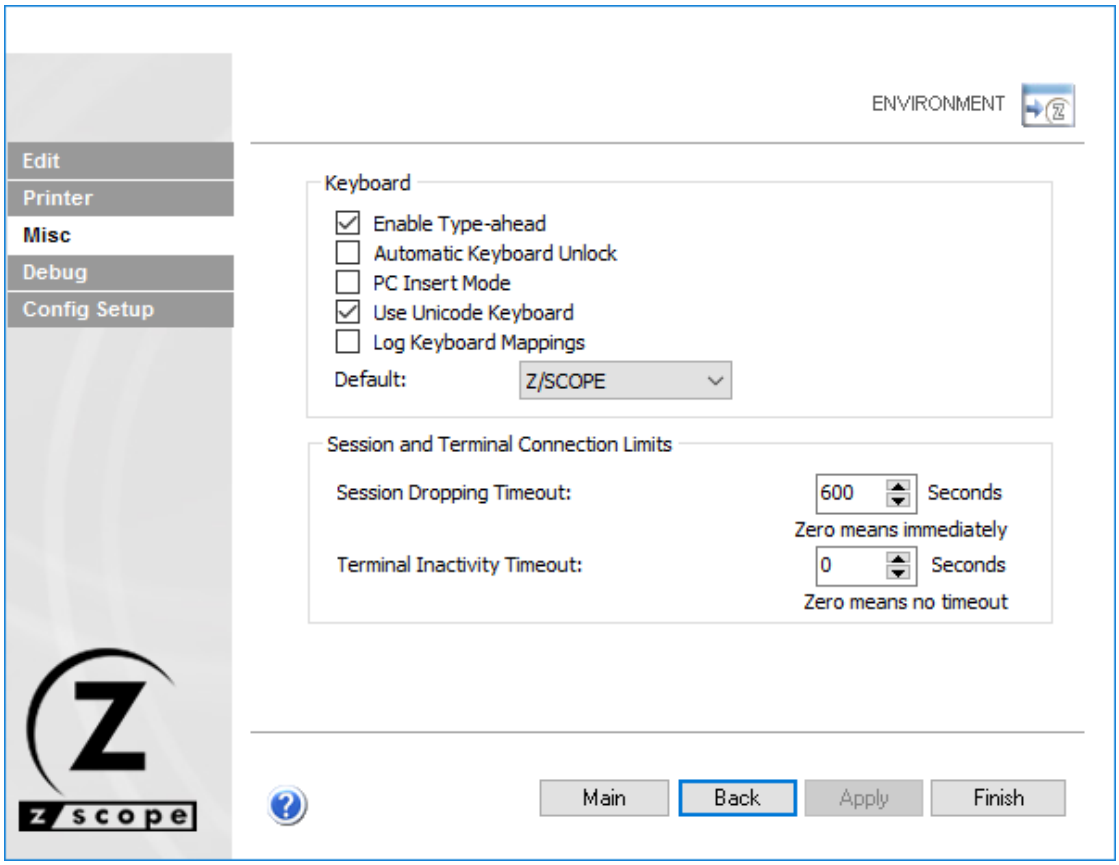

Keyboard

Enable Type-Ahead
Check this option if you want keystrokes to be sent to a buffer when the screen is still loading so the characters typed during that interval are sent when the screen is once again ready for input.

Automatic Keyboard Unlock
Check this option if you want the keyboard to be automatically unlocked after typing in a protected area of the screen.

PC Insert Mode
Check this option if you want to work in the Insert mode instead of the Overwrite mode when typing.

Use Unicode Keyboard
Check this option to use a unicode keyboard. Note: This may affect your keyboard mapping.

Log Keyboard Mappings
Check this option to log the keyboard mappings.

Default

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Select one of the existing keyboards to be the default one.

Session and Terminal Connection Limits

Session Dropping Timeout
Choose how many seconds will pass before z/Scope Anywhere drops a session after the browser is closed. Zero seconds in this field means a session will be dropped immediately when it's not used.

Terminal Inactivity Timeout
Choose how many seconds will pass before z/Scope Anywhere disconnects an inactive connection to a host. Zero seconds in this field means the connection will not be terminated by z/Scope Anywhere.

Read more:

- Configuration Manager - Environment - Edit Settings
- Configuration Manager - Environment - Printer Settings
- Configuration Manager - Environment - Debug Settings
- Configuration Manager - Environment - Config Setup Settings

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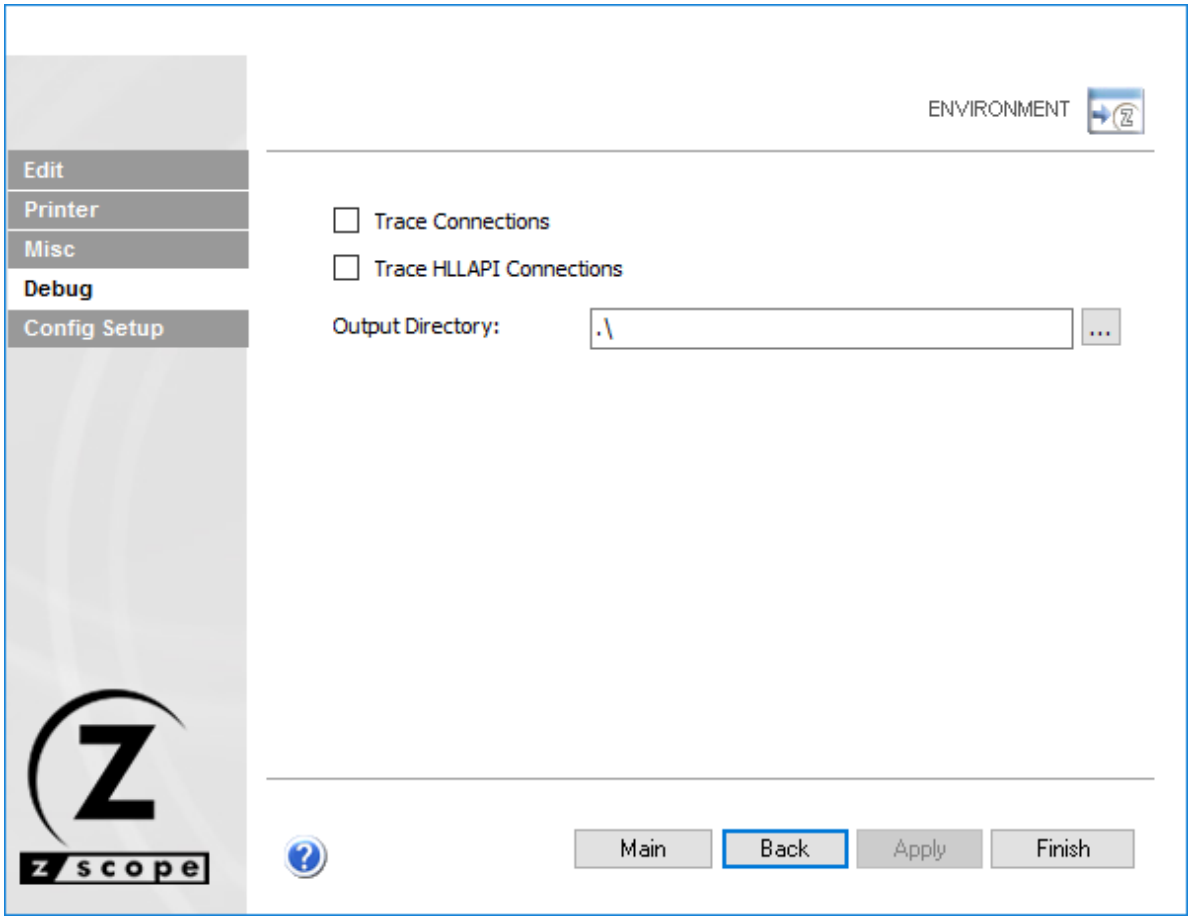
7.1.7.4 Debug

In the 'Debug' tab you will find the following parameters:



Trace Connections
Check this option if you want to keep track of the connection's activity in a dump file that can be used later to trace errors.

Trace HLLAPI Connections
Check this option if you want to keep track of HLLAPI connections' activity in a dump file that can be used later to trace errors.

Output Directory
Here you can specify the directory where the trace files will be placed.

Read More:

- Configuration Manager - Environment - Edit Settings
- Configuration Manager - Environment - Printer Settings
- Configuration Manager - Environment - Misc Settings
- Configuration Manager - Environment - Config Setup Settings

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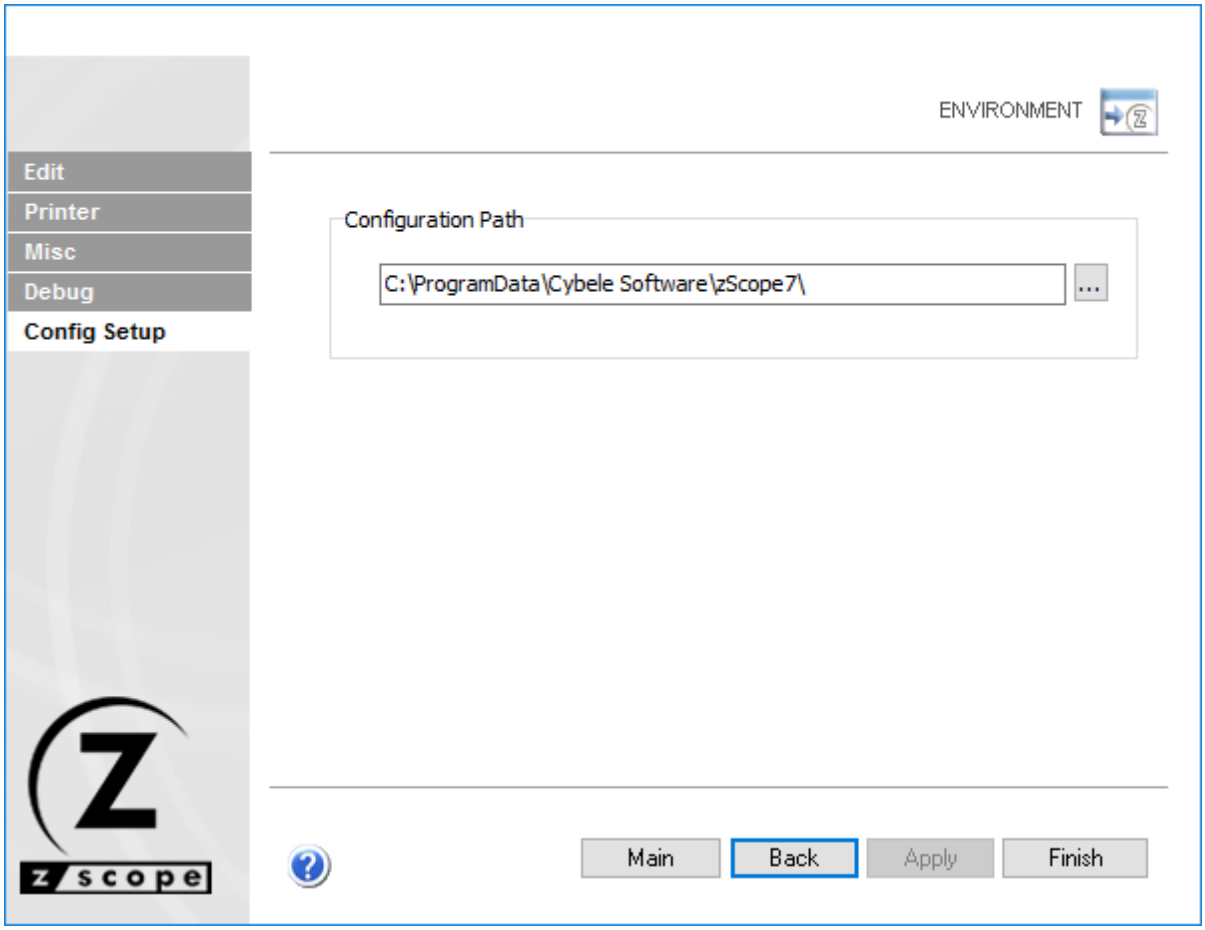
7.1.7.5 Config Setup

In the 'Config Setup' tab you will find the following parameters:



Configuration Path
This is the path to where the z/Scope Anywhere configuration is stored.

Read more:

- Configuration Manager - Environment - Edit Settings
- Configuration Manager - Environment - Printer Settings
- Configuration Manager - Environment - Misc Settings
- Configuration Manager - Environment - Debug Settings

7.1.8 Server Settings

The Server Settings are managed on the 'Configuration Manager' through the 'Server Settings' icon.

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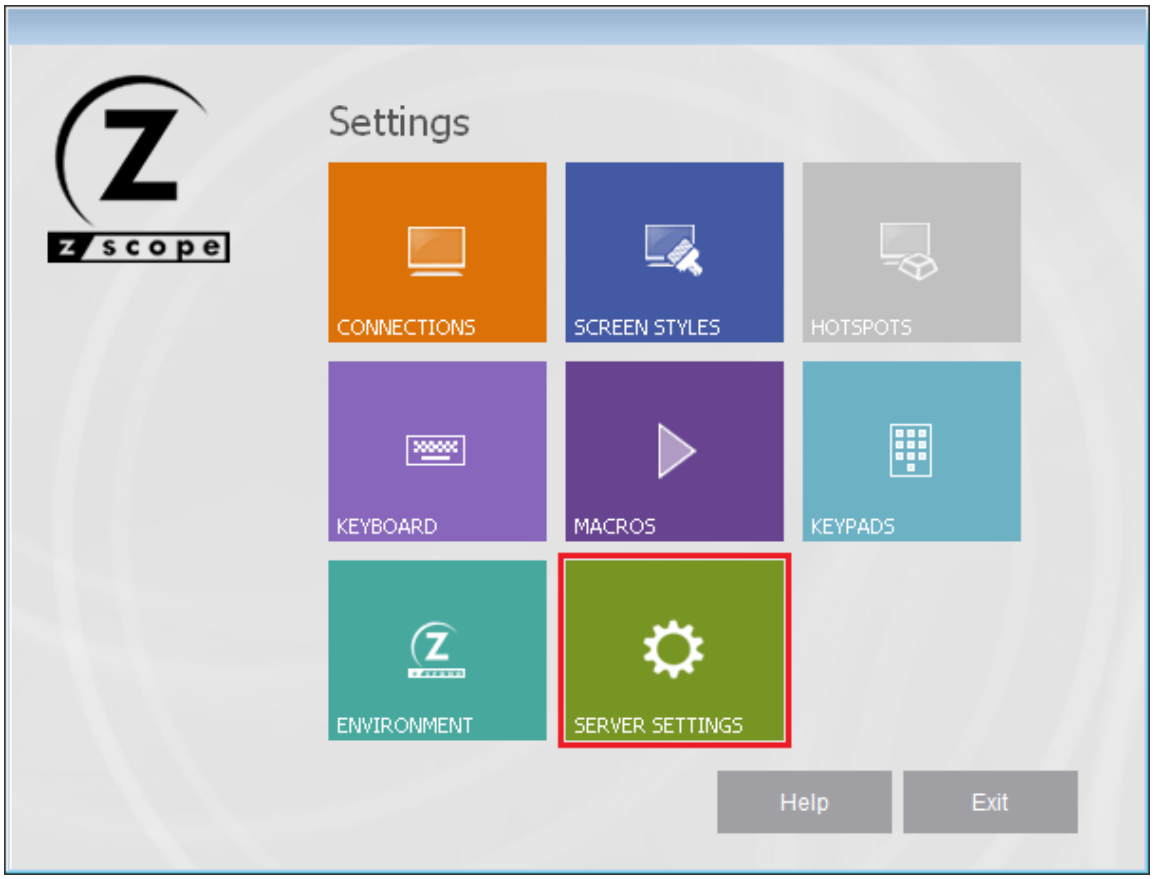

Read More:

- Configuration Manager - Server Settings - Communication Settings
- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Migration Settings
- Configuration Manager - Server Settings - Licenses Settings

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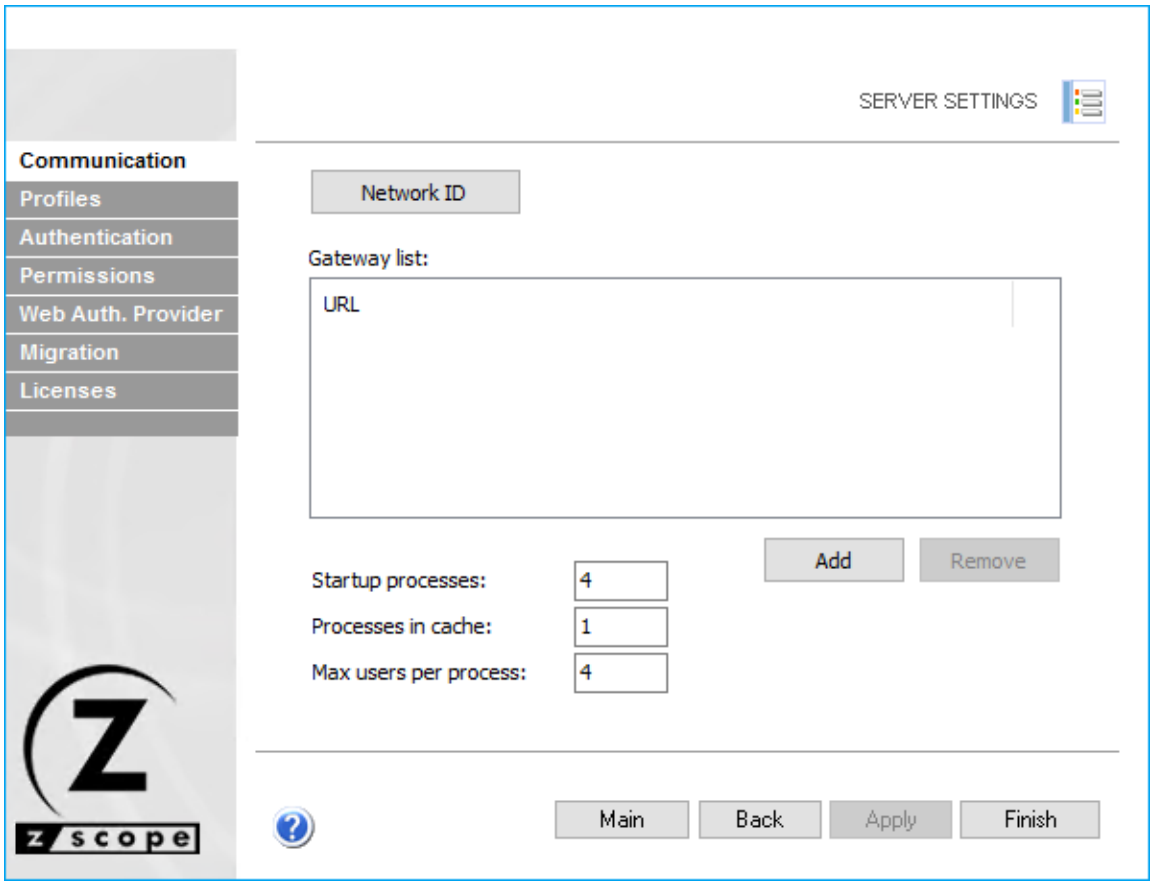
7.1.8.1 Communication

In the 'Communication' tab you will find different parameters depending on your installation choices.

Server Mode Installation



Network ID
The network ID identifies this installation. z/Scope Anywhere Servers that want to share their resources through one or more Gateways must match their Network ID. Press this button to see and/or change the Network ID. The default value is a random string but you can change it to something more descriptive.

Gateway List
A list of the gateways that a user can connect to in order to access this server's resources. For a typical installation, with no load balancing architecture, leave it blank.

Add
Add a new gateway to the Gateway List. Only if you will use Scaling and Load Balancing.

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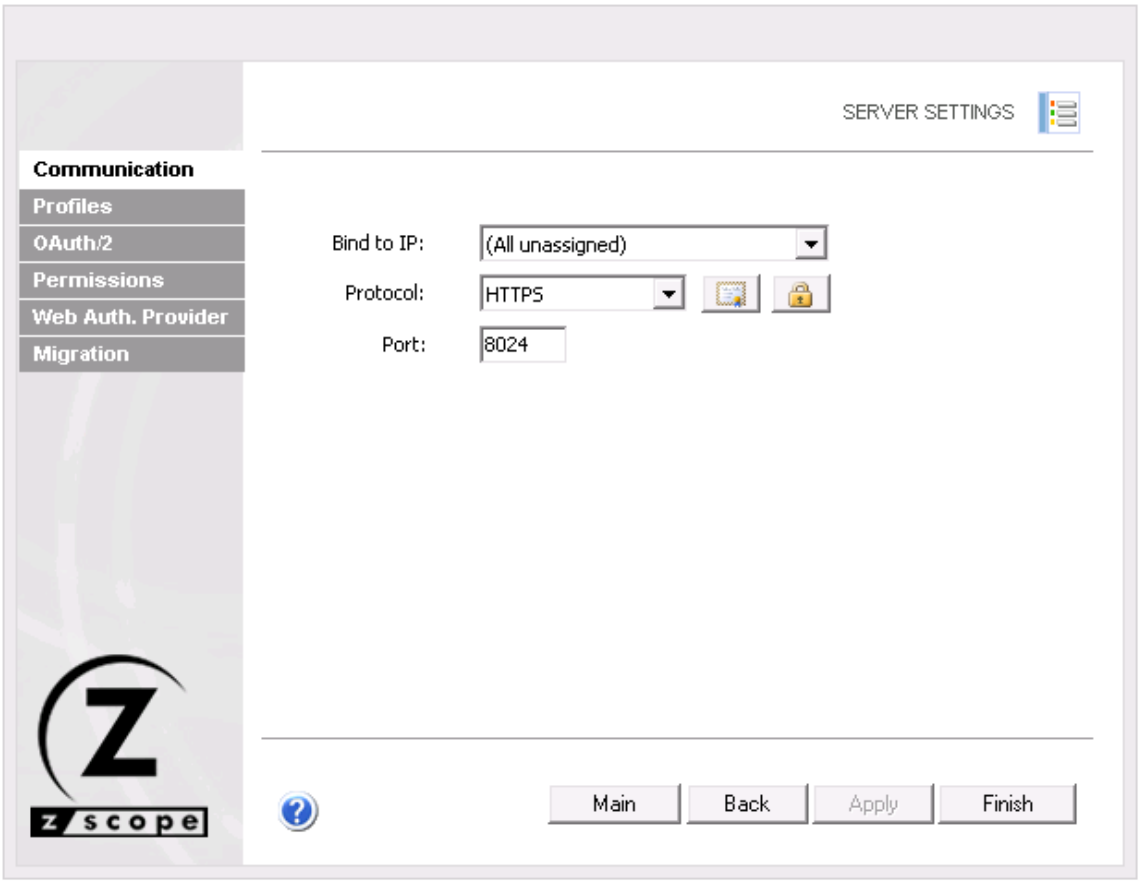
Remove
Remove a selected gateway from the Gateway List.

Startup Processes
The number of processes that z/Scope Anywhere will start by default, as opposed to starting them on demand when a user connects. This reduces the waiting time for the user.

Processes in Cache
The number of processes that z/Scope Anywhere will reserve in memory to attend new connections after the startup processes are executed.

Max Users per Process
The maximum number of users per process. If the total amount of connections exceeds the maximum users for all the processes, a new process is created.

Desktop Mode Installation



Bind to IP

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Use this option to restrict access to the service through one specific IP. The "All unassigned" option allows access through all the possible IP's for the computer where z/Scope Anywhere is installed.

Protocol
Choose between the http and https protocol. The https protocol uses SSL. Hence, it's more secure.

Port
Choose the port number for this computer to be accessed.

Press this button to configure HTTP error responses

Press this button to access the options for replacing the default installed certificate with your own. Read more about this subject on the topic Managing the SSL Certificate.

In a Server Mode Installation, this parameters can be found in the Gateway Manager.

Read More:
- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Migration Settings
- Configuration Manager - Server Settings - Licenses Settings

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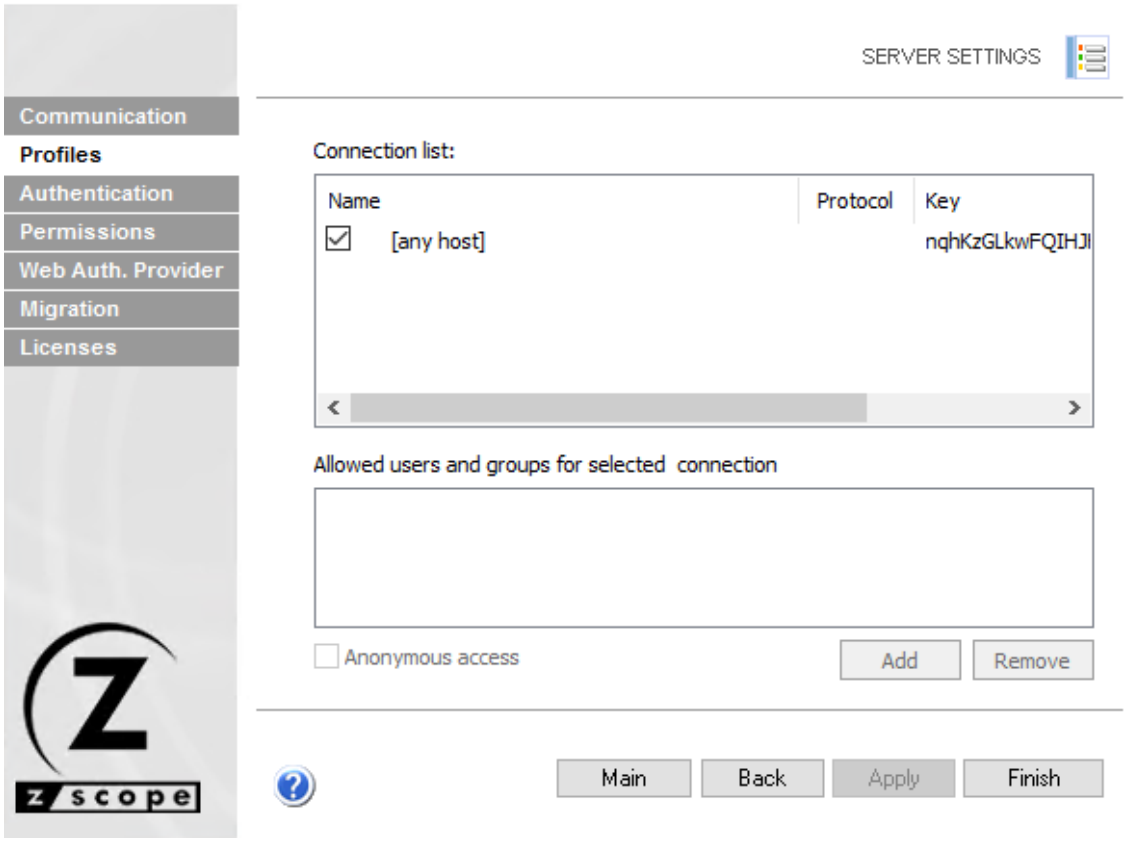
7.1.8.2 Profiles

In the 'Profiles' tab you will find the following parameters:



Connection List

Name
Show you the name of the listed connection profiles. If you uncheck the checkbox placed beside a connection, you will inactivate this connection, and it won't be shown on the web interface.

Protocol
Shows the protocol for the profile's connection.

Key
Shows the access key for the profile.

Allowed Users and Groups for Selected Connection

Add

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Select the connection on the connection list and click on the "Add" button to grant permission to a new user or group.

Remove
Select the connection on the connection list and click on "Remove" button to take out a permission to a listed user or group.

Anonymous Access
Check this option to make this connection available without any authentication. Use this option, if you want this connection to be available to everyone. Checking this option will disable the Add and Remove buttons.

Read More:

- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Communication Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Migration Settings
- Configuration Manager - Server Settings - Licenses Settings

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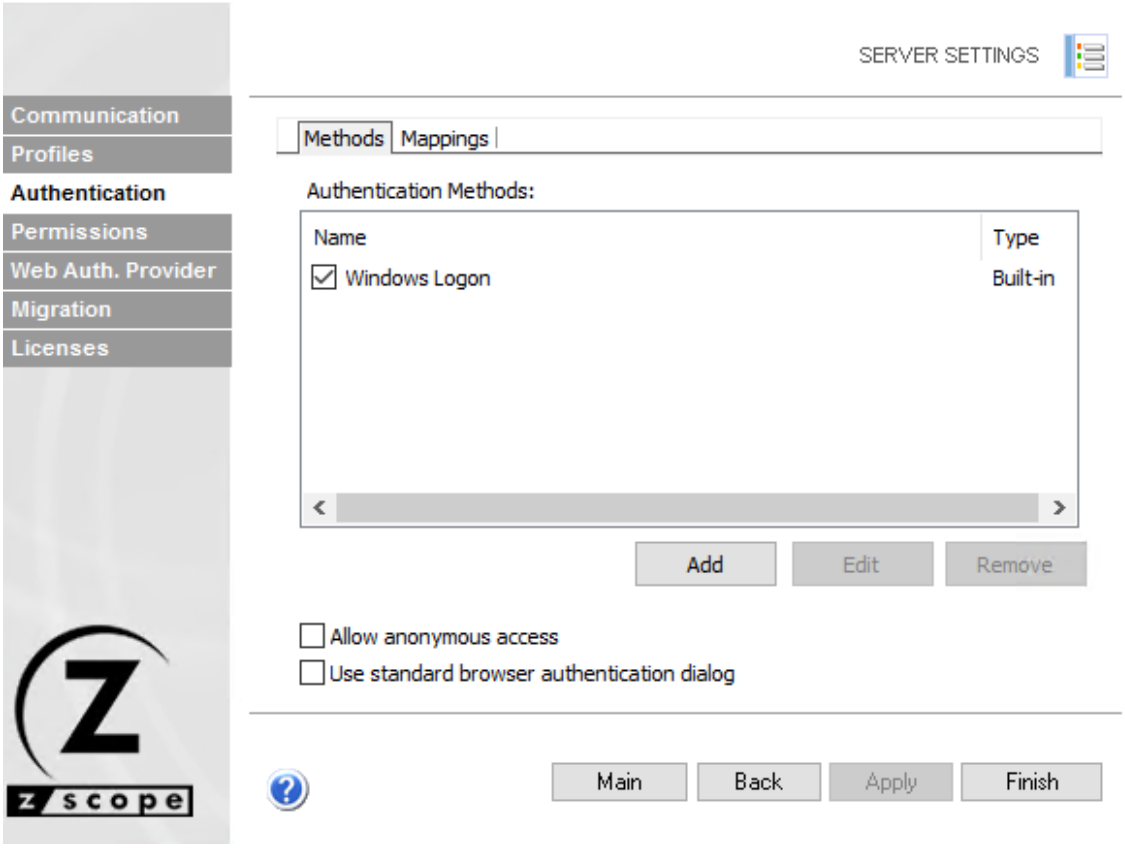
7.1.8.3 Authentication

In the 'Authentication' tab you will find the following parameters.



Authentication methods
This list shows the available authentication methods. You can enable or disable them by checking the box to the left of the name.

Name
Shows the name of the authentication method.

Type
Shows the authentication method type.

Add
Press this button to add a new authentication method. Each method presented will open a new form for you to fill in the relevant information.

Edit
Select an authentication method and press this button to edit it.

Remove

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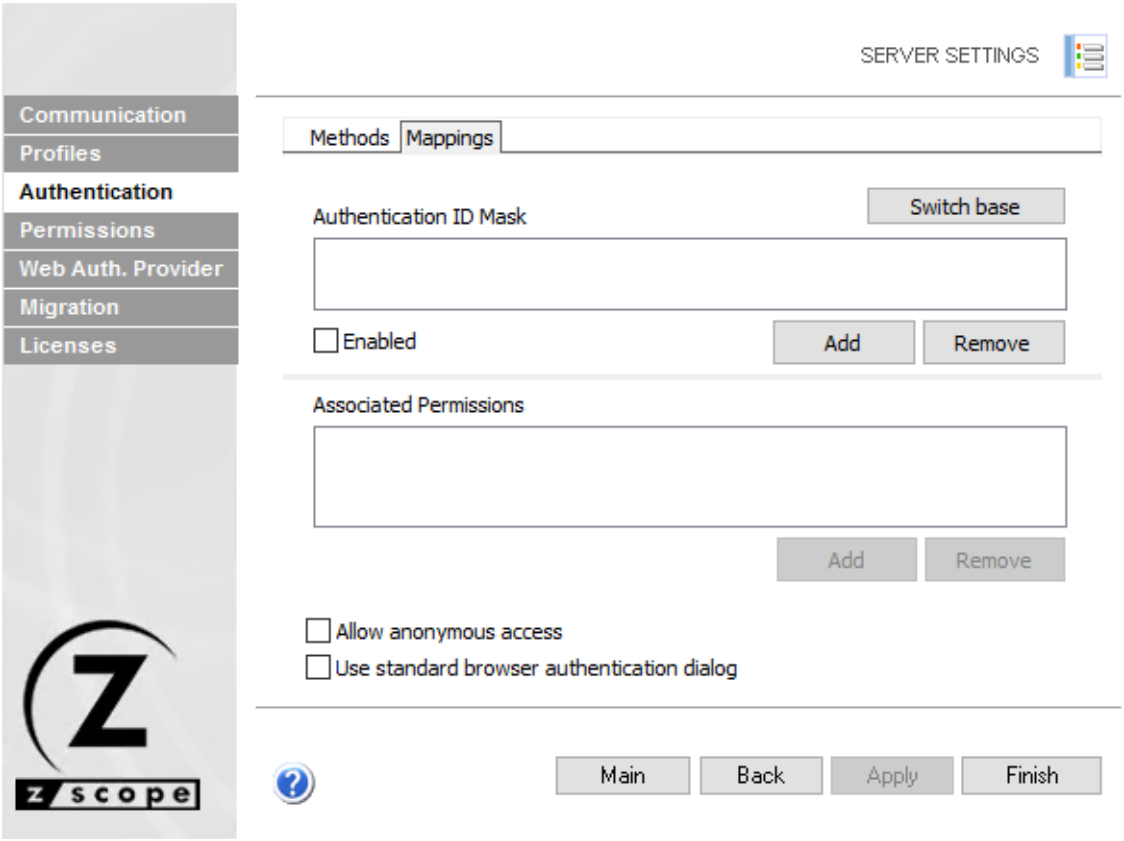
Select an authentication method and press this button to remove it.

Allow Anonymous Access
Check this to allow anonymous access. This means that users can access anonymous access profiles without any kind of authentication.

Use Standard Browser Authentication Dialog
Check this to use the standard browser authentication dialog. When this is unchecked, users will authenticate through the z/Scope Anywhere web login.

The 'Mappings' tab of the 'Authentication' tab is where you will map all the credentials of methods other than Active Directory user so they can be authenticated against the profiles.



Switch Base
The 'Mappings' tab can show information in two different ways to ease your mapping process. By pressing the 'Switch base' button, you select whether you prefer to see a list of your authentication ID masks above, that you will map with the Associated User(s)/Group(s) Access below, or a list of Associated Permissions for Active Directory User(s) or Group(s) above that you will map to authentication IDs below. This doesn't change the way it works, only the way it is shown. You might want to think that a certain authentication method username has several

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Active Directory groups it's associated with and thus choose to see the authentication method usernames above; or you might prefer to see, for example, a list of Active Directory users and link each of them with several authentication method usernames. You can try, and even go back and forth as you add users and decide which way works best for you. Switching the base doesn't change the users or their mapping.

Authentication ID Mask
This list shows your authentication ID Masks. This means that you can either use an authentication ID, or a mask that matches only some of the username's characters (the rest are represented with *).

Associated Permissions
This list shows the Active Directory user(s) and/or group(s) associated with authentication ID masks.

Enabled
Use this checkbox to enable or disable a particular authentication ID mask (only available when the Authentication ID Masks box is shown above)

Add
Use this button in the box above to add a new authentication ID mask or a new Active Directoy user or group.
Use this button in the box below after selecting an authentication ID mask, Active Directory user or group in the box above, to associate an Active Directory user or group or authentication ID mask, respectively, in the box below.

Remove
Use this button in the box above to remove an authentication ID mask or an Active Directory user or group. Bear in mind that this will also remove the mapping (use the 'Enabled' checkbox to disable it temporarily).
Use this button in the box below to remove the mapping of an Active Directory user or group or authentication ID mask to the authentication ID mask or Active Directory user or group selected in the box above.

Read More:
- Configuration Manager - Server Settings - Authentication Settings - Adding a Aew Authentication Method
- Configuration Manager - Server Settings - Authentication Settings - External DLL
- Authentication API
- Configuration Manager - Server Settings - Communication Settings
- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Migration Settings
- Configuration Manager - Server Settings - Licenses Settings

7.1.8.3.1 Adding a New Authentication Method

When you add a new authentication method, you need to set some parameters.

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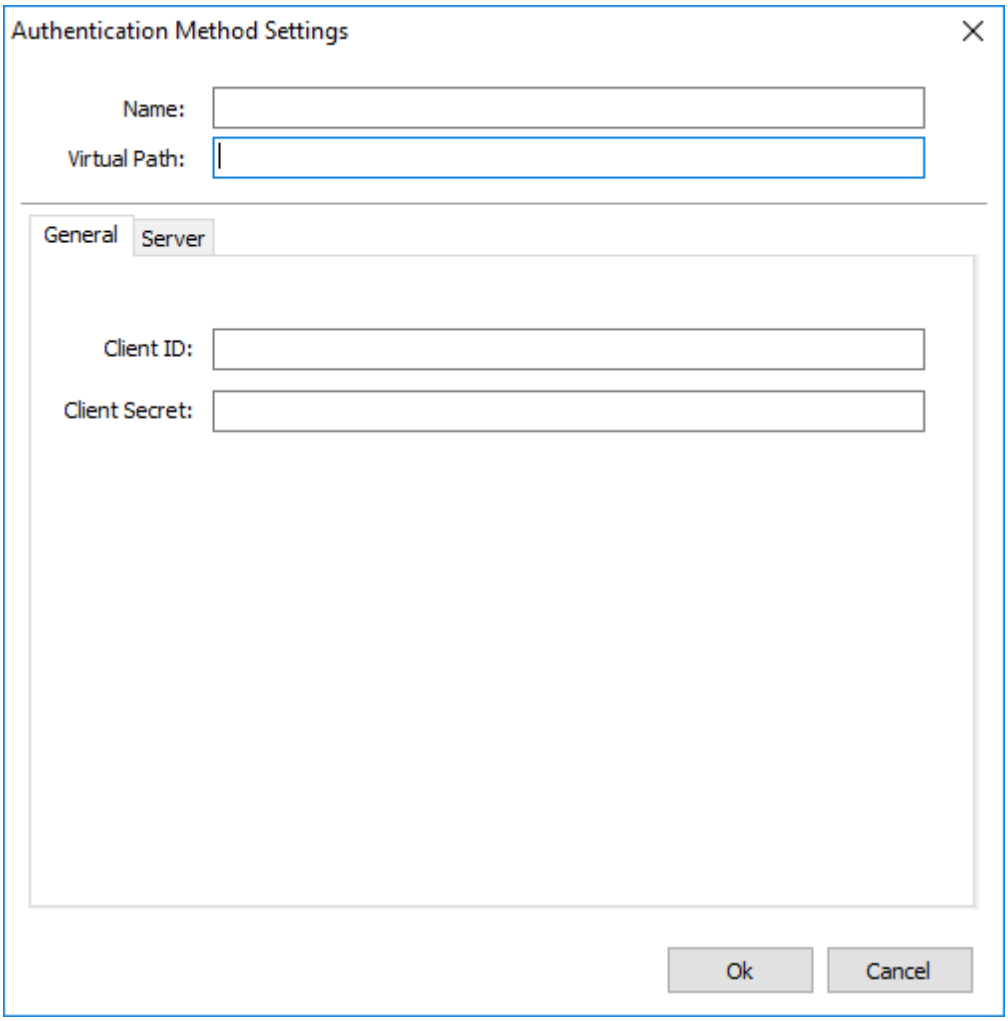
General tab:



Name
Choose a name to identify this authentication method.

Virtual Path
Type a Virtual Path. If you access your z/Scope Anywhere URL followed by the virtual path:

http(s)://ip:port/virtualPath

the application will attempt to log in with this method.

Client ID
Enter your authentication provider Client ID, generated while configuring your account integration.

Client Secret
Your authentication provider's Client Secret generated while configuring your account

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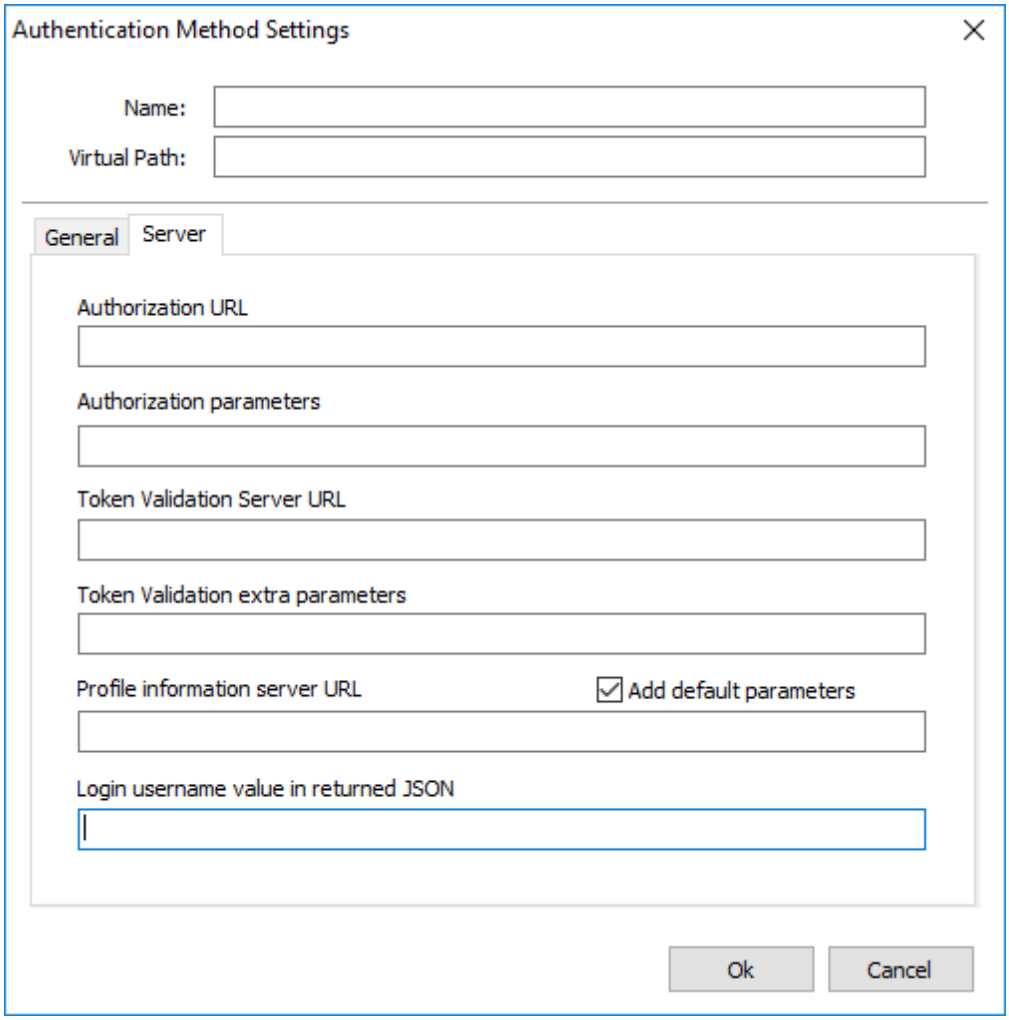
integration.

Server Tab:



Authorization URL
Enter here the URL where your authentication provider can be reached to request authorization.

Authorization Parameters
Additional parameters for the authorization URL

Token Validation Server URL
Enter your authentication provider's token validation server URL.

Profile Information Server URL
Enter your authentication provider's information server URL.

Login Username Value Returned in JSON
The name of the login username field as returned in a JSON from you authentication

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provider.

Read More:

- Configuration Manager - Server Settings - Authentication Settings - External DLL
- Authentication API

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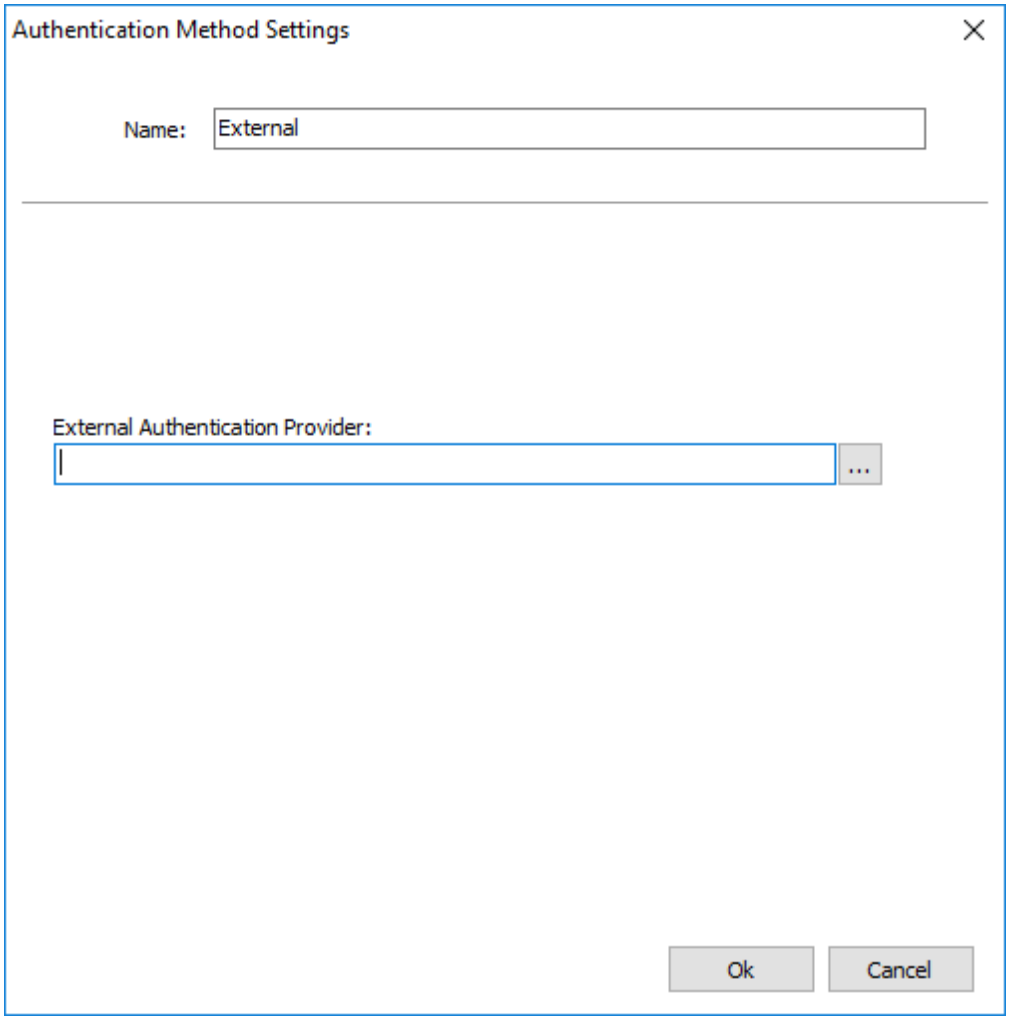
7.1.8.3.2 External DLL

When you use your own customized external DLL as an authentication methods, you only need to set the DLL.



Name
Choose a name to identify this authentication method.

External Authentication Provider
Select the DLL of your external authentication method.

Read More:

- Configuration Manager - Server Settings - Authentication Settings - Adding a Aew Authentication Method
- Authentication API

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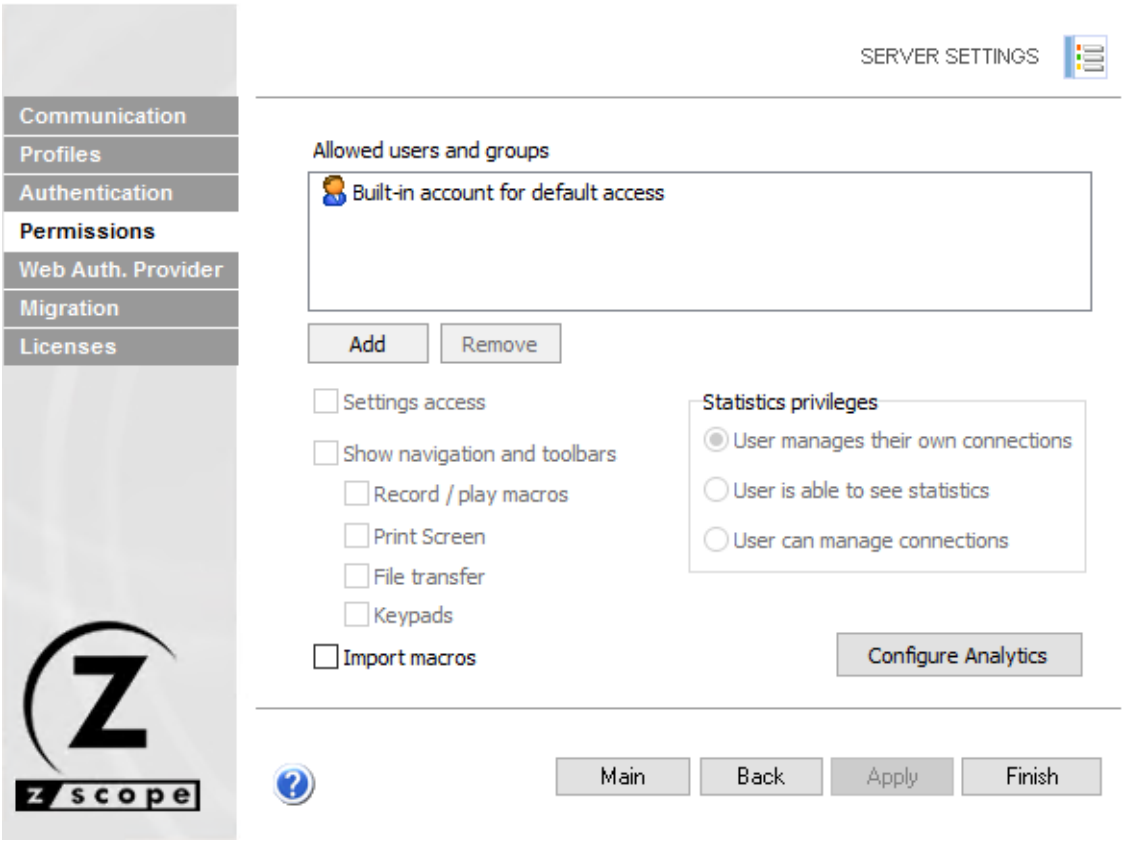
7.1.8.4 Permissions

In the 'Permissions' tab you will be able to select users and give them special permission to access different z/Scope Anywhere features:



Allowed Users and Groups

Lists the users and groups to be granted features and statistics permissions.

Add
Adds a new Active Directory user or group into the Permissions list.

Remove
Select a user/group and click on the 'Remove' button to remove all of this section's permissions from them.

Built-in Account for Default Access
Default account for anonymous access

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Features Permissions

Settings Access
Gives the selected user access to see and open the system "Settings" from the Start Page.

Show Navigation and Toolbars
If you uncheck this option most of the navigation controls (Navigation, Open sessions List) and toolbars (Start Page Toolbar, Connection Toolbar) will be disabled on the user interface.

When you disable this option the following options will be automatically disabled along with it:

Record/Play Macros
Enables the Record and Play macros feature for the selected user.

Print Screen
Allows the selected user to take Print Screens from an active connection.

File Transfer
Gives the selected user access to perform File Transfers.

Keypads
Allows the selected user to access the connections Keypads.

Import Macros
Allows the selected user to import Macros.

Statistics Privileges

User Manages Their Own Connections
Check this option if you want the selected user to open and disconnect only their own connections.

User is Able to See Statistics
If you mark this option, the selected user/group will be able to see the system statistics for all users.

User Can Manage Connections
This option will authorize the selected user to see and manage all z/Scope Anywhere connections and sessions (disconnect and delete active sessions from other users, for example).

Configure Analytics
Access MS SQL to Set up a database for storing the Analytics data. Learn how to Configure MS SQL Server.

