Dell Wyse ThinOS

Version 8.6 Administrator's Guide

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Contents

1

Introduction

Thin clients running Dell Wyse ThinOS firmware are designed solely for optimal thin client security and performance. These efficient purpose-built thin clients are virus and malware resistant and offer ultrafast access to applications, files and network resources within Citrix, Microsoft, VMware and Dell vWorkspace environments, and other leading infrastructures. ThinOS based thin clients are self-managed, go from power-on to fully productive in seconds, and with no published API, locally accessible file system or browser, require no local McAfee Anti-Virus software or firewall to protect against viruses or malware.

About this guide

This guide is intended for administrators of thin clients running Wyse ThinOS. It provides information and detailed system configurations to help you design and manage a ThinOS environment.

Supported Products

This guide is intended for the following Dell Wyse ThinOS products:

- Wyse 3010 thin client with ThinOS (T10)
- Wyse 3020 thin client with ThinOS (T10D)
- Wyse 3030 LT thin client with ThinOS
- Wyse 3030 LT thin client with PCoIP
- Wyse 3040 thin client with ThinOS
- Wyse 3040 thin client with PCoIP
- Wyse 5010 thin client with ThinOS (D10D)
- Wyse 5010 thin client with PCoIP (D10DP)
- Wyse 5040 AIO thin client with ThinOS (5212)
- Wyse 5040 AIO thin client with PCoIP (5213)
- Wyse 5060 thin client with ThinOS
- Wyse 5060 thin client with PCoIP
- Wyse 5070 thin client with ThinOS
- Wyse 5070 thin client with PCoIP
- Wyse 5070 extended thin client with ThinOS
- Wyse 5070 extended thin client with PCoIP
- Wyse 7010 thin client with ThinOS (Z10D)

Finding the information you need in this guide

You can use either the Search window or Find toolbar to locate a word, series of words, or partial word in an active PDF document. For detailed information on using these features, refer to the Help in your PDF reader.

Technical support

To access technical resources self-service portal, knowledge base, software downloads, registration, warranty extensions/ RMAs, reference manuals, contact information and so on, visit www.dell.com/wyse/support.

What is new in ThinOS 8.6_027

The following are the new features or updates to the existing features in this release:

- Updates to ThinOS packages
  - Updated the Citrix RTME package to version 2.8.
  - Updated the VMware Horizon package to version to 5.1.
  - Updated the Flash Redirection package to version 1.28.
- VMware updates
  - Updated the VMware Horizon client from version 5.0 to version to 5.1.
  - Supports the relative mouse feature in a Blast session. See, Enable relative mouse feature.
  - Supports USB splitting for Blast protocol. See, USB device splitting in Blast session.
- Imprivata updates
  - Added grace period support to skip the second authentication factor. See, Grace period to skip second authentication factor.
- Amazon WorkSpaces updates
  - Supports Amazon WorkSpaces using direct connection mode. See, Configuring the Amazon WorkSpaces broker connection.
- ThinOS enhancements
  - Supports the Omnikey 5321v2 device. See, Smart cards and smart card readers.
  - Supports Rutoken smart cards. See, Rutoken smart card reader
  - Added the option to disable on-board serial ports using INI parameters. See, Configuring the serial settings.
  - Improved the security for CA validation on Wyse Management Suite. See, Configuring the Wyse Device Agent settings.
- **INI parameter updates**:
  Added new INI parameters. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/manuals.

What is new in ThinOS 8.6_024

The following are the new features or updates to the existing features in this release:

- **Updates to ThinOS packages**:
  - Updated the VMware Horizon package to version 5.0.53374.
  - Updated the Flash Redirection package to version 1.26.53224.
- **VMware updates**:
  - Updated the VMware Horizon package version from 4.8 to 5.0.
  - Supports the relative mouse feature in a PCoIP session. See, Enable relative mouse feature.
  - Supports the High Color Accuracy feature in a Blast session with H.264 enabled. See, Global Connection Settings.
  - Supports the **Username Hint** option during smart card authentication for the Horizon View broker. See, Enable username hint for smart card login.
  - Enhanced the reconnect workflow for VMware Horizon View broker using INI parameters. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/manuals.
- **Teradici updates**:
  Supports the Teradici Cloud Access connection broker. See, Configuring Teradici Cloud Access.
- **Imprivata updates**:
  Added support to treat smart card authentications as proximity card authentications. See, Use smart card as proximity card.
- **Enhancements**:

- UI enhancement to capture logs of the application console. See, Using the troubleshooting options.
- UI enhancement to select DisplayPorts for DP audio. See, Configuring the audio settings.
- UI enhancement to display Frames Per Second (FPS) in the **Performance Monitor** window. See, Using the troubleshooting options.
- Supports creating a VDI connection by a low-privileged user using INI parameters. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/manuals.
- Supports a new system variable—$UMAC—for MAC address in the uppercase format. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/manuals.
- Supports customizing the text color in the lock window using INI parameters. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/manuals.

- **INI parameter updates**:

  Added new INI parameters. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/manuals.

NOTE: ThinOS 8.6_024 supports Wyse Management Suite version 1.4.