Read More:
- Configuration Manager - Server Settings - Communication Settings

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- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Migration Settings
- Configuration Manager - Server Settings - Licenses Settings

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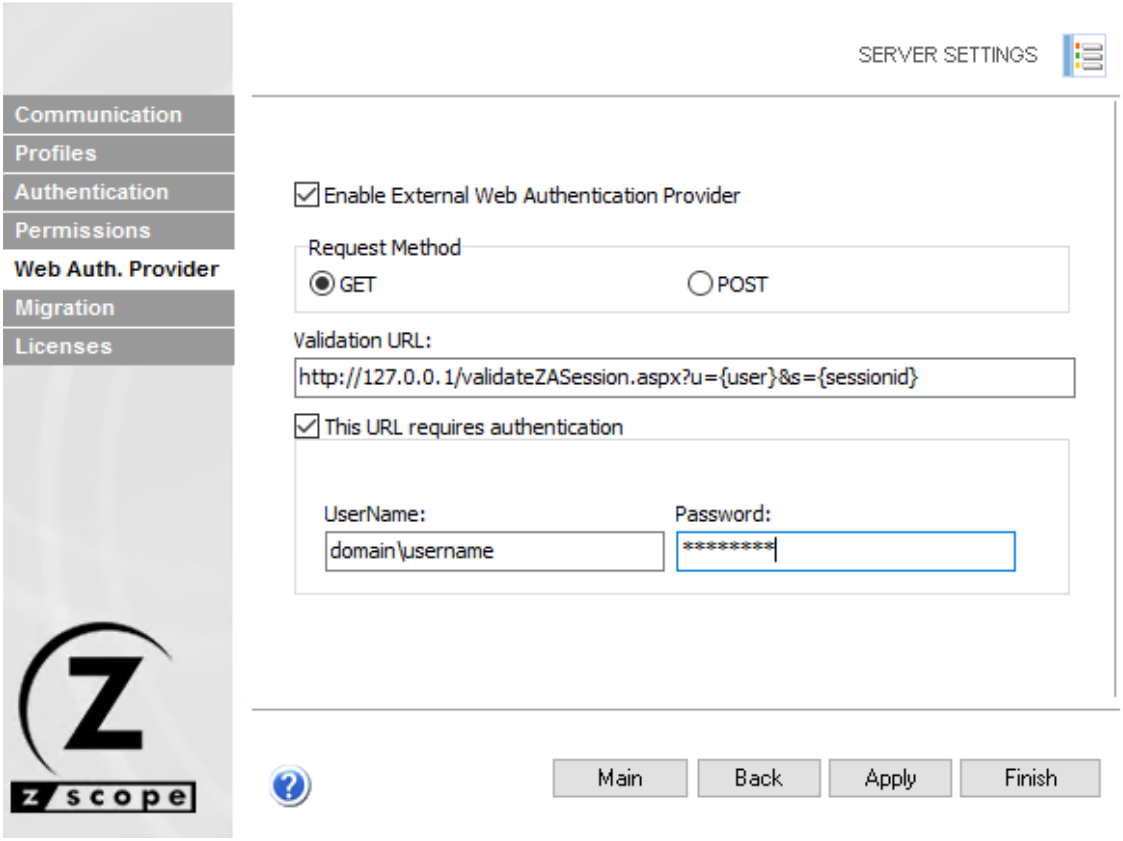
7.1.8.5 Web Auth Provider

In the 'Web Auth Provider' tab you will find the following parameters:



Enable External Web Authentication Provider
Check this option to use an external web authentication provider.

Request Method
Select the HTTP method with which you want to communicate with the validation URL.

Validation URL
Complete the validation URL. This is the URL that z/Scope Anywhere will make a call to in order to validate the user.

This URL requires authentication
Check this if the validation URL requires authentication and complete the credentials. These credentials will be used to log in to the validation URL.

Read More:
- Configuration Manager - Server Settings - Communication Settings

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- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Migration Settings
- Configuration Manager - Server Settings - Licenses Settings
- Web Authentication Provider
- External Authentication

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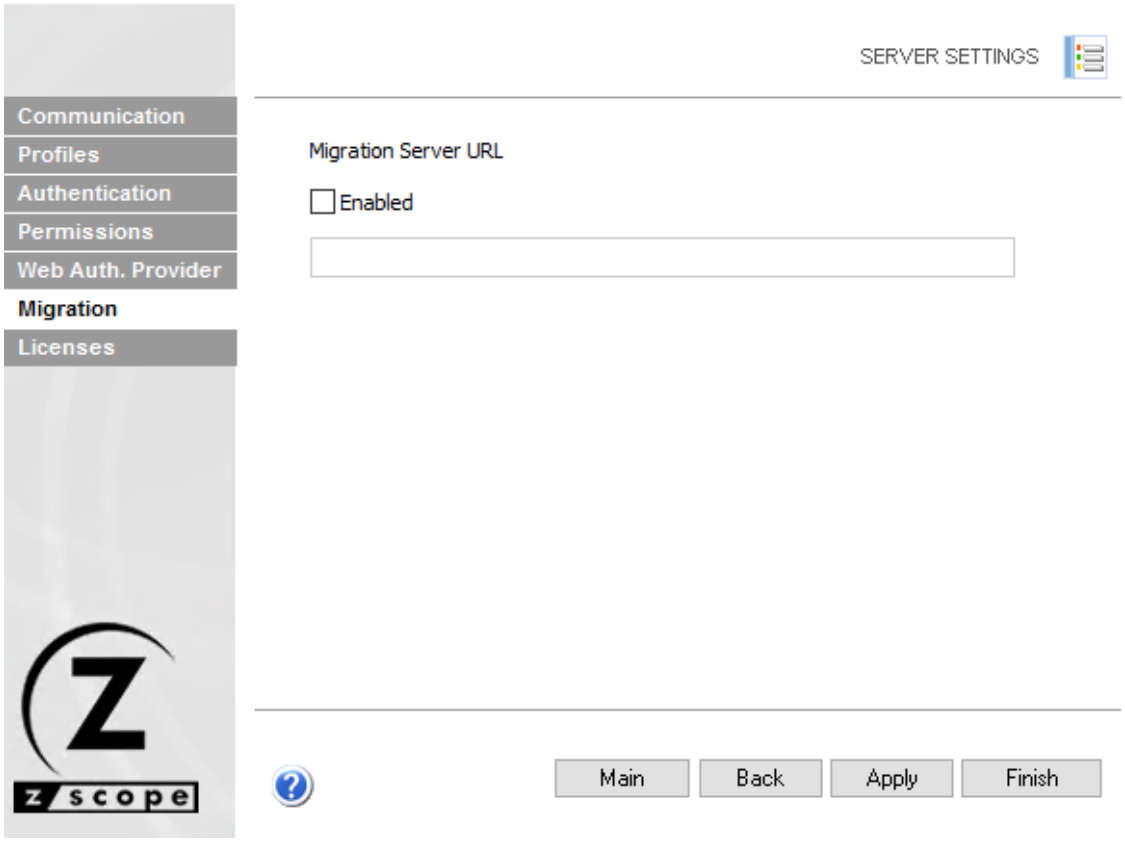
7.1.8.6 Migration

In the 'Migration' tab you will find the following parameters:



Migration Server URL
Enable the checkbox to use a migration server, and complete the migration server's URL.

Read More:
- Configuration Manager - Server Settings - Communication Settings
- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Licenses Settings

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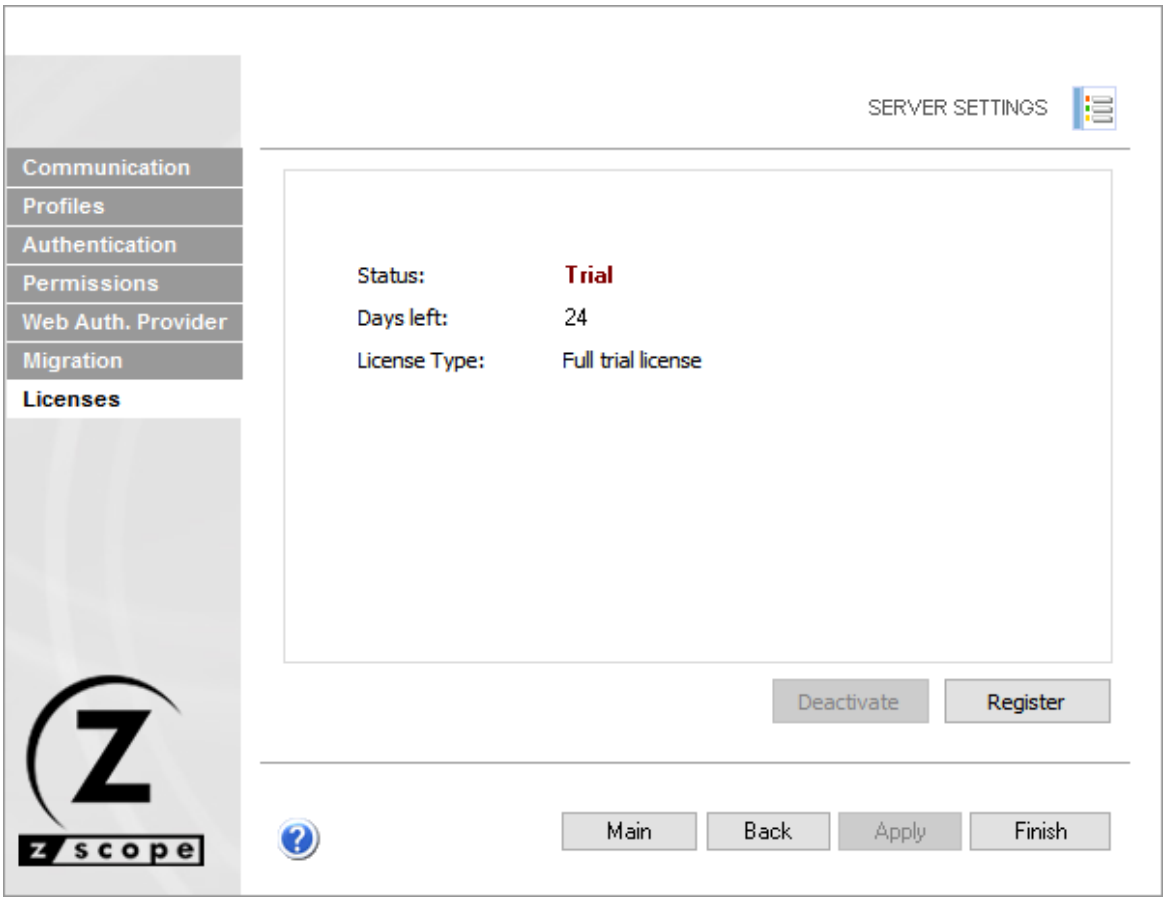
7.1.8.7 Licenses

This is how the 'Licenses' tab of z/Scope Anywhere Configuration Manager in Activation mode looks like when the 30 day trial is over:



This tab always shows the current license. If you don't have a license, you will see a message letting you know how many evaluation days you have left until the trial finishes, as the image above.

a. Register a License:

If you have your z/Scope Anywhere license, you should register it by following the next steps:

1. Click on the "Register" button.
2. Enter the License "E-mail" and "Serial" number information, received by e-mail.

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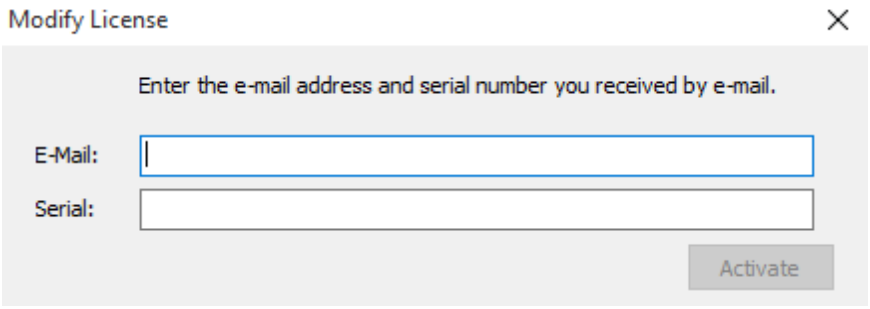

3. Press Activate.
4. If the information is correct, you probably have z/Scope Anywhere registered already.
5. Verify the new licensing information on the "License" Tab.
6. Contact us if you want to increase your license limits or if you want to enable a new feature.

b. Deactivate this Machine:

You may want to deactivate a machine in order to make the license limits available to be used on another machine.
The deactivation button will be enabled only when a license is already registered on this machine.
To deactivate your already registered license, follow the steps bellow:

1. Click on the "Deactivate" button.
2. Press "Yes" on the Confirmation Dialog.
3. A message confirming the license deactivation will be shown.

c. Show the Current Licensing Status:

The License status can be:

Trial	Right after you install z/Scope Anywhere, the license status will be "Trial". This status will be kept until the trial period is over. On this status you are able to see how many days left the trial period still has.
Registered	After buying z/Scope Anywhere license and registering, you will have the application status turned to "Registered". On this status you will have the information regarding the license registration: 1. E-mail, 2. Company or Name, 3. Serial Number, 4. License type, 5. Expiration date, 6. License limits and 7. Enabled features.
Trial Expired	If you do not register a license until the end of the trial period, the status will turn to "Trial Expired". During this status the application won't be available.

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Deactivated by User	Whenever you deactivate a license, z/Scope Anywhere application will have the "Deactivated by User" Status. This status will be kept until you register another license. During this status the application won't be available.

Contact us regarding pricing and/or licensing questions or visit our website http://www.cybelesoft.com/buy/.

Read More:

- Configuration Manager - Server Settings - Licenses Settings - Manual Activation
- Configuration Manager - Server Settings - Licenses Settings - Proxy Activation
- Configuration Manager - Server Settings - Communication Settings
- Configuration Manager - Server Settings - Profiles Settings
- Configuration Manager - Server Settings - Authentication Settings
- Configuration Manager - Server Settings - Permissions Settings
- Configuration Manager - Server Settings - Web Auth Provider Settings
- Configuration Manager - Server Settings - Migration Settings

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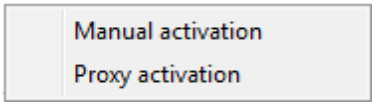
7.1.8.7.1 Manual Activation

Manual Activation is an activation option only for those cases when you want to activate z/Scope Anywhere in a machine that has no internet connection, or an internet connection restricted by heavy security policies that block a regular activation.

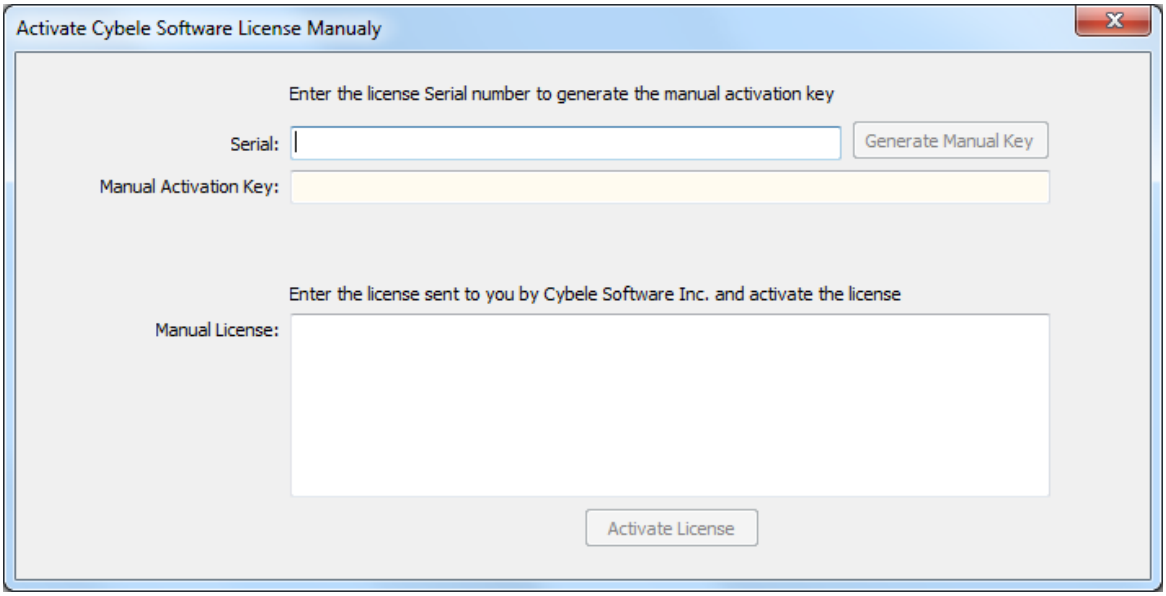
- If you haven't tried a regular activation, follow these instructions: Activation licensing.
- If your internet restrictions are caused by a proxy, follow these instructions: Proxy Activation.

Otherwise, keep reading:

To access Manual Activation, right click on the main area of the License Manager with the 'Activation' radio button option selected:



Choose the 'Manual activation' option. You will see the following pop up:



Serial	Enter the license Serial number to generate the manual activation key
Generate Manual Key	After you have entered the serial number, press this button to generate the Manual Activation Key.

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Manual Activation Key	After you press the 'Generate Manual Key' button, a Manual Activation Key will appear in this field. Send this Manual Activation Key to support.
Manual License	The support team will reply with the Manual License, a code that you will enter in this field.
Activate License	Press this button once you have performed the previous steps to complete your license activation.

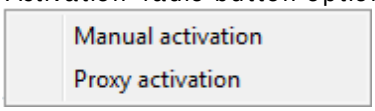
Read More:
- Configuration Manager - Server Settings - Licenses Settings
- Configuration Manager - Server Settings - Licenses Settings - Proxy Activation

7.1.8.7.2 Proxy Activation

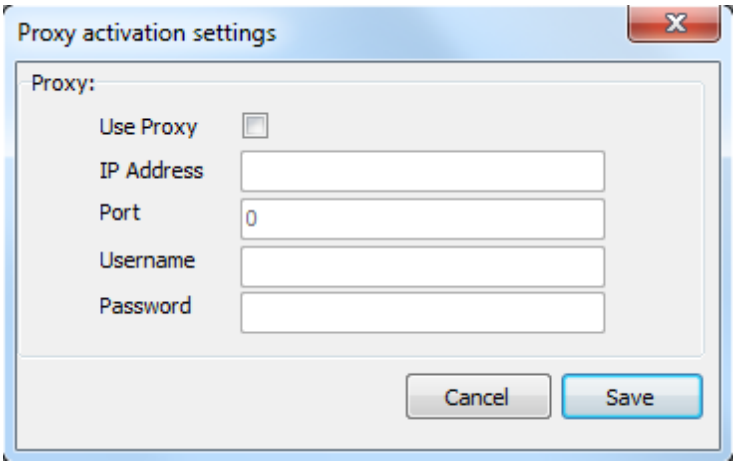
Proxy Activation is an activation option only for those cases when you want to activate Thinfinity® Remote Desktop Server in a machine that access internet through a proxy
- If you haven't tried a regular activation, follow these instructions: Licensing.
- If you are trying to activate on a machine that has no internet connection or internet connections restrictions not caused by a proxy, follow these instructions: Manual Activation.

Otherwise, keep reading:

To access Proxy Activation, right click on the main area of the License Manager with the 'Activation' radio button option selected in the Thinfinity® Remote Desktop Server Manager:



Choose the 'Proxy activation' option. You will see the following popup:



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Use Proxy	Check this field to enable the Proxy activation
IP Address	Fill in your Proxy's IP address
Port	Fill in your Proxy's port
Username	Fill in your Proxy's username
Password	Fill in your Proxy's password

When you are done with the proxy configuration, Activate your license.

Read More:
- Configuration Manager - Server Settings - Licenses Settings
- Configuration Manager - Server Settings - Licenses Settings - Manual Activation

7.2 Gateway Manager

The Gateway Manager is a tool to configure gateway options.

Install z/Scope Anywhere and look for the z/Scope Anywhere Gateway' shortcut in the Start Menu.

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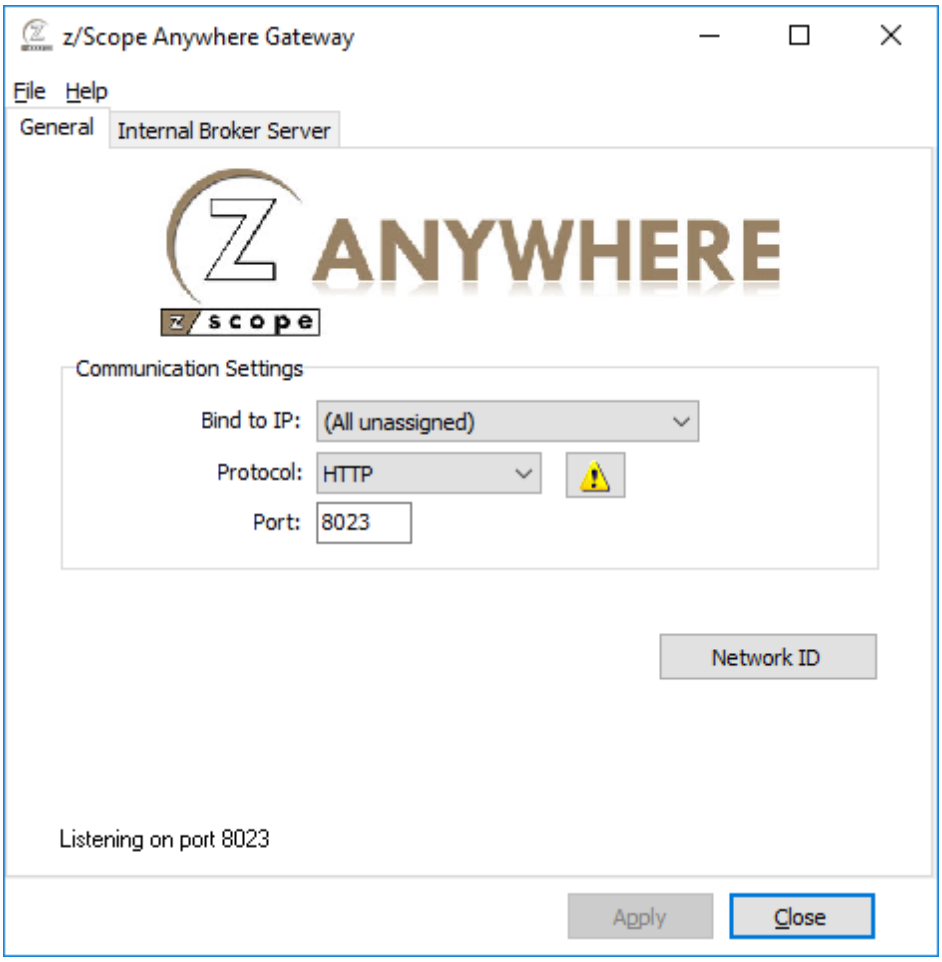
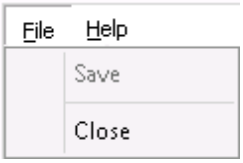


Its main menu has two sub-menus:

File Menu



Save
Click to save any change.

Close Save
Click on this option to exit the z/Scope Anywhere Gateway manager.

Help Menu

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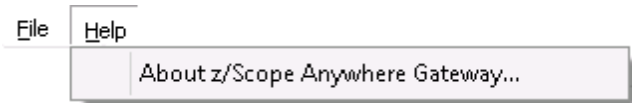

About z/Scope Anywhere Gateway...
Click on the 'About...' option to see the application version and build number.

General Tab Options

Bind to IP
Use this option to restrict access to the service through one specific IP. The "All unassigned" option allows access through all the possible IPs for the computer where z/Scope Anywhere is installed.

Protocol
Choose between the http and https protocol. The https protocol uses SSL. Hence, it's more secure.

Press this button to configure HTTP error responses

Press this button to access the options for replacing the default installed certificate with your own. Read more about this subject on the topic Managing the SSL Certificate.

Port
Choose the port number for this computer to be accessed.

Network ID
The network ID identifies this installation. This Network ID must be matched by all the servers and gateways participating in the load balancing scheme.
Press this button to see and/or change the Network ID. The default value is a random string but you can change it to something more descriptive.

Read More:
- Internal Broker Server
- Scaling and Load Balancing
- Configure HTTP Error Response

7.2.1 Internal Broker Server

In the 'Internal Broker Server' tab you will find the following options:

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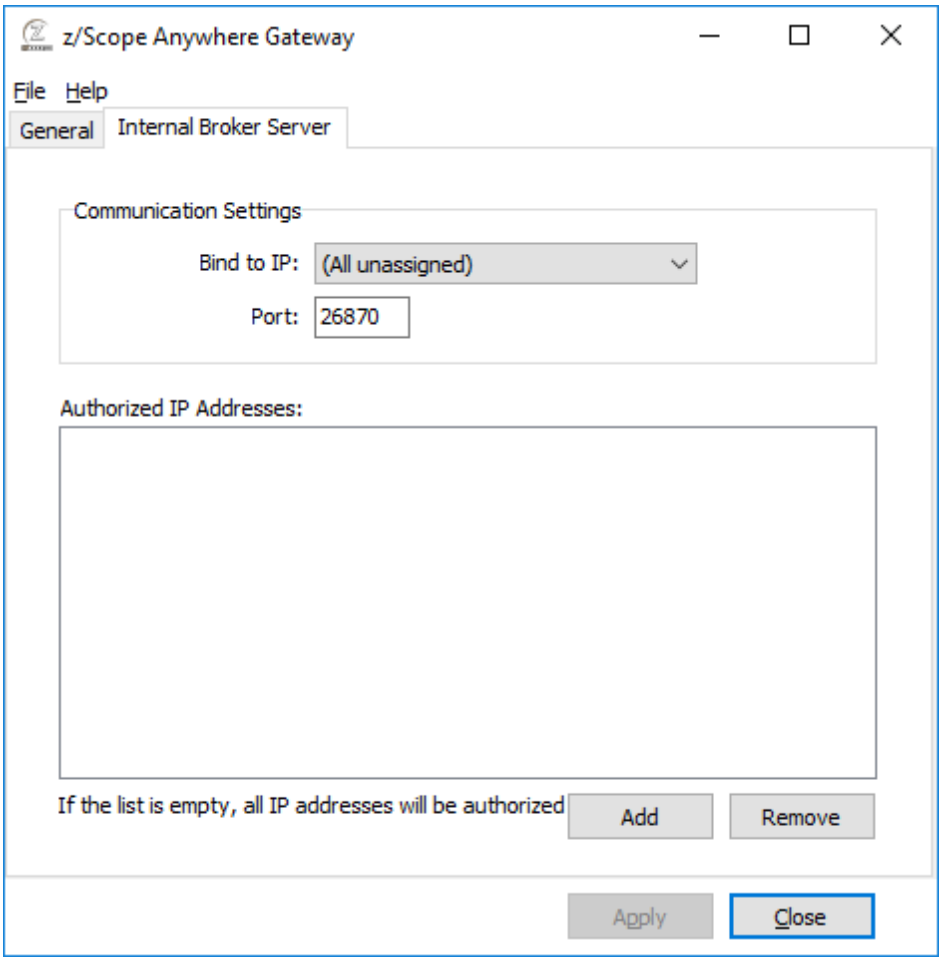

Bind to IP
Use this option to restrict access to the service through one specific IP including 127.0.0.1. The "All unassigned" option allows access through all the possible IPs.

Port
This is the port where z/Scope Anywhere Gateway will run internally.

Authorized IP Addresses:
Choose which IP addresses can access the service.

Add
Add an IP address

Remove
Select an IP address and remove it.

Read More:
- Gateway Manager
- Scaling and Load Balancing

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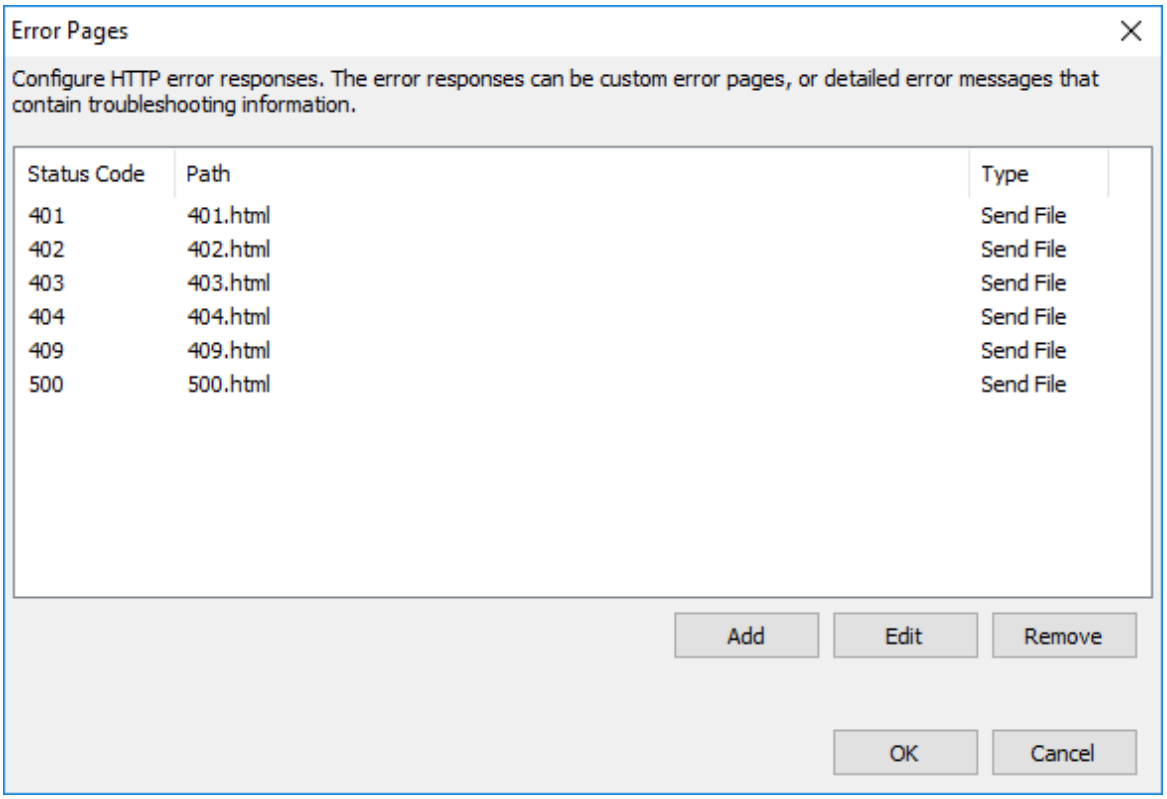
7.2.2 Configure HTTP Error Responses

You can access configuration for the HTTP Error response pages by pressing this button:

which you will find in the Gateway manager General tab, when the protocol is set to HTTPS.

You will be presented with the following dialog:



Status Code
This numeric code indicates the status of the response when a browser tries to connect to z/Scope Anywhere. The error responses may be displayed in the client browser.
The HTTP status code may indicate whether a request is successful or unsuccessful, and may also reveal the exact reason that a request is unsuccessful.

Path
Shows the path to the error file that will show in case of a particular status code. The default path is the 'webzs' directory in the z/Scope Anywhere installation directory.

Type
Shows the z/Scope Anywhere action in the event of an error status code:

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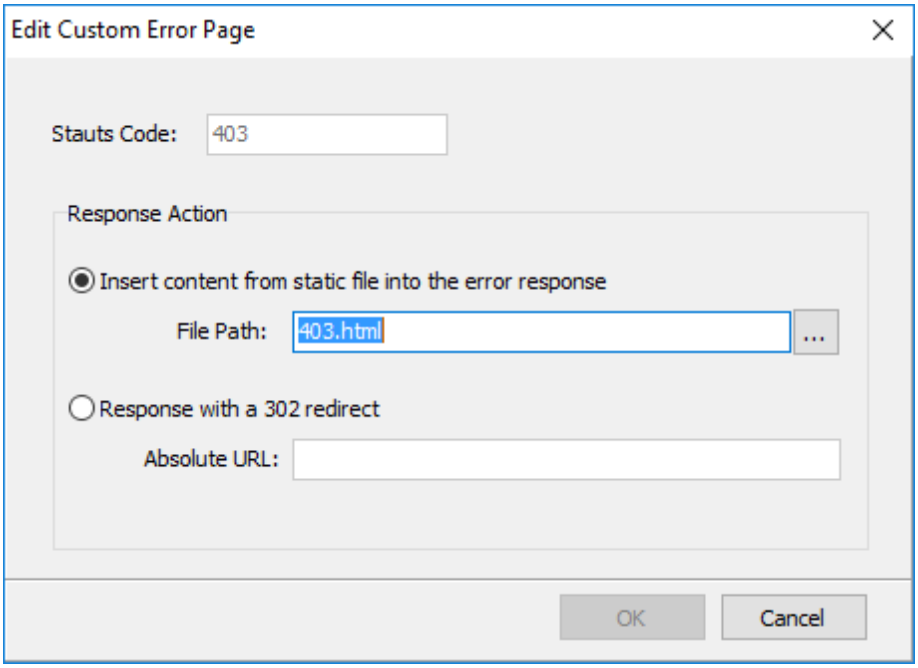
- Send file: z/Scope Anywhere will show an error page located physically in the server's computer.
- Redirect: z/Scope Anywhere will redirect the page to any web page indicated in the configuration.

Add
Press this button to add a new Custom Error page. Read more about this below.

Edit
Press this button to edit an existing Custom Error Page. Read more about this below.

Remove
Press this button to remove a selected Custom Error Page.

If you choose to add or edit a Custom Error Page, you will be presented with the following dialog:



Status Code
Enter the Status Code that you want to configure.

Response Action
Choose whether z/Scope Anywhere will show a page that is stored locally or will redirect the user to another web page.

Insert Content from file into the error response
Choose this option if you want z/Scope Anywhere to show a static page locally stored in your z/Scope Anywhere server. Complete the file path by selecting the file you want to show with the button.

Response with a 302 redirect
Choose this option if you want z/Scope Anywhere to redirect users to a web page.

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Type the Absolute URL to this web page in the field below

Press OK to save the changes.

Read More:

- Gateway manager General tab

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7.3 Managing the SSL Certificate

An SSL certificate is an effective way to secure a website against unauthorized interception of data. At its simplest, an SSL Certificate is used to identify the website and encrypt all data flowing to and from the Certificate holder's Web site. This makes all exchanges between the site and its visitors 100 percent private.
A valid SSL certificate is included with the z/Scope Anywhere installation and all communications are already encrypted with the product's default certificate. You may want to create your own certificate to identify your company better.

Managing the SSL Certificate

1. There are two ways of creating your own SSL certificate:

    a. Create A self-signed certificate
    b. Use A CA Certificate

2. Once you already have your certificate files, go to the z/Scope Anywhere Configuration Manager, click on the "Server Settings" box and then go to the "Communication" tab.

3. Click on the "Manage Certificate" option.

4. On this screen you should inform the location of the certificate files, as follows:

Certificate File
Inform the path to the certificate file.

CA File
If the certificate is issued by a unknown CA, you should fill in the pathname to the CA certificate.

Private Key
You should inform the pathname to the certificate private key file.

PassPhrase
Inform the password, if there is any, used when the private key was generated.

Note: The path names can be absolute (C:\MyCertPath\UserThisCert.pem) or relative to the path where z/Scope Anywhere is installed (\cert\UserThisCert.perm).

Read More:
- The Default Embedded Certificate
- A Self-Signed Certificate
- A CA Certificate

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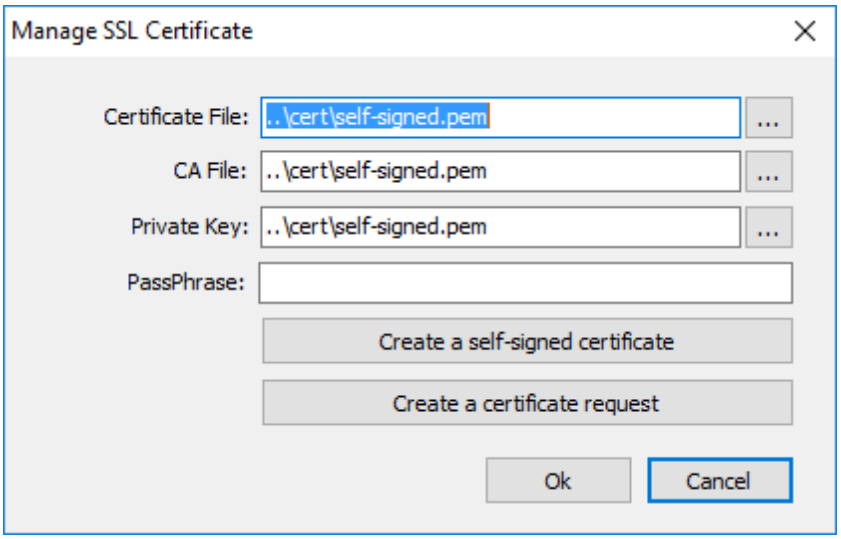
7.3.1 The Default Embedded Certificate

A certificate called "self-signed.pem" is included with the z/Scope Anywhere installation. You will find it inside the \cert directory, located inside the z/Scope Anywhere application path.

If you want to use this default certificate you should have the files set as the image below:



Note: Because this certificate is not issued by a known Certificate Authority (CA), the web browsers will produce a warning about verifying its authority.

Read More:

- A Self-Signed Certificate
- A CA Certificate

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7.3.2 A Self-Signed Certificate

This option is used to create your own self-sign certificate.

1. Go to the z/Scope Anywhere Configuration Manager, click on the "Server Settings" box and then go to the "Communication" tab. Press the "Manage Certificate" button.

2. Press the "Create a self-signed certificate" button.

3. Fill in the form below with your organization data:

4. The "Common Name" field should be filled with the server+domain that will be used to access the z/Scope Anywhere server (zscopeanywhere.mycompany.com).

5. Press Create.

6. Select the location where you want the certificate to be stored.

7. The application will start using this self-signed certificate just created by you.

Note: Because this certificate is not issued by a known Certificate Authority (CA), the web browsers will warn you they can not verify its authority.

Read More:
- The Default Embedded Certificate
- A CA Certificate

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7.3.3 A CA Certificate

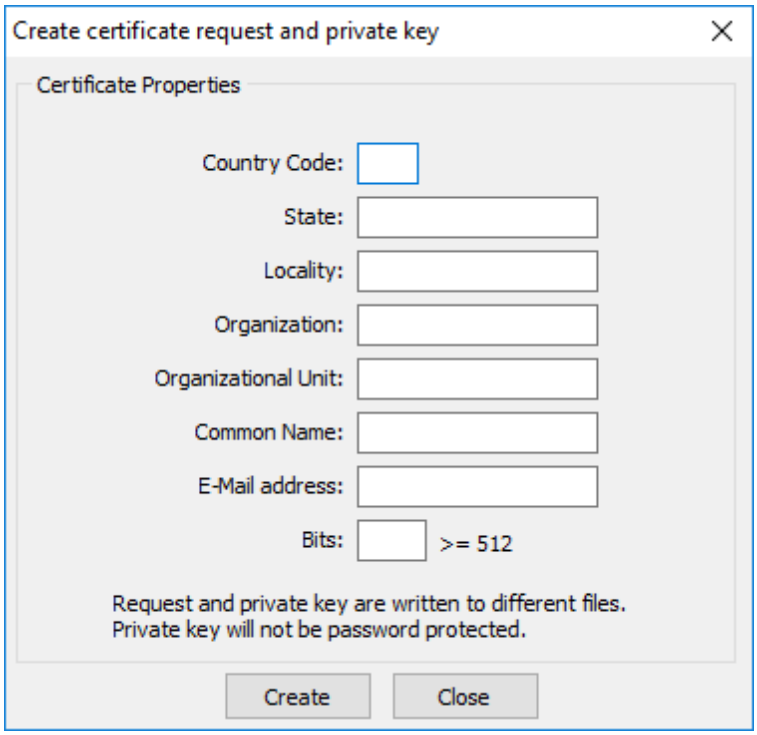
In order to use this option you will have to get a certificate from a known Certificate Authority (CA). Some CA examples are GoDaddy, VeriSign, Thawte, GeoTrust and Network Solutions.

The CA will ask you for a "certificate request". Create one following the next steps:

1. Go to the z/Scope Anywhere Configuration Manager, click on the "Server Settings" box and then go to the "Communication" tab . Press the "Manage Certificate" button.

2. Click on the "Create a certificate request" button.

3. Fill in the form below with your organization data:



4. The "Common Name" field should be filled with the server+domain that will be used to access the z/Scope Anywhere server (zscopeanywhere.mycompany.com).

5. Press "Create" and the application will generate two files.

6. The first window will ask you a location to keep the private key file: "Where do you want the private key file to be stored".

a. Inform a name for your private key.
b. Select a place to keep it safe.
c. Press the "Save" button.

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7. The second window will ask you a location to keep the request file: "Where do you want the request file to be stored.".

a. Inform a name for the request file.
b. Select a directory where you can find the file later on to send to the CA.
c. Press the "Save" button.

8. The first file is the certificate private key. It should always be kept safe with you.

9. Send only the request file to the CA.

After the CA validation process, place the certificate they sent to you on ThinVNC cert directory and inform the path to the files on ThinVNC Manage Certificate option (Certificate file, CA file and Private Key).

Read More:

- The Default Embedded Certificate
- A Self-Signed Certificate

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7.4 One-Time URL

z/Scope Anywhere offers a special access method called “One-Time URL”. This mechanism was designed to create a temporary, unique url to provide one-time access to a specific application. This temporary url is disposed as soon as it is used or after a specified period of time has elapsed.

These are the main scenarios where the One-Time URL access method is most useful:

- External authentication methods.
- One-time invitations to run a program (i.e. application demos/presentations).

Read More:
- How it Works
- Creating a One-Time URL

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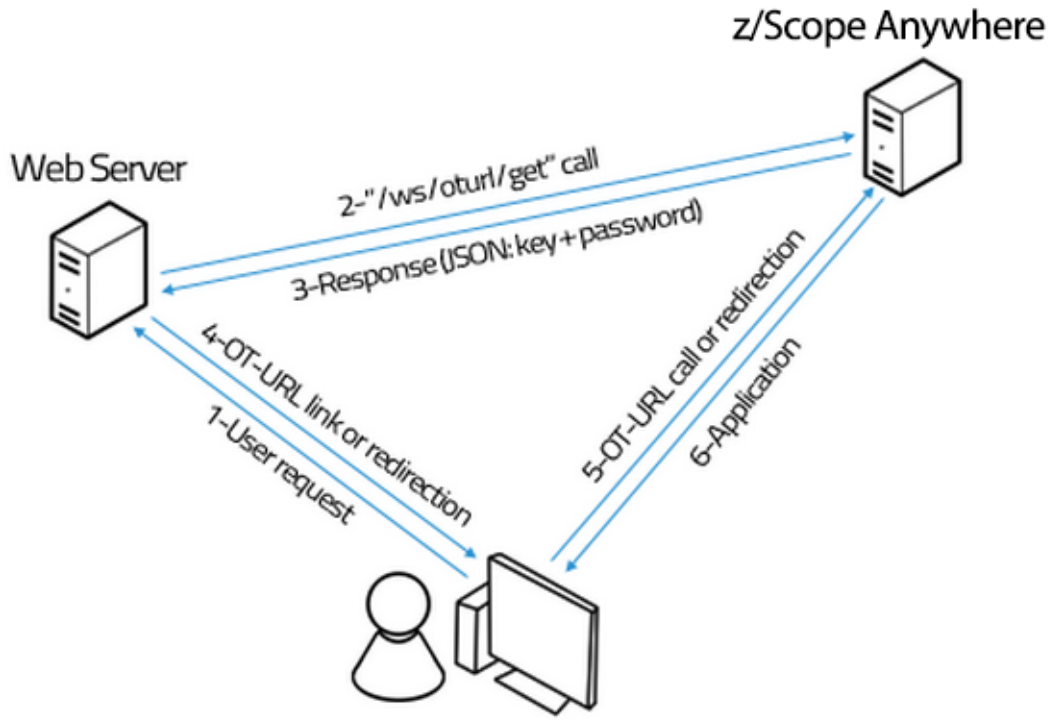
7.4.1 How it Works

The One-Time URL is a unique, disposable URL leading to a specific z/Scope Anywhere connection. What makes it useful is that it allows for passing credentials and/or custom data to the application through an independent secure channel, hidden to the end user.



A usual scenario involves a backend service (ie. a web server), where the user's credentials are validated. This backend service communicates with z/Scope Anywhere to request the creation of a One-Time URL, passing information about the profile to connect to, credentials and custom data. This information is stored temporarily and indexed by a unique access key. Also a random passcode is created and used to encrypt the stored information. This access key and passcode are returned to the backend service to build the final One-Time URL.

Once the user is directed to the provided URL (automatically or by clicking on a link), z/Scope Anywhere validates the access key and passcode and starts the application passing the associated data. Finally, this key and associated data are removed from memory and therefore the URL becomes invalid. The same happens if the URL was not used for the amount of time specified in the creation request.

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Read More:

- One-Time URL - Introduction
- Creating a One-Time URL

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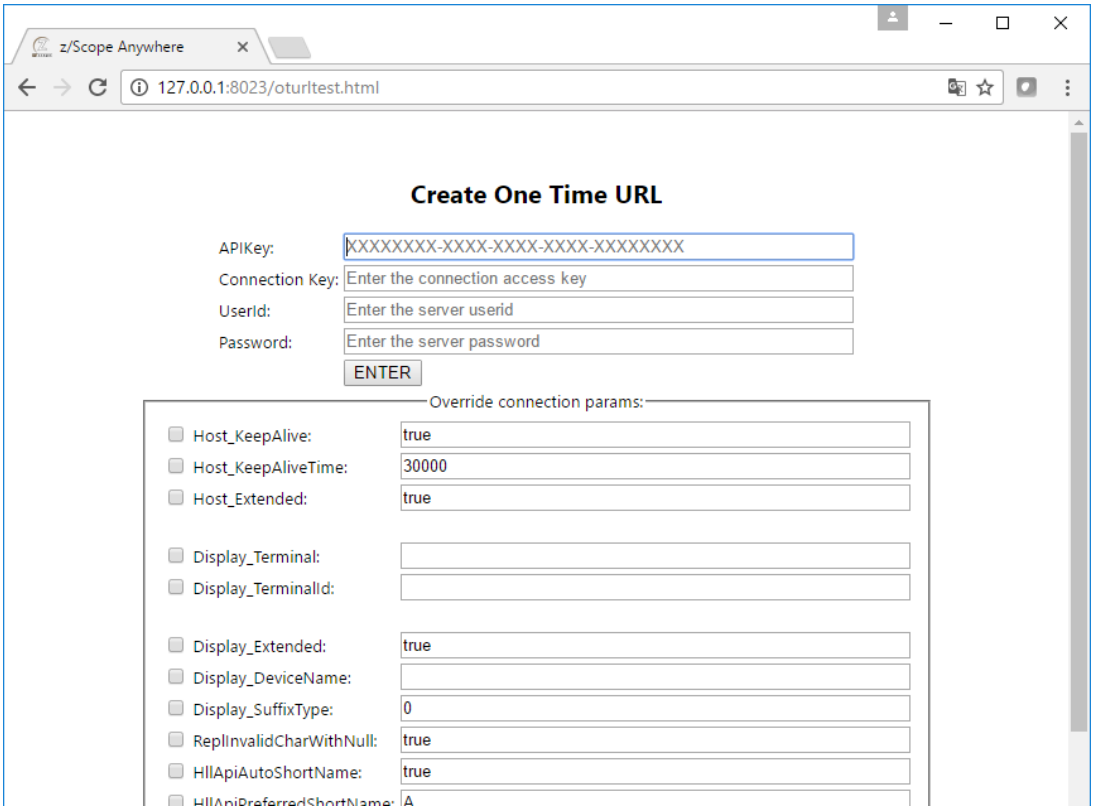
7.4.2 Creating a One-Time URL

In order to learn how to create a One-Time URL, you can use the example in 'oturltest.html', located in the 'web' folder of the installation folder. Access it with this URL:

http(s)://yourdomain:port/oturltest.html

This file shows all the parameters you can set in the One-Time URL. After you are done, press 'ENTER' and z/Scope Anywhere will redirect you to the URL that reflects your settings.



Read More:

- One-Time URL - Introduction
- One-Time URL - How it works

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7.5 End-User Authentication

z/Scope Anywhere allows you to protect the connection profiles by applying Active Directory (AD) objects to each one of them. In order to be able to connect to a host via the z/Scope Anywhere environment, either the connection profile must have anonymous access or the end-user must provide credentials that satisfy the AD objects assigned to that application.

z/Scope Anywhere lets you activate one or more authentication methods, allowing for the mapping of credentials to AD objects, which in turn will grant access to the applications that had the same AD objects applied.

Read More:

- Entering Credentials
- Processing End-User Credentials
- Authentication Methods

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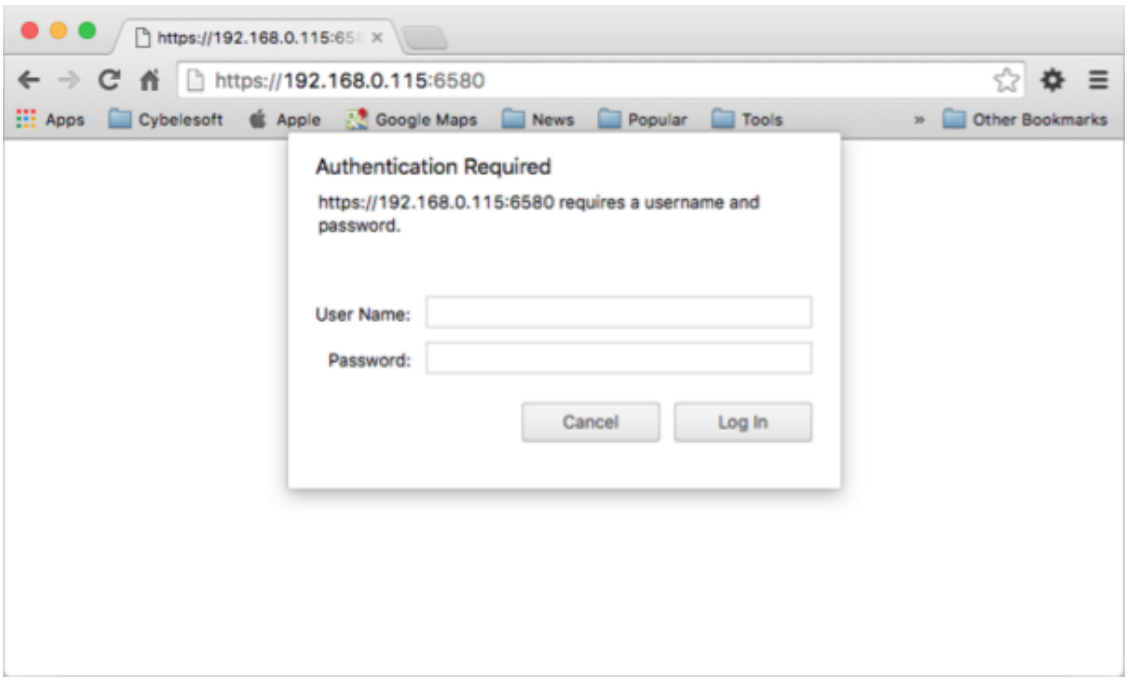
7.5.1 Entering Credentials

z/Scope Anywhere allows you to enable one or more authentication methods at a time. There are two possible ways to ask for credentials:

- Using the standard Web Browser authentication dialog
- Showing a log-in page

The *Standard Web Browser Authentication* (aka *Basic Authentication*) is, in the context of an HTTP/HTTPS transaction, a method for the HTTP User Agent (the Web Browser) to provide end-user credentials when a request is started. The standard Web Browser authentication dialog is provided by each Web Browser and it looks like this:



This dialog is available when you use only one of the authentication access methods that require user and password.
You can also the z/Scope Anywhere login page, which will dynamically show all configured authentication methods in your z/Scope Anywhere Server. Every login option will be present only if the proper authentication method is configured.

For example, if only the 'Windows Logon' method is configured, the page will look like this:

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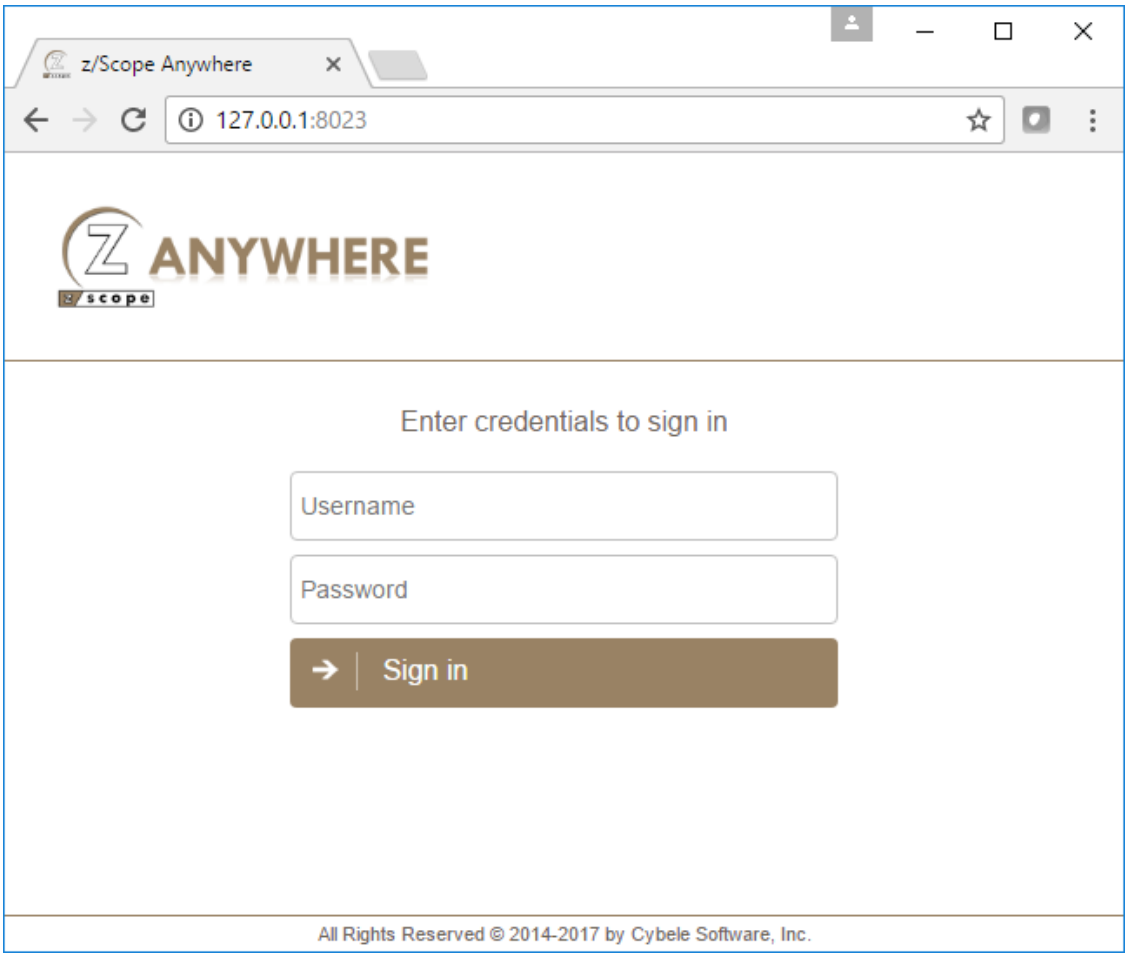

If you enable other methods, your login will show them in this way:

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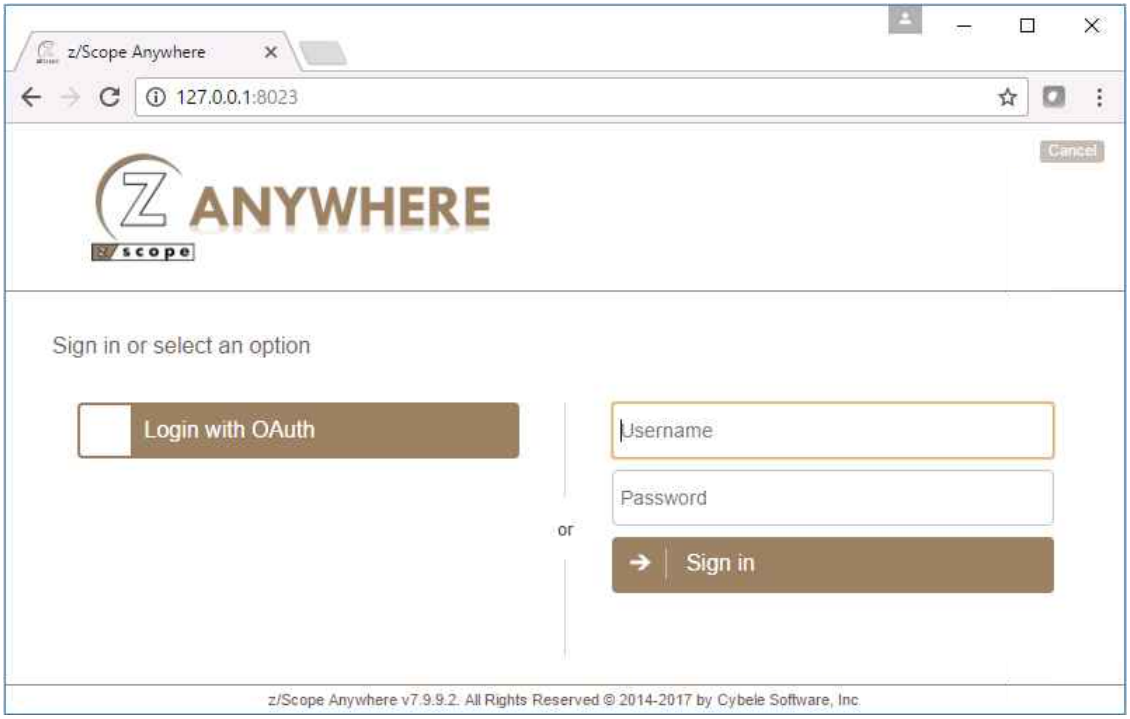

Read More:

- Processing End-User Credentials
- Authentication Methods

7.5.2 Processing End-user Credentials

Each connection profile with authenticated access requires the assignment of one or more Active Directory objects which define the users that can see and execute it.

z/Scope Anyhwhere implements a mapping mechanism to transform end-user credentials to AD objects. Only connectin profiles that match these AD objects will be granted access to the end-user.

When you enable an authentication method, you must add the mapping rules that will allow you to link the user ID with an AD object. This is done by specifying an external user ID mask and its linked AD objects.

Depending on the selected authentication method, z/Scope Anywhere uses the identification provided provided by the user to scan the mapping rule list and obtains the associated AD objects. If the matching process returns one or more AD objects, all applications with the same AD object are enabled to be seen and accessed by the end-user.

Read More:

- Entering Credentials
- Authentication Methods

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7.5.3 Authentication Methods

z/Scope Anywhere allows you to use the following authentication methods.

Windows Logon
This option enables Active Directory credentials. This method is enabled by default.

OAuth 2.0
OAuth 2.0 (or OAuth/2) is an open standard for authorization and authentication, commonly used as a way for Internet users to log into third party websites using their social network (Facebook, Google, LinkedIn, etc.) account without exposing their password.

External DLL
A custom authentication method implemented by you or a third party with our authentication API and referenced in the Thinfinity VirtualUI server.

Anonymous Authentication
You can also allow users to access applications anonymously. When this access is combined with other authentication methods, the anonymous access applications will be shown along with a 'Sign in' link for users to enter credentials.

All these methods will be enabled and configured in the z/Scope Anywhere Configuration Manager: choose the methods and configure the mapping in the 'Authentication' tab.

Read More:
- Authentication Methods - Windows Logon
- Authentication Methods - OAuth 2.0
- Authentication Methods - OAuth2Models.ini
- CSS for SSO Options
- Authentication Methods - External DLL
- Authentication API

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7.5.3.1 Windows Logon

Windows Logon means that the end-user will have to enter Windows Activate Directory credentials in order to gain access to a set of z/Scope Anywhere connection profiles.

The profiles matching the credentials provided in their the 'Profiles' tab of the z/Scope Anywhere Configuration Manager will be the profiles shown to the authenticated user, along with those with the 'Anonymous Access' option checked.

Windows Logon is enabled by default in the 'Authentication' tab of the z/Scope Anywhere Configuration Manager. Toggle its availability as an authentication method by checking or unchecking it.

Read More:

- Authentication Methods - OAuth 2.0
- OAuth2Models.ini
- CSS for SSO Options
- Authentication Methods - External DLL
- Authentication API

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7.5.3.2 OAuth 2.0

OAuth 2.0 is a standard authentication method used mostly in social web sites. The user will have to enter their OAuth 2.0 (Facebook, Dropbox, LinkedIn, Google or other) credentials in order to gain access to a connection profile defined in z/Scope Anywhere.

An OAuth 2.0 authentication method can be added in the 'Authentication' tab of the z/Scope Anywhere Configuration Manager. Toggle their availability as an authentication method by checking or unchecking them.

When you add an OAuth 2.0 method you will be required to provide the relevant information. Check the complete reference in the New Authentication Method Settings section. This information is also reflected in the OAuth2Models.ini file, distributed with the installation.

The user definition is completed through the mapping between the user ID returned by the selected OAuth 2.0 method (in the examples mentioned it's always the email) and a user registered for this Authentication ID Mask. The OAuth 2.0 method's credentials are mapped to Active Directory Objects in the 'Mappings' subtab in the 'Authentication' tab. Those Active Directory objects should satisfy the permission access rules of the applications that they are expected to get access to.

Read More:
- Authentication Methods - Windows Logon
- OAuth2Models.ini
- CSS for SSO Options
- Authentication Methods - External DLL
- Authentication API

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7.5.3.2.1 OAuth2Models.ini

OAuth2Models.ini is a file is distributed with the z/Scope Anywhere installation that has all the information of the default available logins:

```
[Google]
ClientID =
ClientSecret =
AuthorizationParameters = scope=https://www.googleapis.com/auth/
userinfo.email&approval_prompt=auto
AuthorizationURL = https://accounts.google.com/o/oauth2/auth
TokenValidationURL = https://accounts.google.com/o/oauth2/token
ProfileValidationURL = https://www.googleapis.com/oauth2/v1/userinfo
UsernameField = email

[Facebook]
ClientID =
ClientSecret =
AuthorizationParameters = scope=email
AuthorizationURL = https://www.facebook.com/dialog/oauth
TokenValidationURL = https://graph.facebook.com/oauth/access_token
ProfileValidationURL = https://graph.facebook.com/me?
UsernameField = email

[LinkedIn]
ClientID =
ClientSecret =
AuthorizationURL = https://www.linkedin.com/uas/oauth2/authorization
AuthorizationParameters =
state=HIJK98sDT88jnS23S&scope=r_emailaddress
TokenValidationURL = https://www.linkedin.com/uas/oauth2/accessToken
ProfileValidationURL = https://api.linkedin.com/v1/people/~:
(emailAddress)?format=json
UsernameField = emailAddress

[Dropbox]
ClientID =
ClientSecret =
AuthorizationURL = https://www.dropbox.com/1/oauth2/authorize
AuthorizationParameters =
TokenValidationURL = https://api.dropboxapi.com/1/oauth2/token
ProfileValidationURL = https://api.dropboxapi.com/1/account/info
UsernameField = email

[Azure]
ClientID =
ClientSecret =
AuthorizationURL = https://login.microsoftonline.com/[Directory ID]/
oauth2/authorize
AuthorizationParameters =
TokenValidationURL = https://login.microsoftonline.com/[Directory ID]/
```

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```
oauth2/token
TokenValidationParams = resource=https://graph.windows.net/
ProfileValidationURL = https://graph.windows.net/me?api-version=1.6
ProfileValidationDefaultParams = 0
UsernameField = mail
```

Use this file as a template and edit it in order to add new authentication methods or ask your authentication provider for different data.

Read More:

- Authentication Methods - OAuth 2.0
- CSS for SSO Options

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7.5.3.2.2 CSS for SSO Options

In the login.css file, included in the 'web\css' folder of the z/Scope Anywhere installation, you will find the style for the login buttons.

```
#google { background-color:#4285F4; }
#google .imgbtn { background-image: url(../images/sso/google.png); }

#facebook { background-color:#2f4e9e; }
#facebook .imgbtn { background-image: url(../images/sso/facebook.png); }

#yahoo { background-color:#6839af; }
#yahoo .imgbtn { background-image: url(../images/sso/yahoo.png); background-
size: 30px; }

#linkedin { background-color:#00A0DC; }
#linkedin .imgbtn { background-image: url(../images/sso/linkedin.png); }

#dropbox { background-color:#007ee6; }
#dropbox .imgbtn { background-image: url(../images/sso/dropbox.png);
background-size: 30px; }
```

You can change the logo and/or background color of the login buttons for the Oauth 2.0 authentication methods.

Each pair of entries corresponds to one authentication method. The ID (#google, #facebook) must match the Virtual Path established in the New Authentication Method Settings section. With the installation, these parameters are matching by default, but make sure to change it in both places if you do.
The first line of each pair defines the button color, and the second one the button image.

Read More:
- OAuth 2.0
- OAuth2Models.ini

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7.5.3.3 Custom authentication with External DLL

z/Scope Anywhere allows you to integrate your own custom authentication method. In order to do this, use the z/Scope Anywhere Authentication API.

The External DLL authentication method can be added in the 'Authentication' tab of the z/Scope Anywhere Configuration Manager. Toggle its availability as an authentication method by checking or unchecking it.

When you add an External DLL authentication method you will be required to reference the .dll in the 'External DLL' option. Check the complete reference in the External DLL Authentication Method Settings.

The user definition is completed through the mapping between the user ID returned by the external DLL and an Active Directory Objects mapped for this Authentication ID Mask.

Read More:

- Authentication Methods - Windows Logon
- Authentication Methods - OAuth 2.0
- OAuth2Models.ini
- CSS for SSO Options
- Authentication API

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7.5.3.3.1 Authentication API

z/Scope Anywhere provides you with an API that you can use to develop your own authentication method and integrate it with z/Scope Anywhere.

Choose the code sample of your language of preference and add it to your implementation:

Delphi:

```
function ValidateUser(
    const UserName, Password, Metadata: PWideChar;
    SecurityRole, WinUser, WinPass, CustomData: PWideChar;
    var Handled: Boolean): Cardinal; stdcall;
```

Input:

Username & Password	The credentials that you are trying to validate with the external authentication
Metadata	A JSON with the remote browser/user information: URL, IP, Cookie UBRWID and the product's name

Output:

SecurityRole	Specifies the Windows mapping of the authenticated user (UserName and Password). This SecurityRole can either be a Windows user or group, and it will be used to check which profiles it has access to
WinUser, WinPass	(optional) Credentials of a mapped Windows user. Will be used to run the application instance.
CustomData	(optional) Data for passing on to the application
Handled	Returns whether the login could be handled by the DLL.

C++:

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```
THINFINITY_API DWORD __stdcall ValidateUser(LPWSTR lpUserName, LPWSTR
lpPassword, LPWSTR lpMetadata,
  LPWSTR lpSecurityRole, LPWSTR lpWinUser, LPWSTR lpWinPass, LPWSTR
lpCustomData,
  PBOOLEAN pHandled)
```

Input:

lpUserName & lpPassword	The credentials that you are trying to validate with the external authentication
lpMetadata	A JSON with the remote browser/user information: URL, IP, Cookie UBRWID and the product's name

Output:

lpSecurityRole	Specifies the Windows mapping of the authenticated user (UserName and Password). This SecurityRole can either be a Windows user or group, and it will be used to check which profiles it has access to
lpWinUser, lpWinPass	(optional) Credentials of a mapped Windows user. Will be used to run the application instance.
lpCustomData	Data for passing on to the application
pHandled	Returns whether the login could be handled by the DLL.

C#:

```
[DllExport("ValidateUser", CallingConvention =
CallingConvention.StdCall)]
[return: MarshalAs(UnmanagedType.I4)]
public static Int32 ValidateUser(
        [In, MarshalAs(UnmanagedType.LPWStr)] string lpUserName,
        [In, MarshalAs(UnmanagedType.LPWStr)] string lpPassword,
        [In, MarshalAs(UnmanagedType.LPWStr)] string lpMetadata,
        [In, Out, MarshalAs(UnmanagedType.LPWStr)] StringBuilder
lpSecurityRole,
        [In, Out, MarshalAs(UnmanagedType.LPWStr)] StringBuilder
lpWinUser,
        [In, Out, MarshalAs(UnmanagedType.LPWStr)] StringBuilder
```

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```
lpWinPass,
        [In, Out, MarshalAs(UnmanagedType.LPWStr)] StringBuilder
lpCustomData,
        [Out] bool pHandled);
```

Input:

lpUserName & lpPassword	Specifies the Windows mapping of the authenticated user (UserName and Password). This SecurityRole can either be a Windows user or group, and it will be used to check which profiles it has access to
lpMetadata	A JSON with the remote browser/user information: URL, IP, Cookie UBRWID and the product's name

Output:

lpSecurityRole	The authenticated username
lpWinUser, lpWinPass	(optional) Credentials of a mapped Windows user. Will be used to run the application instance.
lpCustomData	Data to pass on to the application
pHandled	Returns whether the login could be handled by the DLL.

Read More:

- Authentication Methods - External DLL

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7.6 Scaling and Load Balancing

Scaling and load balancing come into play when one machine is not capable of managing all the required resources. Too many concurrent connections may cause an overload.
Load balancing and fault tolerance are methodologies designed to distribute workload across multiple services to achieve optimal resource utilization, avoid overload and allow the system to operate properly in the event of failure of any of its components.

z/Scope Anywhere provides components that allow you to distribute the workload across multiple servers. You can scale the application availability in terms of server instances and failover scenarios.

Some of the benefits of load balancing:

- Avoids the overload by distributing the connections among different servers
- Minimizes response time
- More reliability (redundancy)
- Fail over control

This help section is intended to show you how to create a network configuration using the load balancing capabilities included in z/Scope Anywhere.

Read More:
- Scaling and Load Balancing Configurations
- Installing Componentes
- Configuring a Load Blancing Scenario

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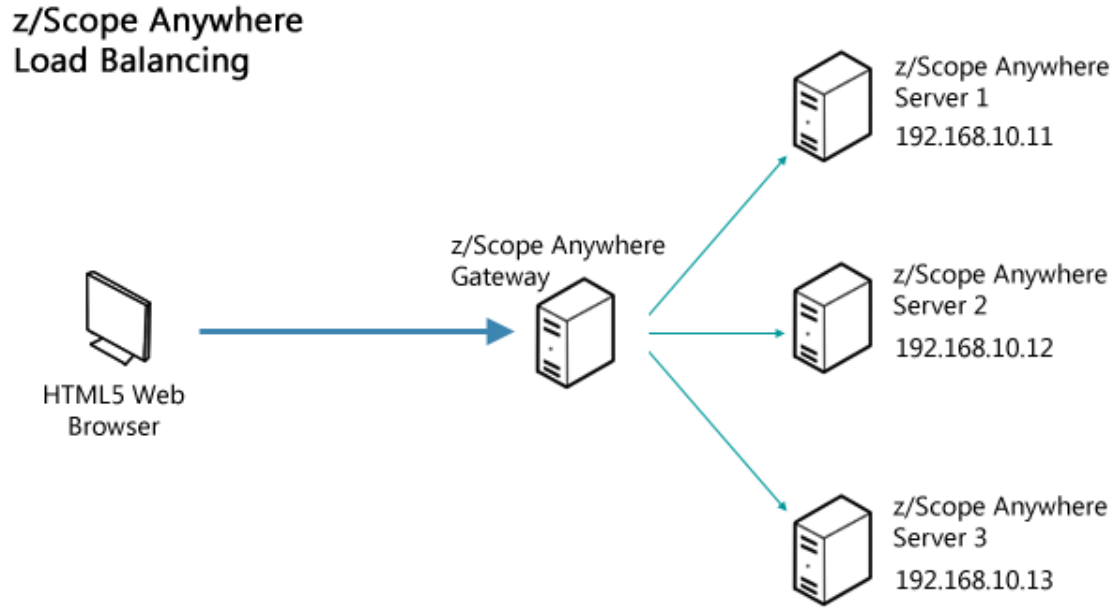
7.6.1 Scaling and Load Balancing Configurations

If you arrive to the conclusion that your z/Scope Anywhere environment would benefit from using load balancing, you can choose between two possible architectures. This decision is an essential step in planning the hardware scheme and configuring the system to work in a distributed way.

Scenario 1: One Gateway and multiple Servers



In this simple scenario, a single Gateway distributes the connection load between a number of Servers.

Scenario 2: Multiple Gateways and multiple Servers

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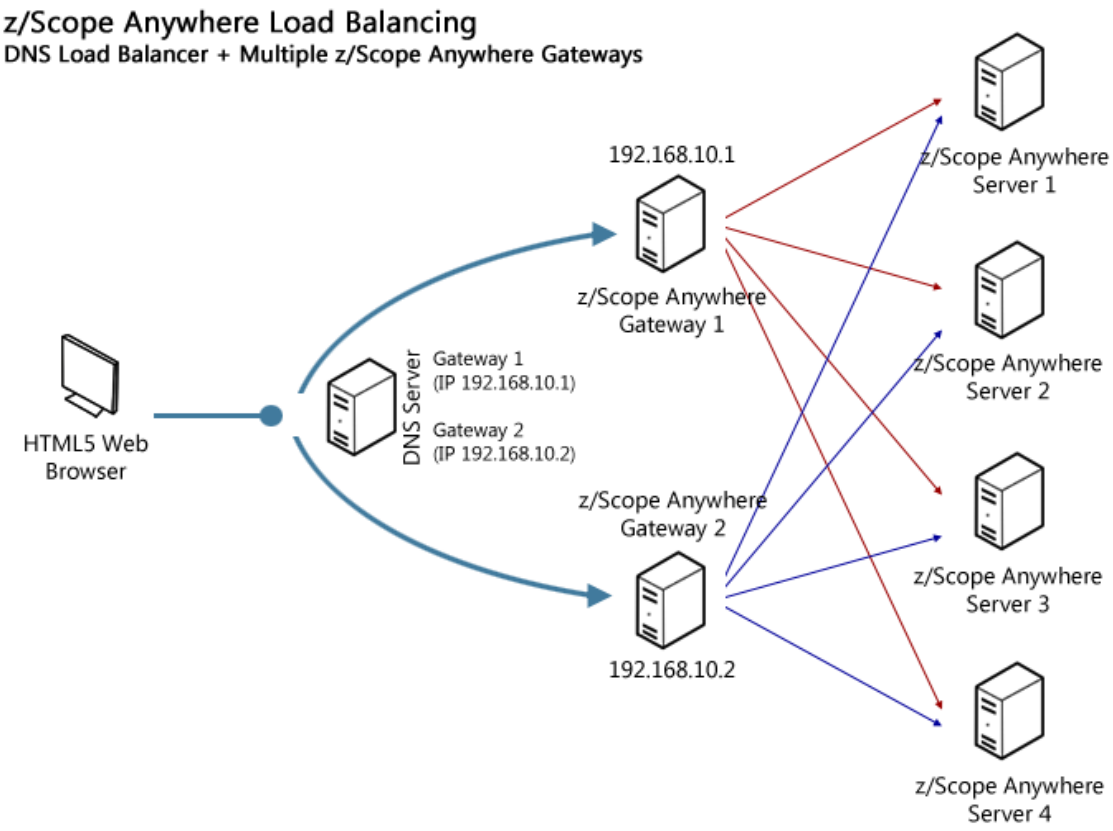

This second scheme is composed by multiple Servers, multiple Gateways and the DNS Server, its domain name associated to all the available Gateways' IPs.

Read More:

- Installing Components
- Configuring a Load Balancing scenario

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7.6.2 Installing Components

In this section you will learn how to set up z/Scope Anywhere's components in a load-balancing network configuration.

You can install z/Scope Anywhere in desktop mode and server mode. In order to configure a load balancing scenario, you need to choose the Server mode installation.

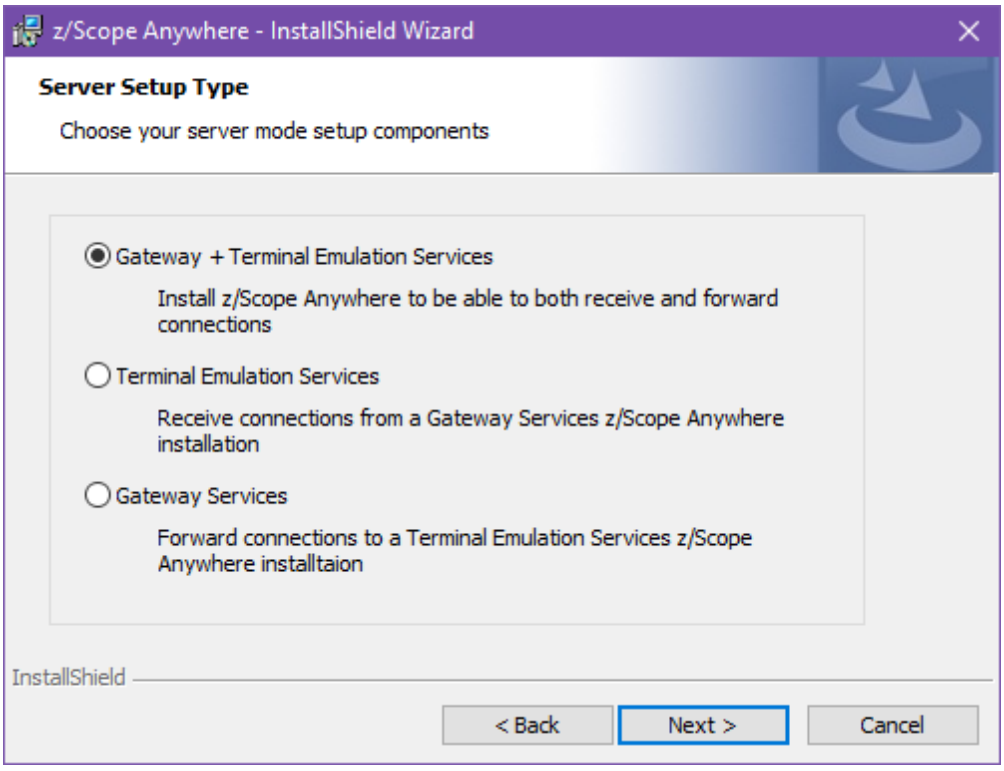
Desktop Mode

Designed for serving the current desktop user only. If you choose this mode, z/Scope Anywhere will be installed as a standalone application. On this mode, there will be only one personal preference corresponding to the logged user.

Server Mode

Designed for serving remote users. If you choose this mode, z/Scope Anywhere will be installed as a Windows Service and will manage remote users accessing their connections.

z/Scope Anywhere must be installed in two or more servers that participate in the load balancing/faulttolerance scenario.



Gateway Services: Under this role, z/Scope Anywhere Gateway responds to all web-page requests and, when a connection is solicited, it selects the appropriate Server to forward that request to.
In case any established connection fails, or a Server falls down, the Gateway will be able to reconnect to the Server that has the highest availability at the moment.
All the system settings and profiles are centralized and shared between the Servers.

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Terminal Emulation Services: Under this role, z/Scope Anywhere only processes forwarded connections. The Server is responsible for establishing and processing the connections assigned by the Gateway.

Before configuring a distributed environment, you should go over some steps:

1. Choose out of the possible Scaling and Load Balancing Configurations the one that best fits your needs.
2. Plan which machines will run z/Scope Anywhere Terminal Emulation Services, and which will run Gateway Services and DNS Servers.
3. Make sure all the IP addresses are public to the web browsers that will access z/Scope Anywhere Terminal Emulation Services.

Read More:

- Scaling and Load Balancing Configurations
- Configuring a Load Balancing Scenario

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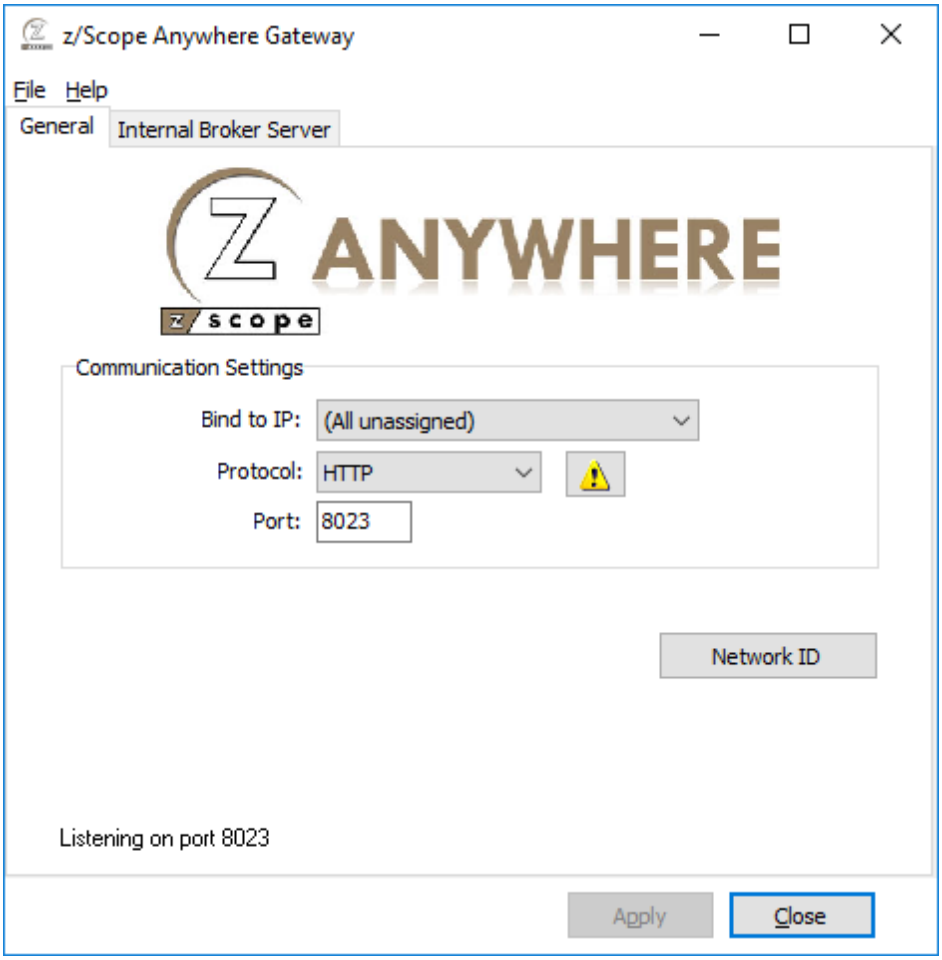
7.6.3 Configuring a Load Balancing Scenario

In order to configure a load balancing scenario, you need at least one Gateway installation and two Server installations.

Configuring the Gateway

Under this role, z/Scope Anywhere Gateway responds to all web-page requests and, when a connection is solicited, it selects the appropriate Server to forward that request to.

To configure the Gateway, open the Gateway Manager. Set the IP and port where the Gateway will run. If you only have one gateway, this is where the users will connect to. If you use more than one Gateway in your architecture, you will use this IP in the DNS server you set up to distribute the connection between the Gateways. Also, set the Network ID. All the Gateway and Server installations involved in a Load Balancing architecture share the same network ID.



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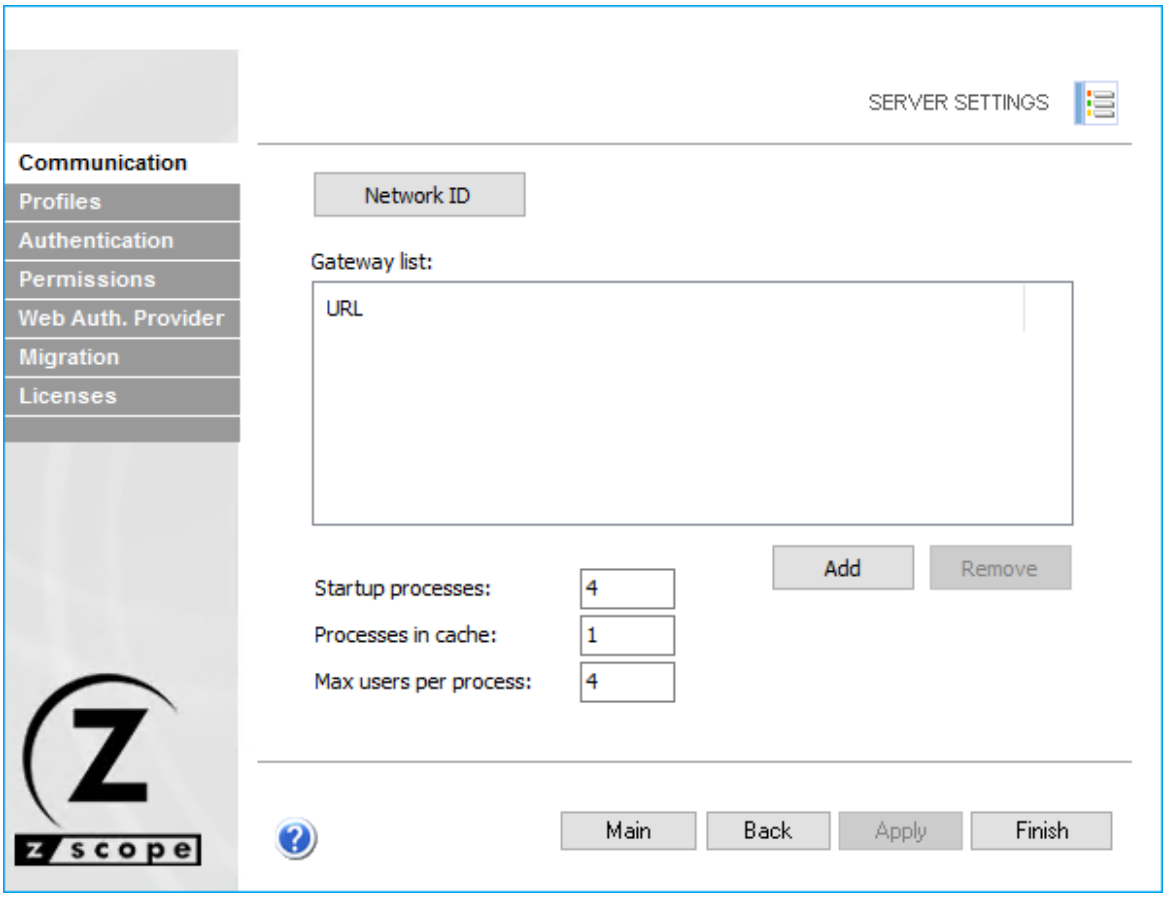
Configuring the Server

Under this role, z/Scope Anywhere only processes forwarded connections. The Server is responsible for establishing and processing the connections assigned by the Gateway.
To configure the Server, open z/Scope Anywhere Configuration Manager and go the 'Communication' tab.



Press the 'Add' button to add a gateway to the Gateway List. This means that now this server's resources can be accessed through the listed gateways.
Make sure that the Network ID is the same for all the gateways and servers involved in this load balancing architecture.

Then, go to the 'Config Setup' tab in the 'Environment' settings:

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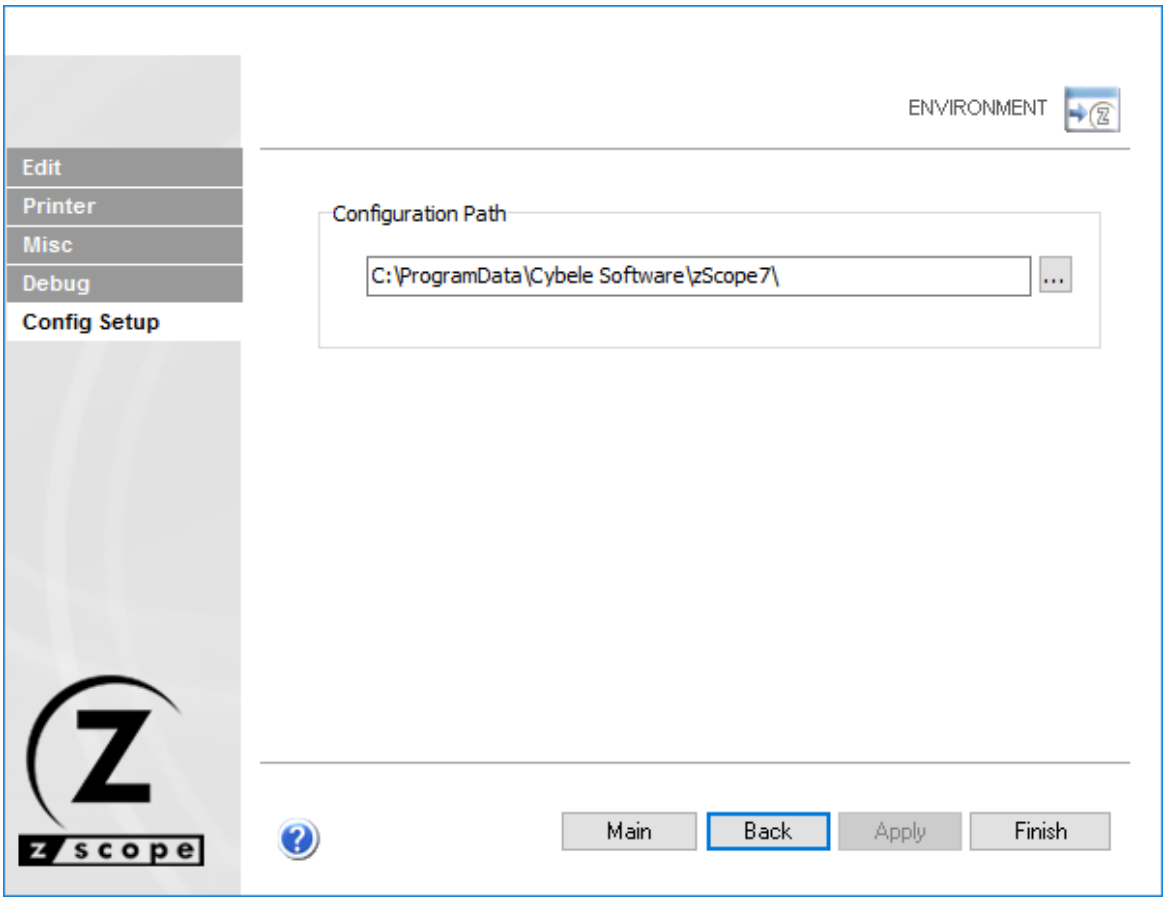

Set the 'Configuration Path' field in a network location that you can access from the other Server installations.
Once you share the configuration path, all the settings will be shared with other z/Scope Anywhere installations. Make sure you modify the settings from one location at a time, as all changes will be reflected in the other installations.

Also, make sure all the Gateways' IPs are public to the locations that will access z/Scope Anywhere through a web browser.

Read More:
- The Gateway Manager
- Scaling and Load Balancing Configurations
- Installing Components

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7.7 Custom Settings

In addition to the Configuration Manager settings, z/Scope Anywhere offers another way in which global parameters can be easily set from the application website. These global parameters apply to all the z/Scope Anywhere functioning, regardless of the session.

Read More:

- The *customSettings* Configuration Object
- Changing Permissions by Using *customSettings*
- Custom Settings Example

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7.7.1 The customSettings Configuration Object

The *customSettings* object is a JSON structure placed within the customsettings.js file, which is included in the z/Scope Anywhere installation. You can find it in the installation directory, inside the 'web' folder. This javascript file is loaded when z/Scope Anywhere is opened in the browser. Like any other javascript file, you can open it with any text editor, like notepad.
By default, the customSettings object is empty.

```
var customSettings = {
};
```

Some of the settings specified in this file can conflict with those set in the configuration manager. In this case, the custom settings will override the manager's profile object attributes.

Note: The custom settings will apply to all sessions. Also, bear in mind that having the configuration in a file that is not seen in the Manager interface might lead to misinterpretation.
Therefore, it is highly recommended to always use the z/Scope Anywhere Configuration Manager for configuring profiles. The use of this file is recommended only for situations when many profiles are already created and it would take too long to modify them all.

Read More:
- Changing Permissions by Using *customSettings*
- Custom Settings Example

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7.7.2 Changing Permissions by Using Custom Settings

The *connParams* attribute is a hierarchical substructure inside customSettings.

The following table shows the current available *connParams* settings:

forceAjax	Force z/Scope Anywhere to use Ajax by setting this parameter to true.

The *permissions* attribute is a hierarchical substructure inside customSettings. The first attribute level inside *permissions* will be applied to all users. A second attribute level, inside the *anonymous* attribute, will be applied only to users accessing z/Scope Anywhere without authentication. The settings for unauthenticated users will override the global permissions values for users that access without authentication.

The following table shows the current available *permission* settings:

settings	Toggles the visibility of the button that accesses Profile Settings.
macros	Toggles the visibility of the macro options in the menu.
fileTransfer	Toggles the visibility of the file transfer options in the menu.
printScreen	Toggles the visibility of the screen print option in the menu.
keypads	Toggles the visibility of the keypad options.

The *mobile* attribute is a hierarchical substructure inside customSettings.

The following table shows the current available *mobile* settings:

disableClipboard	Disables the Clipboard
keyboardPressDetection	Timeout to show the z/Scope Anywhere keyboard after pressing, in miliseconds.
clipboardPressDetection	Timeout to show z/Scope Anywhere keyboard, in miliseconds.

Read More:
- The *customSettings* configuration object
- Custom Settings Example

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7.7.3 Custom Settings Example

In the following example, macros and file transfer options are restricted for all users. Unauthenticated users will have the same restrictions in defined inside permissions and, additionally, the ones defined inside anonymous. The *ConnParams* settings are commented.

```
var customSettings = {
  /*
  "connParams": {
     "forceAjax": true
  }
 ,*/
 "permissions": {
     // overrides permission settings for all users
     "macros": false,
     "fileTransfer": false,
     // overrides permission settings for anonymous users
     "anonymous": {
         "settings": false,
         "printScreen": false,
         "keypads": false
     }
 }
 "mobile": {
        "disableClipboard": false,
        "keyboardPressDetection": 500,
        "clipboardPressDetection": 1000,
    }
};
```

Read More:

- The *customSettings* Configuration Object
- Changing Permissions by Using *customSettings*

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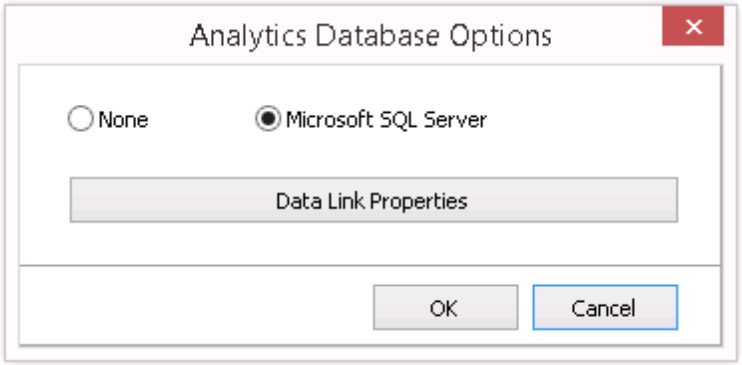
7.8 Configuring MS SQL Server

MS SQL Server is needed by z/Scope Anywhere to store Analytics data.

Requirements:
1. An MS SQL Server 2005 (or higher) installation that is accessible from the machine running z/Scope Anywhere Server.
2. Create a blank database with permissions to Create/Modify tables and Read/Insert/Update data.
3. Go to the 'Permissions' tab in the Server Settings section of the z/Scope Anywhere Configuration Manager, and press the 'Configure Analytics' button:



Choose 'Microsoft SQL Server'.

4. Access the Microsoft SQL Server Data Link Properties and configure the connection:

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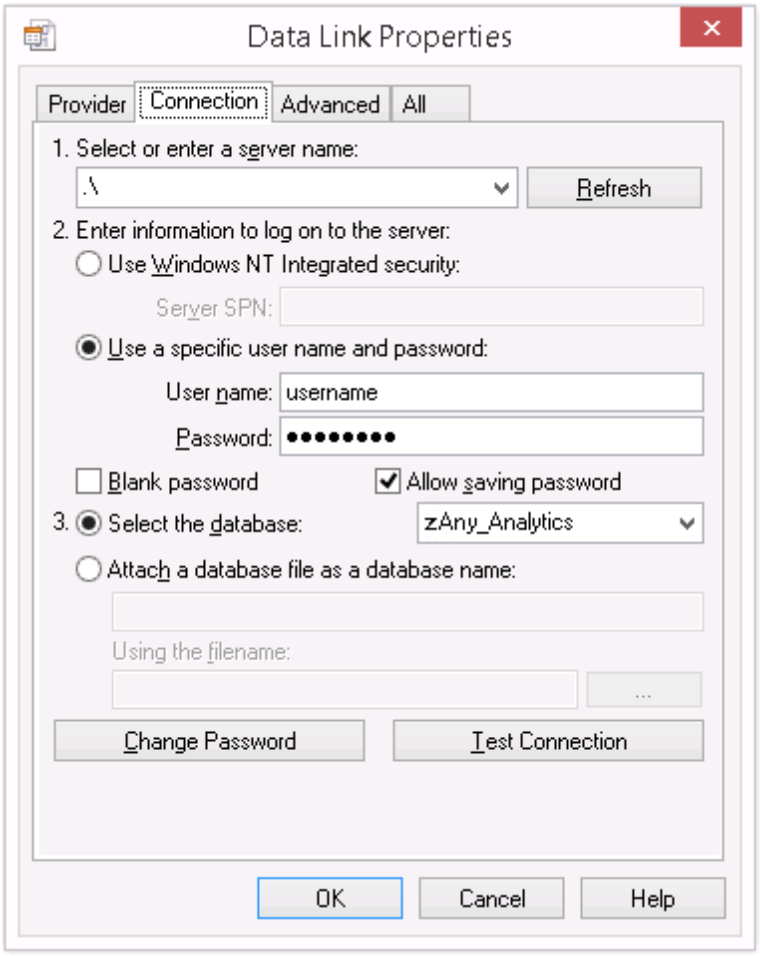

4.1 Enter the server name and complete the information to log in to the server.
4.2 Uncheck the 'Blank password' field and check the 'Allow saving password' field.
4.3 Select the database created in step 2.

5. Go to the 'All' tab:

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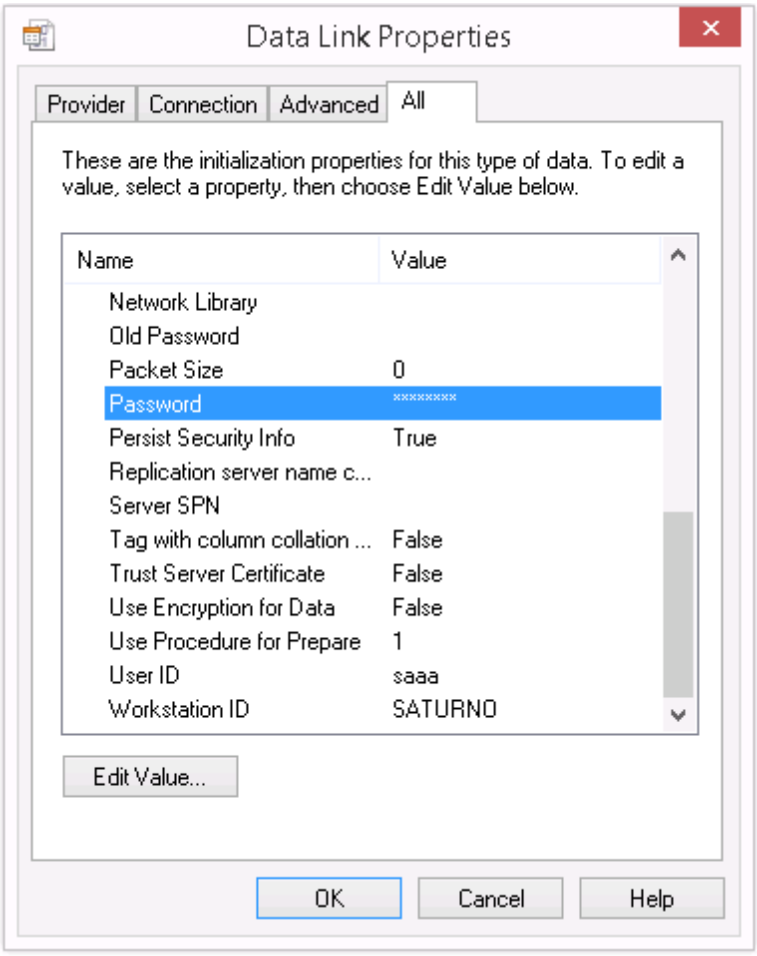

5.1 Set the 'Persist Security Info' property to 'True'.
5.2 Type the password in the 'Password' field.

Read More:

- Configuration Manager - Server - Permission Settings
- Features - Admin Control Panel
- Analytics Tables Reference

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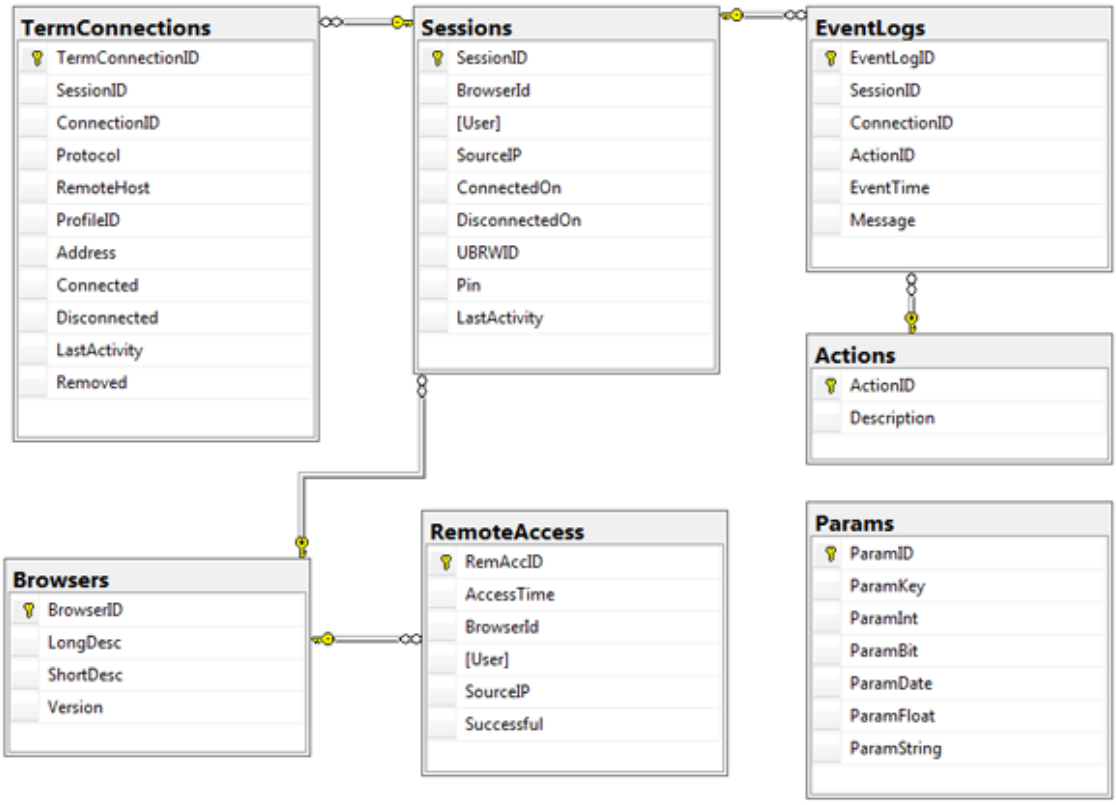
7.8.1 Analytics Tables Reference

Analytics tables



Note: The Analytics tables are automatically created when using the product or through the migration utility.

Main Tables

RemoteAccess Table: Registers the information relevant to the z/Scope Anywhere Server user access.

Field	Description
RemAccID	Auto increment field. Unique ID
AccessTime	The moment when the user accessed z/Scope Anywhere.
BrowserID	Reference to the browser the user accessed with, shown in the Browser table.
[User]	Username.

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SourceIP	IP address that the user logged in from.
SuccessFul	1 = successful login, 0 = Error

z/Scope Anywhere Server session information

The z/Scope Anywhere Server session information is stored in two tables with a master/detail relationship.

Sessions Table: Each time a user access a remote server through z/Scope Anywhere Server an entry in the Sessions table is generated. This entry is updated with the disconnection date when the session ends (by closing the tab or browser).

Field	Description
SessionID	Auto increment field. Unique session ID.
BrowserID	Reference to Browsers table indicating which browser did the user start the session with.
[User]	z/Scope Anywhere Server logged in username.
SourceIP	Source IP address.
ConnectedOn	Date/time of session start.
DisconnectedOn	Date/time of session end. If this field has a *NULL* value it means the session is still open.
UBRWID	Unique browser ID.
Pin	Session Identifier.
LastActivity	Date/time of last activity.

TermConnections Table: In this table an entry is generated for each connection started.

Field	Description
TermConnectionID	Auto increment field. Unique ID.
SessionID	Reference to Sessions.SessionID. Shows the session the event belongs to.

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ConnectionID	Reference to the Connection that performs the action. The value can be *NULL* (server start or any other server action) or a number (terminal action).
Protocol	Protocol used for the connection.
RemoteHost	Destination host name.
ProfileID	Connection profile's ID.
Address	Destination host address.
Connected	Date/time of connection start.
Disconnected	Date/time of session end. If this field has a *NULL* value it means the connection is still open.
LastActivity	Date/time of last activity.
Removed	Indicates if the connection was removed from Anaylitics.

EventLogs Table: In this table an entry is generated for each event related to the session referenced by the SessionID field.

Field	Description
EventLogID	Auto increment field. Unique ID.
SessionID	Reference to Sessions.SessionID. Shows the session the event belongs to.
ConnectionID	Reference to the Connection that performs the action. The value can be *NULL* (server start or any other server action) or a number (terminal action).
ActionID	Reference to Actions.ActionID. Shows the action of the event.
EventTime	Date/time of the event.
Message	A textual description for the event.

Auxiliary Tables

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Actions: Fixed list container for actions referenced by the ActionID column in the EventLogs table.

Field	Description
ActionID	Action ID.
Description	Action description.

Browsers: Has a unique list of browsers detected by the product. Any reference in User Agent generates a new entry in the Browsers list. This table is referenced both by the RemoteAccess table and the Sessions table.

Field	Description
BrowserID	Auto increment field. Unique ID.
LongDesc	User Agent.
ShortDesc	Short description – CHROME, FIREFOX, etc.
Version	Not used for the moment.

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8 Javascript Programming

This topic is aimed at providing the foundation to develop Javascript-based applications that seamlessly bridge the gap between legacy terminal-based information systems and the internet.
z/Scope offers the following Application Programming Interfaces:

- HLLAPI
- HostSurfer

8.1 HLLAPI

HLLAPI is a Javascript implementation of the well-known High Level Language Application Program Interface, so that developers are now be able to make use of the same API they are familiar with, to build web applications.

To learn more about HLLAPI, please refer to hllapi.js Reference

8.2 HostSurfer

HostSurfer is a Javascript development framework that allows for terminal-based applications to be leveraged to the web, thus offering ubiquitous access to information systems that otherwise are platform-specific.

It offers developers a high-level abstraction layer that provides complete interaction between the web application and the terminal-based application.

The HostSurfer framework is built on top of hllapi.js for back-end communications, allowing seamless integration with popular Javascript frameworks (angular.js, react.js, etc.) or plain 'vanilla' Javascript. HostSurfer provides maximum flexibility to achieve solutions that reformulate the way terminal-based application systems can be accessed through a widespread variety of platforms and devices, while ensuring data synchronicity and integrity all along the way throughout the different application layers.

HostSurfer allows you to:

- Update legacy terminal-based applications offering ubiquitous access through web technologies, with no impact on existing assets.
- Develop complex macros to automate data entry, retrieval and exchange on terminal-based applications.
- Implement web toolboxes or widgets to enhance interaction with the terminal-based application and integrate them with other platforms and environments.

Read more:

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HostSurfer Overview
Getting Started

8.2.1 Overview

Much more than Terminal Emulation

z/Scope Anywhere takes full advantage of latest web technologies to bring you not only the best Web Terminal Emulator available today, but also, through HostSurfer, a radically new approach that will change your terminal emulation experience forever.

How HostSurfer works

From the conceptual approach, HostSurfer transforms the Telnet stream into a data set, retaining field contents and attributes. Based on these fields and on a high-level Javascript API, it allows you define screen identification rules. So, for each identification rule, you can define new associated rules to combine and transform existing fields, define views, trigger automated actions and declare navigation rules to create powerful and sophisticated web front-ends, including the ability to collect and compound data from other sources and applications with the HostSurfer data set contents.

Modern Web UX with the technology of your choice

Today web is not just HTML5. Javascript technology has matured enough and nowadays Javascript frameworks (such as Angular, React, Vue.js and a growing list of excellent Javascript frameworks) allow an increasingly powerful data integration. HostSurfer allows you to take advantage of any of these technologies according to your own needs and preferences to transform and integrate on the web your terminal-based applications with no more restrictions other than your imagination.

Surf the Host Application

The "PF" keys are the most usual way to navigate through terminal-based application screens, but this mechanism is far from suitable to navigate the application in the web. HostSurfer Navigators allows you to define high-level chained shortcuts to go from one screen to another, avoiding redundant in-between screens.

HostSurfer Functional Structure

The HostSurfer structure is a layered arrangement of functionally distinctive components, as depicted in the following diagram.

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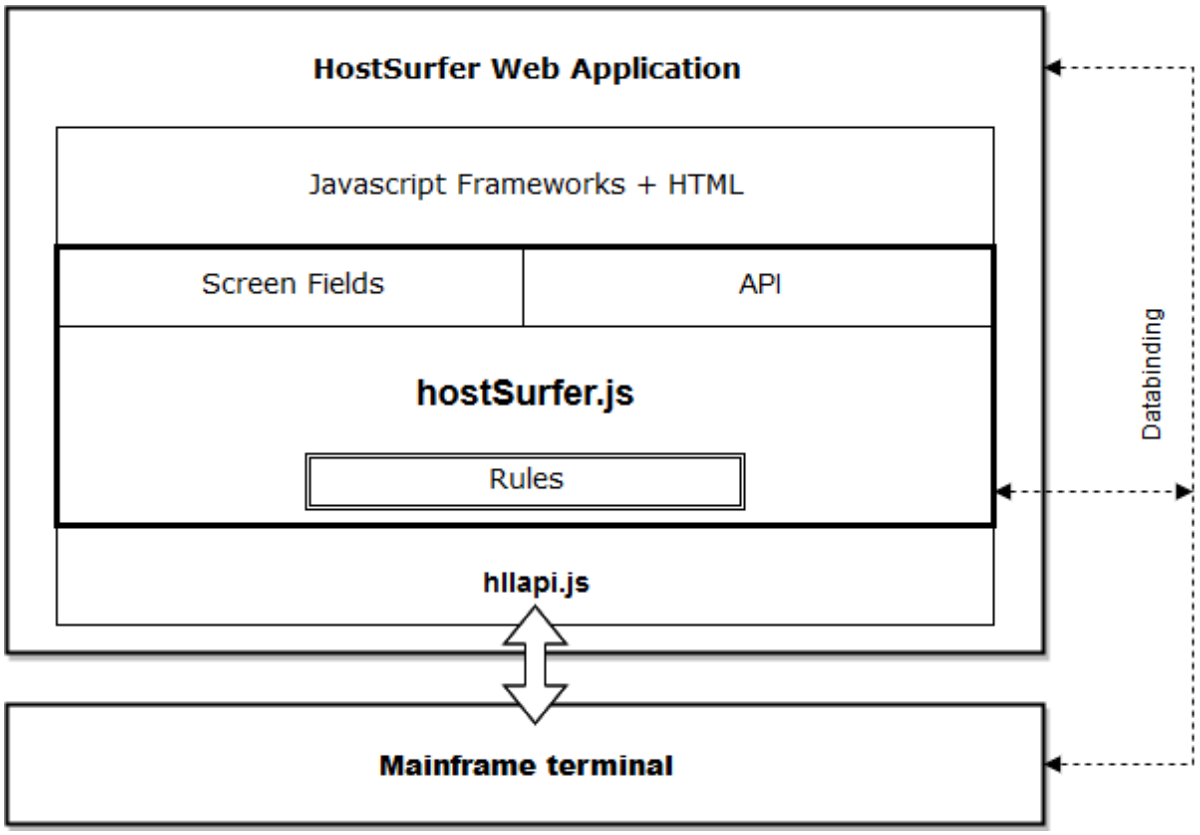

Both the source and target of data are ultimately the terminal-based application screen, at the basis of the diagram. hllapi.js is the Javascript library HostSurfer relies on, to retrieve host screen information and to send single keystrokes or entire strings to the underlying terminal-based application.
At a higher abstraction level, HostSurfer keeps a collection of rules and screen fields, which are introduced in the next paragraphs and constitute the web application structure that determines the navigation flow and data access features, as well as end-to-end data synchronization (data binding).
At the upper level, the integration of HostSurfer, in stand-alone way or in conjunction with any Javascript-based web application framework, is combined with static HTML pages to accomplish the user front-end.

- Fields

At the core of HostSurfer is the concept of *DataSet*. The DataSet is a collection of fields that are retrieved from screens of the underlying terminal-based application.
Fields are associated to each screen instance and can be accessed by name, read from and written to (in case of entry fields). One of the key features of HostSurfer is the implementation of bi-directional data binding between fields in the host screen, their in-memory representation and the web front-end.

There are two kind of fields:

1. Fields automatically created by HostSurfer by scanning the host screen. These fields

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are named as 'RrnCcn', where 'rn' and 'cn' are the row and column coordinates of the field within the screen. For example, R20C55 is a dynamically created field located at row 20 and column 55 of the host screen.

2. User-defined fields, declared within a rule (see HostSurfer Rules for further details). The developer must specify their name, location, length and, if required, a getter function.

Both kinds of fields are accessible in Javascript code, by their name, as properties of the HostSurfer instance data property.

- Rules

Another key concept of the HostSurfer architecture is the so called rule. Making use of rules, the web application can declare and tie together in a single Javascript object, an individual host screen (identifying it by a matching condition), a collection of fields that the screen exposes, the web render that provides the user interface and the actions to be called from the web page. Each defined action is both a navigation target (at the web page level) as well as a screen input (at the rule definition level).
Each rule is a Javascript object, declared in code, that must be registered with the HostSurfer instance by means of the register method.

By combining statically declared rules with latest Javascript technologies/frameworks like MVW, MVVM, MVC, HostSurfer offers the foundation to design and develop conceptually solid, scalable and maintainable web applications.

- Applications

The preceding diagram shows the basic scenario, where a single web application interacts with the terminal-based application running at the host. However, each host screen may have one or more web applications associated, and each one may be auto-started or initiated by the user. The available applications are shown under the icon, in the upper right corner of the emulator frame. None, one or more than one applications can be run at the same time (assuming they were designed to work collaboratively over the same screen data). Applications are declared as Javascript objects, with similar structure as rules, except the apply property encloses an inner array property which key is 'apps'. They must be registered with the HostSurfer instance by means of the register method.

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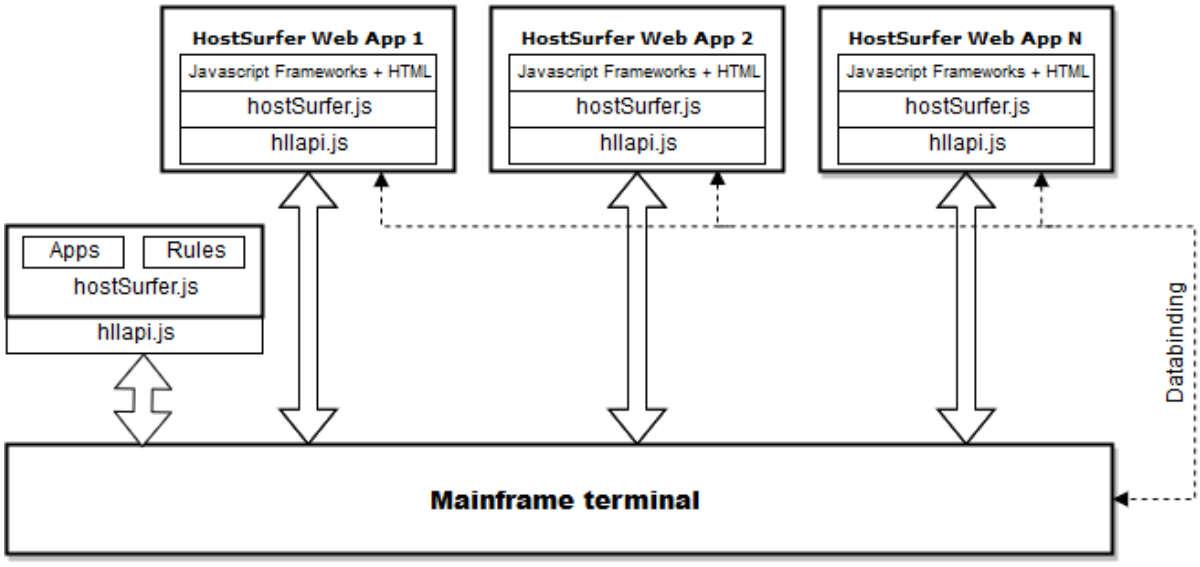

Please refer to HostSurfer Applications for further details.

Read more:

- HostSurfer Rules
- HostSurfer Applications
- hostsurfer.js Application Programming Interface.

8.2.1.1 Screen rules

HostSurfer allows to define special Javascript objects called *screen rules*. By means of screen rules, the web application can declare and bind together an individual host screen, a collection of fields that the screen exposes, the HTML templates that provides the user interface and actions that can to executed from the resulting web page.

Each screen rule is registered with HostSurfer instance by means of its register method. This method takes an optional parameter for the rule's parent rule. This way, the set of screen rules can be defined as a hierarchical structure.

Also, screen rules can be defined in separated Javascript files that are loaded in run-time when the HostSurfer instance is created. To do this, the screen rules repository folder and all the screen rule names are declared into the HostSurfer constructor parameter.

A HostSurfer screen rule object has the following properties, as defined below.

Rule Properties

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Property name	Explanation
id	A string constant that uniquely designates the rule object.
match	Any condition that can return a "match" between the underlying host screen and the specified criteria. Please see the Screen matching topic for further details.
apply	A complex property that encloses a 'fields' array, a HTML rendering specification and 'actions' list. Please refer to the apply Property topic to get structure details.
rules	An optional property that allows you to define child rules. Rules can be chained in a parent-children relationship. The same goal can be accomplished using the second parameter of the HostSurfer register method.

The following example illustrates a screen rule definition:

```
    var _rule = {
        id: 'Available',
        match: [
            { text: "GENERAL ACCOUNT INFORMATION", row: 1, col: 29 },
            { text: "AVAILABLE", row: 2, col: 38 }
        ],
        apply: {
            fields: [
                { name: 'screenTitle', row: 1, col: 29, len: 30, get: function (value)
{ return value.trim() } },
                { name: 'screenSubtitle', row: 2, col: 29, len: 30, get: function
(value) { return value.trim() } },
                { name: 'accountNumber', row : 5, col : 19, len : 15 },
                { name: 'accountType', row : 6, col : 2, len : 60, get :
function(value) { return value.replace(/\*/g, '').trim() } },
                { name: 'message', row : 13,  col : 2, len : 79 }
            ],
            render: {
                view: {
                    template: 'available.html'
                }
            },
            actions: {
                main: function(hs) {
                    hs.send.pf1();
                },
                logout: function(hs) {
                    hs.send.pf1();
                }
            }
        }
    };
    zScope.hostSurfer.register(_rule);
```

Please note that the preceding code snippet:

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1. Declares a JSON object that is the HostSurfer screen rule.
2. Makes a call to the register method of the HostSurfer instance, passing the JSON object as its argument.

8.2.1.1.1 Screen matching

The 'match' property

The match property represents the matching criteria between the underlying host screen and an expression specified under this property, allowing HostSurfer to determine which rule applies to each screen.

The *match* property needs one or more matching criteria expressions to identify a host screen. At run-time, and for each received host screen, HostSurfer evaluates the complete matching rule-set collection and selects the one that best matches the underlying screen data.

The matching criteria can be:

1. A simple string constant which have to be present on the screen. This is the laziest way to identify a host screen, and must be used with caution.
Example:

```
match: "GENERAL ACCOUNT INFORMATION"
```

2. A JSON array with one or more matching objects, where each object defines the row and column coordinates where to locate the origin of the text within the screen, and the string constant the text will be compared to.
Example:

```
match: [
            { text: "GENERAL ACCOUNT INFORMATION", row: 1, col: 27 },
            { text: "PURCHASE LIMIT.....................:", row: 6, col: 3 }
        ],
```

3. A Javascript function, that takes the HostSurfer object instance as the only parameter and returns a Boolean value indicating the result of the matching criteria.
Example:

```
match: function (hs) { return (hs.getText(19,55,8) == 'USERNAME')},
```

8.2.1.1.2 Applying properties to a Screen Rule

The 'apply' Property

Once a host screen was identified, HostSurfer is ready to apply the associated rule definitions. This property is used with two meanings:

- To declare user fields
- To define the rendering template
- To provide a handler that can take action upon rule selection
- To provide complex actions defined for the recognized screen.

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Property name	Explanation
fields	An array of objects that identifies each user-defined field mapped to the underlying host screen, implementing two-way data binding. Please refer to 'fields' Property for details.
render	It defines the HTML view for the underlying screen. This property supports two different sets of values, which is determined by the framework used to render the view. Please refer to 'render' property for details.
handler	A function that gets executed when the rule is selected. Please refer to 'handler' property for details.
actions	A list of actions that can be used from the resulting web page. Please refer to 'actions' property for details.

The following code snippet is a simple example of 'apply' property declaration:

```
apply: {
    fields: [
        { name: 'screenTitle', row : 1, col : 35, len : 30},
        { name: 'option', row : 18, col : 63, len : 2 }
    ],
    render: {
       view:  {
          template: '<h3>{{hs.data.shopsUpdatedUntil}} {{hs.data.shopsLastUpdate}}</
h3>';
       }
    },
    handler: function (hs) {
              alert('Accounts last update: '+hs.data.accountsLastUpdate);
    },
    actions : {
        main: function(hs) {
            hs.data.option = "01";
            hs.send.enter();
        },
        logout: function(hs) {
            hs.send.pf1();
        }
    }
}
```

Additionally, in the context of a z/Scope Anywhere environment:

- To declare HostSurfer applications.

Property name	Explanation
apps	An Javascript object array that declare one or more

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Property name	Explanation
	HostSurfer applications or web-widgets. Please refer to 'applications' for details.

8.2.1.1.2.1 User fields

The 'fields' property

The 'fields' property is an array of objects, each one having the following structure describing each field element:

Property name	Explanation
name	A string constant that identifies the field element.
row	The row's field location, using the host screen row/column coordinates.
col	The column's field location, using the host screen row/column coordinates.
len	The length of the field, expressed as the number of characters.
get	An optional getter function to retrieve and transform field content.
items	An array of fields that defines the field property as an array.

Please note that fields explicitly declared in this property, are added to the field collection automatically created by HostSurfer from the current screen.
The following code snippet shows how field objects are declared within a rule:

```
fields : [
    { name : 'screenTitle', row : 1, col : 35, len : 30, get : function (value)
{ return value.trim() } },
    { name : 'option', row : 18, col : 63, len : 2 }
]
```

It is also possible to declare a field being an array of inner fields, for array grouping purposes:

```
{
    name : 'label', fromRow : 16, toRow : 19, items : [
        {
            name : 'caption', col : 25, len : 20, get : function (value) {
                return value.toLowerCase().replace(/\b\w/g, function (l) { return
l.toUpperCase() })
            }
```

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```
        }
    ],
        skip : function (obj) {
            return false;
        },
        break : function (obj) {
            return false;
    }
}
```

The field declaration in the above code snippet, illustrates how a field named 'label' is composed as a result of iterating from row 16 to row 19, thus creating an array of property fields with 'caption' key, located at column 25 with a length of 20 characters, and a value resulting from the specified getter function. Such structure has optional 'skip' and 'break' property keys, which values are condition evaluating functions. The 'skip' property defines a condition upon which a row included within the bounds 'fromRow' and 'toRow', is skipped on the iteration. The 'break' property determines the condition upon which the iteration is halted.

As an example of use of this property:

```
var caption1 = hs.data.label[0].caption;
var caption2 = hs.data.label[1].caption;
var caption3 = hs.data.label[2].caption;
```

As shown in the example below, it is possible to include a regular expression as a 'match' condition to select the fields on the iteration between the specified starting and ending rows.

```
{
    name : 'pfkeys', fromRow : 22, toRow : 24, match : '(F[0-9]{1,2})\\s*:\\s([^:]+)(?
:(?=F[0-9]{1,2})|$)', items : [
        { name : 'pf', index : 1 },
        { name : 'desc', index : 2 }
    ], skip : function (obj) {
        return (obj.desc == '');
    }, break : function (obj) {
        return false;
    }
}
```

Example code:

```
hs.data.pfkeys.forEach(function(pfkey) {
   document.write('<br><b>'+pfkey.pf+'</b> - '+pfkey.desc+'</br>');
})
```

8.2.1.1.2.2 Rendering HTML

The 'render' property

The 'render' property defines the HTML view for the host screen. This property supports two different sets of values, which is determined by the framework used to render the view:

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- If you declare view, HostSurfer will render the HTML on the specified container using handlebars.js.
- If you declare route, the HTML will be rendered by an external framework like Angular, React, Vue.js, etc.

By using HTML with Handlebars templates and some Javascript code, you can build a complete HostSurfer application. However, HostSurfer is flexible enough to allow you to use any modern Javascript framework if it is familiar to you or when, for example, you need integration between the HostSurfer application and some other web solution developed with any of these libraries, as part of a more complex web ecosystem.

The attributes for the *view* are:

Property name	Explanation
id	The id of the HTML element container where the HTML template will be rendered. Defaults to the view id passed in the HostSurfer constructor. If not specified, the default is 'hs-view'.
template	The file or code containing the handlebars template. This page will be processed by HostSurfer and inserted into the declared HTML container.
oncomplete	A Javascript function callback to be executed when the rendering process has been completed. This property is optional.

The following example how to specify a 'view' :

```
render: {
    view: {
        id: 'hs-view',
        template: 'login.html',
        oncomplete: function () {
            // some Javascript code;
        }
    }
}
```

If you work with Angular framework, you may want to use its intrinsic router and template system to render the final HTML view. In this you need to declare a *route* like this:

```
render: {
    route: {
        url: '#!login'
    }
}
```

So, this is the structure for *route*:

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Property name	Explanation
url	String or function that returns the url 'route' to be processed by the selected Javascript framework.

8.2.1.1.2.3 Executing code

The 'handler' Property

This is a function declaration. This function gets called when the screen rule is selected.

The following snippet is an example of a 'handler' property:

```
handler: function (hs) {
          alert('Accounts last update: '+hs.data.accountsLastUpdate);
}
```

8.2.1.1.2.4 Navigating the screens

The 'actions' property

The 'actions' property encloses a set functions with names that can be used as parameters of navigate and go methods.

Example:

```
'actions': {
    'main': function(hs) {
        hs.data.option = "01";
        hs.send.enter();
    },
    'logout': function(hs) {
        hs.send.pf1();
    }
}
```

In the example shown above, the 'main' action has associated a function that takes the application HostSurfer instance as parameter and executes the following methods:

- Sets 'hs.data.option' to "01", as if the user would have typed "01" in the menu option field in the terminal emulator screen.
- Sends an "ENTER" key, as if the user would accepted the selected option.

NOTE: The 'option' field is retrieved from the 'data' property of the HostSurfer instance because it was explicitly defined in the 'fields' property of the corresponding rule, as shown in the following code snippet:

```
'fields': [
    { ... },
    { 'name': 'option', 'row': 18, 'col': 63, 'len': 2 },
    { ... }
}
```

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Actions can be chained with a single "navigate" call.

8.2.1.1.2.5 Defining HostSurfer Applications

The 'apps' Property

The 'apps' property is an array of JSON objects that contain the list of HostSurfer applications available to the user (inside z/Scope Anywhere Terminal Emulation window) when the screen matches with the identification criteria.
The following example shows an application definition which automatically runs when the screen is successfully identified:

```
var _login = {
    id: 'LogIn',
    match: [{ text: 'CICS', row: 5, col: 1 }],
    apply: {
        apps: [
            {
                name: 'blue_card_1',
                desc: 'Blue Card Std',
                link: '/hs/std/index.html',
                panel: {
                    width: 1024, height: 800,
                    features: {
                        maximized: false,
                        hasToolbar: true,
                        headerControls: {
                            minimize: 'remove'
                        },
                        resizable: true,
                        draggable: true
                    }
                },
                autostart: true
            }
        ]
    }
};
```

8.2.1.2 Applications

A HostSurfer Application is web application that uses HostSurfer to interact and/or transform to HTML a group of host screens.

Hostsurfer Applications can be hosted under any standard web server like apache, node.js or IIS. When they are simple HTML pages, they may also run under z/Scope Anywhere web server.

Depending on how the application has been designed to run, it could be accessed:

- pointing the web browser to a particular URL
- clicking on a menu item inside z/Scope Anywhere Terminal Emulation toolbar.

In the last case, we need to tell z/Scope when a particular application is available to the user.

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Each Terminal Emulation window inside z/Scope Anwyhere runs its own HostSurfer instance. By using the same screen rule scheme to identify screens, we can tell z/Scope what HostSurfer Applications will be available using applications using the "apps" property under "apply".

For enumeration of properties, please refer to apps property.

The following code snippet shows how HostSurfer Applications are declared.

```
    var
_login
= {
        id: "LogIn",
        match: [{ text: 'USERNAME :', row: 19, col: 55 }],
        apply: {
            apps: [
                {
                    desc: "Blue Card Demo",
                    link: "/hs/demo/index.html",
                    panel: {
                        width: 1024, height: 800,
                        features: {
                            maximized: false,
                            hasToolbar: true,
                            headerControls: {
                                minimize: 'remove',
                            },
                            resizable: true,
                            draggable: true
                        }
                    },
                    autostart: true
                },
                {
                    desc: "Blue Card Demo 2",
                    link: "/hs/demo/index.html",
                    panel: {
                        width: 800, height: 600,
                        features: {
                            maximized: true,
                            hasToolbar: false,
                            resizable: false,
                            draggable: false
                        }
                    },
                    autostart: false
                }
            ]
        }
    };
    zScope.hostSurfer.register(_login);
```

The example shows two applications defined for a screen identified by matching the text "USERNAME" at row 19 and column 55. If a screen complies the matching pattern, then such screen will have two applications available. None, one or more than one application

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can have the 'autostart' property set to true, in which case, for a given screen, all applications assigned to a screen with its 'autostart' property set to true, will be opened concurrently.
Please note that:
1. Registered applications are shown in the terminal emulation frame menu, under the icon.
2. There is no need to register an application if the terminal emulation is not to be used. This point will be explained in next topics.

8.2.2 Getting Started

This topic covers the key concepts behind HostSurfer application development, introducing the fundamental subjects of screen matching, rules and fields, by means of guided examples.

The first part deals with HostSurfer basic fundamentals, which is explained and introduced progressively. It makes use of plain HTML and Javascript, as to avoid any complexity burden from third-party frameworks. This topic is titled HostSurfer Application Fundamentals.

The second part of these guided examples, explains more advanced concepts such as web application flow control and data binding, and explains how to work with HostSurfer in the standalone mode. This second part is designated as Building a Simple Example Application.

Both guided examples are built around the 'Blue Card' terminal-based demo application, available at https://zanywhere.cybelesoft.com/hsdemo/.

8.2.2.1 HostSurfer Application Fundamentals

The goal of this topic is to introduce the fundamental concepts behind HostSurfer web application development. In order to begin this tutorial, we developed this basic example application through the following sequential steps:

- Enabling HostSurfer for the connection
- Creating the index.html file
- Adding a Screen Rule
- Working with HostSurfer Fields

8.2.2.1.1 Enabling HostSurfer for the connection

As HostSurfer runs on top of the HLLAPI communication layer, the first step is to enable HLLAPI and HostSurfer in the connection's configuration panel.

In the z/Scope Anywhere Connection Manager, edit the connection definition and, into the Display section of the configuration panel, please check the "Enable HLLAPI & HostSurfer" option:

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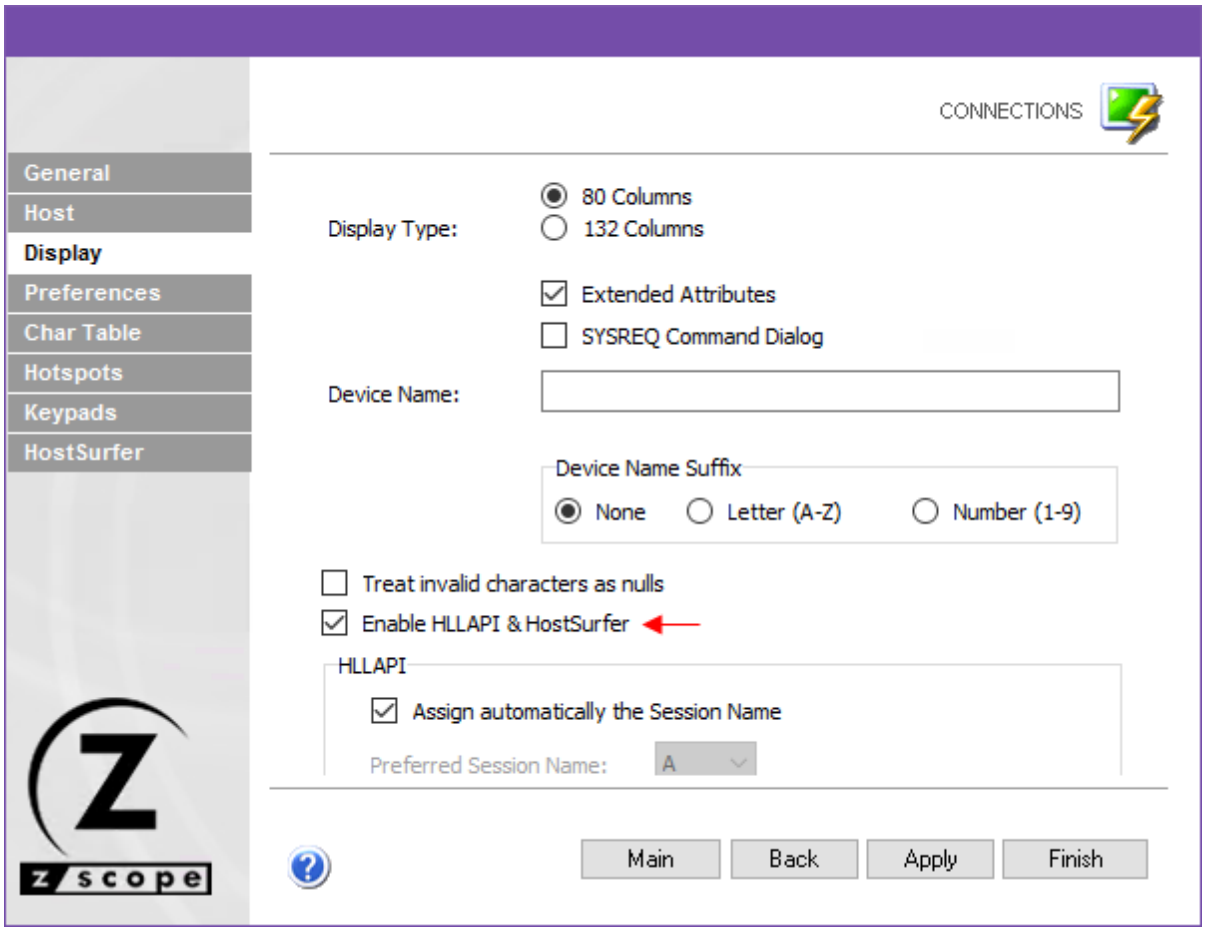

8.2.2.1.2 Creating the default HTML Page

We need to create a default HTML page. This page will have two parts:

- An embedded terminal emulation.
- The container where HostSurfer will output HTML.

This page will also include a reference to the z/Scope Anywhere Terminal API Javascript library (terminal.api.min.js) and the Javascript code needed to create a HostSurfer object instance.

Go to this jsfiddle to see and test the example code.

In the page body there are three div sections:

- The first one contains an <iframe> where the terminal-based demo application will run.
- The second contains a title and a button to clear the "log" content.
- The last div section is display log, where events of interest will be sequentially

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written. To be able to log HostSurfer events we must subscribe to HostSurfer events.

The <script> section performs the following tasks:

- Defines a function to write messages into the 'log' section:

```
function log(msg) {
    var logPane = document.getElementById('logger');
    logPane.innerHTML += msg;
    logPane.scrollTop = logPane.scrollHeight;
}
```

- Creates a HostSurfer instance:

```
var hs = new zScope.HostSurfer();
```

- Registers event handlers to write messages to the 'log' section.

```
hs.on('ready', function() { log('Ready!<br/>'); });
hs.on('pageLocked',function() { log('Page locked.<br/>'); });
hs.on('pageUnlocked',function() { log('Page unlocked.<br/>'); });
hs.on('ruleSelected', function(value) {
    if (value) { log('Rule selected: ' + value.id + '<br/>'); }
    else { log('No matching rule<br/>'); }
});
```

The following image depicts how our index.html page is displayed in the web browser:

Please note that, even if the HostSurfer instance has been created and is firing events (that we can trace by means of our simple logging mechanism), no screen rules have been defined yet and therefore, HostSurfer is not 'recognizing' screens yet.

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8.2.2.1.3 Adding a Screen Rule

This topic is aimed at adding a very basic HostSurfer Screen Rule to identify the "BlueCard Login" screen.

To navigate to this screen from the first one, just press the <Enter> key.

The following screen is the "Blue Card" screen:

As you can see, the `ruleSelected` event has been triggered with a null argument, indicating there are no rules with a 'match' criteria that satisfies the current screen.

In order to make HostSurfer identify a screen, we must:

- Create a screen rule containing a 'match' property with a text pattern to be found on the screen.
- Register the rule in the HostSurfer instance.

Example:

```
hs.register(
   {
          id: "bluecardLogin",
          match: [{text: "USERNAME", row: 19, col: 55}]
   }
);
```

Please note that the rule object contains only two properties: 'id' and 'match'. The 'match' property sets the criteria on which screens will be compared to.

As we have set the 'match' property to search for the literal string 'USERNAME' at row 19 and column 55, the rule criteria will be met by the screen depicted in the previous image.

Go to this jsfiddle to see and test the example code.

The web browser will display the contents depicted below, after running the example application and pressing the <Enter> key in the first screen:

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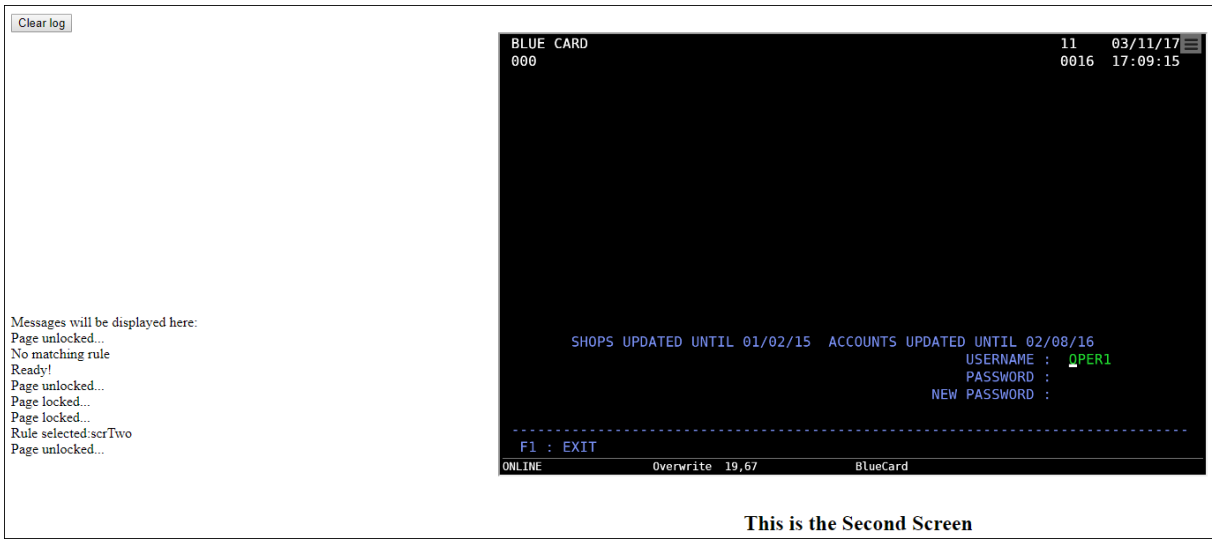

Please note that when the second screen is displayed, 'Rule selected' plus the 'id' of the matching rule is written to the "log". Additionally, as expected, the rule handler writes the text 'This is the BlueCard Login Screen' in the log.

In order to extend the current example, we'll add a new screen rule to identify the next screen (the 'Main Menu' screen) and display an identifying text on the log.

Go to this jsfiddle to see and test the example code.

The HostSurfer application flow can now be described as follows:

When the terminal-based demo application shows the first screen, pressing the <Enter> key causes a navigation to the "Blue Card Login", as well as a text indication below it. Pressing <Enter> key again, causes the application to go to the next screen (which is the one titled 'Main Menu'), because this screen layout satisfies 'bluecardMainMenu' rule 'match' property. This rule is now selected.
As a result, the web page now shows 'This is the Main Menu' text indication as the last message in the log.

The browser windows contents are represented in the following image:

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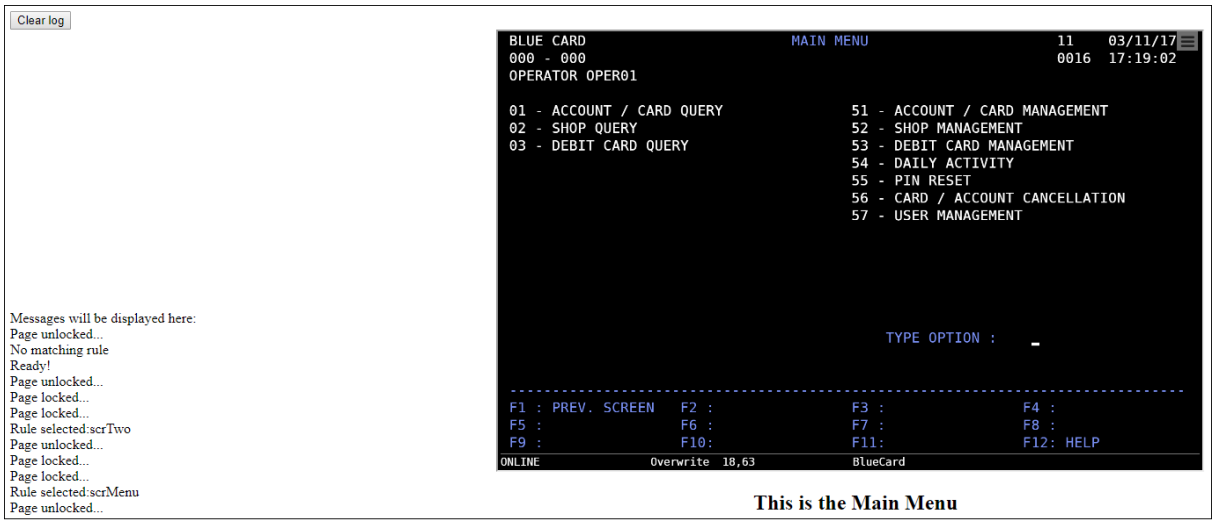

8.2.2.1.4 Working with HostSurfer Fields

Another key concept within the HostSurfer architecture are *dynamic fields* and *user fields*.

Whenever the underlying screen changes, HostSurfer examines the screen and retrieve all of its fields. These are the so called 'dynamic' fields that can be accessed by Javascript user code (read from and written to, in case of an entry field) and kept synchronized with the underlying host screen. Fields dynamically retrieved by HostSurfer from the underlying screen are named under the convention RrnCcn, where rn and cn are the row and column coordinates of the field within the screen. For example, R20C55 is a dynamically created field located at row 20 and column 55 of the terminal-based application screen.

The following code, added to the `ruleSelected` event handler, shows all dynamic fields containing data.

```
hs.on('ruleSelected', function (value) {
    if (value) { log('Rule selected: ' + value.id + '<br/>'); }
    else { log('No matching rule<br/>'); }
    if (document.getElementById("showFields").checked) {
        for (field in hs.data) {
            if (hs.data[field] != "") {
                log(field + ": '" + hs.data[field] + "'");
            }
        }
    }
});
```

Also, we introduced some changes to index.html to get more control and a better view of the log information.

Besides the dynamically created fields, user fields can be declared as a property called 'fields', composed by an array of Javascript objects that define those fields.

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In our example, we will update 'bluecardLogin' screen rule, so that when a screen satisfies the rule 'match' condition, screen fields are displayed.

To begin with, we will add more information to the 'bluecardLogin' rule, declaring four fields from the second screen. To do so, the 'fields' property has been added to the 'apply' property. 'Fields' property is an array of Javascript objects, identified by a name, additional 'row', 'col' and 'len' properties that define their location within the underlying screen. There is not a mandatory one-to-one relationship between screen fields and user-defined fields, as fields can also be derived by combining and transforming screen fields. For a more detailed information on Fields, please refer to 'fields' Property.

The 'fields' property in 'bluecardLogin' rule is represented in the following code snippet:

```
fields: [
    { name: 'shopsUpdatedUntil', row: 18, col: 9, len: 19},
    { name: 'accountsUpdatedUntil', row: 18, col: 39, len: 22},
    { name: 'shopsLastUpdate', row: 18, col: 29, len: 8},
    { name: 'accountsLastUpdate', row: 18, col: 62, len: 8}
]
```

Taking into account that we are going to retrieve fields from the second screen, they correspond to the following texts:

'shopsUpdatedUntil' refers to the text 'SHOPS UPDATED UNTIL', located at row 18, column 9, has a length of 19 characters.
'accountsUpdatedUntil' refers to the text 'ACCOUNTS UPDATED UNTIL', located at row 18, column 39, has a length of 22 characters.
'shopsLastUpdate' refers to the date '01/08/16', located at row 18, column 29, has a length of 8 characters.
'accountsLastUpdate' refers to the date '02/08/16', located at row 18, column 62, has a length of 8 characters.

We intend to display these fields on our application web page, in a similar way they are shown on the underlying terminal screen.
To do so, we will modify the function assigned to the 'handler' property, so that the contents of the defined fields are concatenated and displayed on the "app" div section of the application web page.

The whole screen rule definition is:

```
    hs.register({
        id: "bluecardLogin", match: [{ text: "USERNAME", row: 19, col: 55 }],
        apply: {
            fields: [
              { name: 'shopsUpdatedUntil', row: 18, col: 9, len: 19},
              { name: 'accountsUpdatedUntil', row: 18, col: 39, len: 22},
              { name: 'shopsLastUpdate', row: 18, col: 29, len: 8},
              { name: 'accountsLastUpdate', row: 18, col: 62, len: 8}
            ],
            handler: function (hs) {
                var updateInfo =
                    '<h3>' + hs.data.shopsUpdatedUntil + ' ' +
                    hs.data.shopsLastUpdate + ' ' +
                    hs.data.accountsUpdatedUntil + ' ' +
```

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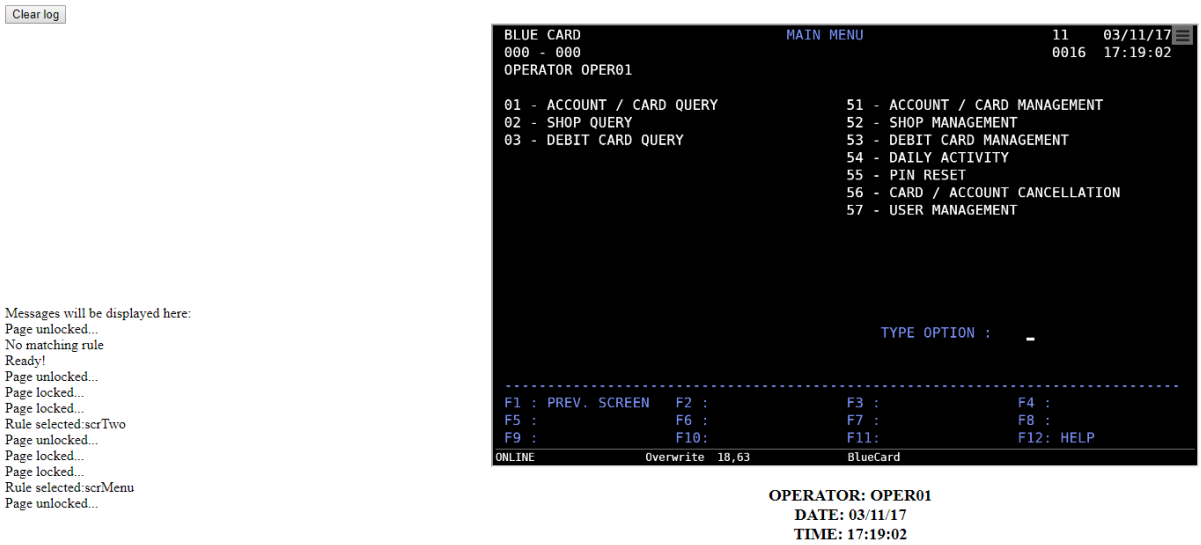
```
                    hs.data.accountsLastUpdate + '</h3>';
                log(updateInfo);
            }
        }
    });
```

The new handler implementation simply gets a reference to the zScope.hostSurfer instance, concatenates the string contents and display the resulting string on the "app" div section of the web page. Please note the way field contents are accessed: they are properties enclosed within the data property of the HostSurfer instance.

The resulting web page is depicted in the following image. At the bottom of log and after the dynamic fields, we can see the user fields enumeration:



Go to this jsfiddle to see and test the example code.

8.2.2.2 Building a HostSurfer Application

This topic is aimed at helping you to start developing HostSurfer web applications.

We'll provide step-by-step examples that can be tested online on JSFiddle service (https://jsfiddle.net/). You can also test the examples in your own environment, in which case, we strongly recommend using an code editor such as Brackets (https://brackets.io/) for editing and testing during the application development process.

Building a simple Example Application

8.2.2.2.1 Building a simple Example Application

In next topics we'll apply the previously learned fundamentals to build a HostSurfer application. In this case, we'll use Handlebars (bundled with z/Scope Anywhere) to generate the web interface.

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Handlebars is an open source Javascript library which let us build *semantic templates* in HTML. These templates combine HTML code with special expressions that, at runtime, will be processed and replaced by other content, such in this case data extracted from the terminal screen. The handlebars.js library is already included with the HostSurfer API library and none explicit reference is necessary to use it. For more information and reference please refer to http://handlebarsjs.com/.

Pre-Requisites

To begin with, please setup the following development environment:

- Create a folder for your application, i.e., 'myapp'.
- Create a sub-folder named 'js' under 'myapp' folder.
- Create a sub-folder named 'rules' under 'myapp' folder. You can also create 'css' and 'images' sub-folders as needed.
- Open Brackets and set the working folder to your application local folder.

Now you are ready to start developing your first HostSurfer application by following these steps:

- Creating the Index.html page
- Adding screen rules
- Using HTML page templates
- Running the Example Application
- Extending the Example Application

8.2.2.2.1.1 Creating the Index.html page

The main purpose of the index page is:

1. Define the container into which the HTML template rendering will take place.
2. Load the necessary resources for the application.

The new index.html is a variation of the HostSurfer Application Fundamentals last example. The CSS stylesheets (index.css and styles.css) and the Javascript code (index.js) now is loaded from external files. Also, this time we prefer to not explicity embed the terminal emulation into the page: HostSurfer allows to create a terminal emulation inside a floating panel to be able to see the terminal display and the HTML representation at the same time. This feature allows programmers to facilitate the development process.

The most important of this first step is in the HostSurfer constructor parameter:

```
var hs = new zScope.HostSurfer({
    term: {
        url: "https://zanywhere.cybelesoft.com/hsdemo/",
        float: { top: 5, right: 5, width: 350, height: 235 }
    },
    view: {
        id: "hs-view"
    }
});
```

Please note the changes made to the HostSurfer constructor call: instead of embedding a

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terminal emulator in an iframe, we'll delegate the creation of the terminal emulator to HostSurfer. To do that, we added the *term* parameter including the connection *url*. The *float* attribute indicates to HostSurfer we want to use the terminal emulation inside a floating panel.

The *view* attribute indicates to HostSurfer the HTML element where the processed template will be embedded. Through this attribute, HostSurfer automatically will take control of the page element identified with this id as the application rendering container. The default id for the HostSurfer rendering container is 'hs-view'. In this case (as we are using "hs-view" as id for the rendering container) we can avoid the explicit declaration of this attribute:

```
var hs = new zScope.HostSurfer({
    term: {
        url: "https://zanywhere.cybelesoft.com/hsdemo/",
        float: { top: 5, right: 5, width: 350, height: 235 }
    }
});
```

Go to this jsfiddle to see and test the example code.

In the next topic, we will create a screen rule with a callback handler.

8.2.2.2.1.2 Adding Screen Rules

We'll add two rules. The first screen rule will be associated with the first screen and will have a handler function, which will be called upon rule selection. Please note the condition specified in this function: it will only send the <ENTER> key when the hs.screens attribute array contains no previous screens, meaning that the connection has been established and this is the first screen received. So, this rule will help to bypass the "cics" screen when the connection is open, but not when the user returns from the log-in (the second screen).

The *handler* definition for this screen rule is:

```
    apply: {
      handler: function (hs) {
        if (hs.screens.length == 1) {
          hs.enter();
        }
      }
    }
```

The second screen rule will be associated with the second application screen. It will include user fields that will be used in the HTML template to bind part of the screen buffer with HTML elements. Also, it will include a couple of actions that will provide screen navigation.

The *apply* property will have this content:

```
    apply: {
      fields: [
        { name: 'shopsLastUpdate', row: 18, col: 29, len: 8 },
```

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```
        { name: 'accountsLastUpdate', row: 18, col: 62, len: 8 },
        { name: 'username', row: 19, col: 67, len: 6 },
        { name: 'password', row: 20, col: 67, len: 6 }
        { name: 'newPassword', row: 21, col: 67, len: 6 }
      ],
      render: {
        view: {
          template: "<H5>BLUE CARD LOGIN</H5>"
        }
      },
      actions: {
        main: function (hs) { hs.enter(); },
        exit: function (hs) { hs.pf1(); }
      }
    }
```

Go to this jsfiddle to see and test the example code.

NOTE: In previous examples we included the rules registrations in the same index.js file. This is fine for the scope of this tutorial, but we strongly recommend to use a modular approach by defining the screen rules as external resources and loaded by HostSurfer when is created.

To load screen rules from external files we need to declare a repository, and the list rules that will be loaded during HostSurfer initialization:

```
    var hs = new zScope.HostSurfer({
        term: {
            url: "https://zanywhere.cybelesoft.com/hsdemo/",
            float: { top: 4, right: 4, width: 320, height: 200 }
        },
        rules: {
            baseUrl: 'rules/',
            paths: ['cics', 'bluecardLogin']
        },
        view: {
            id: "hs-view"
        }
    });
```

Now, when the HostSurfer object is created, it will load and register the new rules from the declared repository. Each screen rule has to be created as an auto-executable script:

```
(function () {
    hs.register({
        id: 'cics',
        match: [{ text: "CICS", row: 5, col: 1 }],
        apply: {
            handler: function (hs) {
                if (hs.screens.length==1) {
                    hs.enter();
                }
            }
        }
    });
})();
```

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8.2.2.2.1.3 Using HTML templates

To create an external template and bind it to the terminal screen data we need to:

- create the HTML template.
- update the screen rule to apply the template.

The HTML template is a Handlebars template that includes data binding to terminal screen content. When a screen rule is selected, HostSurfer will load and process this template. The resulting HTML is inserted into HTML element passed as "view" container.

You can bind output fields using the standard Handlebars syntax ie.

```
<p>{{hs.data.R18C9}} {{hs.data.commerceLastUpdate}} &mdash; {{hs.data.R18C39}}
{{hs.data.accountsLastUpdate}}</p>
```

where "hs.data" is the node exposed by HostSurfer as root of both dynamic and custom screen fields.

To bind input fields, you must use the "hs-field" attribute like this:

```
<input type="text" size="13" maxlength="6" hs-field="hs.data.username"/>
```

This attribute will link the HTML input element with the terminal screen field, allowing for a two-way data binding.

The HTML template will be processed upon screen identification, replacing the Handlebars expressions and HostSurfer attributes with the corresponding screen information. Please note that we have combined dynamic and user defined fields.

Also, we have two "actions", each one associated to a "button" click event handler:

```
<span class="button" id="login_btn" tabindex=0
onclick="hs.navigate('main')">Sign in</span>
<span class="button" id="exit_btn" tabindex=0
onclick="hs.navigate('exit')">Exit</span>
```

Actions are a great ally to control the application screen flow, because all actions with the same name are linked across the different screens and will be executed in chain while the action exists for the current screen.

We create the HTML template inside a hidden div:

```
<div id="login" style="display:none">
  <div style='font-size: 10pt; margin: 5px'>
    <h1>Blue Card / User Login</h1>
    <p> </p>
    <p>SHOPS UPDATED UNTIL: {{hs.data.shopsLastUpdate}} &mdash; ACCOUNTS UPDATED
UNTIL {{hs.data.accountsLastUpdate}}</p>
    <p> </p>
    <p>Username:
```

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```
      <input type='text' size=13 maxlength=6 hs-field='hs.data.username' />
    </p>
    <p>Password:
      <input type='password' size=13 maxlength=6 hs-field='hs.data.password' />
    </p>
    <p>New Password:
      <input type='password' size=13 maxlength='6' hs-field='hs.data.newPassword' /
>
    </p>
    <p> </p>
    <p>
      <button id='login_btn' tabindex=0 onclick='hs.navigate(\"main\")'>Sign in</
button> 
      <button id='exit_btn' tabindex=0 onclick='hs.navigate(\"exit\")'>Exit</
button>
    </p>
  </div>
</div>
```

Next we will update our rule with the template and the actions:

```
apply: {
  fields: [
    { name: 'shopsLastUpdate', row: 18, col: 29, len: 8 },
    { name: 'accountsLastUpdate', row: 18, col: 62, len: 8 },
    { name: 'username', row: 19, col: 67, len: 6 },
    { name: 'password', row: 20, col: 67, len: 6 }
    { name: 'newPassword', row: 21, col: 67, len: 6 }
  ],
  render: {
    view: {
        template: '#login'
    }
  },
  actions: {
    main: function (hs) { hs.enter(); },
    exit: function (hs) { hs.pf1(); }
  }
}
```

Alternatively, we can save the HTML template into a file and link it:

```
apply: {
     ...
     ...
     render: {
       view: {
           template: 'login.html'
       }
     },
     ...
     ...
}
```

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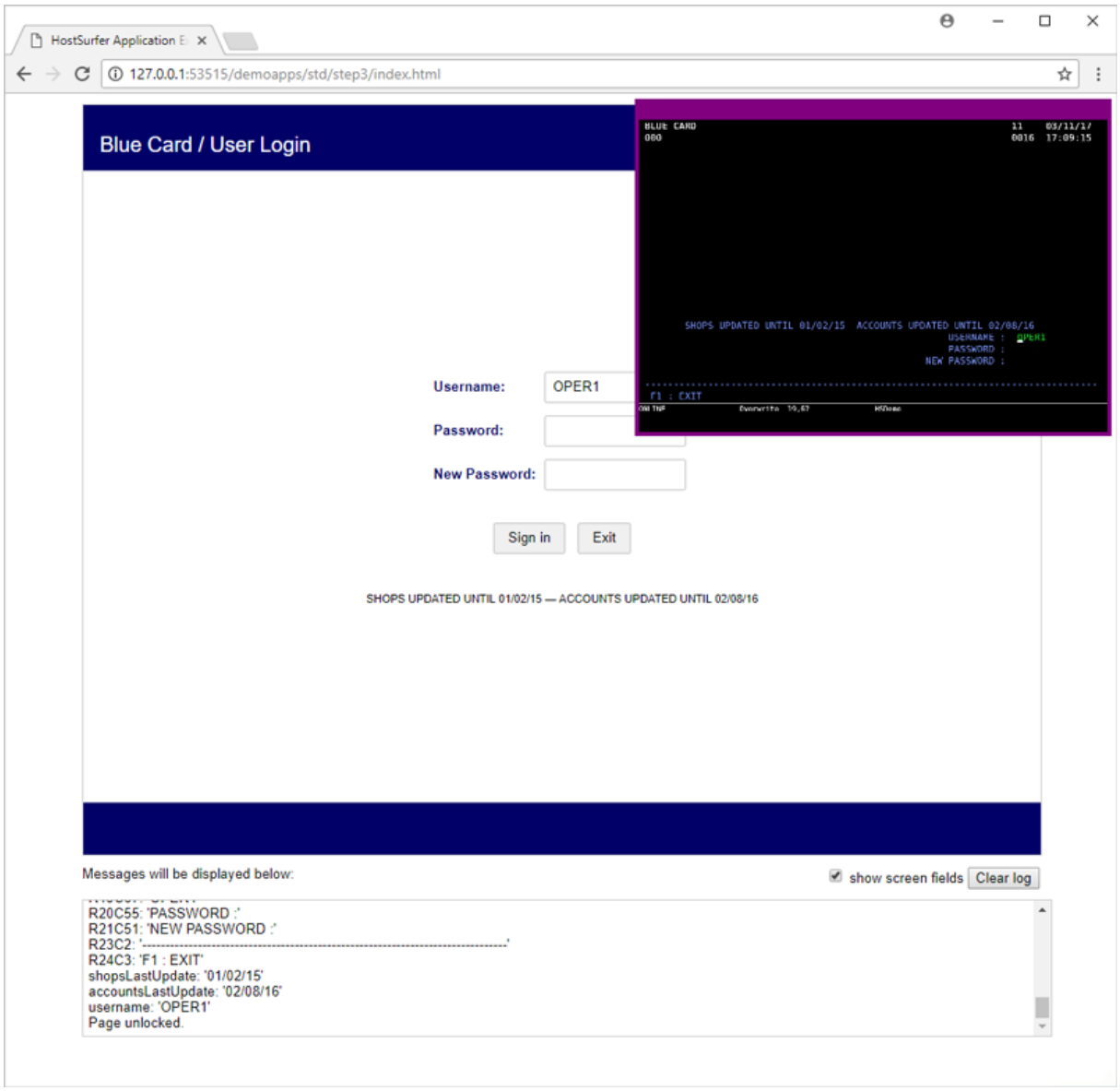
Go to this jsfiddle to see and test the example code.

8.2.2.2.1.4 Running the Example Application

After running the application, you should see something like this:



Let's go through the "log" content to see what happened:

Once the connection is established, these will be the first message you will see:

```
Ready!
Page unlocked.
```

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Now, HostSurfer receives the screen content and checks if one or more rules identification criteria match with the current screen content. HostSurfer applies a score to each matching rule and it will always select the rule that best fits the current screen. In this case, the "CICS" word at the beginning of the fifth row is sufficient enough to match with the 'cisc' rule.

```
R1C2: 'CSSN=SIGUE'
R5C1: 'CICS'
R5C12: 'BLUE CARD - TEST'
R5C64: 'TERMINAL TCLD1006'
R18C21: 'USERNAME'
R18C30: '=>'
R18C33: 'OPER1'
R18C44: 'PASSWORD'
R18C53: '=>'
R20C44: 'NEW PASSWORD'
R20C57: '=>'
R23C1:
'--------------------------------------------------------------------------------'
R24C21: 'PF3 ->'
R24C28: 'EXIT'
Rule selected: cics
Page unlocked.
```

As the 'cics' rule has a "handler" function, HostSurfer executes this callback function which sends the ENTER key.
As a result, the host computer sends a new screen that matches the 'bluecardLogin' rule.

```
Page locked.
Page locked.
R1C2: 'BLUE CARD'
R1C66: '11'
R1C72: '03/11/17'
R2C2: '000'
R2C66: '0016 17:09:15'
R18C9: 'SHOPS UPDATED UNTIL 01/02/15'
R18C39: 'ACCOUNTS UPDATED UNTIL'
R18C62: '02/08/16'
R19C55: 'USERNAME :'
R19C67: 'OPER1'
R20C55: 'PASSWORD :'
R21C51: 'NEW PASSWORD :'
R23C2:
'--------------------------------------------------------------------------------'
R24C3: 'F1 : EXIT'
shopsLastUpdate: '01/02/15'
accountsLastUpdate: '02/08/16'
username: 'OPER1'
Rule selected: bluecardLogin
Page unlocked.
```

Please note that the 'shopsLastUpdate' user-field is the last part of the R18C9 dynamic field. Also, remember we are filtering the empty fields so this log doesn't show them.

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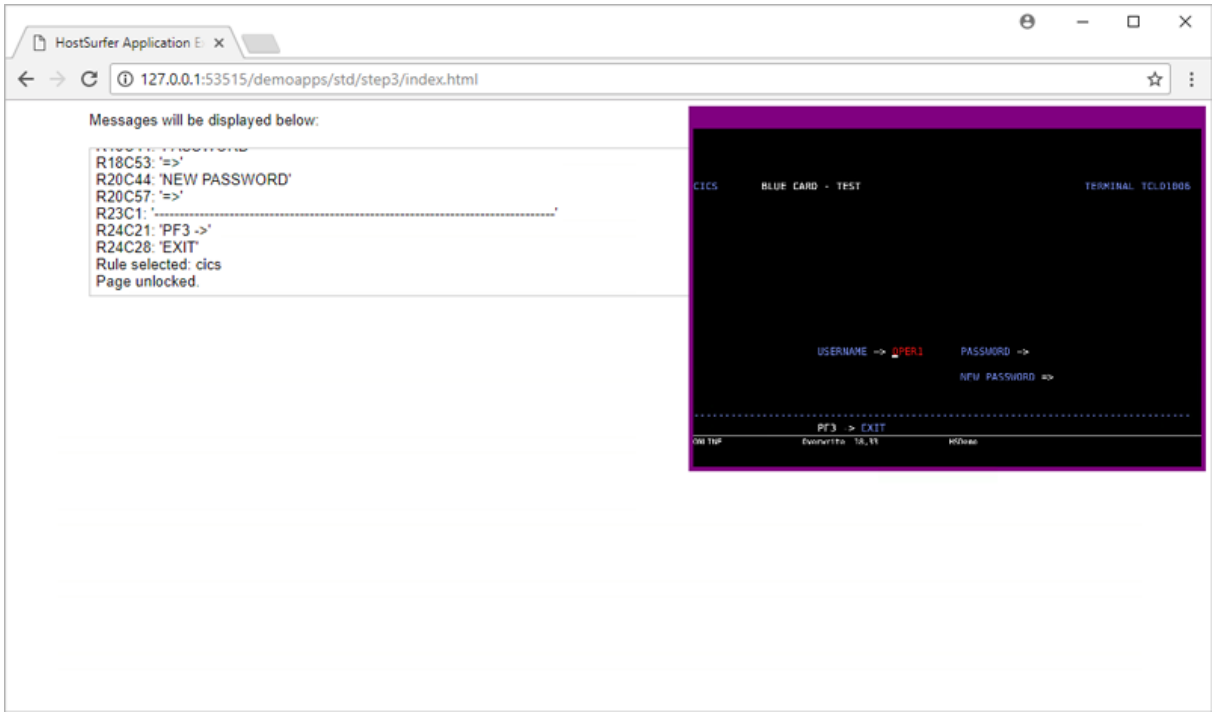
Now we can test the current application's behavior. If you type the username in the input element, the typed content will appear as "mirrored" on the correlating field in the terminal emulation screen.

Below you will see what happens if you press the "Sign in" or "Exit" buttons:

If you press the 'Exit' button the application returns to the first screen (this will be recognized as 'cics'). Though this time, as this is not the first screen in the screens array, the "handler" won't do anything.

Now, the web application will look like this:



The current rule doesn't have any template assigned for its screen.

You can expect a similar behavior if you navigate from the sign-in page by pressing the "Sign in" button when on this screen:

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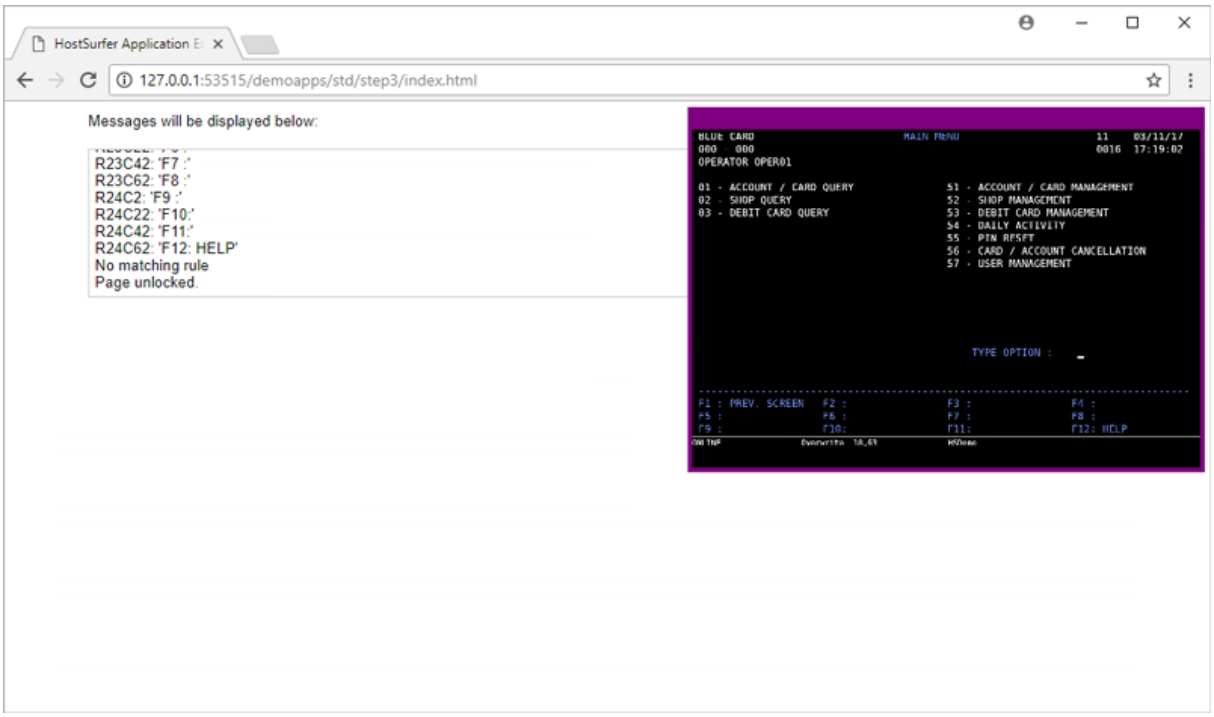
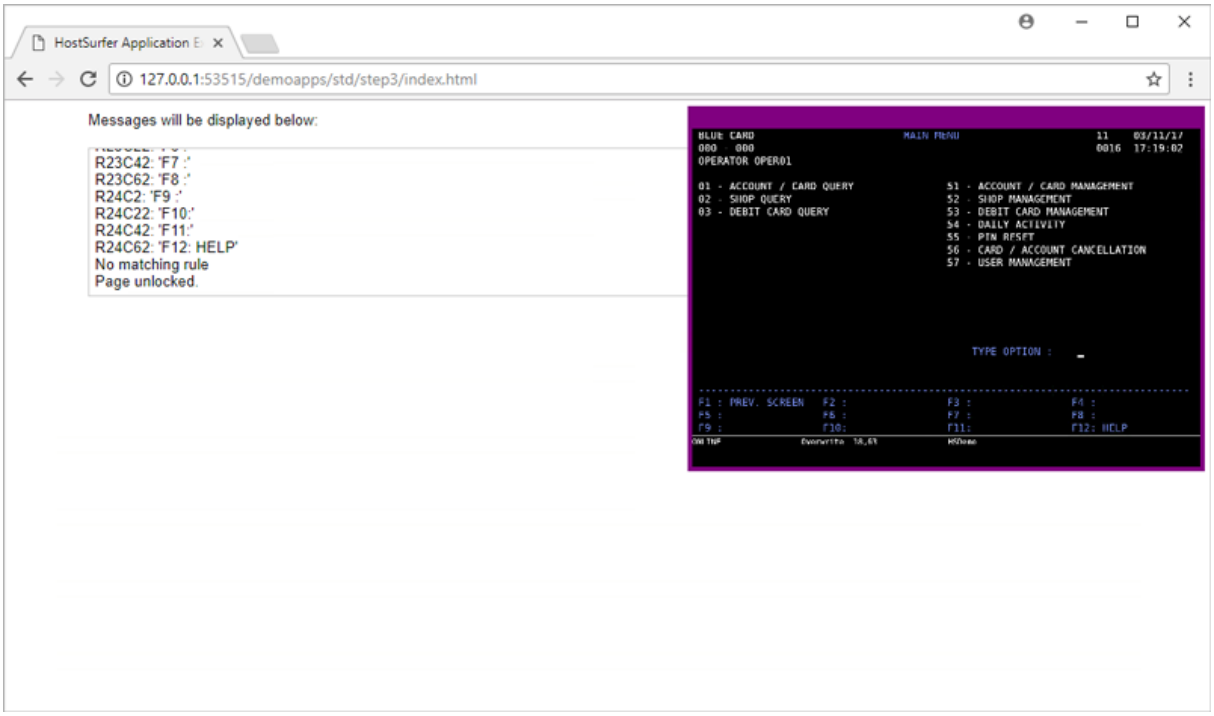


8.2.2.2.1.5 Extending the Example Application

Below is the screen we left off in the previous topic:



Since the first menu option is the only functional one in the "Blue Card" application, we'll

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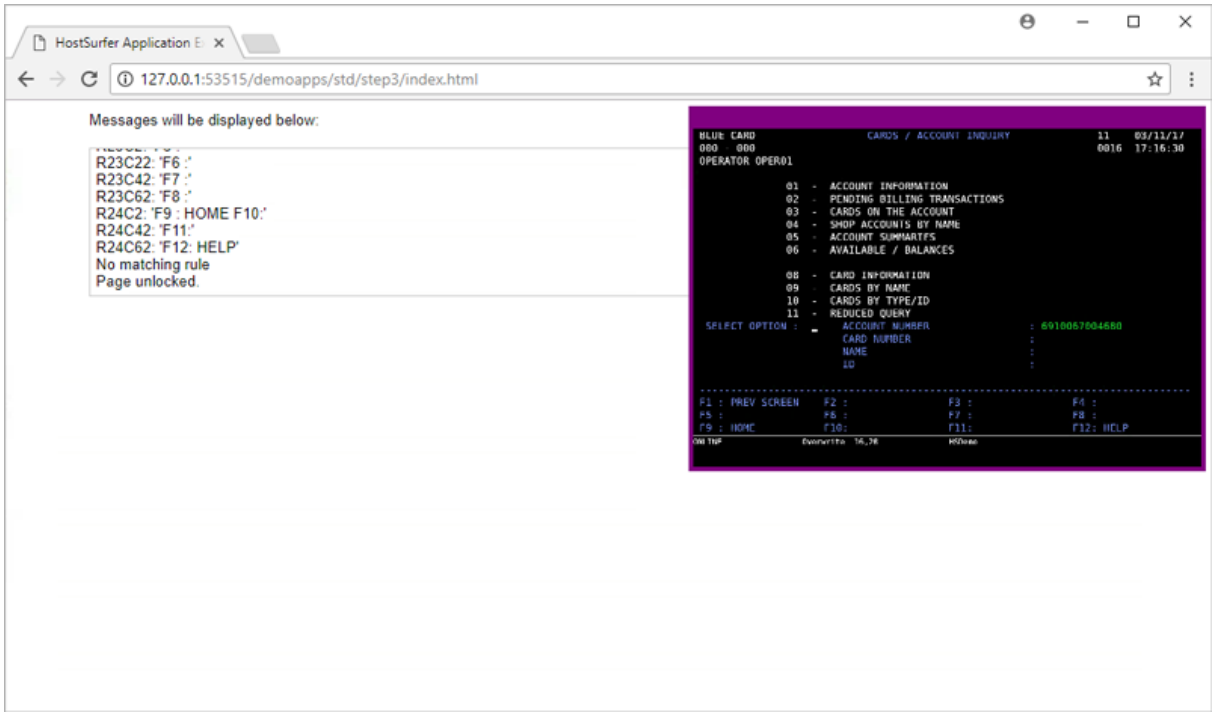
bypass this menu and go directly to the "Account Information" menu.

The following image shows our "real" main menu screen:



To complete the demo we need to:

- add a new screen rule
- add an HTML template for the menu

We will need to define new screen rules for both screens.

Firstly, we will look for the "MAIN MENU" label to identify the first screen .

In addition (as we want to skip this screen) we will add two new versions of the actions defined for the previous screen. For the "main" action we must type "01" in the option field and then press <ENTER>. The second actions you have to add is "exit", because we only need to send a PF1 key.

Note, in the following rule definition, the addition of the "input" user field will be used in "main" as "hs.data.option".

```
    hs.register({
        id: 'bluecardMainMenu',
        match: [{ text: 'MAIN MENU', row: 1, col: 35 }],
        apply: {
            fields: [
                { name: 'option', row: 18, col: 63, len: 2 },
```

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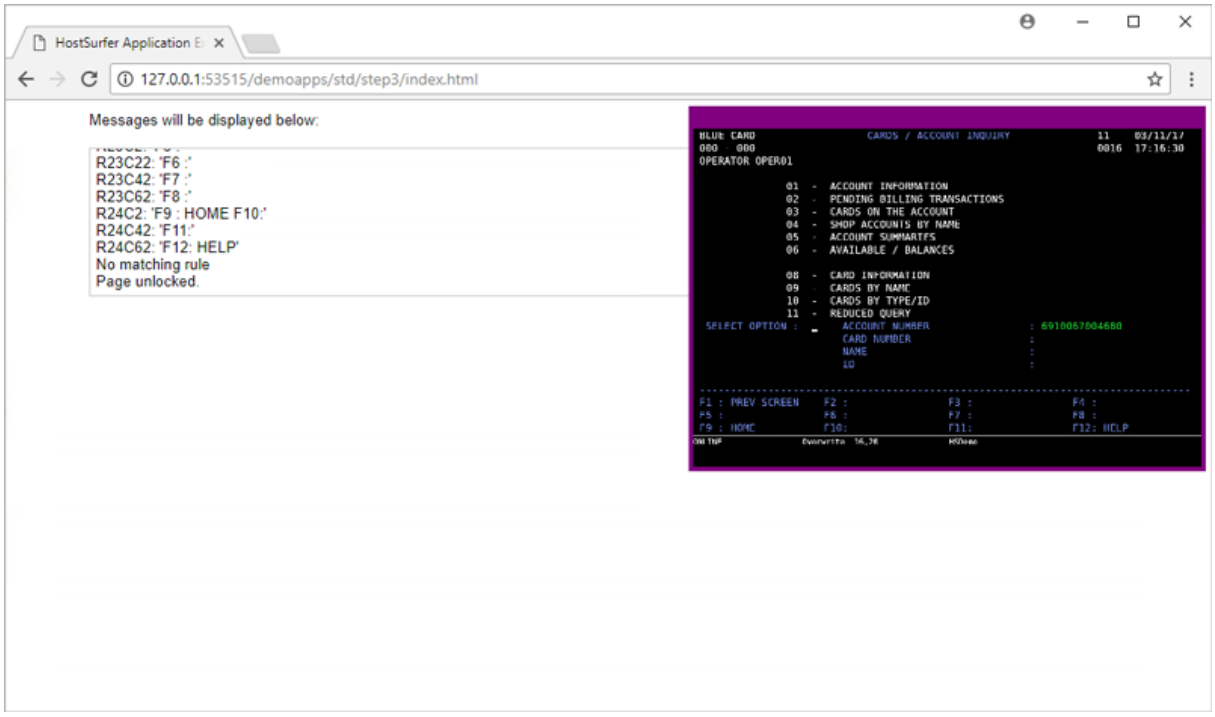
```
            ],
            actions: {
                main: function (hs) {
                    hs.data.option = '01';
                    hs.enter();
                },
                exit: function (hs) {
                    hs.pf1();
                }
            }
        }
    });
```

If we run the application now and press the "Sign in" button on the login page, it will take us directly to "Account Information" screen. The "main" action will be executed in 'bluecardLogin' screen first and then in 'bluecardMainMenu' screen. The resultant screen has no rule yet, therefore, no more "main" actions are found and the navigation sequence stops.

Now we are ready to complete this demo, adding a page for the application menu.

The following image shows the resultant screen after navigating from the login page by using the "Sign in" button:



This screen contains four sections: a header, a menu with options, an input section with several editable fields and a footer with some navigation options. The menu section contains several rows displaying each row an option. We will take advantage of this vertical disposition to recover dynamically all menu options. Please, pay attention to the code highlighted in yellow:

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```
    zScope.hostSurfer.register({
        id: 'bluecardAccountMenu',
        match: [{ text: 'CARDS / ACCOUNT INQUIRY', row: 1, col: 29 }],
        apply: {
            fields: [
                { name: 'option', row: 16, col: 20, len: 2 },
                { name: 'account', row: 16, col: 57, len: 22 },
                {
                    name: 'options', fromRow: 5, toRow: 15,
                    items: [
                        { name: 'value', col: 16, len: 2 },
                        { name: 'description', col: 23, len: 40 }
                    ],
                    skip: function (obj) { return (obj.value == ''); },
                    break: function (obj) { return false; }
                }
            ],
        }
    });
```

The highlighted code tells HostSurfer to scan rows from 5 to 15, skipping the empty fields and retrieving the 'value' and 'description' fields. Now, when you navigate to the Blue Card Account Information menu, you will get the following fields as a Javascript objects array called 'options':

```
options: [
       {"value": "01", "description": "ACCOUNT INFORMATION" },
       {"value": "02", "description": "PENDING BILLING TRANSACTIONS" },
       {"value": "03", "description": "CARDS ON THE ACCOUNT" },
       {"value": "04", "description": "SHOP ACCOUNTS BY NAME" },
       {"value": "05", "description": "ACCOUNT SUMMARIES" },
       {"value": "06", "description": "AVAILABLE / BALANCES" },
       {"value": "08", "description": "CARD INFORMATION" },
       {"value": "09", "description": "CARDS BY NAME" },
       {"value": "10", "description": "CARDS BY TYPE/ID" },
       {"value": "11", "description": "REDUCED QUERY" }
]
```

To complete this rule definition, we need to declare the rule actions and the corresponding page template.

To exit this screen we need to press PF1 key, but as we want to bypass the "Main Menu" we'll define an 'exit' action to send a PF9 key that will make a logout and in turn, will chain with the "exit" action of the Login screen, exiting completely the application. We also define a "logout" action that will only navigate to the login screen.

The complete rule definition looks like:

```
    hs.register({
        id: 'bluecardAccountMenu',
        match: [{ text: 'CARDS / ACCOUNT INQUIRY', row: 1, col: 29 }],
        apply: {
            fields: [
                { name: 'screenTitle', row: 1, col: 29, len: 30,
```

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```
                    get: function (value) { return value.toLowerCase().replace(/\b\w/g,
function (i) { return i.toUpperCase() }) } } },
                { name: 'option', row: 16, col: 20, len: 2 },
                { name: 'account', row: 16, col: 57, len: 22 },
                {
                    name: 'options', fromRow: 5, toRow: 15,
                    items: [
                        { name: 'value', col: 16, len: 2 },
                        { name: 'description', col: 23, len: 40 }
                    ],
                    skip: function (obj) { return (obj.value == ''); },
                    break: function (obj) { return false; }
                },
                {
                    name: 'inputFields', fromRow: 16, toRow: 19,
                    items: [
                        { name: 'caption', col: 25, len: 30 },
                        { name: 'value', col: 57, len: 22 }
                    ],
                    skip: function (obj) { return (obj.value == ''); },
                    break: function (obj) { return false; }
                }
            ],
            actions: {
                logout: function (hs) { hs.pf9(); },
                exit: function (hs) { hs.pf9(); }
            },
            render: {
                view: {
                    template: 'accountmenu.html'
                }
            }
        }
    });
```

Note that the 'screenTitle' field has a "getter" function. This allows to return a custom value. In this case, we are transforming the case of the text obtained from the screen.

Finally, the addition of the 'render' attribute completes this example. The following listing shows the complete HTML template. Please, note the Handlebar for-each loop to generate all the menu buttons. Here, each created button will call the send() Javascript function included inside the HTML body.

Go to this Plunker to see and test the example code.

We are ready to navigate to the Account Menu. The final ouput for this view is the following:

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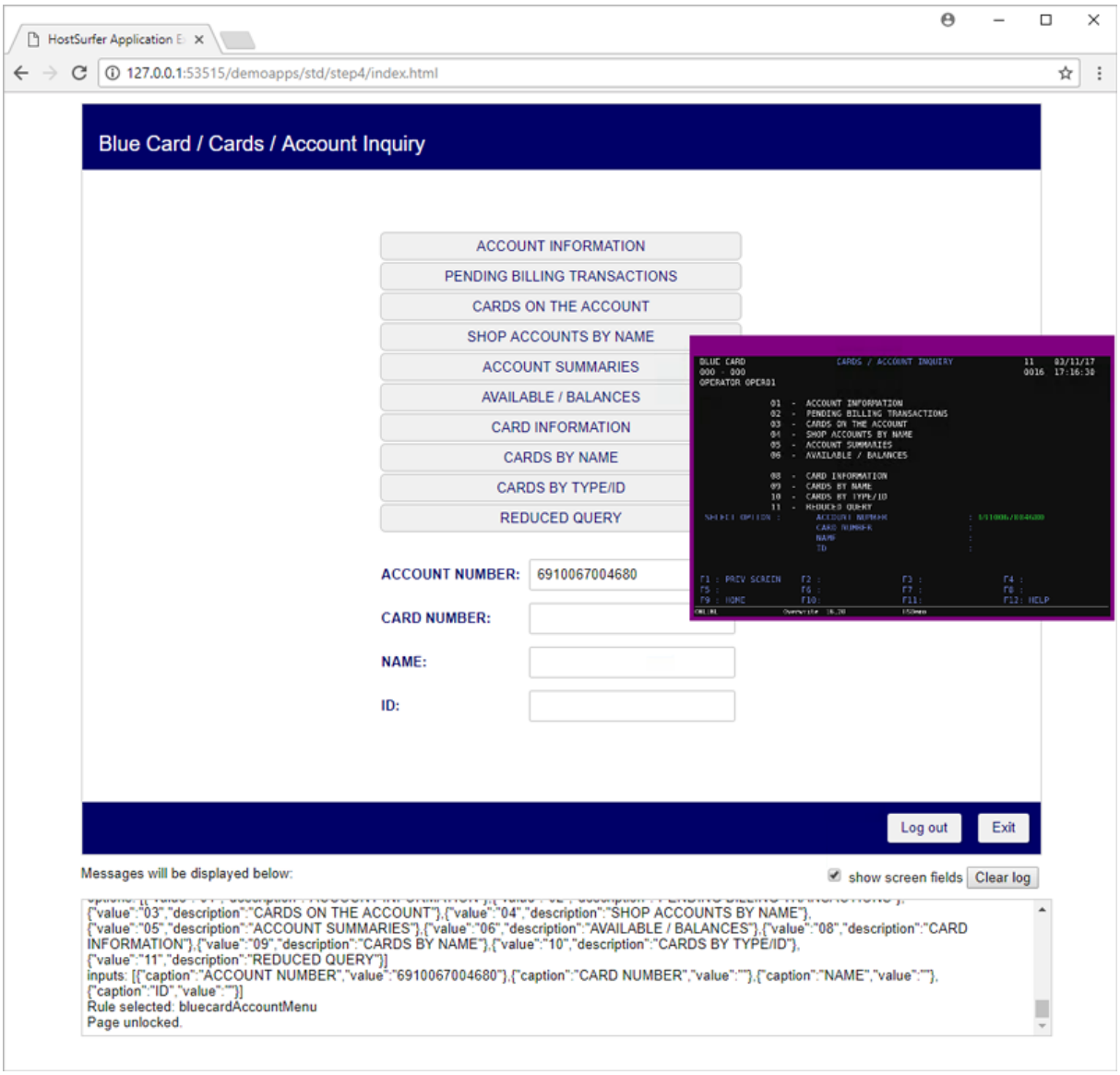

8.2.2.2.2 Building a Simple Example Application with AngularJS

This topic is aimed at helping you to jump start developing HostSurfer web applications. The example shown in next topics make use of AngularJS to generate the web interface, and Brackets for editing and testing during the application development process.

Pre-Requisites

To begin with, please setup the following development environment:

- Create a folder for your application, i.e., 'myapp'.
- Create a file named hsangular.js within 'myapp' folder, in case your application is based on AngularJS framework, like this example.
- Create a sub-folder named 'rules' under 'myapp' folder. You can also create 'css' and 'images' sub-folders as needed.
- Create a sub-folder named 'js' under 'myapp' folder, and copy to it the file named

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require.js.

- Open Brackets and set the working folder to your application local folder.

Now you are ready to start developing your first HostSurfer application by following these steps:

- Create your index.html file
- Create a HostSurfer Rule
- Create a HostSurfer Web Application Page
- Running the example application
- Changing the example application flow

8.2.2.2.2.1 Creating the Index.html page

The main purpose of the index page is:

1. Set the 'ng-view' into a element, into which the rendered template of the current AngularJS route will be included.
2. Load the necessary resources into the application.

```
<!DOCTYPE html>
<html>
<head>
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-
scale=1, user-scalable=no">
    <title>HostSurfer Example App</title>
    <script src="http://zanywhere.cybelesoft.com/js/terminal.min.js" type="text/
javascript"></script>
    <script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.4/
angular.min.js"></script>
    <script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.4/angular-
route.js"></script>
    <script src="hsangular.js"></script>
</head>
<body bgcolor="#FFFFFF">
    <div style="width:800px;height:650px">
      <div ng-view style="width:100%;height:100%"></div>
    </div>
        <div style="width:800px;height:320px;margin:auto">
                <iframe src="zanywhere.cybelesoft.com/hsdemo/" width="800px"
height="400px"></iframe>
        </div>
</body>
</html>
```

Please note that, as soon as index.html is rendered, hostsurfer.js is loaded and thus the application instance of HostSurfer is created. All the required Javascript resources are also loaded. Referenced resources include hsangular.js previously created.

In order to facilitate the development process, the index page shows an 'iframe' containing the terminal emulator (available from the Cybele Software website) on the bottom part of

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the browser client area, while the application will be show at the upper part.

After the index.html page is ready, we can go on by creating a HostSurfer rule as explained in the next topic.

8.2.2.2.2.2 Creating a screen rule with a handler

A rule set must be created in order to bind together the terminal screens, the data set (that HostSurfer creates from each screen) and the actions that will be applied to both navigating the applications as well as interacting with the underlying screen.
Rules are declared as Javascript objects in files under "/myapp/rules" folder, exposing specific properties that determine the linkage between the entities mentioned above. Also, the file hsangular.js must be edited accordingly so that each rule file is loaded in runtime and AngularJS Route provider can properly manage the application flow.
Please refer to HostSurfer Rules for more details.

We will proceed creating one HostSurfer rule by following these steps:

- Identifying the host screen
- Declaring fields
- Setting the rule web page
- Setting the rule actions

Having passed through the preceding steps and completed each of the rule properties, this is how the rule definition, in signin.js file, looks like:

```
(function () {
    var _signin = {
        id : 'signin',
        match : [{text: "USERNAME", row:19, col: 55}],
        apply : {
             fields : [
                { name : 'username', row : 19, col : 67, len : 6},
                { name : 'password',  row : 20, col : 67, len : 6},
                { name : 'newPassword', row : 21, col : 67, len : 6}
            ],
            render: {
              route: '#!signin'
            },
            actions : {
                main: function (hs) {
                    alert("action 'main' has been called");
                    hs.send.enter();
                },
                exit : function(hs) {
                    hs.send.pf1();
                }
            }
        }};
    zScope.hostSurfer.register(_signin);
})();
```

As mentioned in the first paragraph, every rule created must be added to the hsangular.js

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code, which contents are shown in the following code snippet:

```
var hs = new zScope.HostSurfer({
    view: {
        id: "hsview"
    },
    term: {
        url: "http://zanywhere.cybelesoft.com/hsdemo/",
        float: {
            top: 0, right: 0
        }
    },
    rules: {
        baseUrl: "rules/",
        paths: ["signin"]
    }
});

var app = angular.module('hs', ['ngRoute']);
app.controller('hscontroller', function ($scope) {
    $scope.hs = hs.data;
    hs.on('fldupdate', function () {
        $scope.$apply(function () {
            $scope.hs = hs.data;
        });
    });
});

hs.on('ready', function () {
    angular.bootstrap(document, ['hs']);
});

app.config(function ($routeProvider) {
    $routeProvider
        .when("/signin", { templateUrl: 'signin.html', controller: 'hscontroller' })
   .otherwise({ redirectTo: '/' });
})
```

Please note that a reference to signin.html must be set both, in the rule file as well as in hsangular.js.

When creating a HostSurfer rule, the first step is identifying the screen the rule will be based on. For this purpose, a fixed text or pattern needs to be located within the selected string.
In our example, the screen to be identified is the one depicted in the following figure :

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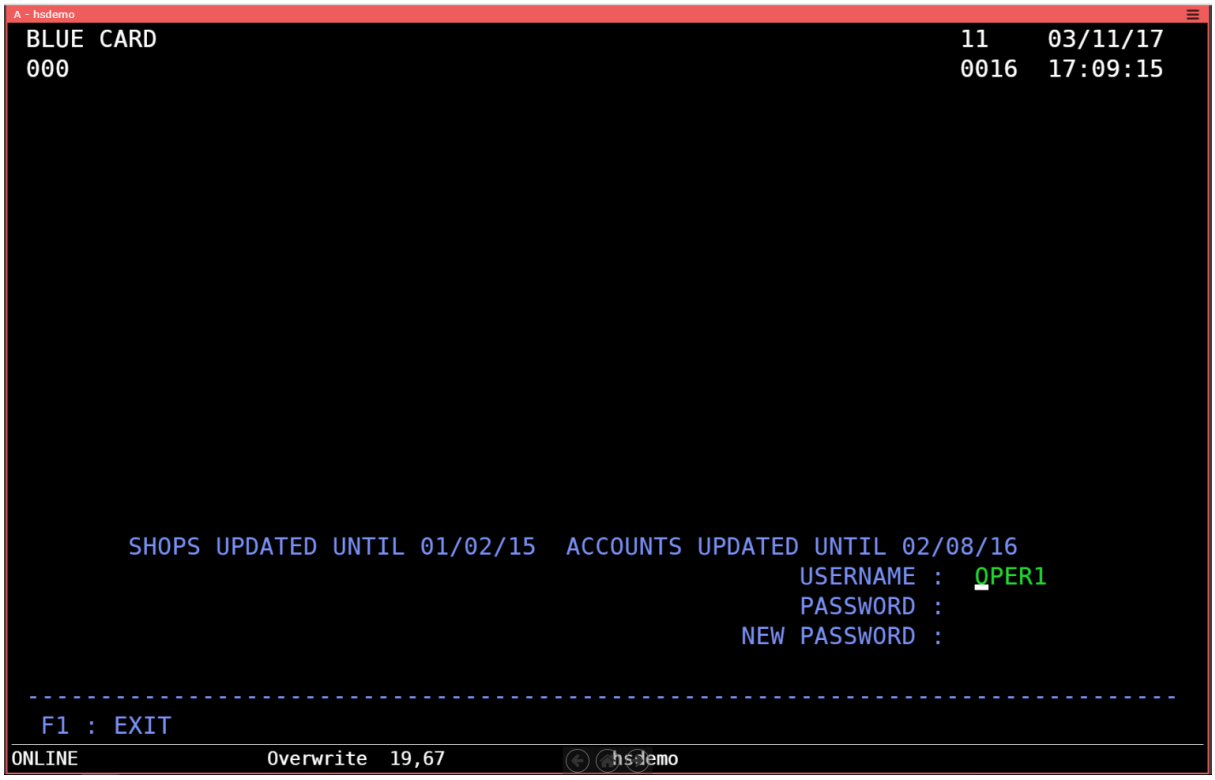

For the current example, the screen can be detected by matching the literal string "USERNAME" located at row 9 and column 55.
Therefore, a 'match' condition for the rule can be expressed as:

```
match : [{text : "USERNAME", row : 19, col : 55}]
```

For a any particular screen, there could be alternate ways to express the match condition, provided it is based on fixed fields or patterns. For example, the next one could be equally valid:

```
match : [{text : "PASSWORD", row : 20, col : 55}]
```

If a matching criterion cannot be satisfied by a single literal string, two or more strings and functions can be used together.

As previously mentioned, HostSurfer automatically creates a collection of fields from the screen that satisfies the 'match' criterion, assigning them a default name based on their row and column locations.
However, there can be situations when the developer wants a field to be explicitly named, or the field data to be transformed or compound in same particular way.
To do so, named fields must be declared as the value of the 'fields' property, within the 'apply' property of the HostSurfer rule.
Given the selected screen:

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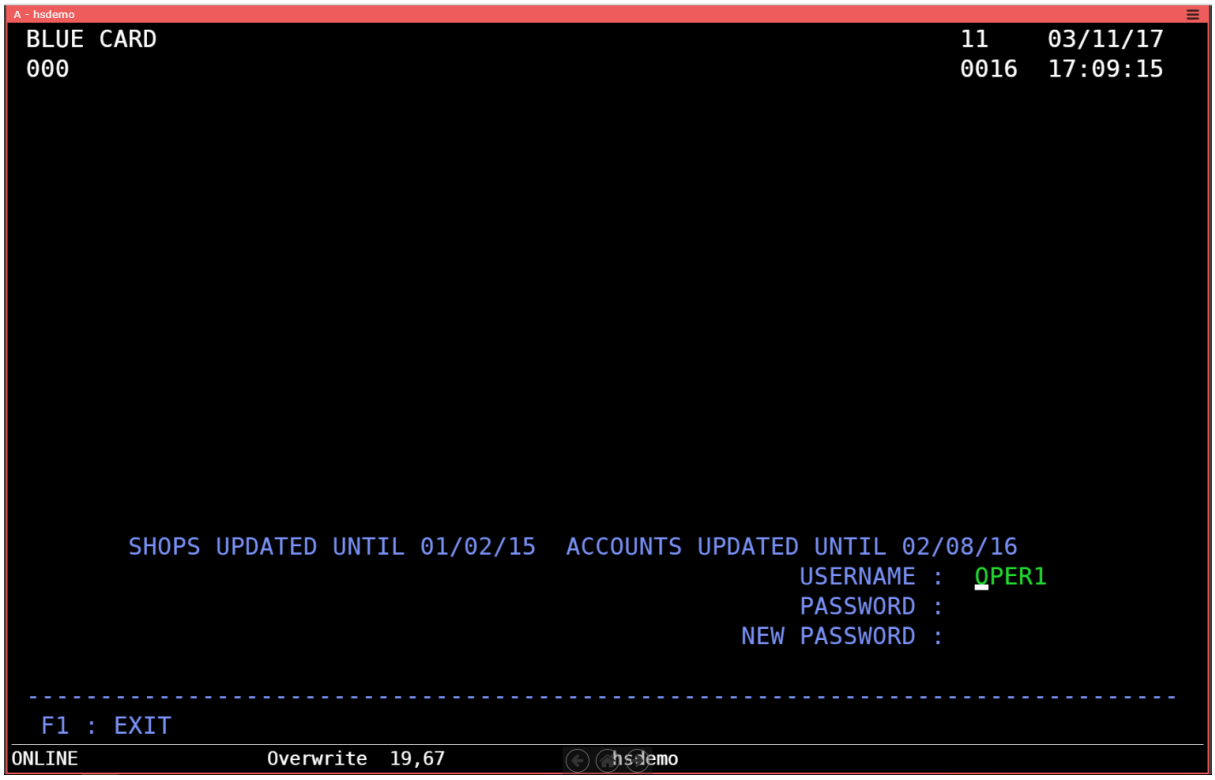

the three entry fields, corresponding to USERNAME, PASSWORD and NEW PASSWORD will be explicitly declared and created.

The following code snippet shows how they are set in the rule:

```
fields : [
    { name : 'username', row : 19, col : 67, len : 6},
    { name : 'password', row : 20, col : 67, len : 6},
    { name : 'newPassword', row : 21, col : 67, len : 6}
```

Please note that, even when only the three entry fields were explicitly declared, the 'data' property of the HostSurfer instance holds all screen fields in the field collection, including those we declared, but with default names.

The 'page' property of the HostSurfer rule, indicates which web page will be rendered when the current host screen satisfies the 'match' criterion.
For this example, we will load a page called signin.html for the screen selected in the topic Identifying the Host Screen

The 'page' property will be set as follows:

```
page : '#!signin'
```

The purpose of the 'signin' page will be functionally similar to the underlying host screen, that is, to request username, password and, if needed, new password from the user.
Please note that only one page can be set to a rule (although not every rule must have a web page assigned, as previously explained).

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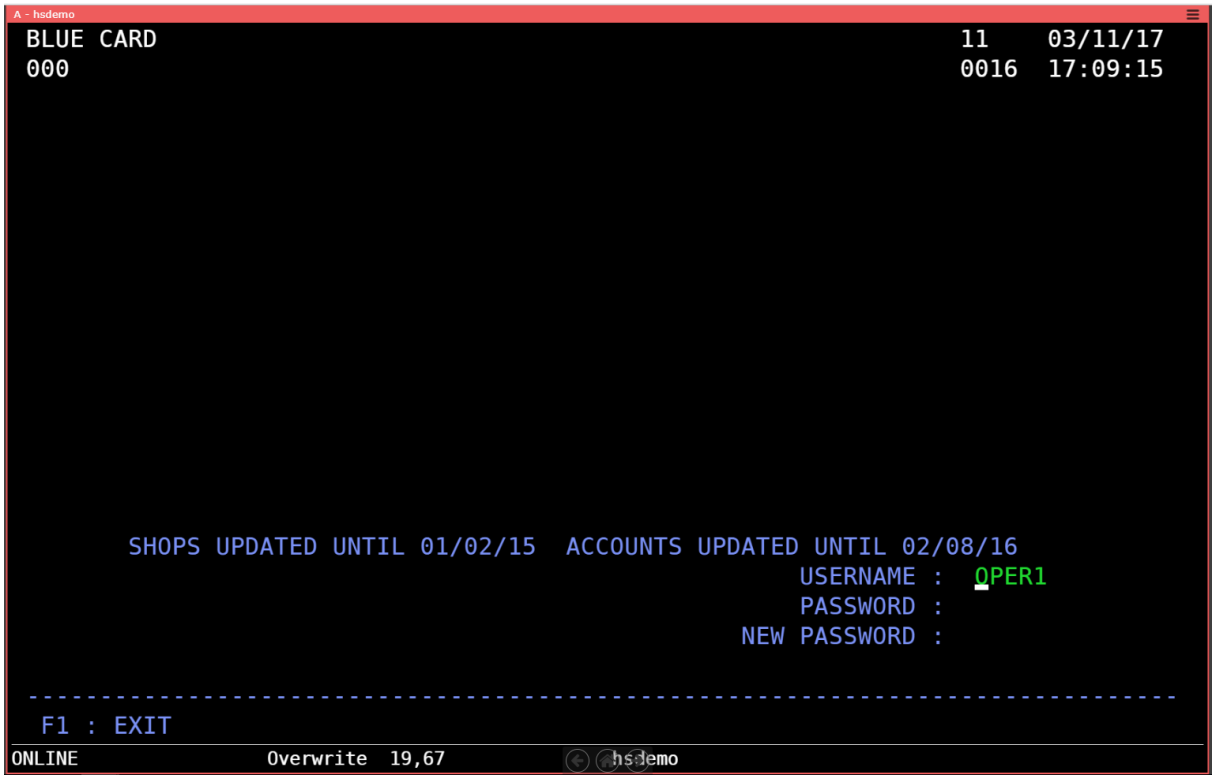
The 'actions' property object encloses a set of properties which keys must match the actions invoked within the web page. Their values are functions that take the HostSurfer instance as the only parameter and executes the methods which send the required keystrokes to the underlying terminal-based application and/or do other processing.
There will be just two actions for the 'signin' rule called: 'main' and 'exit'. These will be called when pressing the 'Sign In' and 'Exit' buttons, respectively.

We will declare the 'action' property as follows:

```
actions: {
    main: function(hs) {
        alert("action 'main' has been called");
        hs.send.enter();
    },
    exit: function(hs) {
        hs.send.pf1();
    }
}
```

The 'main' action will show a message to the user indicating the 'main' was called and then will send an <Enter> keystroke to the underlying screen, because the user log-in is accepted with the current field values (user name OPER1 and blank password).
The 'exit' action sends a 'PF1' keystroke, which instructs the terminal-based application to return to the previous screen, as shown in the selected screen for this rule



8.2.2.2.2.3 Creating a Web Application Page

In order to start testing the example application (to see how the application reacts to the terminal screen change) we will use a simple page as show below.

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```
<html>
<head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-
scale=1, user-scalable=no">
    <title>Example Application</title>
    <link rel="stylesheet" href="css/styles.css">
</head>
<body>
    <div class="fullbox">
    <div class="header">
        <div class="title">Sign In Form</div>
    </div>

    </div>
</body>
</html>
```

The images depicted below, show the browser contents when (1) the application has just been launched and (2) after pressing the <Enter> key:

1.

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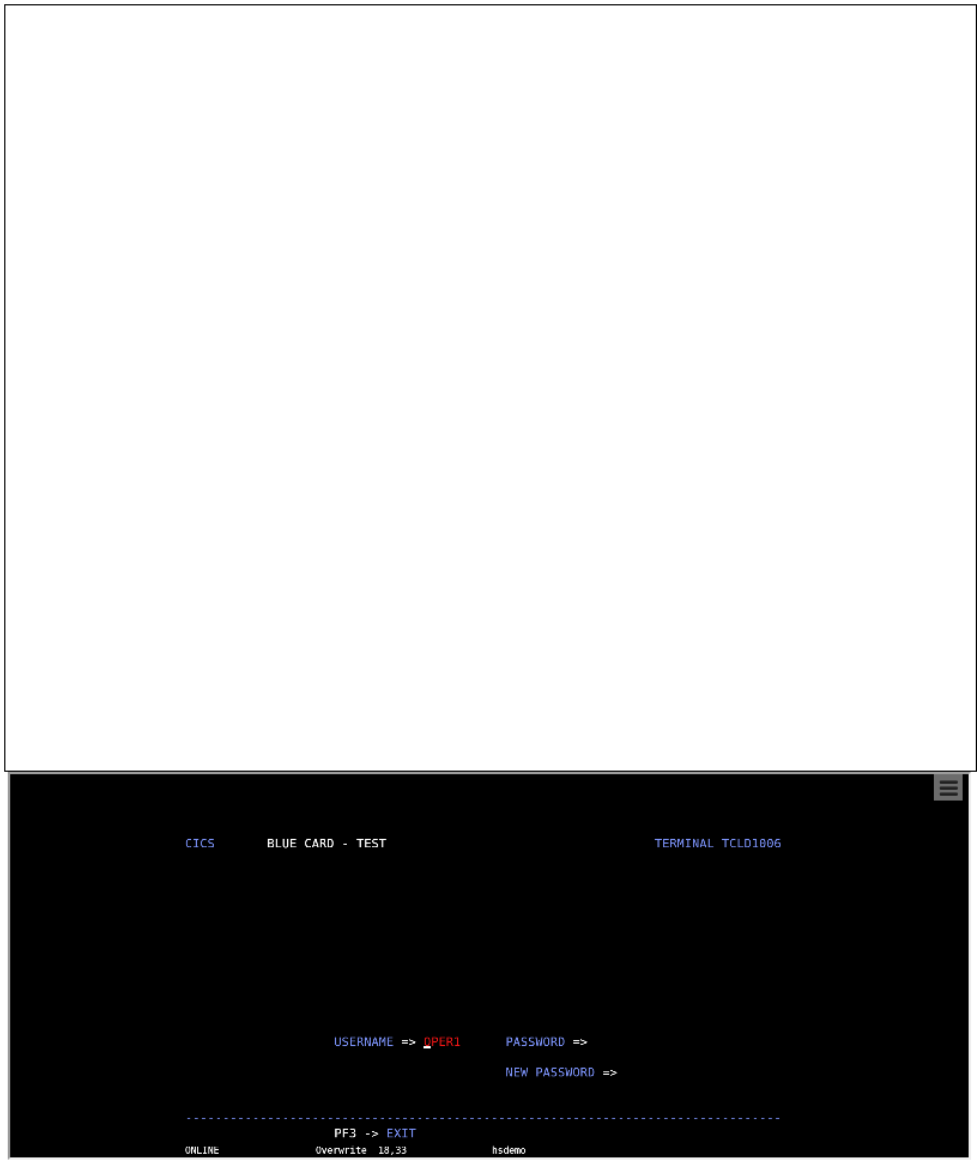

2.

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In order to complete the page design, we will add the user log-in entry fields and their labels, as well as a 'Sign In' and 'Exit' buttons. Both input fields and labels are bound to the HostSurfer fields collection, through AngularJS data binding (that is, the synchronization between the model and the view).

```
<html>
<head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-
scale=1, user-scalable=no">
    <title>Example Application</title>
    <link rel="stylesheet" href="css/styles.css">
</head>
<body>
    <div class="fullbox">
```

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```
    <div class="header">
        <div class="title">{{hs.R1C2}}</div>
    </div>
    <div class="main">
        <div class="floatbox">
            <table class="verticalTable">
                <tr>
                    <th>{{hs.R19C55}}</th>
                    <td><input type="text" size="13" maxlength="6" ng-
model="hs.username" onkeypress="checkkey()"/></td>
                </tr>
                <tr>
                    <th>{{hs.R20C55}}</th>
                    <td><input type="password" size="13" ng-model="hs.password"
maxlength="6" onkeypress="checkkey()"/></td>
                </tr>
                <tr>
                    <th>{{hs.R21C51}}</th>
                    <td><input type="password" size="13" ng-model="hs.newPassword"
maxlength="6" onkeypress="checkkey()"/></td>
                </tr>
                <tr><td colspan="2"> </td></tr>
                <tr>
                    <td colspan="2" style="text-align:center"><span class="button"
id="login_btn" tabindex=0 onclick="hs.navigate('main')">Sign in</span> <span
class="button" id="exit_btn" tabindex=0 onclick="hs.navigate('exit')">Exit</span></td>
                </tr>

            </table>
        </div>
    </div>
    </div>
</body>
</html>
```

Please note that the 'onclick' event of the 'Sign In' button invokes the 'main' action through the "hs.navigate('main')" property value. Likewise, if the user presses the 'Exit' button, 'exit' action will be called by means of "hs.navigate('exit')" .

The following image depicts how the page will look like after the additions:

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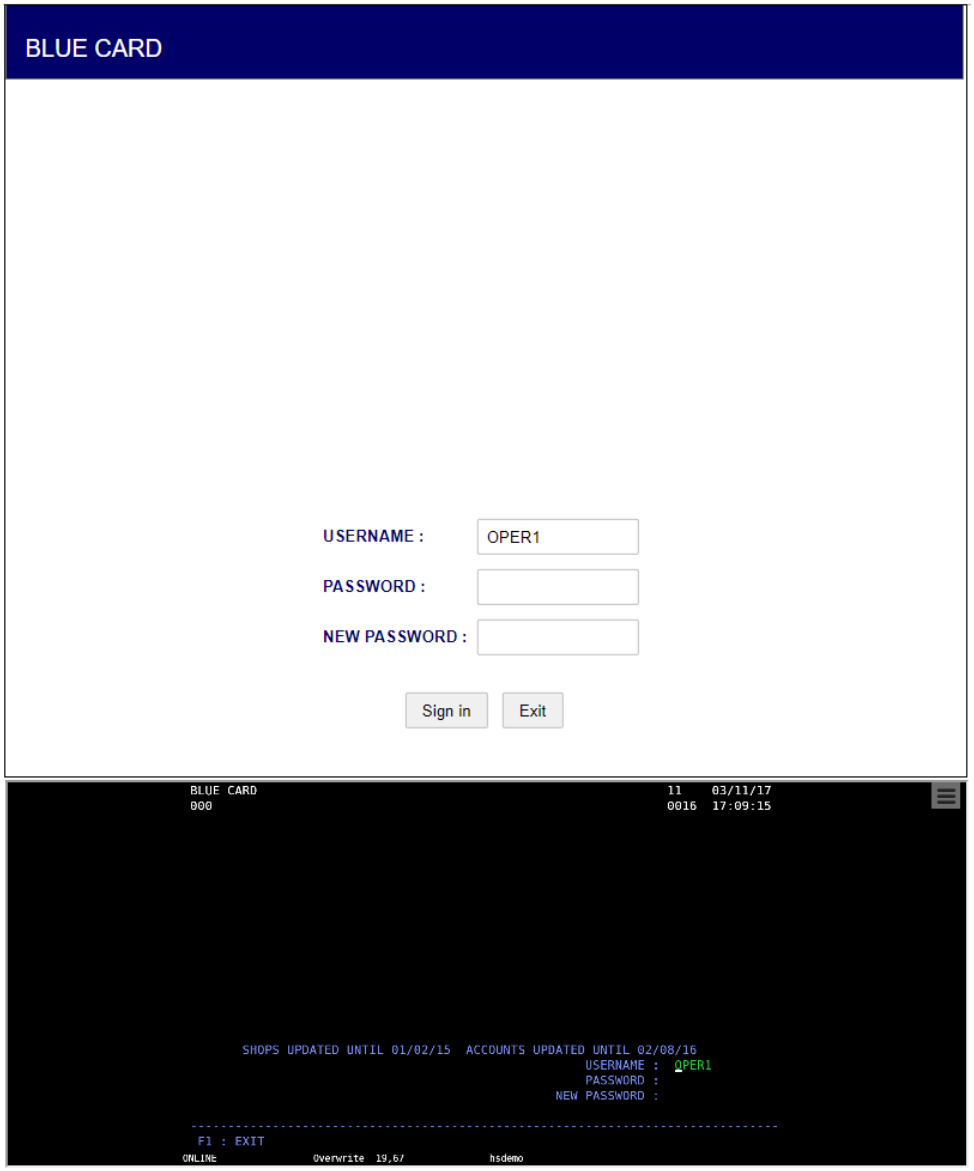

8.2.2.2.2.4 Extending the Example Application

Having completed the minimal set of required conditions to get a running example, this is how the application will look like:

1. When the application is started, there is no matching screen yet, therefore only the terminal emulator iFrame is shown. This behavior is just for demonstration purposes and can be changed so that there is a matching rule for the first screen, as described in the last paragraph.

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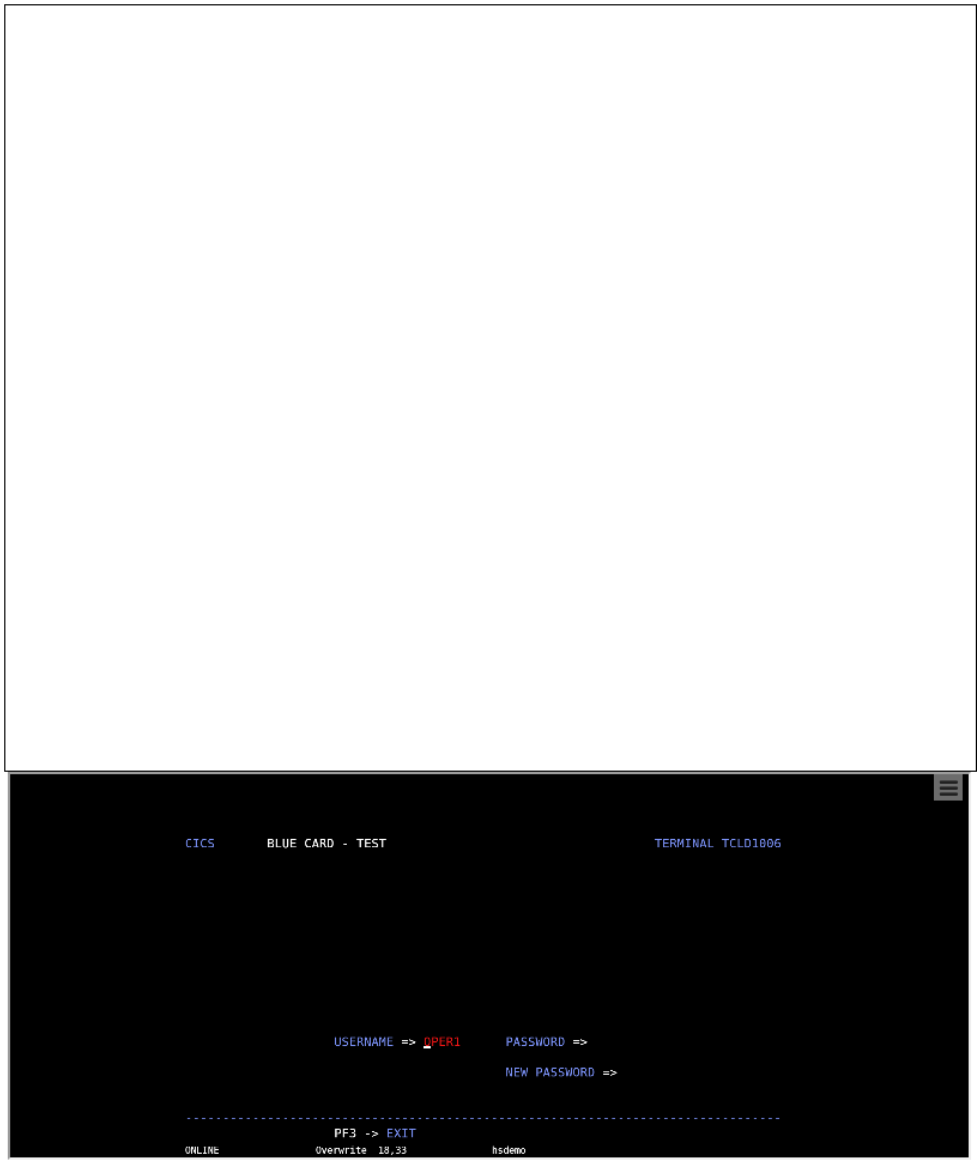

2. After pressing the <Enter> key on the current field of the terminal emulator, the next terminal screen matches the rule criterion and the 'signin' page is displayed.

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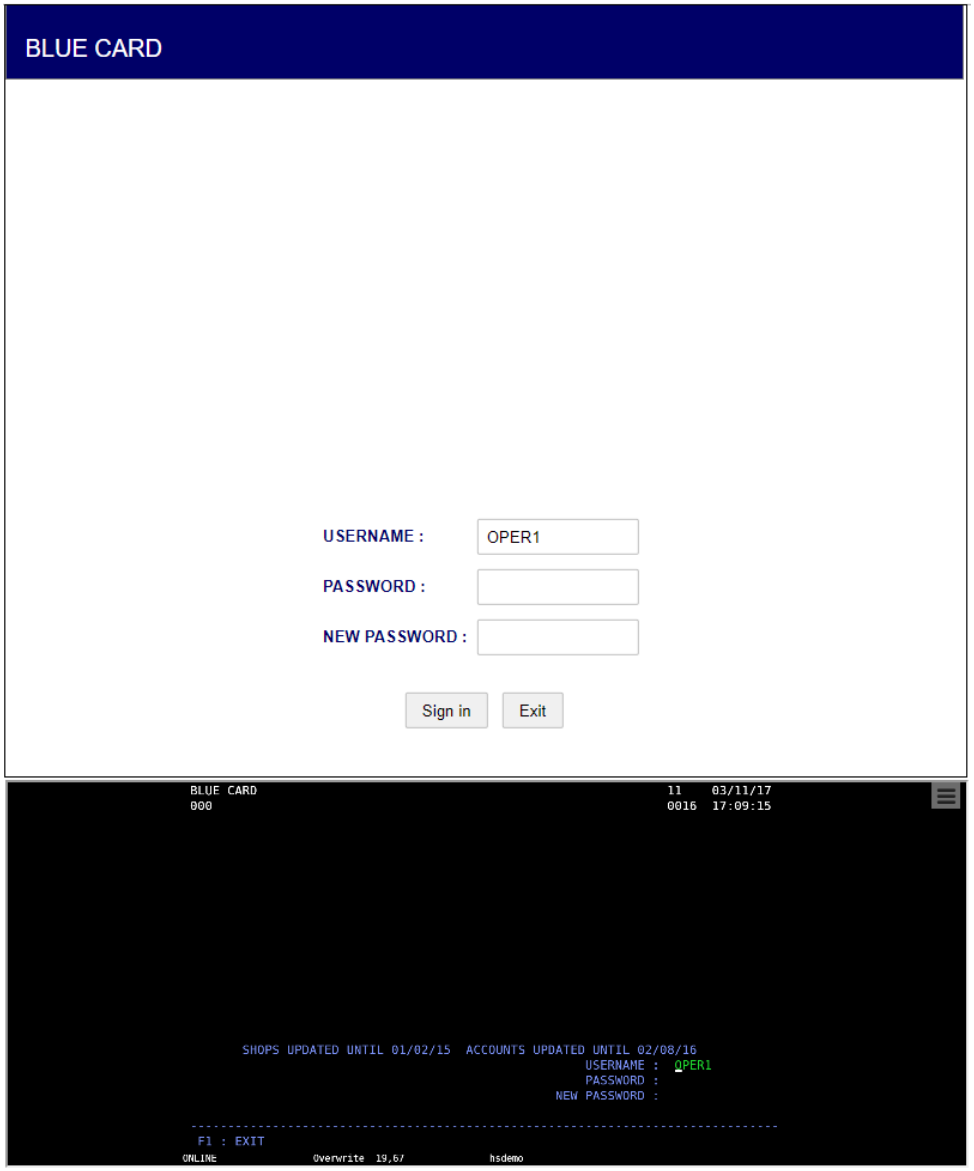

When pressing the 'Exit' button, the action 'Exit' is invoked. As this action sends a PF1 keystroke to the screen, the terminal emulator returns to the previous screen. Given that this screen does not match the only HostSurfer rule defined, the application navigates to the default page (please refer to defaultPage property).

On the other hand, when pressing the 'Sign In' button, the action 'main' is called, which sends an <Enter> keystroke to the terminal emulation, that changes from the current screen to the next, depicted in the following image:

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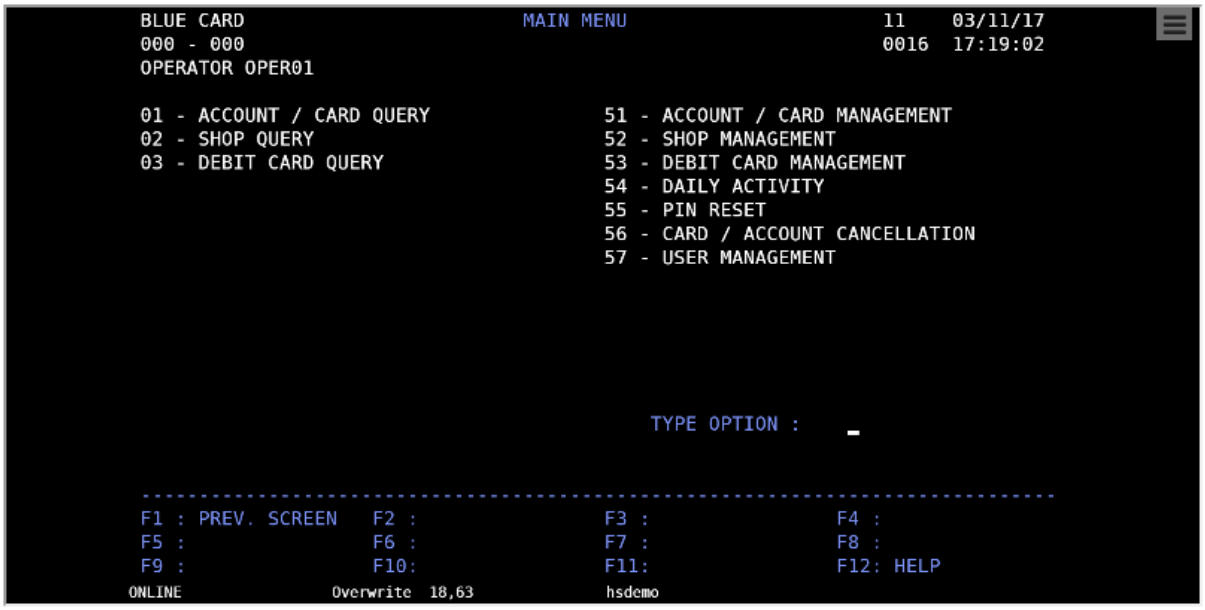

As there is not a matching HostSurfer rule for this screen (when it is shown), our web application is redirected to the page that was set for defaultPage.
However, our example application will be intended to access only the "ACCOUNT / CARD QUERY",in fact, there is no need for an explicit user input. The intended navigation flow of our example application will be useful to demonstrate a special case where there is no web page associated to an emulator screen (because no user interaction is required), and the application behaves like a Macro, by:
- Automatically sending a "01" input and an <Enter> keystroke to select the "01 - ACCOUNT / CARD QUERY" menu option.
- Doing this action through a call to 'main' that is 'chained' from the previous web page (where a call to 'main' was executed as a response to the user clicking on the 'Sign In' button). For more details on 'chained actions', please refer to go and navigate member methods of the HostSurfer class.

Then, we need to complete the example application by:

Adding additional HostSurfer Rules, the first one to detect the "MAIN MENU" screen and automatically select and accept the "01" option.
Adding a new Web Application Page, to manage the "ACCOUNT / CARD QUERY" screen information, resulting of selecting the "01" option.

Once the HostSurfer Example Application has been completed according to the steps detailed in the preceding topics, we can navigate to the 'CARDS / ACCOUNTS INQUIRY' screen, displaying the web page added for such purpose, as represented in the following screen capture:

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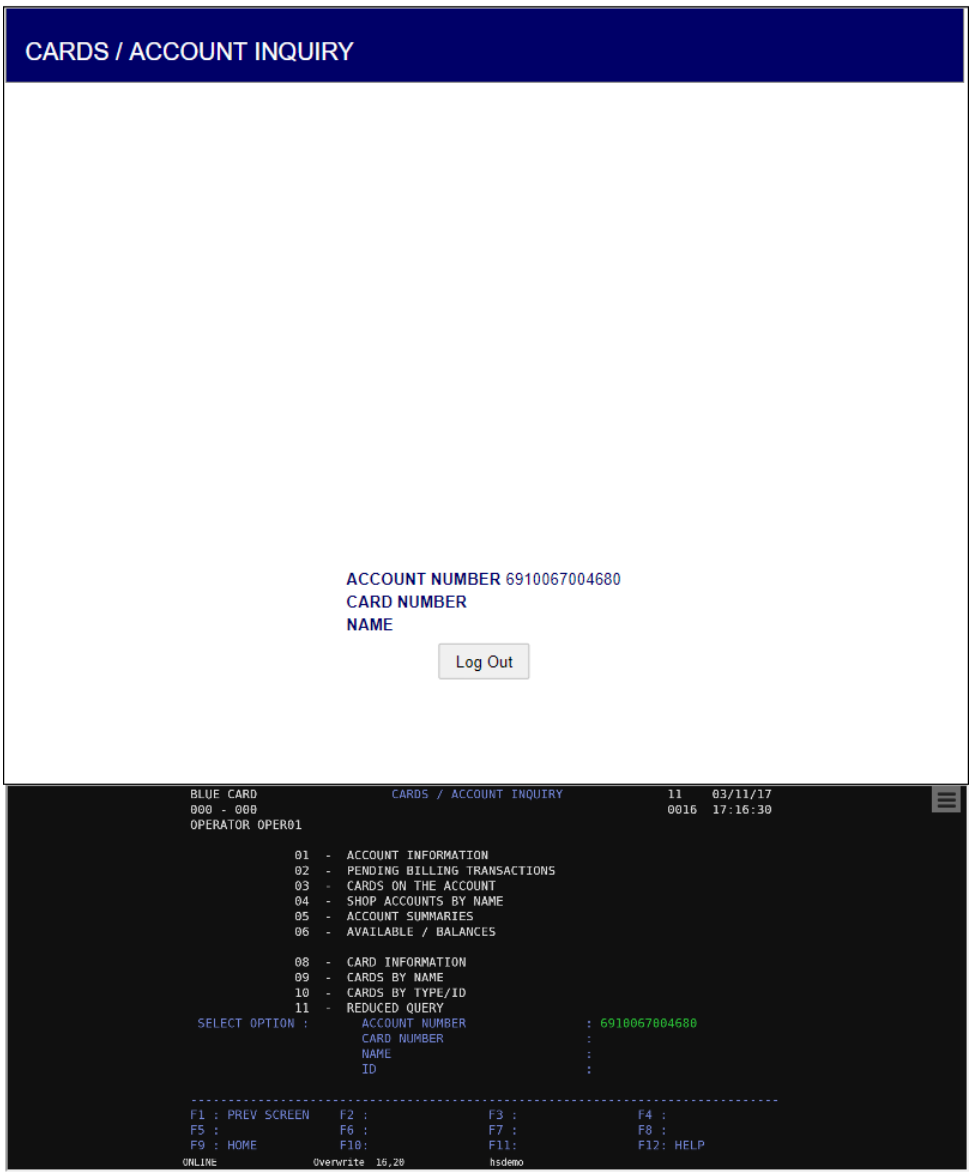

Let's take an overview of the navigation flow through the following diagram:

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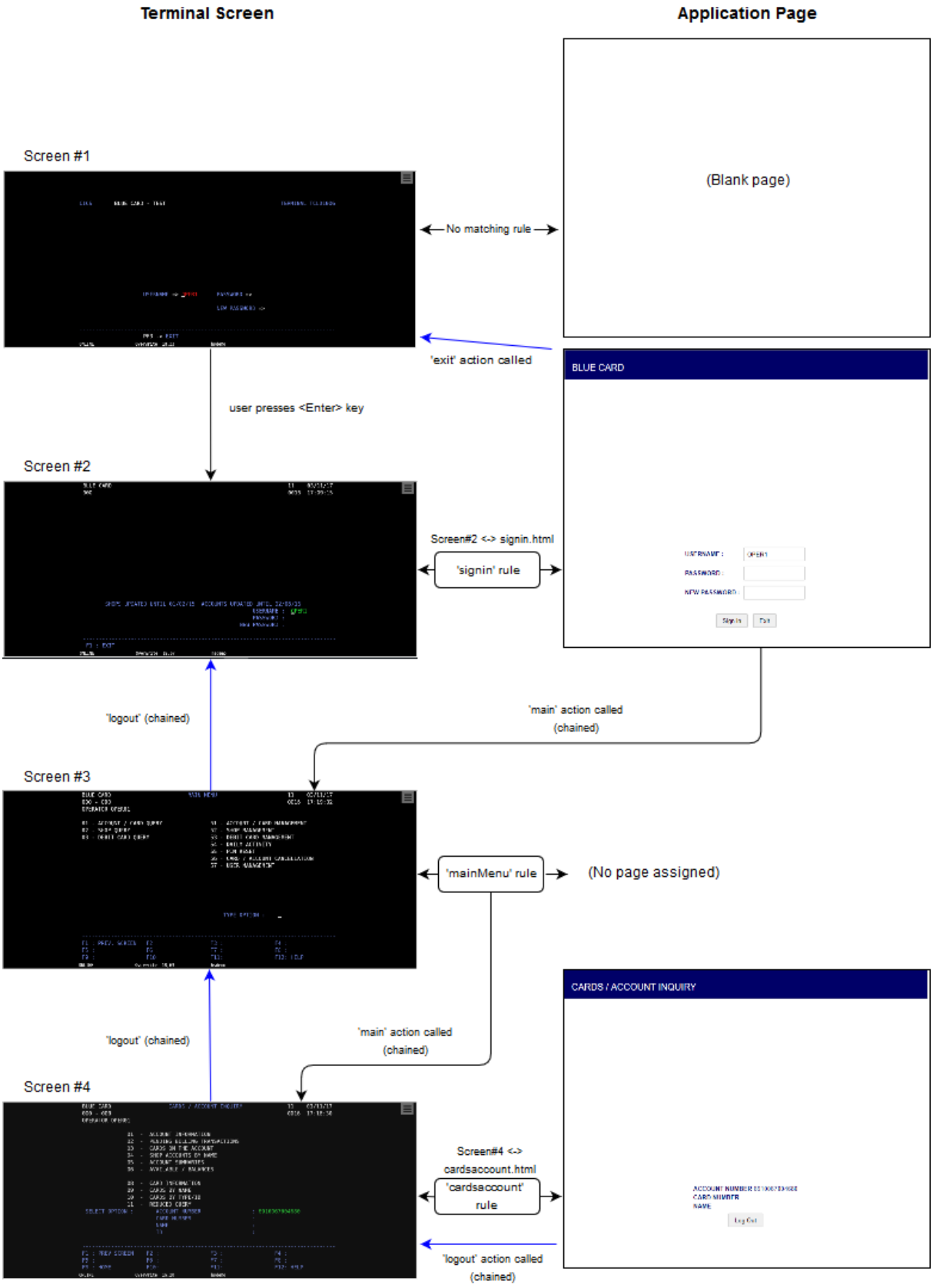

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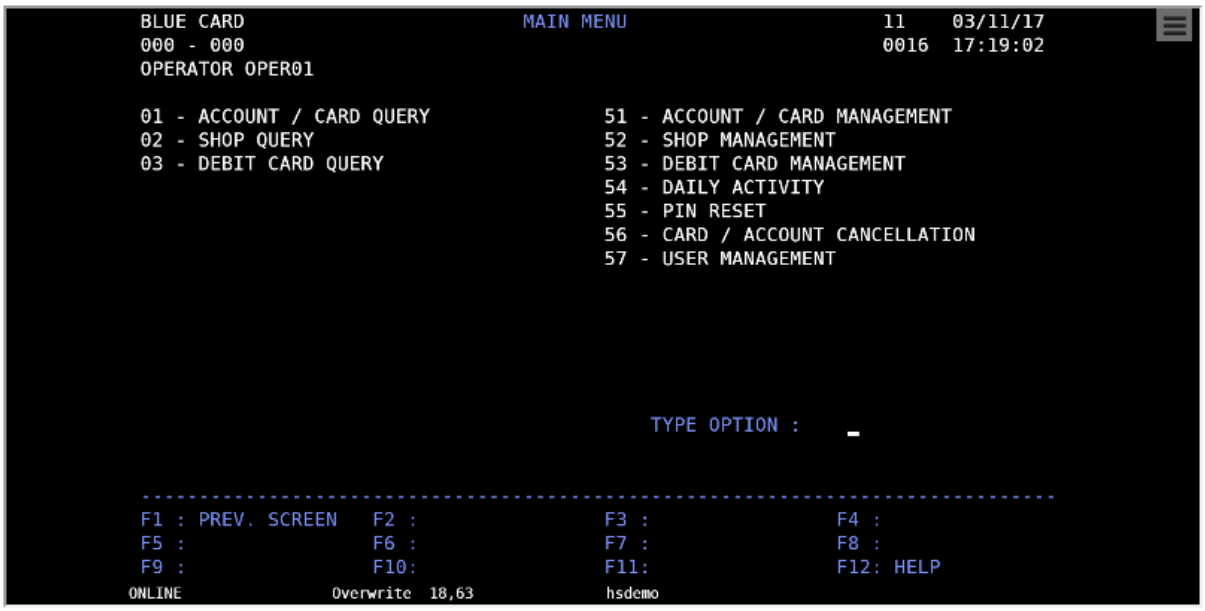
In this topic we will define two rules, the first one to detect the screen below, and a second to detect and process the "ACCOUNT / CARD QUERY".



Please note that the first step is to decide the text or pattern to compare with. This will be set in the 'match' property of the new HostSurfer rule for this screen. In this case we will use the text 'MAIN MENU' that uniquely identifies this screen ('BLUE CARD', for example, is not a suitable identifying pattern because previous screen has the same literal text in the same position of the screen).
Therefore, one possible proper 'match' property is:

```
match : [{ 'text': 'MAIN MENU', 'row': 1, 'col': 35 }],
```

Next, we will proceed to define the 'apply' property of the new rule.

There is only one field required in the 'fields' property. This is the menu "option" entry field and its label is "TYPE OPTION" (as mentioned previously, all screen fields are retrieved and made available by HostSurfer automatically with a default name, but in this example application we want to use an explicitly name field).

As a result, our 'fields' property will look as follows:

```
fields : [
    { name : 'option', row : 18, col : 63, len : 2 }
]
```

Finally, we need to define the 'actions' property of 'apply'. Just two actions are needed: 'main' and 'logout'. Both of these actions serve to the purpose of "bypassing" this screen. The 'main' action will be called implicitly as a result of a 'chained' navigation from the 'signin' web page. The other one, 'logout', will also be called implicitly by a chained navigation from the next web page (the one we will define on the next topic).

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The 'actions' property will be declared as follows:

```
actions : {
    main : function (hs) {
        hs.data.option = "01";
        hs.send.enter();
    },
    logout : function (hs) {
         hs.send.pf1();
    }
}
```

Please note that the 'main' action function value will:

1. Assign a "01" value to the 'option' field (as if the user typed "01")
2. Send an <Enter> keystroke, as if the user accepted the typed option.

In a similar way, the 'logout' action will send a "PF1" keystroke, as if the user had pressed the PF1 key. If you look at the screen capture at the beginning of this topic, the F1 key is assigned as the command to return to the previous screen.

The following code snippet shows the entire HostSurfer rule, as it was defined:

```
(function () {
    var _mainmenu = {
        id: 'mainMenu',
        match : [{ 'text': 'MAIN MENU', 'row': 1, 'col': 35 }],
        apply : {
            fields : [
                { name : 'option', row : 18, col : 63, len : 2 }
            ],
            actions : {
                main : function (hs) {
                    hs.data.option = "01";
                    hs.send.enter();
                },
                logout : function (hs) {
                    hs.send.pf1();
                }
            }
        }
    };
    zScope.hostSurfer.register(_mainmenu);
})();
```

Now, we need to define a new HostSurfer rule, this time to show a web page that will correspond to the terminal screen that is shown below and results from accepting the "01" option in the "MAIN MENU" screen.

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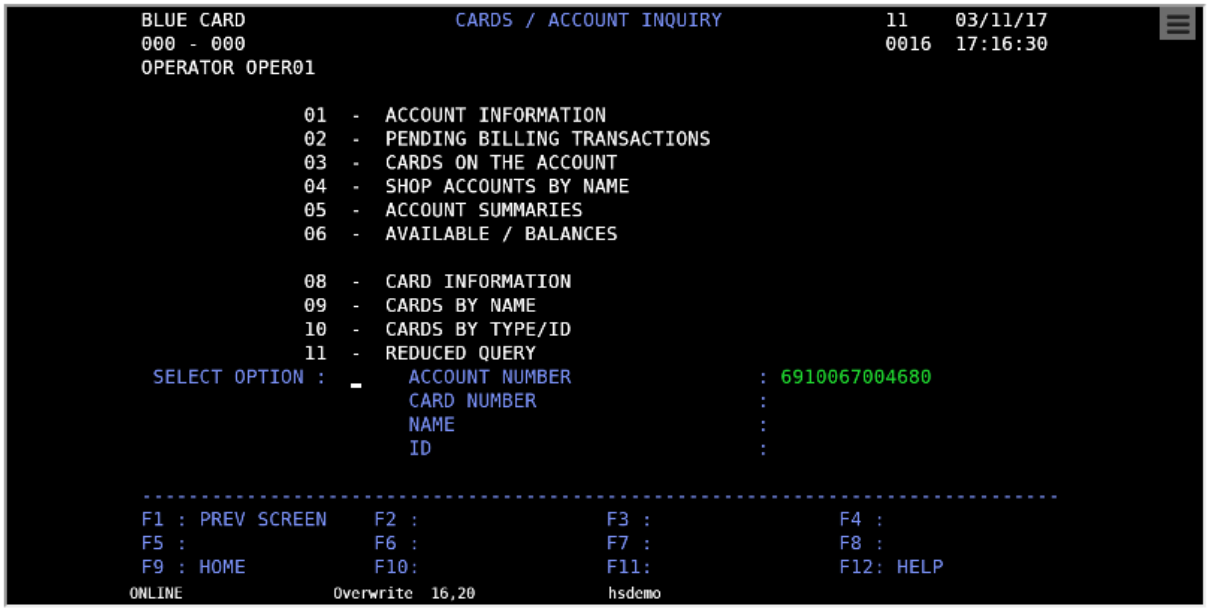

The 'match' condition will be based on screen title "CARDS / ACCOUNT INQUIRY", therefore we will express the match condition as follows:

```
match: [{ text: 'CARDS / ACCOUNT INQUIRY', row: 1, col: 29 }],
```

We will also define a set of named fields, as follows:

```
{ name: 'option', row : 16, col : 20, len : 2 },
{ name: 'accountNumber', row : 16, col : 57, len : 22 },
{ name: 'cardNumber', row : 17, col : 57, len : 22 },
{ name: 'name', row : 18, col : 57, len : 22 },
{ name: 'idNumber', row : 19, col : 72, len : 8 }]
```

Finally, we will define just one 'actions' property, 'logout', as shown in the following code snippet:

```
actions: {
    logout: function (hs) {
        hs.send.pf9();
    }
}
```

The page declaration will be:

```
page: '#!cardsaccount',
```

The whole HostSurfer rule is declared as follows:

```
(function () {
    var _cardsaccount = {
        id: 'cardsAccount',
        match: [{ text: '   CARDS / ACCOUNT INQUIRY', row: 1, col: 26 }],
        apply: {
            fields: [
```

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```
                { name: 'option', row: 16, col: 20, len: 2 },
                { name: 'accountNumber', row: 16, col: 57, len: 22 },
                { name: 'cardNumber', row: 17, col: 57, len: 22 },
                { name: 'name', row: 18, col: 57, len: 22 },
                { name: 'idNumber', row: 19, col: 72, len: 8 }],
            page: '#!cardsaccount',
            actions: {
                logout: function (hs) {
                    hs.send.pf9();
                }
            }
        }
    };
    zScope.hostSurfer.register(_cardsaccount);
})();
```

Once the rules are defined, the file hsangular.js must be modified, so that:

1. The HostSurfer instance can load the rules files in run time.
2. The AngularJS route provider is aware of the page for each route.

The following listing shows the contents of hsangular.js, for the existing set of rules:

```
var hs = zScope.hostSurfer;
hs.init("rules/", ["signin","mainmenu","cardsaccount"]);

var app = angular.module('hs', ['ngRoute']);
app.controller('hscontroller', function ($scope) {
    $scope.hs = hs.data;
    hs.on('fldupdate', function () {
        $scope.$apply(function () {
            $scope.hs = hs.data;
        });
    });
});

hs.on('ready', function () {
    hs.defaultPage = "#!";
    angular.bootstrap(document, ['hs']);
});

app.config(function ($routeProvider) {
    $routeProvider
        .when("/signin", { templateUrl: 'signin.html', controller: 'hscontroller' })
        .when("/cardsaccount", { templateUrl: 'cardsaccount.html', controller:
'hscontroller' })
   .otherwise({ redirectTo: '/' });
})
```

A detail that deserves attention is that, while all rules are registered to the instance of HostSurfer, it is not so when configuring $routeProvider routes (as there is not a template page associated with 'mainmenu').

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Please note that the web page that corresponds to this screen is not intended to expose any useful functionality, but just to demonstrate how HostSurfer manages page navigation.
The cardsaccount.html web page will be defined in the next topic, Adding a new Web Application Page .

This topic is aimed at defining the cardsaccount.html page, which was set to the 'CardsAccount' rule in the previous Adding additional HostSurfer Rules topic.
Please note that this web page is not intended to expose any useful functionality or information extracted from the underlying terminal emulator screen, but just to demonstrate how HostSurfer manages page navigation.

The HTML corresponding to the new web page is shown below:

```
<html>
<head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-
scale=1, user-scalable=no">
    <title>Example Application</title>
    <link rel="stylesheet" href="css/styles.css">
</head>
<body>
    <div class="fullbox">
    <div class="header">
        <div class="title">{{hs.R1C26}}</div>
    </div>
    <div class="main">
        <div class="floatbox">
            <table class="verticalTable">
                <tr>
                    <th>{{hs.R16C25}}</th>
                    <td>{{hs.accountNumber}}</td>
                </tr>
                <tr>
                    <th>{{hs.R17C25}}</th>
                    <td>{{hs.cardNumber}}</td>
                </tr>
                <tr>
                    <th>{{hs.R18C25}}</th>
                    <td>{{hs.cardNumber}}</td>
                </tr>
                <tr>
                    <td colspan="2" style="text-align:center"><span class="button"
id="exit_btn" tabindex=0 onclick="hs.navigate('logout')">Log Out</span></td>
                </tr>

            </table>
        </div>
    </div>
    </div>
</body>
</html>
```

After adding it to the web application, when the 'cardsaccount' rule matches the following

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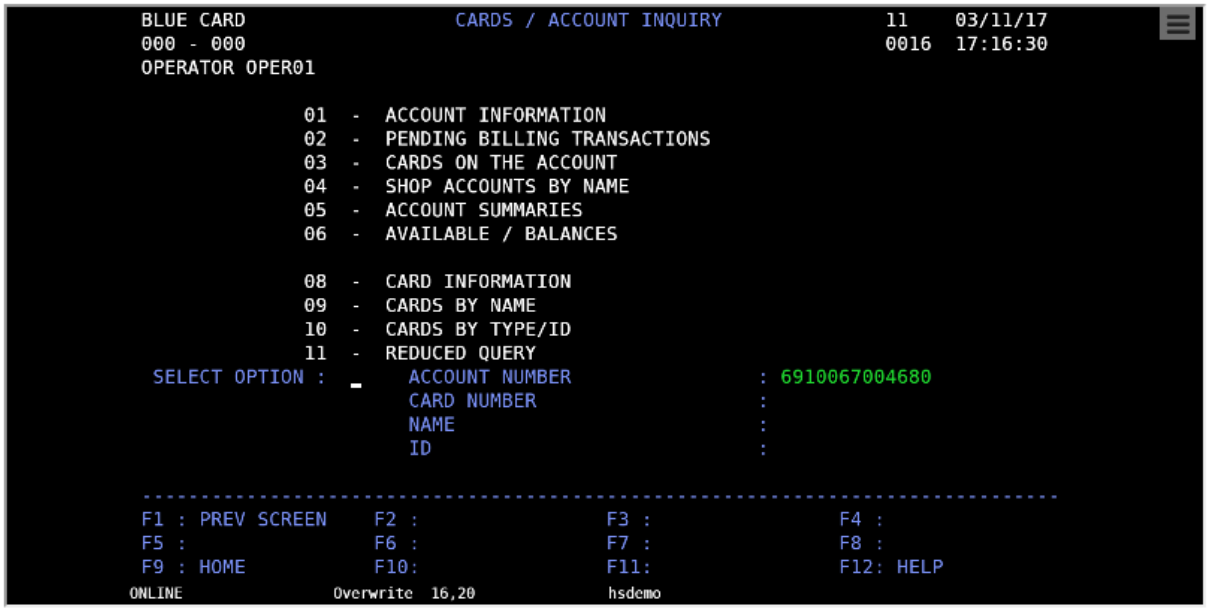
screen:



the web page 'cardsaccount.html' set in the rule will be rendered and the browser client will look as follows:

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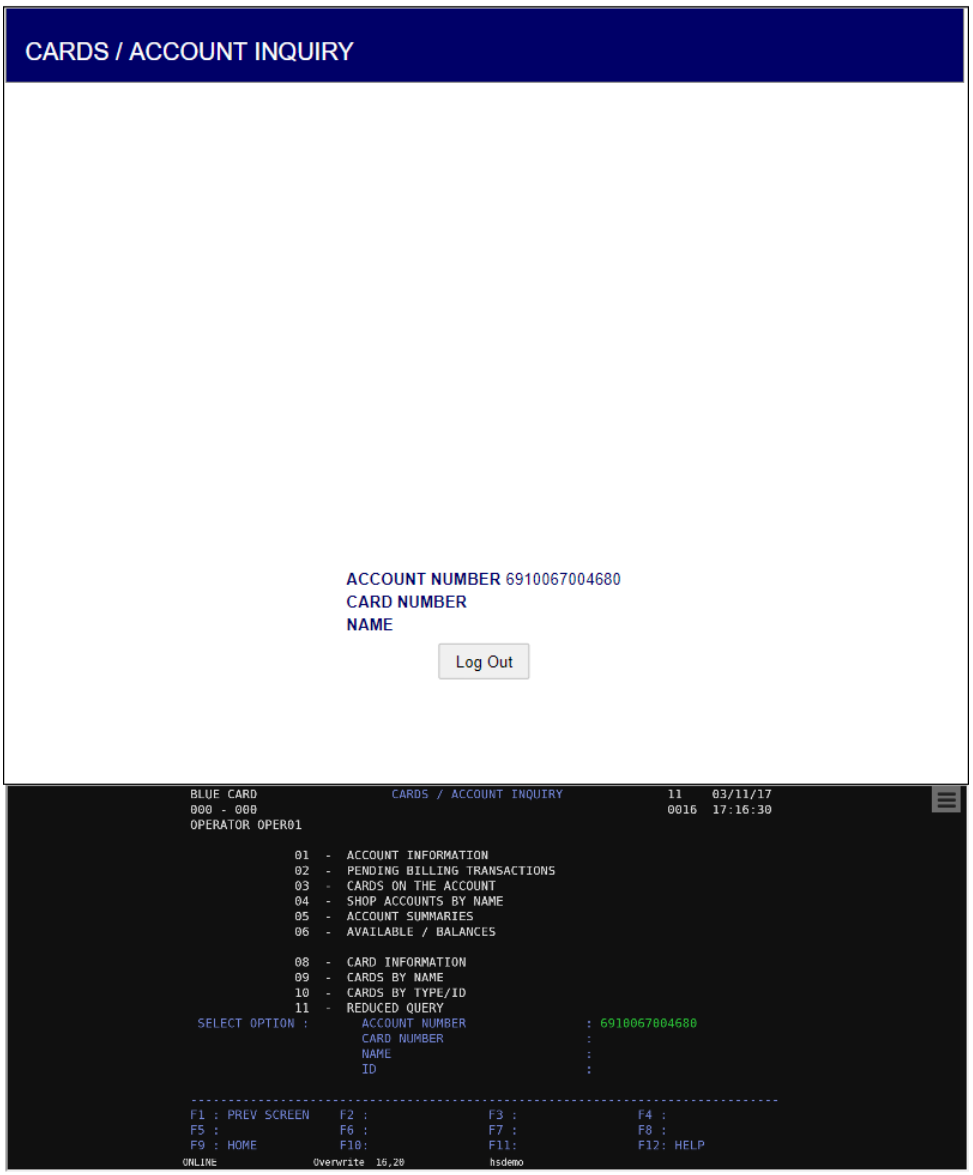

When this page is displayed in the browser, pressing the 'Log Out' button causes the 'logout' action to be called in 'chained' mode. As this action simply sends a 'PF1' keystroke to the terminal screen, it will make the terminal based application to return to the 'MAIN MENU' screen. However, as the call to the 'logout' is chained, it will be invoked again in this screen, causing the terminal application to return to the user log in screen.
Please refer to the parent topic Extending the Example Application for an overview of the application navigation flow.

9 Appendix A - Character Conversion Tables

Z/Scope is shipped with a large list of EBCDIC to ASCII internal conversion tables. It also allows you to use user-generated external conversion tables.

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For more information on how to create and apply your own character conversion tables, see the following sections:

- Internal Conversion Tables
- Using an external Character Table

Read More:
- Selecting a different Character Table

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9.1 Internal Conversion Tables

The following table lists the internal ASCII/EBCDIC conversion tables included in z/Scope:

Country	Code Page
Albania	CP500
Arabic Countries	CP420
Australia	CP037
Austria Euro	CP273
Austria	CP1141
Belarus Euro	CP1154
Belarus	CP1025
Belarus/EEUU	CP037
Belgium Euro	CP1148
Belgium	CP500
Belgium	CP037
Bosnia/Herzegovina	CP870
Brazil Euro	CP1140
Brazil	CP037
Bulgaria Euro	CP1154
Bulgaria	CP1125
Canada Euro	CP1140
Canada	CP037
Canada	CP1047
Croatia Euro	CP1153
Croatia	CP870
Czech Euro	CP1153
Czech	CP870
Denmark Euro	CP1142
Denmark	CP227
Estonia Euro	CP1157
Estonia	CP1122
Estonia	CP037
Finland Euro	CP1143
Finland	CP278
France Euro	CP1143
France	CP297
Germany Euro	CP1141
Germany	CP273
Greece Euro	CP874
Greece	CP423
Greece	CP875
Hebrew	CP424
Hungary euro	CP1153
Hungary	CP870

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International	CP850
Iceland Euro	CP1149
Iceland	CP871
Italy Euro	CP1144
Italy	CP280
Latin America Euro	CP1145
Latin America	CP284
Latvia Euro	CP1156
Latvia	CP1112
Latvia	CP037
Lithuania Euro	CP1156
Lithuania	CP1112
Lithuania	CP037
Macedonia Euro	CP1154
Macedonia	CP1025
Multinational Euro	CP1148
Multinational ISO Euro	CP924
Multinational	CP500
Netherlands Euro	CP1140
Netherlands	CP037
Norway Euro	CP1142
Norway	CP277
Poland Euro	CP1153
Poland	CP870
Portugal Euro	CP1140
Portugal	CP037
Romania Euro	CP1153
Romania	CP870
Russian Euro	CP1154
Russian	CP1025
Serbia Cyrillic Euro	CP1154
Serbia Latin Euro	CP1153
Serbia/Montenegro	CP1025
Slovenia Euro	CP1153
Slovenia	CP870
Slovakia Euro	CP1153
Slovakia	CP870
Spain Euro	CP1145
Spain	CP284
Sweden Euro	CP1143
Sweden	CP287
Switzerland Euro	CP1148
Switzerland	CP500
Turkey Euro	CP1155
Turkey	CP1026
Ukaine Euro	CP1158
Ukaine	CP1123

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Ukaine/EEUU	CP037
United Kingdom Euro	CP1146
United Kingdom	CP285
United States	CP037
United States	CP037/2
United States	CP1047
United States Euro	CP1140
Vietnamese Euro	CP1164
Vietnamese	CP1130
Vietnamese/US	CP037

Read More:

- Using an external Character Table

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9.2 Using an External Character Table

After saving your own character table to a file, you can load it from within any connection. To do this, follow these steps:

1. Go to the 'Settings' dialog and click on the 'Connections' icon.

2. Select the 'Char Table' tab.
3. Select the 'Use external file' option and type the full path of the (.ebc) file to use.

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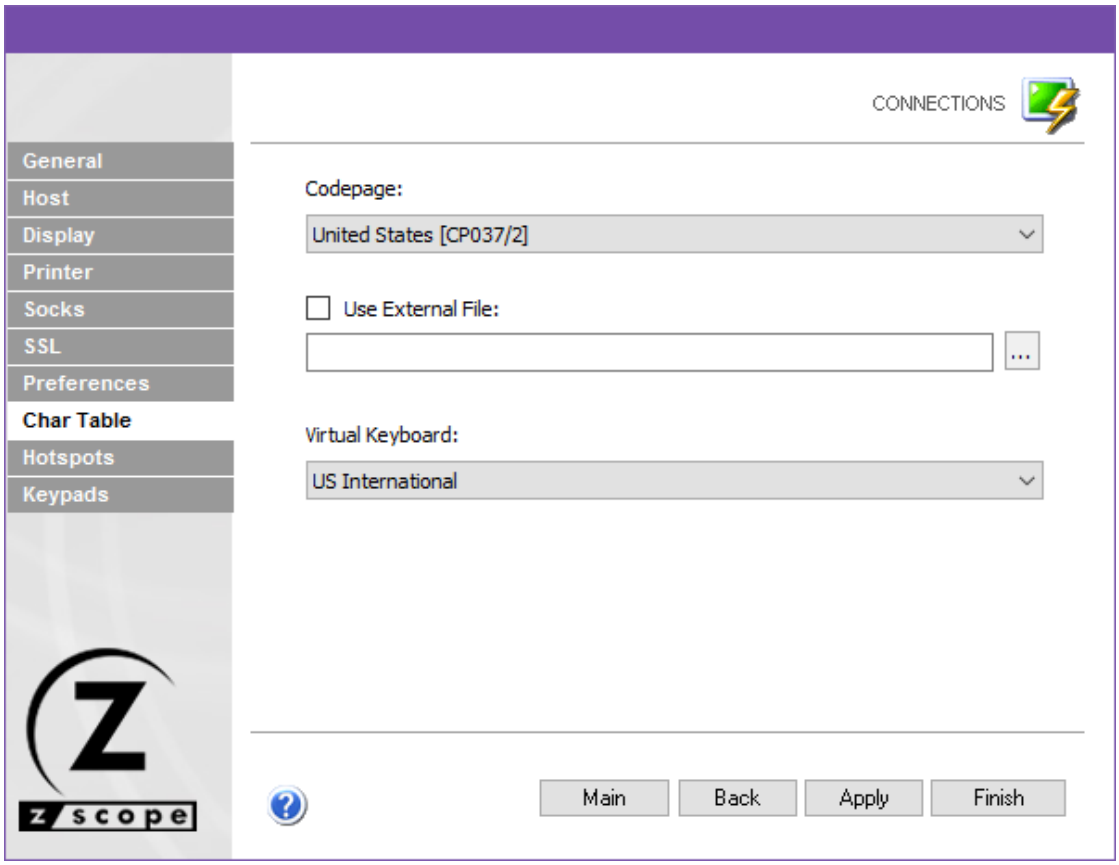

4. Click on 'Finish'.

The next time you connect, the specified external conversion table will be loaded for the selected connection.

Read More:

- Internal Conversion Tables

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10 Appendix B - Regular Expressions

Regular Expressions can be considered a programming language that was specifically designed for string processing. Its main purpose is to locate patterns of substrings within a larger string, according to relative position, context, case and many other attributes.

To achieve this, the Regular Expressions language recognizes a set of special characters that can be compared in functionality to the wildcard characters * and ? in the DOS environment. The language employs many of these special characters to provide endless possibilities when searching for a certain pattern within a string. There's also a system for grouping parts of substrings and intermediate results during a search operation.

z/Scope takes advantage of the power and simplicity of the Regular Expressions language for defining HotSpots, one of z/Scopes' key features. The creation of a HotSpot requires the user to specify the criteria that a text string in the emulation display must fulfill in order to be recognized and respond to mouse clicks. See Creating/ Editing a HotSpot.

Most letters and characters will simply match themselves. For example, the regular expression "engine" will match the string "engine" exactly. However, there are some special characters (usually called metacharacters) that do not match themselves. Instead, they are used to define rules and patterns that will be looked for when analyzing the strings.

Here's a comprehensive list of all available metacharacters:

Character	Description	Example
^	Matches the position at the beginning of the string.	**^B** matches "B" but only if it is the first character in the string.
$	Matches the position at the end of the string.	**$p** matches "p" but only if it is the last character in the string.
.	Matches any single character.	**le.** matches "leg" and "let".
+	Matches the preceding character 1 or more times.	**ca+t** matches "cat" and "caat" but not "ct".
*	Matches the preceding character 0 or more times.	**ca*t** matches "ct", "cat", "caat" and so on.
?	Matches the preceding character 0 or 1 times.	**si?t** matches "st" and "sit" only.
[xyz]	Matches any one of the enclosed characters (character set).	**[gdp]ot** matches the "got", "dot" and "pot".
[^xyz]	Matches any character not enclosed (complementary set).	**[^aeiou]** matches any character that is not a vocal.
[x|y]	Matches either x or y.	**wom[a|e]n** matches either "woman" or "women".
[a-z]	Matches any character in the specified range (character range).	**[a-z]** matches any lowercase letter of the alphabet.

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[^a-z]	Matches any character not in the specified range (complementary range).	**[^a-z]** matches any character that is not in the alphabet.
\b	Matches a word boundary (the position between a word and a space).	**al\b** matches the "al" in "general" but not the "al" in "fall".
\B	Matches a nonword boundary.	**al\B** matches the "al" in "fall" but not the "al" in "general".
\s	Matches any white space character including space, tab, form-feed, and so on.	
\S	Matches any non-white space character.	
\d	Matches a digit character. Equivalent to [0-9].	
\D	Matches any non-digit character. Equivalent to [^0-9].	
\w	Matches any word character including underscore. Equivalent to [A-Za-z0-9_].	
\W	Matches any non-word character. Equivalent to [^A-Za-z0-9_].	
{n}	Matches a character exactly *n* times.	**p{2}** does not match the "p" in "peach" but matches the two p's in "apple".
{n,}	Matches a character at least *n* times.	**p{2,}** does not match the "p" in "peach" and matches all the p's in "apppp".
{n,m}	Matches a character at least *n* and at most *m* times.	**p{1,3}** matches the first three p's in "appppp".

If you need to search for one of the characters that are reserved as metacharacters, you can do so by placing a backslash (\) before the desired character. In this way, for example, \? will actually match "?" instead of matching the position at the end of the string.

Read More:

- Creating/Editing a HotSpot

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11 Appendix C - Tailoring the interface

11.1 Customizing the Web Interface

zScope Anywhere allows you to modify the web interface and tailor it to your branding scheme.

Customizing the application logo and other image files can be very simple, once it only requires you to have the new image file and tell the application where it is located.

Customizing the structure and style of the application may be a little bit more complex. These kind of customizations have to be done at a programming level (HTML and CSS).

Read also how to protect the customized web files in the Files Location topic.

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11.1.1 Changing the Logo

Modifying the application logo can be as simple as copying the new logo image and telling zScope Anywhere application where it is located:

1. Create a folder called "BrandingFiles", if it doesn't exist yet, under the folder web located inside the zScope Anywhere installation directory.
   (e.g.: C:/Program Files/zScope Anywhere/web)

2. Copy your own logo image file to the "BrandingFiles" folder.

3. Create the WebAliases.ini file and configure it:

   a. Create a file called "WebAliases.ini" in the installation directory (e.g.: C:/Program Files/zScope Anywhere/bin32/WebAliases.ini). If the file already exists, only append the lines to it.

   b. Configure the redirection of the logo files you want to substitute, following the two examples below (zawlogo_b.png and favicon.ico):

```
[Alias]

;=================
;Main logo
;=================
/images/zawlogo_b.png=BrandingFiles\MyLogo.png

;=================
;Favicon
;=================
/favicon.ico=BrandingFiles\MyFavicon.ico
```

   c. Save it.

4. Open the application to see the changes.

Bear in Mind:

a. Any line in the "WebAliases.ini" file starting with a semicolon will not be considered by the application. It can be used to leave comments in the file.

b. You can substitute any interface image or file, by following the same steps described above.

c. Sometimes the favicon is not shown right the way, because the browser keeps history of the images. In that case, you should clean the browser cache before trying out the changes.

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11.1.2 Customizing the Web Files

To customize the web files, you should:

1. Create a folder called "BrandingFiles", if it doesn't exist yet, under the folder web located inside the zScope Anywhere installation directory. (e.g.: C:/Program Files/zScope Anywhere/web)

2. Make copies of the original web files that you want to modify to the "BrandingFiles" folder. Copy only the files to be modified without their associated folder structure.

3. Customize the files (html, css, etc) as you prefer.

4. Create the WebAliases.ini file and configure it:

   a. Create a file called "WebAliases.ini" in the installation directory (e.g.: C:/Program Files/zScope Anywhere/bin32/WebAliases.ini). If the file already exists, only append the lines to it.

   b. Configure the redirection to the files you have modified, by adding a line similar to the examples below for each modified file:

```
[Alias]

/index.html=BrandingFiles\my_index.html
/css/index.css=BrandingFiles\my_index.css
```

   c. Save it.

5. Open the application and check out the changes.

Bear in Mind:

a. Any line in the "WebAliases.ini" file that starts with a semicolon will not be considered by the application. It can be used to leave comments.

b. The paths located in the HTML, CSS, and other contents will be kept relative to the original file location. This means that you won't have to change the content paths when customizing this files.

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11.1.3 Files Location

We recommend that a new folder be created in order to keep the customized files instead of having them with the original files. This will enable you to:

a) Get back to the original interface configuration at any time.
b) Make sure that your files will be safe after a version upgrade.

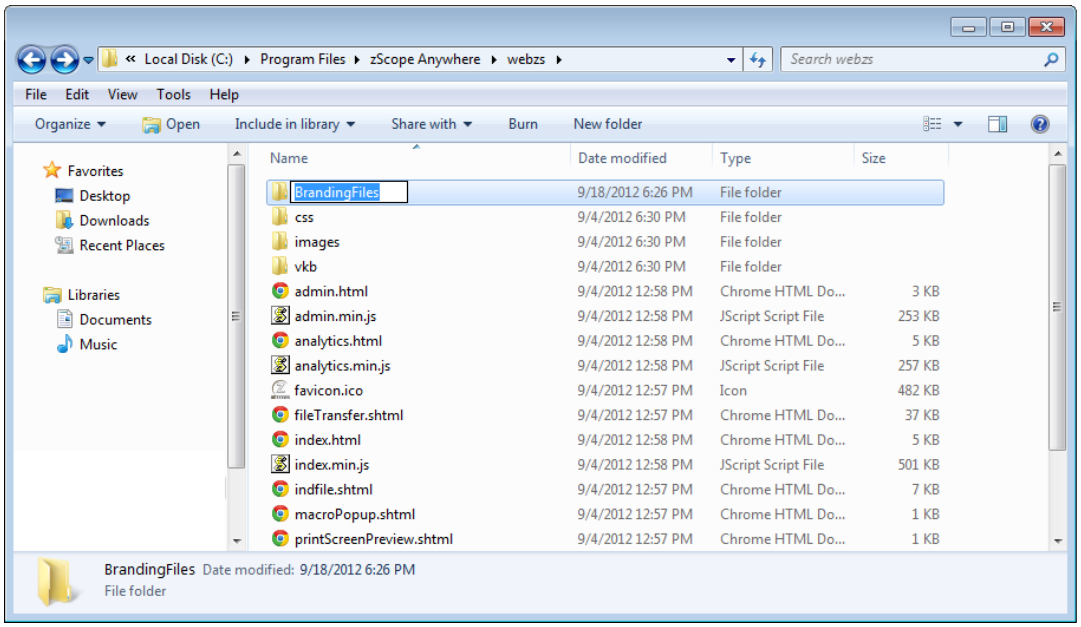
You can also choose to place the files inside or outside the webroot structure. Keep reading to see how each option will behave:

Storing the Customized Files in the Webroot Directory:

In this case:

1) The files will be externally accessible from a URL similar to: https://127.0.0.1/BrandingFiles/customizedFile.html

2) The file paths, indicated in the "WebAliases.ini", can be relative to the webroot directory. (e.g. "/img/zawlogo_b.png=BrandingFiles\MyLogo.png"). You will find other relative path examples on the topics Changing the logo and Customizing the web files.



Storing the Customized Files Outside the Webroot Directory:

In that case:

1) The files will be protected, because it won't be possible to access the customized files from a URL.

2) The file paths, indicated in the "WebAliases.ini", must be absolute, as in the example below:

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```
[Alias]

/index.html=c:/BrandingFiles/my_index.html
/images/zawlogo_b.png=c:/BrandingFiles/MyLogo.png
```

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12 Appendix D - Programming Reference for Macros

When a macro is created through z/Scope Anywhere interface, it will be stored in a JavaScript file that can be placed in two different locations, depending on the installation mode used:

Desktop Mode

On this installation mode, the macro will be stored on:

C:\Users\[UserName]\AppData\Roaming\Cybele Software\zScope7

1. Inside this directory there will be one folder for each existing connection, and their name will follow a format that looks like this: "EB088A84-C46D-4882-90B3-15BD0A6A26D0C"

2. Open these connections folders and look for a file that has the same name as the macro you are looking for

3. If the macro's name were "Navigation" for example, the file name would be "Navigation.js".

Server Mode

When the application is installed as server mode, the macros will be stored on:

C:\ProgramData\Cybele Software\zScope7\[UserName]

1. Inside this directory there will be subdirectories for each existing connection. Their name stands for the connection ID and will have a format that looks like this: "EB088A84-C46D-4882-90B3-15BD0A6A26D0C"

2. Open each one of these connections folders and look for a file that has the same name as the macro you are looking for.

3. If the macro's name were "Navigation" for example, the file name would be "Navigation.js".

If you have the server mode you can make the macros Public by moving their containing connection folder from the user folder to C:\ProgramData\Cybele Software\zScope7\

The macro's execution sequence can be manually modified as long as the person who will do it is familiar with the JavaScript language and understands the macro structure, as well as the methods and properties used to communicate with the emulation screen.

Read More:
- Macro Feature
- Macro Script File Structure

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- Methods and Properties
- Integrating a Login Macro

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12.1 Macro Script File Structure

The Macro script file has a JavaScript function that allows the interaction with the emulation screen.
The script is structured in the three main sections:

1. Obtain the Display Object:

The command getDisplay() will return an object display, the resource that will allow interaction with the emulation screen.

2. Define the Macro Steps:

In this section there should be a function for each step to be executed by the macro. A step generally ends with an AID key command sent to the host.

3. Set the Order for the Steps to be Executed:

At last, it is necessary to set the sequence in which all the steps will be executed. The display.addNavigationPath command should be used to complete this section.

Macro Script Example

```
(function () {

    // Section 1- Obtains the object to interact with the emulation
    var display = getDisplay();


    // Section 2 - Macro execution steps
    step1 = function () {
        display.type("USERX");
        display.setField("R4C47"
                                ,"kljhfhvkjgiuihkljhhmkjfhldskfjdlkfasdldfjf0dfka
                                jsdf=");
        display.cursorPos = 295;
        display.pressAndWait("ENTER");
    },

    step2 = function () {
        display.cursorPos = 561;
        display.pressAndWait("ENTER");
    },

    step3 = function () {
        display.waitForField("R20C7", 5000);
        display.type("wrksplf");
        display.cursorPos = 1534;
        display.pressAndWait("ENTER");
    },

    step4 = function () {
        display.type("4");
```

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```
        display.setField("R11C3", "4");
        display.cursorPos = 883;
        display.pressAndWait("ENTER");
    },

    step5 = function () {
        display.cursorPos = 1;
        display.pressAndWait("ENTER");
    },

    step6 = function () {
        display.setField("R21C7", "go main");
        display.cursorPos = 1614;
        display.pressAndWait("ENTER");
    },

    step7 = function () {
        display.type("90");
        display.cursorPos = 1529;
        display.pressAndWait("ENTER");
    }


    // Section 3 - Order in which the macro steps will be executed
    display.addNavigationPath(this, null, null, step1);
    display.addNavigationPath(this, step1, null, step2);
    display.addNavigationPath(this, step2, null, step3);
    display.addNavigationPath(this, step3, null, step4);
    display.addNavigationPath(this, step4, null, step5);
    display.addNavigationPath(this, step5, null, step6);
    display.addNavigationPath(this, step6, null, step7);

})();
```

You can also see more examples, by creating macros from the z/Scope Anywhere interface and then opening the generated script files to see how they were written by the application (here you can find out where they are going to be placed by z/Scope Anywhere).

Read More:

- Creating Macros
- Macro Methods and Properties

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12.2 Methods and Properties

Available macro's properties and methods:

Property

- cursorPos

Methods

- type
- typeV
- setField
- setFieldV
- pressAndWait
- waitForField
- waitForNewScreen
- addNavigationPath

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12.2.1 cursorPos

The `cursorPos` property sets the cursor to other position of the emulation screen.

JavaScript Code

```
display.cursorPos = position;
```

Assigned Value

position : Integer

Read More:

- Macro Script File Structure
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.2 type

The type method can be used to send key sequences to the mainframe, starting from the current cursor position.

JavaScript Code

```
display.type(keys);
```

Parameters

keys : String

By using special codes you can send several special keys. These codes consist of an escape character ("@") and a mnemonic code that corresponds to the supported function.
Type method can also make entered data to be sent along with an AID key (Attention Identifier key), avoiding the use of Press method.
The following table lists the functions keys and its corresponding codes.

Code Value	Meaning
@A@Q	Attention
@<	Backspace
@B	BackTab (Left Tab)
@C	Clear
@E	Enter
@F	Erase Field
@A@Q	Sys Request
@T	Tab (Right Tab)
@x	PA1
@y	PA2
@z	PA3
@1	PF1
@2	PF2
@3	PF3
@4	PF4
@5	PF5
@6	PF6
@7	PF7
@8	PF8
@9	PF9
@a	PF10

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@b	PF11
@c	PF12
@d	PF13
@e	PF14
@f	PF15
@g	PF16
@h	PF17
@i	PF18

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.3 typeV

The typeV indicates a variable for z/Scope Anywhere to get the value from and send it to the mainframe, starting from the current cursor position.

JavaScript Code

```
display.typeV(variableName);
```

Parameters

variableName : String

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.4 setField

The `setField` command will write a text into the indicated `fieldName`. If the text is encrypted, it will be decrypted by z/Scope Anywhere.

JavaScript code

```
display.setField(fieldName,text);
```

Parameters

fieldName : String
text : String

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.5 setFieldV

The `setFieldV` command indicates a variable (that has had its value assigned previously) for z/Scope Anywhere to get the value from and write it into the indicated `fieldName`.

JavaScript code

```
display.setFieldV(fieldName, variableName);
```

Parameters

fieldName : String
variableName : String

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.6 pressAndWait

In a real terminal, the typed data is sent to the mainframe upon pressing one of the keys known as Attention Identifier keys (AID). These keys act as function keys that are sent along with the typed data. In z/Scope Anywhere you can use the PressAndWait method to simulate this action.

The `pressAndWait` method sends an Attention Identifier Key along with the modified fields, but it blocks the code execution waiting until the system gets unlocked. Modified fields can be input fields (unprotected) or sometimes protected fields having the property Modified set to True.

JavaScript code

```
display.pressAndWait(aidKey);
```

Parameters

aidKey : String

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.7 waitForField

The `waitForField` command waits for a screen containing the specified field, blocking the code execution until the event is raised or the operation times out.

JavaScript code

```
display.waitForField(fieldName, timeout);
```

Parameters

fieldName : String
timeout : Integer

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForNewScreen
- Programming Reference for Macros - addNavigationPath

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12.2.8 waitForNewScreen

The `waitForNewScreen` command waits until a new screen arrives, blocking the code execution until the event is raised or the operation times out. In case the operation succeeds, the `success` function will be executed in case the operation fails or times out, the `error` function will be executed.

JavaScript code

```
display.waitForNewScreen(timeout, success, error);
```

Parameters

timeout : Integer (milliseconds)
success : JavaScript function
error : JavaScript function

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - addNavigationPath

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12.2.9 addNavigationPath

The addNavigationPath command defines the sequence of steps to be executed. The command has to be called once for each step (except the last one), letting the application know what step should follow one another.

JavaScript code

```
display.addNavigationPath(this, stepFrom, null, stepTo);
```

Parameters

stepFrom : JavaScript function
stepTo : JavaScript function

Read More:

- Macro Script File Structure
- Programming Reference for Macros - cursorPos
- Programming Reference for Macros - type
- Programming Reference for Macros - typeV
- Programming Reference for Macros - setField
- Programming Reference for Macros - setFieldV
- Programming Reference for Macros - pressAndWait
- Programming Reference for Macros - waitForField
- Programming Reference for Macros - waitForNewScreen

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13 Appendix E - External Authentication

Z/Scope Anywhere incorporates a mechanism to validate users in a corporate environment so that the user will not need to validate itself every time he enters the application or connects to a host. These mechanism was designed to be used with the Server Installation mode.

Authenticating Against z/Scope Anywhere from External Applications:

Every time you call z/Scope Anywhere, you can send within its URL additional information regarding the authentication, inside a query string. Find out how to build a query string in order to authenticate against z/Scope Anywhere Server as well as authenticate against the connection host.

Using External Data on Macros:

The Integrating a login macro section is a step-by-step example on how to send the host credentials from an external application, as well as creating and configuring a macro that automates the host login.

Encrypting the Query String:

Learn how to encrypt the information sent on the query string using a Diffie Hellman Key Exchange mechanism, provided by z/Scope Anywhere.

Demo:

With the IIS asp.net demo application you can learn how to: 1) authenticate against z/Scope Anywhere Server, 2) Open a determined connection, 3) Send the host credentials; and 4) Encrypt all the query string data with the Diffie Hellman Key Exchange method.

Read More:

- ApiKey
- Diffie Hellman Key Exchange
- Building the Query String
- Integrating a login macro
- Demo

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13.1 Apikey

The ApiKey is a secret value, known only by z/Scope Anywhere and the corporate application that connects to it.
By sending the apikey, the corporate application is indicating that the user is valid and s/he is logged on the corporate network properly, so that the password would not be required. This method is useful for applications that do not keep the users passwords and only authenticate its users against windows or a network Active Directory Server.

The ApiKey is a configurable value. It is set in the z/Scope Anywhere ini configuration file. The location of this file depends on the Windows version z/Scope Anywhere is running at:

Windows 2003: C:\Documents and Settings\All Users\Application Data \Cybele Software\ThinZS\ThinZS.ini
Windows 2008: C:\ProgramData\Cybele Software\ThinZS\ThinZS.ini

Inside the ini file, the apikey information should be append following format below:

```
[API]
Key = 3884F316-3429-49A0-9282-AF0C52B62107
```

You should use a personal value for the apikey setting, as long as it follows the pattern shown above and matches the value send by the external application that will authenticate against z/Scope Anywhere Server.
Do not use this apiKey value shown above, once this is a public document accessible to everyone.

If the ApiKey does not exist in the configuration file, the server creates a random ApiKey value the first time it starts.

```
[API]
Key = 3884F316-3429-49A0-9282-AF0C52B62107
IPList=192.168.0.1;192.168.0.2
```

Use the IPList parameter to limit to a list the ip addresses authorized to make calls using this apikey. In the absence of the IPList parameter, all uncategorized ips will be allowed access through this Api Key.

Read More:
- Diffie Hellman Key Exchange
- Building the Query String
- Using z/Scope Anywhere In-Memory Dictionary
- Integrating a Login Macro
- C# External Authentiation Demo
- Web Authentication Provider

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13.2 Diffie Hellman Key Exchange

This external authentication method is maintained for compatibility purposes only. We suggest you to use our OTUrl authentication method or use the Authentication API.

"Diffie–Hellman key exchange is a specific method of exchanging cryptographic keys. It is one of the earliest practical examples of key exchange implemented within the field of cryptography. The Diffie–Hellman key exchange method allows two parties that have no prior knowledge of each other to jointly establish a shared secret key over an insecure communications channel. This key can then be used to encrypt subsequent communications using a symmetric key cipher. [wikipedia]"

Using Cybele's ThinAPI library to Perform a Diffie Hellman Key Exchange:

1. Add the Cybele.ThinAPI.dll to your application. It is available on the Demo application under the bin directory.
2. Create an object instance of the `DHCypher` class.
3. Call the Init method, sending the server address as argument. This method is responsible to negotiate the key with z/Scope Anywhere Server.
4. Call the `EncodeStr` method passing the data to be encrypted as argument of the method.

c# example:

```
using Cybele.ThinAPI;

...

        DHCypher myDHCypher = new DHCypher();
        myDHCypher.Init("http://127.0.0.1:8023");
        authInfo = HttpUtility.UrlEncode(myDHCypher.EncodeStr(authInfo));

...
```

Sending Encrypted Data:

After performing the Diffie Hellman key exchange, the external application may send the encrypted data to z/Scope Anywhere Server proceeding it by an * symbol.

c# example:

```
using Cybele.ThinAPI;

...
        authInfo = "*" + authInfo;

...
```

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The authentication information is then encrypted to be send to z/Scope Anywhere Server within the URL query string:

http://127.0.0.1:8023/asp/? + authInfo

Read More:

- Apikey
- Building the Query String
- Using z/Scope Anywhere In-Memory Dictionary
- Integrating a Login Macro
- C# External Authentiation Demo
- Web Authentication Provider

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13.3 Building the Query String

The URL to be called in order to authenticate against z/Scope Anywhere externally should follow the format below:

http://127.0.0.1:8023/asp/?* <queryString>

The query string may contain all the information related to the server credentials, connection to be started, host credentials and any other information you want to use within the connection macros.

Follow the topics below and learn how to create the query string in order to perform the two authentication levels (z/Scope Anywhere Server and host) as well as use external data to perform any other automation task through (macros):

z/Scope Anywhere Server Authentication:

The authentication against z/Scope Anywhere from external applications can be done using: username and password or username and an ApiKey
In order to authenticate you must send the combination of the `_userid` variable and `_password` or `_apikey` inside the queryString.

1. _userid=<UserId>&_password=<Password>
2. _userid=<UserId>&_apikey=<APIKey>

Please, make sure the underscore is placed before the userid and password/apikey parameter names.
You have to replace <UserId> with the username you want to logon and <APIKey> or <Password> with the corresponding ApiKey/Password z/Anywhere is expecting.
For example, if the server username was "john" and his password "john123", the URL followed by the query string would be:

```
http://127.0.0.1:8023/asp/?_userid=John&_password=John123
```

Starting a Connection:

If you want to open a particular connection, you can add to the query string the "start" parameter. This parameter works as an "autostart" command. If we wanted to start a connection called "MyConnection", the query string above would became this one:

```
http://127.0.0.1:8023/asp/?
_userid=John&_password=John123&start=MyConnection
```

Hiding the Connections Start Panel:

You can make z/Anywhere jump the start panel and go straight to the connection

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that autostarted by sending the hsp parameter = 1.
This parameter only makes sense if a Connection will be started automatically.

```
http://127.0.0.1:8023/asp/?
_userid=John&_password=John123&start=MyConnection&_asuser=hostUser&_aspass=
hostPassword&hsp=1
```

Authenticating Against the Host:

Once a connection is automatically open it is possible to login automatically to the host. To do that you should send the host credentials on the query string and have a login macro associated the connection autostart setting.
The parameters to authenticate against the host could have any name of your preference, let's suppose you are going to name them _asuser and _aspass. The query string should look like this:

```
http://127.0.0.1:8023/asp/?
_userid=John&_password=John123&start=MyConnection&_asuser=hostUser&_aspass=
hostPassword
```

Adding Other Information to Be Used on the Connection Macros:

Besides de host username and password, z/Scope Anywhere enables you to send any other parameter within the query string so that you can use them to program macros. The parameters names should have a prefixed underscore and should not match the reserved parameters "userid" and "apikey".

```
_myIntParam=1500&_myStrParam=Hello World&_myBoolParam=true
```

On the Integration a login macro section you will find a example on how to send parameters within the query string and use them to perform a login automation. The same principles of sending and using external application data covered on the example, can be applied to perform any other macro automation task.

Encrypting the Query String Information:

Before deploying your application, it is strongly recommended that you encrypt all the exchanged query string data, by using a Diffie Hellman Key Exchange provided by z/Scope Anywhere.

Read More:

- Apikey
- Diffie Hellman Key Exchange
- Using z/Scope Anywhere In-Memory Dictionary
- Integrating a Login Macro
- C# External Authentiation Demo
- Web Authentication Provider

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13.4 Using z/Scope Anywhere In-Memory Dictionary

z/Scope Anywhere includes an in-memory dictionary to save name-value pairs that can be accessed from within the application.
In order to save name-value pairs into the internal in-memory dictionary, make an https request as follows:

https://z-scope_server_url/var/?_sessionid=...&name1=value1&name2=value2&.....

In this example, name1 is the variable that corresponds to value1. You can use the "name1", "name2", etc variable names within z/Scope Anywhere and set their values (value1, value2, etc) through the URL depending on where you access from or who is the user.

In order to receive name-value pairs, z/Scope Anywhere requires that you identify through a session id to associate to the name-value pairs using this parameter:
_sessionid: a string identifying the session. It will be used as a key to store and further use of the name-value pairs, making them available from different browsers.

These variables will be available in the in-memory dictionary for as long as you determine in the configuration file using the SessionVar.Timeout variable. Here is an example configuration file (ThinZS.ini). Learn more about the configuration file.

```
[API]
Key=F49E5D97-42B3-428E-92FE-237A3E8DB1EA
IPList=192.168.0.1;192.168.0.2
SessionVar.Timeout=30
```

The SessionVar.Timeout variable expresses the maximum time allowed in minutes since the last access to a stored variable, after which this variable is cleared.

This means that, in this example, the variable will remain in z/Scope Anywhere's in-memory dictionary for as long as 30 minutes after the last time it is used. When 30 minutes have passed since the last access to the variable, it will be cleared.

Learn how to use these in-memory dictionary name-value pairs in z/Scope Anywhere with a login macro example.

Read More:
- Apikey
- Diffie Hellman Key Exchange
- Building the Query String
- Integrating a Login Macro
- C# External Authentiation Demo
- Web Authentication Provider

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13.5 Integrating a Login Macro

Let's suppose you need to authenticate a user into a connection host. To do that you need a macro that positions the cursor in the username and password fields and enters the right credentials. Let's suppose our username is "peter" and his password is "peterPass".
You can send these values in the z/Scope Anywhere URL query string by adding them like this:

```
                        http://127.0.0.1:8023/asp/?
_userid=....&_apikey=...&start=MyConnection&_asuser=peter&_aspass=peterPass
```

The _asuser and _aspass values will be available inside the z/Scope Anywhere macros. That way you can use them to authenticate against the connection host. Follow the next steps to learn how to use these values to perform the host authentication:

1. Record the Macro:

You can start by recording a macro that performs the host login.
Find out on the Programming Reference for Macros how to edit the macro after you've created it.
You will see that the macro code will look like this:

```
(function() {
    var display = getDisplay();
    step1 = function() {
          display.type("peter");
          display.setField("R4C47","YEgY8gNCpoKU2zX-fky...");
          display.cursorPos = 295;
          display.pressAndWait("ENTER");
    }
    display.addNavigationPath(this, null, null, step1);
})();
```

2. Modify the Macro to Work with All Users:

You know that this macro is now running for the user "peter" only, but you need it to be generalized for all users.
The way to modify this macro to use the variables "_asuser" and "_aspass" is by replacing the methods `type` and `setField`, as follows:

```
1) display.type("peter") => display.typeV("_asuser")

2) display.setField("R4C47","YEgY8gNCpoKU2zX-tfky...") =>
display.setFieldV("R4C47","_aspass")
```

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The "v" methods will use the query string variable values. You can check further documentation regarding the typeV and setFieldV methods.
The updated macro should look like this:

```
(function() {
    var display = getDisplay();
    step1 = function() {
          display.typeV("_asuser");
          display.setFieldV("R4C47","_aspass");
          display.cursorPos = 295;
          display.pressAndWait("ENTER");
    }
    display.addNavigationPath(this, null, null, step1);
})();
```

3. Take the Macro to the Public Directory

All the macros are created by default on the user directory. In order to make the macro available to all users, you have to move it from the user directory to one directory level above. Copy the login macro you have just created:

from C:\ProgramData\Cybele Software\zScope7\[UserName] to C:\ProgramData\Cybele Software\zScope7\

4. Configure the Connection to Auto Start the Macro:

If you want the connection to automatically perform the authentication every time it is started, you should set this macro to be autostarted on the Connection Preferences tab.

Read More:

- Apikey
- Diffie Hellman Key Exchange
- Building the Query String
- Using z/Scope Anywhere In-Memory Dictionary
- C# External Authentiation Demo
- Web Authentication Provider
- Macro Script File Structure
- Macro Programming Reference

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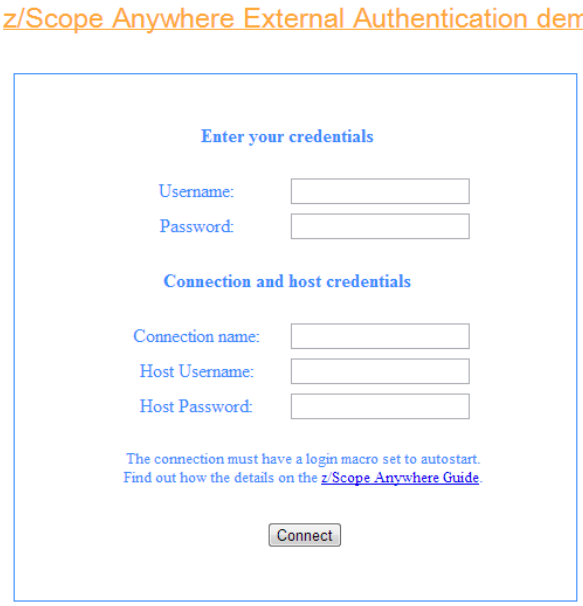
13.6 C# ASP .Net Demo

This C# asp.net demo is intended to help you learn how to authenticate securely against z/Scope Anywhere Server from an external application.

The demo Logon.aspx page is an authentication form that performs a Windows Logon. This page was designed to show how to authenticate to z/Scope Anywhere externally using username/password or apikey and having the authentication data encrypted through the Diffie Hellman Key Exchange method.

After authentication against z/Scope Anywhere, the application redirects to the Default.aspx page that has an IFrame pointing to z/Scope Anywhere URL.



The website demo is accessible from the Users documents folder, under the directory \zScope Anywhere Demos\IISAuth
In order to compile this application, you can use the Microsoft Visual C# Studio 2010 Express. Download it from here.
Open the application from the menu *File-Open Web Site.*

The web.config parameters:

username/apikey:

The external authentication is set to use username/password by default, but you can also change the web.config file to start using the username/apikey. Once you set a proper "`APIKEY`" value, the application will start doing the external authentication with username/apikey.

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```
<add key="APIKEY" value="3884F316-3429-49A0-9282-AF0C52B62107"/>
```

HTTP Protocol:

The demo application should be completely functional for environments where the z/Scope Anywhere is deployed on the same machine and running under the HTTP protocol. If your environment does not attend these conditions you can also personalize those values on the web.config file:

```
<add key="PROTOCOL" value="http:"/>
<add key="SERVER" value="127.0.0.1:8443"/>
```

HTTPS Protocol:

If the you want to use the HTTPS protocol, then a valid certificate will be required. Set up the application to use your personal Certificate: Managing the SSL Certificate section.

```
<add key="PROTOCOL" value="https:"/>
```

Read More:

- Apikey
- Diffie Hellman Key Exchange
- Building the Query String
- Using z/Scope Anywhere In-Memory Dictionary
- Integrating a Login Macro
- Web Authentication Provider

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13.7 Web Authentication Provider

z/Scope Anywhere lets you grant or deny access to connections based on users and groups defined in Active Directory Services. Additionally, the access to a z/Scope Anywhere connection can be granted using the External Web Authentication Provider. This mechanism resolves an authentication request by passing it to the external authentication source and then allows or denies the access according to its response.

To use this option, the ADS (Active Directory Services) authentication must be enabled.

Read More:

- Enabling z/Scope Anywhere ADS Authentication
- Enabling and Configuring the External Web Authentication Provider
- How to Use the External Web Authentication Provider
- How to Integrate your Custom Web Authentication Provider

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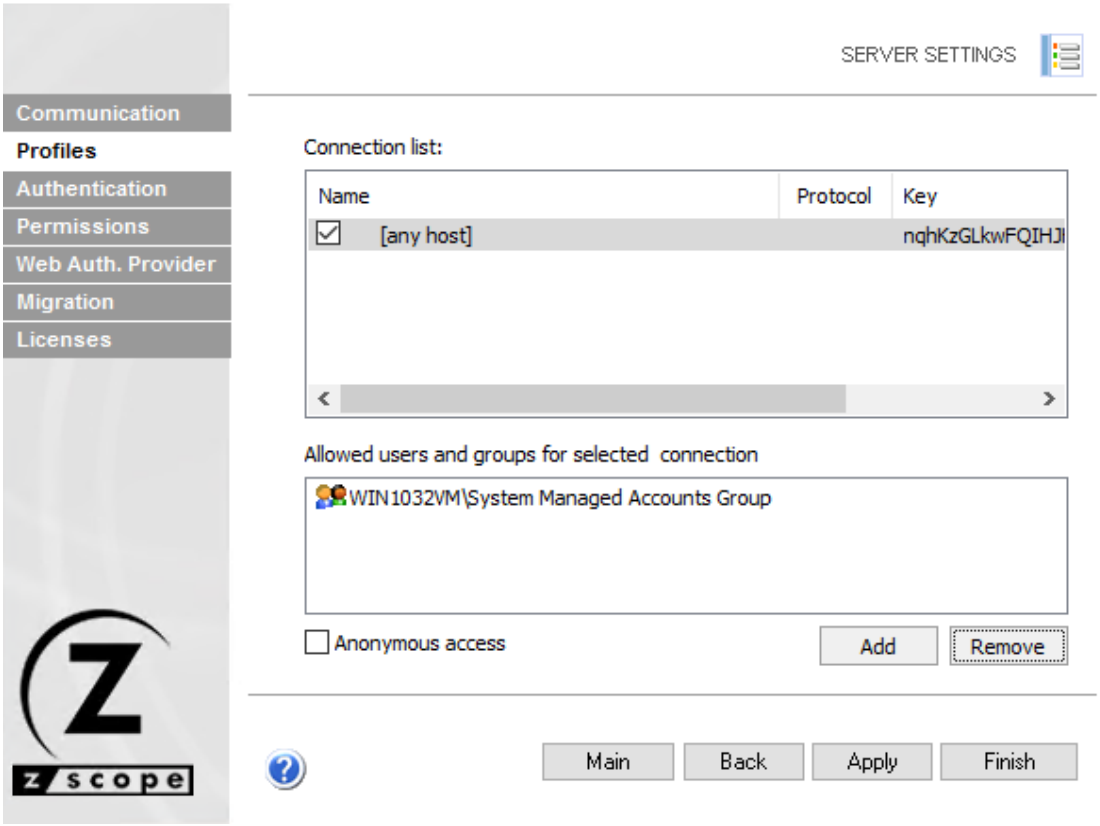
13.7.1 Enabling z/Scope Anywhere ADS Authentication

To enable ADS authentication, remove the “Anonymous access” option from a connection. Then, add user(s) or group(s) to the connection to grant access according to your needs.



Read More:

- Enabling and Configuring the External Web Authentication Provider
- How to Use the External Web Authentication Provider
- How to Integrate your Custom Web Authentication Provider

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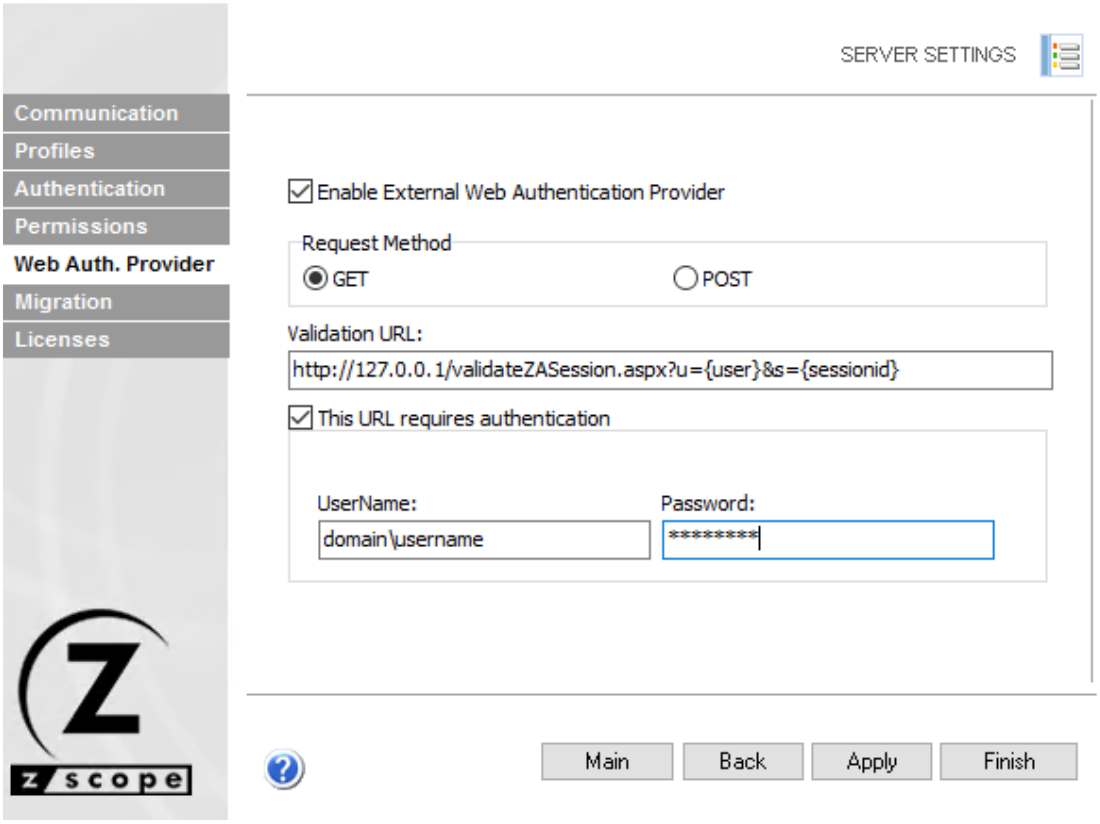
13.7.2 Enabling and Configuring the External Web Authentication Provider

To enable the External Web Authentication Provider, check the 'Enable External Web Authentication Provider' option in the 'Web Auth. Provider' tab in the Server Settings. Select the HTTP method and complete the validation URL and, if the URL requires authentication, check the 'This URL requires authentication' option and enter the remote credentials.



Press 'Apply' or 'Finish' to save the changes.

Read More:

- Enabling z/Scope Anywhere ADS Authentication
- How to Use the External Web Authentication Provider
- How to Integrate your Custom Web Authentication Provider

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13.7.3 How to Use the External Web Authentication Provider

Make an Ajax call to the z/Scope Anywhere external authentication handler to validate the external credentials. For example:

```
<script type="text/javascript">
    function authenticateUser(serverurl, params, callback) {
        if (!serverurl)serverurl = "";
        if (serverurl.lastIndexOf("/") == serverurl.length - 1)
            serverurl = serverurl.substring(0, serverurl.length - 1);
        var cd = serverurl != "";
        var dt = serverurl == ""? "html" : "jsonp";
        $.ajax({
            url: serverurl + "/authprov/?" + params,
            crossDomain: cd,
            dataType: dt,
            statusCode: {
                200: function (data) {
                    var url = cd? data.url : data;
                    if (url.indexOf("://") > 0) serverurl = "";
                    if (callback) {
                        callback(serverurl + url);
                    }
                    else {
                        location.href = serverurl + url;
                    }
                }
            }
        });
    }

    function sendRequest(params) {
        authenticateUser("http://zscope.anywhere.server:8023",
        params,
        function(url) {
            location.href = url;
        });
    }
</script>
```

Use the *sendRequest* function with parameters specific to your authentication page so it can identify the user and return the appropriate values to z/Scope Anywhere. You can, for instance, call the sendRequest function with your website's session identifier. As in this example: `sendRequest("mySessionID=12345678&myUserID=JDoe")`

z/Scope Anywhere will forward these parameters to the validation URL and will return a new location URL.

Read More:

- Enabling z/Scope Anywhere ADS Authentication
- Enabling and Configuring the External Web Authentication Provider
- How to Integrate your Custom Web Authentication Provider

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13.7.4 How to Integrate your Custom Web Authentication Provider

Z/Scope Anywhere processes and forwards the received parameters depending on how it is configured.

How the z/Scope External Web Authentication Provider manages the received parameters

Using the GET HTTP method: the parameters will be forwarded to the validation URL using a QueryString(*).
For example:
`http://zscope.anywhere.server:8023/authprov/?mySessionID=12345678&myUserID=JDoe`

Using the POST HTTP method: the parameters will be forwarded on the request body as a JSON object(*).
For example:

```
{
    "mySessionID": "12345678",
    "myUserID": "JDoe"
}
```

Field Masks (*)

A *Field Mask* is a parameter enclosed within brackets. The field masks are used in the validation URL to customize it according to your needs.
These field masks aren't part of the data (QueryString or JSON) that z/Scope Anywhere will send to the validation URL.

For example, if the validation URL is set to:
`https://auth.server.domain/isValid/{mySessionID}/`
z/Scope Anywhere will call the URL replacing the field mask with the values assigned to these parameters in the ajax call:
https://auth.server.domain/isValid/12345678/

What the Validation URL Should Return

The validation URL must return a JSON object that indicates if the authentication worked.

When the authentication fails, it should return a JSON with this format:

```
{
    "isValid": false,
    "redirectTo": "http://auth.server.domain/accessdenied.html"
}
```

This indicates that the external authentication has failed and redirects the users to a web page that handles this situation.

When the authentication is successful, it should to return a JSON following this format:

```
{
    "isValid": true,
    "username": "Company\\UserID",
```

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```
    "fullname": "John Doe",
    "redirectTo": "http://auth.server.domain/integratedpage.html"
}
```

This indicates that the external authentication has been successful and redirects the users to a web page with the z/Scope Anywhere integration.

Read More:

- Enabling z/Scope Anywhere ADS Authentication
- Enabling and Configuring the External Web Authentication Provider
- How to Use the External Web Authentication Provider

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14 Appendix F - hllapi.js Reference

The hllapi.js application programming interface is a Javascript library that leverages the well-known HLLAPI specification to web apps development, being also the foundation for the HostSurfer application development framework.

Read More:

- hllapi.js Member Functions
- hllapi.js Properties

14.1 hllapi.js Member Functions

For information about a particular Member Function, please refer to the following links:

- connectPresentationSpace
- convertPosition
- copyFieldToString
- copyPresentationSpace
- copyPresentationSpaceToString
- copyStringToField
- copyStringToPresentationSpace
- disconnectPresentationSpace
- findFieldLength
- findFieldPosition
- pause
- queryCursorLocation
- querySessions
- querySessionStatus
- searchPresentationSpace
- sendKey
- setCursor
- wait

14.1.1 connectPresentationSpace

The connectPresentationSpace function establishes a connection between your hllapi.js application program and the host presentation space.

3270	5250
Yes	Yes

Prerequisite Calls

There are not prerequisite calls for this function.

Call Parameters

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Parameter name	Explanation
psId	1-character short name of the host presentation space.
success	A callback function that takes one parameter (the _jsro object) and is called upon successful connection with the host Presentation Space.
failure	A callback function that takes one 'data' parameter and is called upon a failed connection attempt
disconnect	A callback function that takes one 'data' parameter and is called upon a disconnection event.

Return Value

This function always returns 0.

Remarks

1. This function is equivalent to HLLAPI Function Number 1.
2. An hllpapi.js web application cannot be connected to multiple presentation spaces concurrently. Calls requiring the connectPresentationSpace function as a prerequisite use the currently connected presentation space. For example, if an application is connected to presentation space A, B, and C in that order, the application must connect to B or A again to issue functions.
3. Each process that requests a connectPresentationSpace must have a corresponding disconnectPresentationSpace.
4. More than one hllapi.js application can share a presentation space, if the applications support sharing (that is, if they were developed to work together and if they exhibit predictable behavior).

14.1.2 convertPosition

The convertPosition function converts the host presentation space positional value into the display row and column coordinates or converts the display row and column coordinates into the host presentation space positional value. This function does not change the cursor position.

3270	5250
Yes	Yes

Prerequisite Calls

There are not prerequisite calls for this function.

Call Parameters

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Parameter name	Explanation
row	When the intended conversion is display row and column coordinates to host presentation space positional value, this parameter represents the display row coordinate. Otherwise, it represents the host presentation space positional value.
col	When the intended conversion is display row and column coordinates to host presentation space positional value, this parameter represents the display column coordinate. Otherwise, it must be null, 0 or 'undefined'.

Return Properties

Property name	Explanation
rc	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.
pos	The resulting host presentation space positional value, when converting from row and column display coordinates, in the range 1-3564. The upper limit can be smaller than 3564 depending on how the host presentation space is configured.
row	The resulting display row coordinate, when converting from host presentation space positional value. Values range from 1 to 43, but the upper limit can be smaller depending on how the host presentation space is configured.
col	The resulting display column coordinate, when converting from host presentation space positional value. Values range from 1 to 132, but the upper limit can be smaller depending on how the host presentation space is configured.

Return Code

The following values are defined for the 'rc' property:

Return Code	Explanation
0	The convertPosition function was successful.
1	The function returns a Return Code of 1 if either row and col parameter values are out of screen coordinates range (when the intended conversion is row and column coordinates to host presentation space positional value) or row parameter value is out of presentation space positional value range (when the intended conversion is in the opposite direction). In both cases, the upper limit for valid input depends on how the host

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Return Code	Explanation
	presentation space is configured and the lower limit is 1.

Remarks

1. This function is equivalent to HLLAPI Function Number 99.
2. To find out how many rows and columns are in your presentation space, examine the returned object in querySessionStatus.

14.1.3 copyFieldToString

The copyFieldToString function transfers characters from a field in the host-connected presentation space into a string.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
position	Identifies the target field. This can be the Presentation Space position of any byte within the target field. Copy always starts at the beginning of the field.
length	Number of bytes to copy (the length of the data string).
params	An object containing a subset of Session Options parameters, which values will take precedence over the defaults for the execution context of this function.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

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Property name	Explanation
length	The length of the data returned.
data	A string containing data from the identified field in the host presentation space. The first byte in the returned data string is the beginning byte of the identified field in the host presentation space. The number of bytes in the returned data string is determined by the smaller of: • Number of bytes specified in the calling length parameter. • Number of bytes in the identified field in the host presentation space.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The copyFieldToString function was successful.
1	Your program is not connected to a host session.
2	An error was made in specifying parameters.
4	Successful connection was achieved, but the host presentation space is busy.
5	Successful connection was achieved, but the host presentation space is locked (input inhibited).
7	The host presentation space position is not valid.
28	Field length of 0 bytes.

Remarks

1. This function is equivalent to HLLAPI Function Number 34.
2. The field position and length information can be found by using findFieldPosition and findFieldLength. The copyFieldToString function can be used with either protected or unprotected fields, but only in a field-formatted presentation space.
3. The copy is ended when the end of the field is reached.
4. An EAB can be returned when EAB option has been included in the 'params' Session Parameters options. EAB is related to each character in the presentation space and is returned preceding each character.
5. The copyFieldToString function is affected by the ATTRB/NOATTRB/NULLATTRB, the EAB/NOEAB, the XLATE/NOXLATE and DISPLAY/NODISPLAY session options.

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14.1.4 copyPresentationSpace

The copyPresentationSpace function copies the contents of the host-connected presentation space into a data string that you define in your hllapi.js web application program.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
params	An object containing a subset of Session Options parameters, which values will take precedence over the defaults for the execution context of this function.

Return Properties

Property name	Explanation
data	Contents of the connected host presentation space.
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.
length	The length of the data copied.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The host presentation space contents were copied to the application program. The target presentation space was active and the keyboard was unlocked.
1	Your program is not connected to a host session.
4	The host presentation space contents were copied. The

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Return Code	Explanation
	connected host presentation space was waiting for host response.
5	The host presentation space was copied. The keyboard was locked.

Remarks

1. This function is equivalent to HLLAPI Function Number 5.
2. An EAB can be returned when the EAB option is included in 'params' parameter.
3. The copyPresentationSpace function is affected by the following session options: ATTRB/NOATTRB/NULLATTRB, EAB/NOEAB, XLATE/NOXLATE, BLANK/NOBLANK, DISPLAY/NODISPLAY.
4. If you want to copy only a portion of the host presentation space, use the copyPresentationSpaceToString function.

14.1.5 copyPresentationSpaceToString

The copyPresentationSpaceToString function is used to copy all or part of the host-connected presentation space into a data string that you define in your hllapi.js application program.
The input PS position is the offset into the host presentation space. This offset is based on a layout in which the upper-left corner (row 1/column 1) is location 1 and the bottom-right corner is 3564, which is the maximum screen size for the host presentation space. The value of PS Position + (Length - 1) cannot exceed the configured size of your host presentation space.
The copyPresentationSpaceToString function translates the characters in the host source presentation space into ASCII. Attribute bytes and other characters not represented in ASCII normally are translated into blanks. If you do not want the attribute bytes translated into blanks, you can override this translation with the ATTRB option for the 'attrb' field in the 'params' parameter.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
pos	Position within the host presentation space of the first byte in your target data string.

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Parameter name	Explanation
len	Length of the target data string.
params	An object containing a subset of Session Options parameters, which values will take precedence over the defaults for the execution context of this function.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.
data	Contents of the host presentation space.
length	The length of the data copied.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The host presentation space contents were copied to the application program. The target presentation space was active and the keyboard was unlocked.
1	Your program is not connected to a host session.
2	An error was made in specifying string length, or the sum of (len - 1) + pos is greater than the size of the connected host presentation space.
4	The host presentation space contents were copied. The connected host presentation space was waiting for host response.
5	The host presentation space was copied. The keyboard was locked.

Remarks

1. This function is equivalent to HLLAPI Function Number 8.
2. An EAB can be returned when the EAB option is included in 'params' parameter. EAB is related to each character inn the presentation space and is returned following each character.
3. The copyPresentationSpaceToString function is affected by the following session

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options: ATTRB/NOATTRB/NULLATTRB, EAB/NOEAB, XLATE/NOXLATE, BLANK/NOBLANK, DISPLAY/NODISPLAY.

14.1.6 copyStringToField

The copyStringToField function transfers a string of characters into a specified field in the host-connected presentation space. This function can be used only in a field-formatted host presentation space.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
input	String containing the data to be transferred to a target field in the host presentation space.
position	Identifies the target field. This can be the PS position of any byte within the target field. Copy always starts at the beginning of the field.
params	An object containing a subset of Session Options parameters, which values will take precedence on the defaults for the execution context of this function.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

Return Code

The following values are defined for the 'returnCode' property:

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Return Code	Explanation
0	The copyStringToField function was successful.
1	Your program is not connected to a host session.
2	Parameter error or zero length for copy.
5	The target field was protected or inhibited, or incorrect data was sent to the target field (such as a field attribute).
7	The host presentation space is not valid.
24	Unformatted host presentation space.
28	Field length of 0 bytes.

Remarks

1. This function is equivalent to HLLAPI Function Number 33.
2. The copyStringToField function is affected by the following session options: STRLEN/STREOT, EOT, EAB/NOEAB, XLATE/NOXLATE, PUTEAB/NOPUTEAB.
3. The string to be transferred is specified with the calling 'input' parameter. The string ends when one of these three conditions is encountered:
   - When an end-of-text (EOT) delimiter is encountered in the string if EOT mode was selected using the 'params' parameter.
   - When the end of the string passed in the 'input' parameter is reached, if not in EOT mode.
   - When an end-of-field is encountered in the field.

   Note: If the field at the end of the host presentation space wraps, wrapping occurs when the end of the presentation space is reached.
4. The keyboard mnemonics (see sendKey function) cannot be sent using the copyStringToField function.
5. The first byte of the data to be transferred is always placed at the beginning of the field that contains the specified PS position.

14.1.7 copyStringToPresentationSpace

The copyStringToPresentationState function copies an ASCII data string directly into the host presentation space at the location specified by the PS position calling parameter.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

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Parameter name	Explanation
input	String of ASCII data to be copied into the host presentation space.
position	Position in the host presentation space to begin the copy, a value between 1 and the configured size of your host presentation space.
params	An object containing a subset of Session Options parameters, which values will take precedence on the defaults for the execution context of this function.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The copyStringToPresentationSpace function was successful.
1	Your program is not connected to a host session.

Remarks

1. This function is equivalent to HLLAPI Function Number 15.
2. The copyStringToPresentationSpace function is affected by the following session options: STRLEN/STREOT, EOT, EAB/NOEAB, XLATE/NOXLATE, PUTEAB/NOPUTEAB.
3. The keyboard mnemonics (see sendKey function) cannot be sent using the copyStringToPresentationSpace function.
4. The string ends when an end-of-text (EOT) delimiter is encountered in the string if EOT mode was selected using the 'params' parameter.
5. Although the sendKey function accomplishes the same purpose, this function responds with the prompt and enters a command more quickly. Because the sendKey function emulates the terminal operator typing the data from the keyboard, its process speed is slow for an application operating with a lot of data. This function provides a faster input path to the host.
6. The original data (the copied string) cannot exceed the size of the presentation space.

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14.1.8 disconnectPresentationSpace

The disconnectPresentationSpace function drops the connection between your hllapi.js application program and the host presentation space.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

This function does not take any call parameters.

Return Value

This function does not return any object.

Remarks

1. This function is equivalent to HLLAPI Function Number 2.
2. After the disconnectPresentationSpace function is called, functions that interact with the host-connected presentation space are no longer valid (for example, sendKey, wait).
3. Your hllapi.js application should disconnect from the host presentation space before exiting.

14.1.9 findFieldLength

The findFieldLength function returns the length of a target field in the connected presentation space. This function can be used to find either protected or unprotected fields, but only in a field-formatted host presentation space. This function returns the number of characters contained in the field identified using the call PS position parameter. This includes all characters from the beginning of the target field up to the character preceding the next attribute byte.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

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Call Parameters

Parameter name	Explanation
type	Please see the following table.
position	Identifies the field within the host presentation space at which to start the Find. It can be the PS position of any byte within the field in which you desire the Find to start.

The calling 2-character 'type' parameter can contain:

Code	Explanation
[RB][RB] or T [RB]	This field.
P [RB]	The previous field, either protected or unprotected.
N [RB]	The next field, either protected or unprotected.
NP	The next protected field.
NU	The next unprotected field.
PP	The previous protected field.
PU	The previous unprotected field.

Note:
[RB] represents a required blank.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.
length	The length of the field. Please see the following table.

The following lengths are valid:

Length	Explanation
= 0	When return code = 28, field length is 0. When return code = 24, host presentation space is not field formatted.
> 0	Required field length in the host presentation space.

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Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The findFieldLength function was successful.
1	Your program is not connected to a host session.
2	A parameter error was encountered.
7	The host presentation space position is not valid.
24	No such field was found.
28	Field length of 0 bytes.

Remarks

1. This function is equivalent to HLLAPI Function Number 32.
2. Except when [RB][RB] or T [RB] is used as 'type' parameter, if the field found is the same as the field from which the Find started, a return code of 24 is returned.

14.1.10 findFieldPosition

The findFieldPosition function returns the beginning position of a target field in the host-connected presentation space. This function can be used to find either protected or unprotected fields but only in a field-formatted host presentation space.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
type	Please see the following table.
position	Identifies the field within the host presentation space at which to start the Find. It can be the PS position of any byte within the field in which you desire the Find to start.

The calling 2-character 'type' parameter can contain:

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Code	Explanation
[RB][RB] or T [RB]	This field.
P [RB]	The previous field, either protected or unprotected.
N [RB]	The next field, either protected or unprotected.
NP	The next protected field.
NU	The next unprotected field.
PP	The previous protected field.
PU	The previous unprotected field.

Note:
[RB] represents a required blank.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.
position	Relative position of the requested field from the origin of the host presentation space. This position is defined to be the first position after the attribute byte.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The findFieldPosition function was successful.
1	Your program is not connected to a host session.
2	A parameter error was encountered.
7	The host presentation space position is not valid.
24	No such field was found.
28	Field length of 0 bytes.

Remarks

1. This function is equivalent to HLLAPI Function Number 31.
2. Except when [RB][RB] or T [RB] is used as 'type' parameter, if the field found is the same as the field from which the Find started, a return code of 24 is returned.

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14.1.11 pause

The pause function waits for a specified amount of time before the callback function parameter is executed.

3270	5250
Yes	Yes

Prerequisite Calls

There are no prerequisite calls for this function.

Call Parameters

Parameter name	Explanation
time	The time-out interval, expressed in milliseconds.
callback	The callback function to be called after 'time' interval has elapsed.

Return Value

This function returns a Number, representing the ID value of the timer that is set.

Remarks

1. This function is equivalent to HLLAPI Function Number 18.

14.1.12 queryCursorLocation

The queryCursorLocation function indicates the position of the cursor in the host-connected presentation space by returning the cursor position.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

This function does not take any call parameters.

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Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.
position	Host presentation space position of the cursor.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The queryCursorLocation function was successful.
1	Your program is not connected to a host session.

Remarks

1. This function is equivalent to HLLAPI Function Number 7.
2. If Return Code is 1, the 'position' property will be 0.

14.1.13 querySessions

The querySessions function returns an array of objects, each of them containing the short name and long name of existing host sessions.

3270	5250
Yes	Yes

Prerequisite Calls

There are no prerequisite calls for this function.

Call Parameters

This function does not take any call parameters.

Return Properties

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Property name	Explanation
returnCode	A numeric code indicating the execution status of the function.
sessions	An array of objects containing short name and long name of existing host sessions. For further reference on the 'sessions' property, see the table below.

Return Code

Value of 'returnCode' property is always 0.

'sessions' Property

Property name	Explanation
shortName	A 1-character presentation space short name (PSID)
longName	Host session long name (same as profile name; or, if profile not set, same as short name)

Remarks

1. This function is equivalent to HLLAPI Function Number 10.

14.1.14 querySessionStatus

The querySessionStatus function is used to obtain session-specific information.

3270	5250
Yes	Yes

Prerequisite Calls

There are no prerequisite calls for this function.

Call Parameters

This function does not take any call parameters.

Return Properties

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Property name	Explanation
psId	A 1-character presentation space short name.
sessionType	An empty string.
rows	Number of rows in the host presentation space.
cols	Number of columns in the host presentation space.

Remarks

1. This function is equivalent to HLLAPI Function Number 22.

14.1.15 searchPresentationSpace

The searchPresentationSpace function lets your hllapi.js program examine the host presentation space for the occurrence of a specified string.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
data	Target string for search.
from	Position within the host presentation space where the search is to begin (if SRCHFRWD option set in 'params') or to end (if SRCHBKWD option set in 'params').
params	An object containing a subset of Session Options parameters, which values will take precedence on the defaults for the execution context of this function.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

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Property name	Explanation
position	Should the string been found, it represents the host presentation space position.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The searchPresentationSpace function was successful.
1	Your program is not connected to a host session.
24	The search string was not found.

Remarks

1. This function is equivalent to HLLAPI Function Number 6.
2. Four sets of parameters that may be passed in 'params' parameter are related to this function. They are the SRCHALL/SRCHFROM, STRLEN/STREOT, SRCHFRWD/SRCHBKWD, and the EOT=c session options.
3. The searchPresentationSpace function normally checks the entire host presentation space. However, you can use 'params' call parameter to specify SRCHFROM. In this mode, the calling PS position parameter specifies a beginning or ending point for the search. If the SRCHFRWD option is in effect, the search for the designated string begins at the specified PS position and proceeds toward the end of the host presentation space. If the SRCHBKWD option is in effect, the search for the designated string begins at the end of the PS and proceeds backward toward the specified PS position. If the target string is not found, the search ends at the PS position specified in the calling PS position parameter.
4. The SRCHFROM option is also useful if you are looking for a keyword that might occur more than once in the host presentation space.
5. The searchPresentationSpace function is useful in determining when the host presentation space is available. If your hllapi.js application is expecting a specific prompt or message before sending data, the searchPresentationSpace function allows you to check for a prompt message before continuing.

14.1.16 sendKey

The sendKey function is used to send either a keystroke or a string of keystrokes to the host presentation space.
You define the string of keystrokes to be sent with the calling data string parameter. The keystrokes appear to the target session as though they were entered by the terminal operator. You can also send all attention identifier (AID) keys such as Enter and so on. All host fields that are input protected or are numeric only must be treated accordingly.

3270	5250

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Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
key	A string of keystrokes, maximum 255. Uppercase and lowercase ASCII characters are represented literally. Function keys and shifted function keys are represented by mnemonics. See Keyboard Mnemonics.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The keystrokes were sent; status is normal.
1	Your program is not connected to a host session.

Remarks

1. This function is equivalent to HLLAPI Function Number 3.
2. The parameters under the 'params' property are related to this function. They are the AUTORESET/NORESET, STRLEN/STREOT, EOT=c, ESC=c, and RETRY/NORETRY session options.
3. Keystrokes cannot be sent to the host session when the keyboard is locked or busy. You can check this condition with the wait function.
4. If the host is busy, input might be rejected.
5. To send special control keys, a compound character coding scheme is used. In this coding scheme, one keystroke is represented by a sequence of two to four ASCII characters. The first and third character are always the escape character. The second and fourth character are always a keycode. To send the sequence LOGON ABCDE

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followed by the Enter key, you would code the string LOGON ABCDE@E. A complete list of these keycodes is represented in Keyboard Mnemonics. This compound coding technique allows an ASCII string representation of all necessary keystroke codes without requiring the use of complex hexadecimal key codes. The default escape character is @. The value of the escape character can be changed to any other character with the ESC=c option of the 'params' property.

6. Users needing higher levels of performance should use the copyStringToField or copyStringToPresentationSpace function rather than send keystrokes with the sendKey function. But remember, only the sendKey function can send the special control keys.
7. Refer to session NORESET option to improve the performance of this function. Unless NORESET is required, the reset mnemonic is added to the keystroke strings as a prefix. Therefore, all resettable status except input inhibit are reset.
8. The keystroke strings, including the AID key, are sent to the host via multiple paths. Each path sends the strings before the first AID key (or including the AID key). HLLAPI adjusts the string length and the start position of each path. For a host application program, any keystroke might be lost by the AID key process. Therefore, you should not send a keystroke list that includes plural AID keys.
9. During the @P (Print) or @A@T (Print Presentation Space) process, all requests that update the presentation space are rejected. If the presentation space is busy or the interruption request occurs during the print request, the mnemonic @A@R (Device Reset - Cancel to print the Presentation Space) cancels the request and resets the status.

14.1.17 setCursor

The setCursor function is used to set the position of the cursor within the host presentation space. Before using the setCursor function, a workstation application must be connected to the host presentation space.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
input	Desired cursor position in the connected host presentation space.

Return Properties

This function returns neither a value nor an object.

Remarks

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1. This function is equivalent to HLLAPI Function Number 40.

14.1.18 wait

The wait function checks the status of the host-connected presentation space. If the session is waiting for a host response, the wait function causes hllapi.js to wait up to 1 minute to see if the condition clears.

3270	5250
Yes	Yes

Prerequisite Calls

connectPresentationSpace

Call Parameters

Parameter name	Explanation
success	A callback function parameter that gets executed if the session is not currently waiting for a host response.
failed	A callback function parameter that gets executed when the 1 minute time-out has elapsed.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The wait function was successful.
1	Your program is not connected to a host session.

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Remarks

1. This function is equivalent to HLLAPI Function Number 4.

14.2 hllapi.js Properties

The following Properties are defined by hllapi.js. For information on any particular property, please refer to the following links:

- const
- params

14.2.1 hllapi.js params Property

The 'params' property allows to get and set the Session Options values for the connected Presentation Space, by accessing its member properties. Their default values are listed in the following table:

Member Name	Default Value
searchFrom	SRCHALL
searchDir	SRCHFRWD
str	STRLEN
eot	0
pause	FPAUSE
attrb	NOATTRB
sndrcv	NOQUIET
timeout	0
esc	'@'
reset	AUTORESET
wait	TWAIT
eab	NOEAB
xlate	NOXLATE
blank	BLANK
display	DISPLAY
puteab	NOPUTEAB
retry	RETRY

14.2.2 hllapi.js Constants

The following constants are defined for hllapi.js, which can be accessed through the 'const' property:

Name	Value
STRLEN	0
STREOT	1

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Name	Value
EOT	0
SRCHALL	0
SRCHFROM	1
SRCHFRWD	0
SRCHBKWD	1
NOATTRB	0
ATTRB	1
NULLATTRB	2
FPAUSE	0
IPAUSE	1
NOQUIET	0
QUIET	1
TIMEOUT	0
ESC	'@'
AUTORESET	0
NORESET	1
CONLOG	0
CONPHYS	1
TWAIT	0
LWAIT	1
NWAIT	2
NOEAB	0
EAB	1
NOXLATE	0
XLATE	1
BLANK	0
NOBLANK	1
DISPLAY	0
NODISPLAY	1
NOPUTEAB	0
PUTEAB	1
RETRY	0
NORETRY	1

15 Appendix G - hostsurfer.js Reference

The HostSurfer class, implemented in hostsurfer.js javascript file, exposes the following interface:

- HostSurfer Properties
- HostSurfer Methods
- HostSurfer Events

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15.1 constructor

The constructor must be called to initialize a HostSurfer instance. It can be invoked without parameters, as they are all optional.

```
var hs = new zScope.HostSurfer({
	view: {
		id: "outputContainer"
	},
	term: {
		url: "https://myzscopeserver/myconnection/"
		float: { ... }
	},
	rules: {
		baseUrl: "/myrules"
		paths: ["rule1", "rule2"..., "ruleN"]
	}
});
```

Call Parameters

Parameter name	Explanation
view	Specifies where the HTML rendering will be placed.
term	Specifies the parameters for the terminal emulation to be used and its layout.
rules	Indicates the screen rules information associated with the application.

Attributes for the 'view' parameter:

Attribute name	Explanation
id	Indicates the HTML element ID where the rendering for the underlying screen will be placed.

Attributes for the 'term' parameter:

Attribute name	Explanation
url	An url pointing to a z/Scope Anywhere connection.
float	A JSON with the coordinates where a floating panel with the terminal emulation will be placed. If this parameter is not specified, the terminal emulation is embedded on the page. It accepts the top, bottom, left, right, width and height attributes.

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Attributes for the 'rules' parameter:

Attribute name	Explanation
baseUrl	The base URL where the screen-rule files will be loaded from. If omitted, is assumed that files are located in the root directory.
paths	An array with the screen-rule files to load.

Return Object

This function returns a HostSurfer object

15.2 HostSurfer Properties

The following properties are defined in HostSurfer class. For information on any particular property, please refer to the following links:

- actions
- apps
- checkRulesOnPsUpdate
- cursorPos
- data
- defaultPage
- defaultRoute
- hllapi
- key
- prevScreen
- screen
- screenNotificationDelay
- screenPath
- screens
- send
- state

15.2.1 actions

The actions property returns the list of action objects associated with the current screen.
The screen actions are declared as properties of the actions property within a rule declaration.

Remarks
Read only property.

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15.2.2 apps

The apps property returns the list of HostSurfer applications available to the user, defined within the HostSurfer instance of the terminal emulator frame.

Each element of apps object array, has the following properties:

Property name	Explanation
desc	The title of the application, as will be showed in the emulator panel application menu, as well as window bar.
link	The relative path to the main web page.
panel	A JS object that defines the container jsPanel properties and features within which the web application will be run.
autostart	Boolean value indicating whether the application is run by default.

'panel' has the following properties:

Property name	Explanation
width	Panel width, as number type.
height	Panel height, as number type.
features	Specification of visual appearance of the panel control on which the web application runs. Please refer to next table.
position	Position property can be set with a string value that allows to set some position properties in one string. Following "substrings" separated by a space can be used: basic position This can be one of the values `left-top`, `left-center`, `left-bottom`, `center-top`, `center`, `center-bottom`, `right-top`, `right-center`, `right-bottom`. offsetX The added string represents either a number or a percentage value that is used to set `option.position.offsetX`. offsetY The added string represents either a number or a percentage value that is used to set `option.position.offsetY`.
toolBarClass	The toolbar css class designation

'features' has the following properties:

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Property name	Explanation
draggable	Boolean type, indicates whether the panel can be dragged over the browser client area.
hasToolbar	Boolean type, indicates whether the panel has a toolbar.
maximized	Boolean type, indicates whether the panel is shown maximized.
resizeit	Boolean type, indicates whether the panel can be resized.
headerControls	A collection of properties that indicates which controls are removed from the header bar

Remarks
Read only property.

15.2.3 checkRulesOnPsUpdate

The checkRulesOnPsUpdate property allows developers to enable/disable the rule checking when the host presentation space is updated. This is useful when you receive several screens before an unlock.

Default
The default value for this property is *false*.

15.2.4 cursorPos

The cursorPos property returns a sequential integer number, which represents the current screen position where the cursor is located.

Remarks
Read only property.

15.2.5 data

The data property returns a collection of fields (including both dynamic and user-defined in rules). A field property can be an array containing field properties. In such case, the inner fields are accessed by index instead of by name.
User-defined fields are created from the rules associated to a screen. For further details, please refer to hostSurfer.js Rules.
Fields dynamically retrieved by HostSurfer from the underlying Presentation Space are named under the convention RrnCcn, where rn and cn are the row and column coordinates of the field within the screen. For example, R20C55 is a dynamically created field located at row 20 and column 55 of the Presentation Space.
Any field object from the data property can be seamlessly accessed in code and kept synchronized with the underlying host screen.

Remarks
Read only property.

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15.2.6 defaultPage

The defaultPage property allows to get and set the default page of the HostSurfer application.

See also
defaultRoute

15.2.7 defaultRoute

The defaultRoute property allows to get and set the default route of the HostSurfer application.

See also
defaultPage

15.2.8 hllapi

The hllapi property is the instance of hllapi.js application programming interface, through which HostSurfer establishes communication with the underlying host screen.

Remarks
Read only property.

15.2.9 key

The key property enumerates a collection of methods to send keystrokes to the host screen by Javascript.
These methods are associated to the underlying terminal type, and each one represents a different keystroke.

The following example shows how to send ENTER ('@E'):

```
hs.key.enter();
```

The following table lists the complete keystroke collection for 3270 and 5250 terminals, with the HLLAPI squence depending on the terminal type:

Name	Keystrokes / HLLAPI sequence	3270	5250
enter	'@E'	*	*
clear	'@C'	*	*
reset	'@R'	*	*
attn	'@AQ'	*	*
sysreq	'@AH'	*	*
eraseeof	'@AF'	*	*
erasefield	'@F'		*
fieldminus	'@A-'		*
fieldplus	'@A+'		*

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fieldexit	'@AE'		*
help	'@H'		*
print	'@P'		*
pageup	'@u'		*
pagedown	'@v'		*
backspace	'@<'	*	*
backtab	'@B'	*	*
tab	'@T'	*	*
pa1	'@x'	*	*
pa2	'@y'	*	*
pa3	'@z'	*	*
pf1	'@1'	*	*
pf2	'@2'	*	*
pf3	'@3'	*	*
pf4	'@4'	*	*
pf5	'@5'	*	*
pf6	'@6'	*	*
pf7	'@7'	*	*
pf8	'@8'	*	*
pf9	'@9'	*	*
pf10	'@a'	*	*
pf11	'@b'	*	*
pf12	'@c'	*	*
pf13	'@d'	*	*
pf14	'@e'	*	*
pf15	'@f'	*	*
pf16	'@g'	*	*
pf17	'@h'	*	*
pf18	'@i'	*	*
pf19	'@j'	*	*
pf20	'@k'	*	*
pf21	'@l'	*	*

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pf22	'@m'	*	*
pf23	'@n'	*	*
pf24	'@o'	*	*

The following table lists the complete keystroke collection for VT terminals:

Name	Keystrokes / HLLAPI sequence
enter	'@E'
left	'@L'
right	'@Z'
print	'@P'
tab	'@T'
up	'@U'
down	'@V'
backspace	'@<'
backtab	'@Q@a'
DEL	'@M@z'
f1	'@1'
f2	'@2'
f3	'@3'
f4	'@4'
f5	'@5'
f6	'@6'
f7	'@7'
f8	'@8'
f9	'@9'
f10	'@a'
f11	'@b'
f12	'@c'
f13	'@d'
f14	'@e'
f15	'@f'
f16	'@g'

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f17	'@h'
f18	'@i'
f19	'@j'
f20	'@k'
pf1	'@M@a'
pf2	'@M@b'
pf3	'@M@c'
pf4	'@M@d'
newline	'@N'
numPad0	'@M@0'
numPad1	'@M@1'
numPad2	'@M@2'
numPad3	'@M@3'
numPad4	'@M@4'
numPad5	'@M@5'
numPad6	'@M@6'
numPad7	'@M@7'
numPad8	'@M@8'
numPad9	'@M@9'
numPadMinus	'@M@-'
numPadComma	'@M@,'
numPadPeriod	'@M@.'
numPadEnter	'@M@e'
find	'@M@f'
insert	'@M@i'
remove	'@M@r'
select	'@M@s'
prevScreen	'@M@p'
nextScreen	'@M@n'
NUL	'@M@ '
SOH	'@M@A'
STX	'@M@B'

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ETX	'@M@C'
EOT	'@M@D'
ENQ	'@M@E'
ACK	'@M@F'
BEL	'@M@G'
BS	'@M@H'
HT	'@M@I'
LF	'@M@J'
VT	'@M@K'
FF	'@M@L'
CR	'@M@M'
SO	'@M@N'
SI	'@M@O'
DLE	'@M@P'
DC1	'@M@Q'
DC2	'@M@R'
DC3	'@M@S'
DC4	'@M@T'
NAK	'@M@U'
SYN	'@M@V'
ETB	'@M@W'
CAN	'@M@X'
EM	'@M@Y'
SUB	'@M@Z'
ESC	'@M@u'
FS	'@M@v'
GS	'@M@w'
RS	'@M@x'
US	'@M@y'

Remarks
Read only property.

See also
- send method.

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- sendKeys method.

15.2.10 prevScreen

Returns the previous screen object in the screens stack.

Remarks
Read only property.

15.2.11 screen

Returns the last screen object. If there are no screens in the screens stack, it creates a new screen object and returns it.

Remarks
Read only property.

15.2.12 screenNotificationDelay

The screenNotificationDelay property lets you define a delay between a screen update and its notification. The property value is expressed in milliseconds.

Default
The default value for this property is *0*.

15.2.13 screenPath

This property returns a string made of a concatenation of a period symbol ('.') followed by the screen id (for each screen object in the screens array). It denotes the ordered path of screens represented by their id's, from the first to the current screen according to the navigation order. If the screen doesn't have an id, the screen will appear as '*undefined*'.

Remarks
Read only property.

15.2.14 screens

Returns an array of screens. The first and last elements in the array correspond to the first and current screen in the application, being all the elements in the array arranged according to the navigation order. That is, the array returned by this property acts as a stack of screen objects, so that the next screen in the navigation order is placed on top.

Remarks
Read only property.

15.2.15 send

The send object property accepts the following methods, issuing the corresponding AID keystroke to the underlying host screen.
Comprehensive list of method names and the corresponding AID keys are listed below.

Method name	Host AID key	Description
enter	@E	Enter key

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Method name	Host AID key	Description
clear	@C	Clear key
reset	@R	Reset key
attn	@AQ	Attention
sysreq	@AH	System request key
fieldminus	@A-	Field Minus key (F-)
fieldplus	@A+	Field Plus key (F+)
fieldexit	@AE	Field exit key
eraseeof	@AF	Erase to end of field
backspace	@<	Backspace key
backtab	@B	Backtab (Left Tab) key
erasefield	@F	Erase field key
help	@H	Help request key
print	@P	Print request key
pgup	@u	Page up key
pgdown	@v	Page down key
tab	@T	Tab (Right Tab) key
pa1	@x	PA-1 key
pa2	@y	PA-2 key
pa3	@z	PA-3 key
pf1	@1	PF-1 key
pf2	@2	PF-2 key
pf3	@3	PF-3 key
pf4	@4	PF-4 key
pf5	@5	PF-5 key
pf6	@6	PF-6 key
pf7	@7	PF-7 key
pf8	@8	PF-8 key
pf9	@9	PF-9 key
pf10	@a	PF-10 key
pf11	@b	PF-11 key
pf12	@c	PF-12 key
pf13	@d	PF-13 key
pf14	@e	PF-14 key
pf15	@f	PF-15 key
pf16	@g	PF-16 key
pf17	@h	PF-17 key

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Method name	Host AID key	Description
pf18	@i	PF-18 key
pf19	@j	PF-19 key
pf20	@k	PF-20 key
pf21	@l	PF-21 key
pf22	@m	PF-22 key
pf23	@n	PF-23 key
pf24	@o	PF-24 key

Call Parameters

This function does not accept any call parameters.

Return Object

This function returns the calling instance containing the enumerated members listed above

15.2.16 state

The state property allows the developer to make use of custom session-level variables. These variable can be defined as properties of the persistent state property object.

15.3 HostSurfer Methods

For information about a particular hostSurfer.js Member Function, please refer to the following links:

- close
- getText
- go
- init
- navigate
- off
- on
- register
- sendKeys
- wait
- waitFor
- waitForBreak
- waitForLoop

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15.3.1 close

The close method closes the HostSurfer application container (only when the HostSurfer application runs embedded in a terminal emulation under z/Scope Anywhere environment).

Call Parameters

This method does not accept any call parameters.

Return Object

This method does not return any object.

15.3.2 getText

The getText method returns the text of the specified position and length on the screen.

There are two ways to invoke this method:

getText(*position, length*)
getText(*row, column, length*)

Call Parameters

Parameter name	Explanation
position	Numeric value which represents the position of the first character to be retrieved on the host screen. If the "row, column, length" option is used, this value will be calculated automatically, using *(row - 1) * screen.rowWidth + col* formula.
length	The length of the screen text to be retrieved.
row	Screen row coordenate of the first character to retrieve. The base number is 1.
column	Screen column coordenate of the first character to retrieve. The base number is 1.

Return Object

getText returns a string object corresponding to the screen text, as determined by the coordinates and length parameters.

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15.3.3 go

The go function makes the application navigate to the specified 'action' parameter.

Call Parameters

Parameter name	Explanation
action	The target action the web application has to navigate to.
chained	A Boolean type parameter indicating whether navigation is 'chained', that is, if true, the same 'action' will be searched for in the target and, if found, executed again, until no matching action is found.

Return Object

This function does not return any object.

15.3.4 navigate

The navigate function makes the application navigate to the specified 'action' parameter.

Call Parameters

Parameter name	Explanation
action	The target action the web application has to navigate to. Navigation is chained, which means the same action will be searched for in the target and, if found, executed.

Return Object

This function does not return any object.

15.3.5 off

The off function unregisters an external event from the HostSurfer instance, provided the event has been previously registered by the same execution context.

Call Parameters

Parameter name	Explanation
event	The name of the event to be unregistered.

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Return Object

This function does not return any object.

15.3.6 on

The on function registers an external event along with its callback function with the HostSurfer instance, associating it to the caller execution context.

Call Parameters

Parameter name	Explanation
event	The name of the event to be registered.
callback	The callback function assigned to the event.

Return Object

This function does not return any object.

15.3.7 register

The register function allows rules to be added to the current screen rules array. If a parent rule is indicated in the second parameter, the rule will be added to the parent rule array, thus building a hierarchy.

Call Parameters

Parameter name	Explanation
rule	A rule to be added to the screen rules array.
parentRule	If defined, the new rule will be added as an element to the parentRule' rules array, rather than to then screen rules array. In any case, along every rule parent-child relationship, there is a higher level parentRule that belongs to the screen rules array.

Return Object

This function does not return any object.

15.3.8 sendKeys

The sendKeys method is a wrapper of the hllapi.js sendKey function. It is used to send either a keystroke or a string of keystrokes to the host screen.
You have to define the string of keystrokes sent with the calling data string parameter. The keystrokes appear to the target session as though they were entered by the terminal operator. You can also send all attention identifier (AID) keys such as Enter and so on. All

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host fields that are input-protected or are numeric only, must be treated accordingly.

Call Parameters

Parameter name	Explanation
value	A string of keystrokes, maximum 255. Uppercase and lowercase ASCII characters are represented literally. Function keys and shifted function keys are represented by mnemonics.

Return Properties

Property name	Explanation
returnCode	A numeric code indicating the execution status of the function. Please refer to the Return Code table below for all possible values.

Return Code

The following values are defined for the 'returnCode' property:

Return Code	Explanation
0	The keystrokes were sent; status is normal.
1	Your program is not connected to a host session.

Remarks

1. If the host is busy, input might be rejected.
2. The keystroke strings, including the AID key, are sent to the host via multiple paths. Each path sends the strings before the first AID key (or including the AID key). HLLAPI adjusts the string length and the start position of each path. For a host application program, any keystroke might be lost by the AID key process. Therefore, you should not send a keystroke list that includes plural AID keys.
3. During the @P (Print) or @A@T (Print Presentation Space) process, all requests that update the host screen are rejected. If the presentation space is busy or the interruption request occurs during the print request, the mnemonic @A@R (Device Reset - Cancel to print the Presentation Space) cancels the request and resets the status.

15.3.9 wait

The wait method will wait until a new data stream from the host is received or for a host screen unlock.

Call Parameters

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Parameter name	Explanation
success	Callback assigned to execute when the wait finishes successfully.
failed	Callback assigned to execute when there is an error or times out.

Return Object

This method does not return any object.

See also

- waitFor method.
- waitForBreak method.
- waitForLoop method.

15.3.10 waitFor

The waitFor method waits for a new data stream from the host and for a match to occur.

This method works like the wait method, but expects a match. If the match doesn't occur, it waits for a new change or times out.

If there are two or more matches defined, waitFor selects the best match and calls the associated callback function.

Call Parameters (mode 1)

Parameter name	Parameter type	Explanation
match	String or RegExp	Represents the value to match in the received stream.
success	function	Callback to be called when the match occurs.
fail	function	Callback to be called when the match fails.
timeout	integer	Time to wait for the match, in milliseconds.

Call Parameters (mode 2)

Parameter name	Parameter type	Explanation
matches	Javascript object	An array containing a set of matching objects.

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Parameter name	Parameter type	Explanation
	array	
fail	function	Callback to be called when the match fails.
timeout	integer	Time to wait for the match, in milliseconds.

Matching Object Structure

Parameter name	Parameter type	Explanation
match	String or RegExp	Represents the value to match in the received stream.
function	function	Callback to be called when the match occurs.

Return Object

This function does not return any object.

See also

- wait method.
- waitForBreak method.
- waitForLoop method.

15.3.11 waitForBreak

The waitForBreak method ends the waitForLoop cycle, if it exists.

Call Parameters

This method does not take any call parameters.

Return Object

This method does not return any object.

See also

- wait method.
- waitFor method.
- waitForLoop method

15.3.12 waitForLoop

The waitForLoop method initiates a waitFor cycle to retrieve asynchronous screens (regardless the order in which the screens arrive).

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Unlike waitFor method, waitForLoop processes the matched rule and continues running, waiting for a new match.
The waitForLoop matching cycle can be terminated by calling waitForBreak.

Call Parameters

Parameter name	Parameter type	Explanation
matches	Javascript object array	An array containing a set of matching objects.
fail	function	Callback to be called when the match fails.
timeout	integer	Time to wait for the match, in milliseconds.

Return Object

This method does not return any object.

See also

- wait method.
- waitFor method.
- waitForBreak method.

15.4 HostSurfer Events

hostSurfer.js triggers the following events, to which HostSurfer application code can subscribe to.

- fldUpdate
- pageLocked
- pageUnlocked
- ready
- ruleSelected

15.4.1 fldUpdate

The HostSurfer instance triggers a fldUpdate when a field of its 'data' property is updated from the underlying screen.

15.4.2 pageLocked

When the underlying screen changes, HostSurfer instance triggers a pageLocked event to signal the transition, reflecting the locked state of the terminal-based screen.

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15.4.3 pageUnlocked

pageUnlocked is triggered to signal both the transition to the unlocked state of the underlying screen after it has been changed, as well as the finalization of a chained action.

15.4.4 ready

ready event is triggered once the HostSurfer instance has been initialized and connected to the host-based application screen.

15.4.5 ruleSelected

ruleSelected event is triggered whenever HostSurfer verifies whether there is a Rule that satisfies its 'match' condition for the current screen.

16 Appendix H - HostSurfer Demos Source Code

Enter topic text here.

16.1 Building a Simple Example Application with Handlebars templates

Enter topic text here.

16.1.1 Creating the index.html page

There are the files used to build this example step:

- index.html
- index.css
- styles.css
- index.js

16.1.1.1 index.html

The complete code for index.html used in Creating the Index.html page is:

```
<!DOCTYPE html>
<html>
<head>
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-
scale=1, user-scalable=no">
    <title>HostSurfer Application Example</title>
    <link rel="stylesheet" href="css/index.css" type="text/css"/>
    <link rel="stylesheet" href="css/styles.css" type="text/css"/>
    <script src="http://zanywhere.cybelesoft.com/js/terminal.min.js" type="text/
javascript"></script>
    <script src="js/index.js"></script>
</head>
<body>
  <div class="apppnl" id="hs-view"></div>
  <div class="apppnl" id="logbar">Messages will be displayed below:
      <span style="float:right"><input type="checkbox" id="showFields"
checked="checked" /> <label for="showFields">show screen fields</label>
```

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```
      <button onclick="clearlog()"> Clear log </button></span>
  </div>
  <div class="apppnl" id="log"></div>
</body>
</html>
```

16.1.1.2 index.css

The complete code for index.css used in Creating the Index.html page is:

```
body {
    background-color: #FFFFFF;
    font-family: arial, sans-serif;
}
div.apppnl {
    position: relative;
    display: block;
    width: 802px;
    max-width: 100%;
    margin: auto;
    margin-top: 10px;
    overflow-y: auto;
    border: solid 1px #CCCCCC;
}
div#hs-view {
    height: 720px;
    padding: 0px;
}
div#logbar {
    overflow: hidden;
    border: none;
    font-size: 10pt;
}
div#logger {
    height: 120px;
    padding: 5px;
    font-size: 8pt;
}
```

16.1.1.3 styles.css

The complete code for styles.css used in Creating the Index.html page is:

```
:root {
  --app-height: 720px;
}
html {
    height: 100%;
    width: 100%;
    margin: 0px;
}
body {
    height: 100%;
    font-family: sans-serif;
    background-color: #ffffff;
    margin-top: 0px;
```

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```
    margin-left: auto;
    margin-right: auto;
    margin-bottom: 0px;
    padding: 0px;
    max-width: 920px;
    max-height: 100vh;
    max-height: var(--app-height);
    box-sizing: border-box;
}
.fullbox {
    min-height: 100%;
    display: block;
}
/*------- header ------*/
.fullbox > .header > .title {
    padding: 10pt;
    padding-top: 20pt;
    padding-left: 12pt;
    margin: 0;
    width: 100%;
    max-width: 100%;
    text-align: left;
    background-color: #000068;
    font-family: arial, sans-serif;
    font-size: 15pt;
    color: #FFFFFF;
    box-sizing: border-box;
}
.fullbox > .header > .row {
    margin: 0px;
    margin-top: 1px;
    display: block;
    width: 100%;
}
.fullbox > .header > .row > .item {
    font-size: 10pt;
    background-color: #0066CC;
    color: #FFFFFF;
    text-decoration: none;
    white-space: nowrap;
    text-align: center;
    cursor: pointer;
    margin: 0pt;
    border-left: solid 1px #FFFFFF;
    padding-top: 5pt;
    padding-bottom: 5pt;
    display: inline-block;
    box-sizing: border-box;
}
    .fullbox > .header > .row > .item:hover {
        background-color: #000068;
    }
.fullbox > .header > .row > .item[disabled='disabled'],
.fullbox > .header > .row > .item[disabled='disabled']:hover {
    background-color: #0066CC;
    color: #CCCCCC;
    cursor: default;
```

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```
}
.fullbox > .header > .row > .item:nth-child(1) {
    border-left: 0px;
}
.fullbox > .header > .row > .item.selected,
.fullbox > .header > .row > .item.selected:hover {
    background-color: #CC0000;
    cursor: default;
}
/*------- main ------*/
.fullbox > .main {
    height: calc(100vh - 171px);
    height: calc(var(--app-height) - 171px);
    display: block;
    overflow: auto;
}
.fullbox.nomenu > .main {
    height: calc(100vh - 113px);
    height: calc(var(--app-height) - 113px);
}
/*------- footer ------*/
.fullbox > .footer {
    padding: 4px;
    margin: 0;
    width: 100%;
    text-align: right;
    background-color: #000068;
    color: #FFFFFF;
    font-size: 8pt;
    box-sizing: border-box;
}
.fullbox > .footer span {
    background-color: #F0F0F0;
    color: #000068;
    font-size: 10pt;
    padding-top: 5pt;
    padding-bottom: 5pt;
    padding-left: 10pt;
    padding-right: 10pt;
    margin: 5pt;
    border-radius: 2pt;
    display: inline-block;
    box-sizing: inherit;
    cursor: pointer;
    box-shadow: 1px 1px 3px rgba(0,0,0,.25);
}
.fullbox > .footer span:hover {
    background-color: #F8F8F8;
    color: black;
}
.fullbox > .footer span[disabled='disabled'],
.fullbox > .footer span[disabled='disabled']:hover {
    background-color: rgba(255, 255, 255, .55);
    color: #333333;
    cursor: default;
}
/*------------------end page structure-------------------*/
```

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```
.floatbox {
    position: absolute;
    display: inline-block;
    padding: 20pt;
    left: 50%;
    top: 50%;
    transform: translate(-50%,-50%);
    border: none;
}
.verticalTable {
    width: auto;
    text-align: left;
    font-size: 10pt;
    color: #000068;
    border: none;
    padding: 15pt;
    margin-right: auto;
    margin-left: auto;
    box-sizing: border-box;
}
.verticalTable tr > * > * {
    margin: 3pt;
}
.verticalTable input[type='text'],
.verticalTable input[type='password'] {
    box-sizing: border-box;
    border-radius: 2px;
    border-width: 1px;
    border-color: #C0C0C0;
    border-style: solid;
    padding: 5pt;
    outline-width: 1px;
}
.verticalTable input[type='button'] {
    cursor: pointer;
    padding: 5pt;
    padding-left: 10pt;
    padding-right: 10pt;
    margin-left: 5pt;
    margin-right: 5pt;
}
*::-ms-backdrop, .verticalTable {
    margin: auto;
    position: relative;
    min-height: 1px;
}
.screenmsg {
    font-size: 8pt;
}
.nobreak {
    white-space: nowrap;
}
/*-------------------------------------------------------*/
.hidden {
    visibility: hidden;
}
.center {
```

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```
    text-align: center !important;
}
/*-------- loading --------*/
#divLoading
{
    display: none;
}
#divLoading.show
{
    display: block;
    position: fixed;
    z-index: 100;
    background-image: url('../images/wait.gif');
    background-repeat: no-repeat;
    background-position: center;
    left: 0;
    bottom: 0;
    right: 0;
    top: 0;
}
#loadinggif.show
{
    left: 50%;
    top: 50%;
    position: absolute;
    z-index: 101;
    width: 32px;
    height: 32px;
    margin-left: -16px;
    margin-top: -16px;
}
.fullwidth {
    width: 100%;
    padding-left: 30pt;
    padding-right: 30pt;
    box-sizing: border-box;
}
.button {
    border-radius: 2px;
    border: solid 1px #C0C0C0;
    padding: 5pt;
    outline-width: 1px;
    background-color: #F0F0F0;
    color: #000000;
    font-size: 10pt;
    padding-left: 10pt;
    padding-right: 10pt;
    margin: 5pt;
    display: inline-block;
    box-sizing: inherit;
    cursor: pointer;
}
.button:hover {
    background-color: #F8F8F8;
}
@media screen and (max-height: 600px) {
    .fullbox {
```

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```
            min-height: 600px;
        }
    }
```

16.1.1.4 index.js

The complete code for index.js used in Creating the Index.html page is:

```
    function log(msg) {
        var logPane = document.getElementById('log');
        logPane.innerHTML += msg + "<br/>";
        logPane.scrollTop = logPane.scrollHeight;
    }
    function clearlog() {
        document.getElementById('log').innerHTML = '';
    }
    var hs = new zScope.HostSurfer({
        term: {
            url: "http://zanywhere.cybelesoft.com/hsdemo/",
            float: { top: 5, right: 5, width: 600, height: 400 }
        },
        view: {
            id: "hs-view"
        }
    });
    hs.on('ready', function () { log('Ready!'); });
    hs.on('pageLocked', function () { log('Page locked.'); });
    hs.on('pageUnlocked', function () { log('Page unlocked.'); });
    hs.on('ruleSelected', function (value) {
        if (document.getElementById("showFields").checked) {
            for (field in hs.data) {
                if (hs.data[field] != "") {
                    if (typeof hs.data[field] == "object") {
                        log(field + ": " + JSON.stringify(hs.data[field]));
                    } else {
                        log(field + ": '" + hs.data[field] + "'");
                    }
                }
            }
        }
        if (value) {
            log('Rule selected: ' + value.id);
        } else {
            log('No matching rule');
        }
    });
```

16.1.2 Adding embedded Screen Rules

This is the file modified to build this example step:

- index.js

16.1.2.1 index.js

The complete code for index.js used in Adding embedded Screen Rules is:

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```
function log(msg) {
    var logPane = document.getElementById('log');
    logPane.innerHTML += msg + "<br/>";
    logPane.scrollTop = logPane.scrollHeight;
}
function clearlog() {
    document.getElementById('log').innerHTML = '';
}
var hs = new zScope.HostSurfer({
    term: {
        url: "http://zanywhere.cybelesoft.com/hsdemo/",
        float: { top: 5, right: 5, width: 600, height: 400 }
    },
    view: {
        id: "hs-view"
    }
});
hs.on('ready', function () { log('Ready!'); });
hs.on('pageLocked', function () { log('Page locked.'); });
hs.on('pageUnlocked', function () { log('Page unlocked.'); });
hs.on('ruleSelected', function (value) {
    if (document.getElementById("showFields").checked) {
        for (field in hs.data) {
            if (hs.data[field] != "") {
                if (typeof hs.data[field] == "object") {
                    log(field + ": " + JSON.stringify(hs.data[field]));
                } else {
                    log(field + ": '" + hs.data[field] + "'");
                }
            }
        }
    }
    if (value) {
        log('Rule selected: ' + value.id);
    } else {
        log('No matching rule');
    }
});
hs.register({
    id: 'cics',
    match: [{ text: "CICS", row: 5, col: 1 }],
    apply: {
        handler: function (hs) {
            if (hs.screens.length==1) { hs.enter(); }
        }
    }
});
hs.register({
    id: 'bluecardLogin',
    match: [
      { text: "USERNAME", row: 19, col: 55 },
      { text: "PASSWORD", row: 20, col: 55 }
    ],
    apply: {
        fields: [
            { name: 'shopsLastUpdate', row: 18, col: 29, len: 8 },
            { name: 'accountsLastUpdate', row: 18, col: 62, len: 8 },
```

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```
                { name: 'username', row: 19, col: 67, len: 6 },
                { name: 'password', row: 20, col: 67, len: 6 },
                { name: 'newPassword', row: 21, col: 67, len: 6 }
            ],
        render: {
            view: {
                template: "<div style='font-size: 10pt; margin: 5px'>" +
                    "<h1>Blue Card / User Login</h1>" +
                    "<p> </p>" +
                    "<p>SHOPS UPDATED UNTIL {{hs.data.shopsLastUpdate}} &mdash; " +
                    "ACCOUNTS UPDATED UNTIL {{hs.data.accountsLastUpdate}}</p>" +
                    "<p> </p>" +
                    "<p>Username: <input type='text' size=13 maxlength=6 hs-
field='hs.data.username'/></p>" +
                    "<p>Password: <input type='password' size=13 maxlength=6 hs-
field='hs.data.password'/></p>" +
                    "<p>New Password: <input type='password' size=13 maxlength='6' hs-
field='hs.data.newPassword'/></p>" +
                    "<p> </p>" +
                    "<p><button id='login_btn' tabindex=0 onclick='hs.navigate(\"main
\")'>Sign in</button> " +
                    "<button id='exit_btn' tabindex=0 onclick='hs.navigate(\"exit
\")'>Exit</button></p></div>"
                }
            },
            actions: {
                main: function (hs) { hs.enter(); },
                exit: function (hs) { hs.pf1(); }
            }
        });
```

16.1.3 Loading Screen Rules from external files

There are the files modified and added to build this example step:

- index.js
- cics.js
- bluecardlogin.js

16.1.3.1 index.js

The complete code for index.js used in Adding embedded Screen Rules is:

```
    function log(msg) {
        var logPane = document.getElementById('log');
        logPane.innerHTML += msg + "<br/>";
        logPane.scrollTop = logPane.scrollHeight;
    }
    function clearlog() {
        document.getElementById('log').innerHTML = '';
    }
    var hs = new zScope.HostSurfer({
        term: {
            url: "http://zanywhere.cybelesoft.com/hsdemo/",
            float: { top: 5, right: 5, width: 600, height: 400 }
        },
```

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```
        rules: {
            baseUrl: 'rules/',
            paths: ['cics', 'bluecardLogin']
        },
        view: {
            id: "hs-view"
        }
    });
    hs.on('ready', function () { log('Ready!'); });
    hs.on('pageLocked', function () { log('Page locked.'); });
    hs.on('pageUnlocked', function () { log('Page unlocked.'); });
    hs.on('ruleSelected', function (value) {
        if (document.getElementById("showFields").checked) {
            for (field in hs.data) {
                if (hs.data[field] != "") {
                    if (typeof hs.data[field] == "object") {
                        log(field + ": " + JSON.stringify(hs.data[field]));
                    } else {
                        log(field + ": '" + hs.data[field] + "'");
                    }
                }
            }
        }
        if (value) {
            log('Rule selected: ' + value.id);
        } else {
            log('No matching rule');
        }
    });
```

16.1.3.2 cics.js

The complete code for cics.js used in Loading Screen Rules from external files is:

```
(function () {
    zScope.hostSurfer.register({
        id: 'cics',
        match: [{ text: "CICS", row: 5, col: 1 }],
        apply: {
            handler: function (hs) {
                if (hs.screens.length==1) {
                    hs.enter();
                }
            }
        }
    });
})();
```

This file have to be included into the screen rule repository declared as *baseUrl* HostSurfer constructor parameter attribute.

16.1.3.3 bluecardlogin.js

The complete code for bluecardlogin.js used in Loading Screen Rules from external files is:

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```
(function () {
    zScope.hostSurfer.register({
        id: 'bluecardLogin',
        match: [
            { text: "USERNAME", row: 19, col: 55 },
            { text: "PASSWORD", row: 20, col: 55 }
        ],
        apply: {
            fields: [
                { name: 'shopsLastUpdate', row: 18, col: 29, len: 8 },
                { name: 'accountsLastUpdate', row: 18, col: 62, len: 8 },
                { name: 'username', row: 19, col: 67, len: 6 },
                { name: 'password', row: 20, col: 67, len: 6 },
                { name: 'newPassword', row: 21, col: 67, len: 6 }
            ],
            render: {
                view: {
                    template:
                        "<div style='font-size: 10pt; margin: 5px'>" +
                        "<h1>Blue Card / User Login</h1>" +
                        "<p> </p>" +
                        "<p>{{hs.data.R18C9}} {{hs.data.commerceLastUpdate}} &mdash; "
+
                        "{{hs.data.R18C39}} {{hs.data.accountsLastUpdate}}</p>" +
                        "<p> </p>" +
                        "<p>Username: <input type='text' size=13 maxlength=6 hs-
field='hs.data.username'/></p>" +
                        "<p>Password: <input type='password' size=13 maxlength=6 hs-
field='hs.data.password'/></p>" +
                        "<p>New Password: <input type='password' size=13 maxlength='6'
hs-field='hs.data.newPassword'/></p>" +
                        "<p> </p>" +
                        "<p><button id='login_btn' tabindex=0
onclick='hs.navigate(\"main\")'>Sign in</button> " +
                        "<button id='exit_btn' tabindex=0 onclick='hs.navigate(\"exit
\")'>Exit</button></p></div>"
                }
            },
            actions: {
                main: function (hs) { hs.enter(); },
                exit: function (hs) { hs.pf1(); }
            }
        }
    });
})();
```

This file have to be included into the screen rule repository declared as *baseUrl* HostSurfer constructor parameter attribute.

16.1.4 Using HTML page templates

There are the files modified and added to build this example step:

- bluecardlogin.js
- login.html

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16.1.4.1 bluecardlogin.js

The complete code for bluecardlogin.js used in Using HTML page templates is:

```
(function () {
    zScope.hostSurfer.register({
        id: 'bluecardLogin',
        match: [
            { text: "USERNAME", row: 19, col: 55 },
            { text: "PASSWORD", row: 20, col: 55 }
        ],
        apply: {
            fields: [
                { name: 'shopsLastUpdate', row: 18, col: 29, len: 8 },
                { name: 'accountsLastUpdate', row: 18, col: 62, len: 8 },
                { name: 'username', row: 19, col: 67, len: 6 },
                { name: 'password', row: 20, col: 67, len: 6 },
                { name: 'newPassword', row: 21, col: 67, len: 6 }
            ],
            render: {
                view: {
                    template: 'login.html'
                }
            },
            actions: {
                main: function (hs) { hs.enter(); },
                exit: function (hs) { hs.pf1(); }
            }
        }
    });
})();
```

This file have to be included into the screen rule repository declared as *baseUrl* HostSurfer constructor parameter attribute.

16.1.4.2 login.html

The complete code for login.html used in Using HTML page templates is:

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-
scale=1, user-scalable=no">
    <title>HostSurfer Application Example</title>
    <link rel="stylesheet" href="css/styles.css"/>
</head>
<body>
    <script>
        function checkkey(e) {
            e = e || event;
            if (e.key == "Enter") {
                zScope.hostSurfer.navigate('main');
            };
        }
```

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```
    </script>
    <div class="fullbox nomenu">
    <div class="header">
        <div class="title">Blue Card / User Login</div>
    </div>
    <div class="main">
        <div class="floatbox">
            <table class="verticalTable">
                <tr>
                    <th>Username:</th>
                    <td><input type="text" size="13" maxlength="6" hs-
field="hs.data.username" onkeypress="checkkey()"/></td>
                </tr>
                <tr>
                    <th>Password:</th>
                    <td><input type="password" size="13" hs-field="hs.data.password"
maxlength="6" onkeypress="checkkey()"/></td>
                </tr>
                <tr>
                    <th>New Password:</th>
                    <td><input type="password" size="13" hs-
field="hs.data.newPassword" maxlength="6" onkeypress="checkkey()"/></td>
                </tr>
                <tr><td colspan="2"> </td></tr>
                <tr>
                    <td colspan="2" class="center">
                         <span class="button" id="login_btn" tabindex=0
onclick="hs.navigate('main')" onkeypress="checkkey()">Sign in</span>  
                         <span class="button" id="exit_btn" tabindex=0
onclick="hs.navigate('exit')">Exit</span>
                    </td>
                </tr>
            </table>
            <div class="fullwidth screenmsg nobreak center">
                <p>{{hs.data.R18C9}} {{hs.data.commerceLastUpdate}} &mdash;
{{hs.data.R18C39}} {{hs.data.accountsLastUpdate}}</p>
            </div>
        </div>
    </div>
    <div class="footer">
        <span style="visibility: hidden"> </span>
    </div>
    </div>
</body>
</html>
```

17 Appendix I - HLLAPI Reference

HLLAPI was created to handle the interface between a program written in any high-level language and a terminal emulator running on a PC. This API allows a programmer to perform programmatically the same functions that an operator can perform interacting with a terminal emulation, such as navigating on to a terminal application, transferring a file, performing queries, etc.

The z/Scope Anywhere HLLAPI, implemented for the Web World, allows web

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programmers to perform the same actions from JavaScript.

- How to use the z/Scope Anywhere HLLAPI
- HLLAPI Dictionary
- HLLAPI Methods
- HLLAPI Properties

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17.1 How to use the z/Scope Anywhere HLLAPI

Enter topic text here.

17.2 HLLAPI Dictionary

Presentation Space	Interfaz HLLAPI que representa una conexión abierta. Contiene la lista de campos de pantalla, el estado de la pantalla en sí (si está bloqueada o en wait, etc.). Adicionalmente, será el canal desde y hacia donde se enviarán comandos HLLAPI para interactuar con esa conexión en particular.
Field	Una porción de pantalla que representa un texto o un campo de edición en la pantalla del host. Cada campo tiene una coordenada, un tipo y un largo.

17.3 HLLAPI Members

Enter topic text here.

17.3.1 HLLAPI Properties

const
isLocked
on
params

17.3.2 HLLAPI Methods

Enter topic text here.

18 Purchasing z/Scope Anywhere

By purchasing a license of z/Scope Anywhere you will have access to technical support, free upgrades and updates and the activation key for advanced features.

In this section you will find information regarding the different existing licensing options that will help you to choose the type of order you need to place. Also, this section explains how to place your order and finally activate your product to enjoy all of the z/Scope Anywhere benefits.

- Licensing Information
- How to Place an Order
- Registering the z/Scope Anywhere Trial Version

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18.1 Licensing Information

When it comes to purchasing z/Scope Anywhere, there are different licensing modes. Our range of possibilities assures you that you can make the best deal.

Permanent Licenses:

The permanent licenses do not expire and have the first year Maintenance Service included.
We encourage users to renew the annual Maintenance Service contract in order to be eligible for technical support and product upgrades. The Maintenance Service fee after the first year will still be 20% of the updated price of the purchased product.

Annual Licenses:

The annual licenses are a good way of apportion the licenses investment value. It has a more affordable price than the permanent license and has the Maintenance Service always included.

Maintenance Services:

Includes Technical Support by e-mail and/or phone, which also gives access to free updates and upgrades during the covered period and our full commitment to timely fix bugs and problems.
Read more on http://www.cybelesoft.com/docs/Maintenance-Service.pdf

In all cases Cybele Software offers volume pricing according to the amount of the purchase.

If you have any other question, contact us at sales@cybelesoft.com. Our sales representatives will gladly assist you with your licensing situation.

Read More:

- Registering the z/Scope Anywhere Trial Version
- How to Place an Order

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18.2 Registering the z/Scope Anywhere Trial Version

If you downloaded z/Scope Anywhere's Trial version from our web site or a distribution site and you have already purchased a license, you must follow these steps in order to register the product:

1. Open the "Configuration Manager" tool.
2. Go to the "Server Settings" icon.
3. Go to tab "Licenses".
4. Follow the instructions to register a z/Scope Anywhere license.

Read more:

- Licensing Information
- How to Place an Order

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18.3 How to Place an Order

There are many ways to order your z/Scope Anywhere licenses:

- Place an Online Order through our Web Site:

  http://www.cybelesoft.com/buy

- Contact us at sales@cybelesoft.com. Let us know about your licensing needs and we will send you an official quotation. Our sales representatives will get in touch with you to assist you with the purchase.

- You can also call us anytime to any of these phone numbers and place the order immediately:

  Toll Free: 1-866-462-9768
  Local line: 1-302-892-9625
  Fax: 1-302-295-9995

- You can also contact us through Live Chat by pressing this icon in our website:

  and immediately have a conversation with a representative, without even having to pick up the phone.

When you buy z/Scope Anywhere, you will receive a Key to register the Trial version. For instructions on how to register z/Scope Anywhere when you purchase a license, see Registering z/Scope Trial Version.

Read more:

- Licensing Information
- Registering z/Scope Trial Version

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19 Obtaining Technical Support

Cybele Software's goal is to offer high quality products and services to increase the efficiency and ease-of-use of legacy systems. The whole Company focuses on this goal, and the results of our unique expertise are our reliable solutions. We believe passionately that modern, solid and feature-rich host access solutions can actually increase its users' productivity.

Technical support is a very important benefit to consider, especially when it comes to mission critical software solutions.

Using registered Cybele Software applications not only allows you to receive free product upgrades and updates but also the certainty that you will have our team of experienced developers and technical support representatives working hard to assist you with any issue, thus making the product much more accessible in any situation.

By Phone

We are here to help you out from monday to friday 9 a.m. to 5 p.m. eastern time on the phone numbers:

Toll Free: 1-866-462-9768
Local line: 1-302-892-9625
Fax: 1-302-295-9995

If you make your call outside this hour range, you can leave a message and we will get back to you.

By Email

You can send us an email to support@cybelesoft.com and we will write you back timely.

In Our Website

You can also contact us through Live Chat by pressing this icon in our website. Have a conversation with a representative without even having to pick up the phone.

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