What is new in ThinOS 8.6_019

The following are the new features or updates to the existing features in this release:

- **Updates to ThinOS packages**:
  - Updated the Citrix RTME package to version 2.7.52738. See, Citrix HDX RealTime Optimization pack.
  - Updated the Cisco Jabber Softphone for VDI package to version 12.1.52977. See, Cisco Jabber Softphone for VDI.
  - Updated the VMware Horizon package to version 4.8.51817. See, Configuring VMware.
- **Enhancements**:
  - Added the sleep mode feature that enables the power-saving state and quickly resumes full power operations without loss of data. This feature is supported on Wyse 5040 All-in-One client and Wyse 5040 All-in-One client with PCoIP. See, Sleep mode.
  - Supports the VMware Blast Virtual channel on Imprivata Biometrics and Proximity devices. See, Imprivata Bio-metric Single Sign-On.
  - Supports User Datagram Protocol (UDP) through TS Gateway connections. See, Connect to RDP session using UDP with TS Gateway.
  - Supports the OMNIKEY 5422 smart card reader.
  - Supports SecMaker Net iD smart card. See, the *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/support.
  - Supports disabling the cipher suites such as DES, 3DES or both for TLS clients. See, the *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/support.
- **INI parameter updates**:

  Added new INI parameters. See, the *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/support.

What is new in ThinOS 8.6_013

The following are the updates to the existing features or new features in this release:

- **Citrix updates**:
  - Updated the Citrix RTME package to version 2.5. See, Citrix HDX RealTime Optimization pack.
  - Added support for Cisco Jabber Softphone for VDI. See, Cisco Jabber Softphone for VDI.
  - Added support for Okta using Citrix NetScaler Gateway. See, Configuring Citrix NetScaler using Okta.
  - Added support to create icon folders on the StoreFront desktop using the INI parameter. See, the *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/support.
  - Added support for multiple logins with Citrix and VMware Horizon. See, Multiple logins with Citrix and VMware Horizon.
- **VMware updates**:
  - Updated the Horizon client version from 4.6 to 4.8. See, Configuring VMware.
  - Added support for VMware Horizon Virtualization Pack for Skype for Business in VMware Blast session. See, VMware Horizon Virtualization Pack for Skype for Business.

- Added support for hardware cursor in VMware Blast session. See, Enable hardware cursor in Blast session.
- Added support for multiple logins with VMware Horizon and Citrix. See, Multiple logins with Citrix and VMware Horizon.

- **RDP updates**:
  - Ability to select displays when launching RDP connections in full screen mode. See, Configuring RDP connections.
  - Added an option to set the desktop DPI scaling factor. See, Global connection settings.
- **PCoIP updates**:

  Added support to directly configure the PCoIP connection using Teradici Remote Workstation cards. See, Configuring PCoIP connections using Teradici Remote Workstation card.
- **BIOS updates**:
  - Added support to update BIOS on Wyse 5060 and 3030 LT thin clients using Wyse Management Suite. See, Upgrading BIOS on Wyse 5060 thin client and Wyse 3030 LT thin client.
  - Added support to extract and restore certain BIOS settings. See, Using the troubleshooting options.
- **Enhancements**:
  - UI enhancement to configure the IPv4 settings for a wireless connection. See, Configure the WLAN settings.
  - UI enhancement to enable user to connect to a remote host or device using the Telnet client. See, Using the troubleshooting options.
  - UI enhancement to verify the version of the installed packages and generate logs. See, Accessing system information.
  - UI enhancement on the Wyse Device Manager console to display the device details of peripheral devices that are connected to the ThinOS client. For more information, see the *Dell Wyse Device Manager Administrator's Guide* at www.dell.com/support.
  - Added support for Caradigm Way2Care. See, Caradigm Way2Care enhancement.
  - Added support for Vertical Synchronization to eliminate screen tearing. See, Vertical Synchronization.
  - DisplayPort audio is disabled by default on Wyse 3040 thin client.
  - Only 32-bit desktop color is supported on Wyse 3010 thin client and Wyse 3020 thin client.
  - Monitor priority is modified for Wyse 5070 Extended thin client. See, Hardware capability.
- **INI parameter updates**:

  Added new INI parameters. See, *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/support.

2

Before working on ThinOS

This section contains information about firmware upgrade and system configuration that you need to know before using ThinOS version 8.6.

Firmware upgrade and package deployment

Consider the following before you upgrade the ThinOS firmware and deploy the ThinOS packages:

- On Wyse 5070 Extended thin client, the AMD firmware is upgraded to a newer version. If you want to downgrade ThinOS from 8.6 to 8.5.1, you must shut down and boot the thin client again. If you do not shut down and reboot, a black screen is displayed on the monitor that is connected to the AMD GPU port. Also, the AMD DP port sequence is updated.
- On Wyse 5070 thin clients, the Bluetooth firmware is upgraded to a newer version from ThinOS 8.5_108. If you want to update the thin client with the Bluetooth module from ThinOS version 8.5_107 to 8.5_108 or later, Dell recommends that you disconnect the power cable and connect the power cable again before you reboot.
- In ThinOS 8.6, the installed RTME, Horizon, and JVDI packages are saved to the hidden partition. When you downgrade ThinOS firmware to previous versions, and upgrade the firmware to 8.6 again, the ThinOS device reinstalls the saved packages from the hidden partition. You can delete the package to clean the backup data from the device.
- From ThinOS version 8.6, the Merlin images include both RTME and Horizon packages.
- If you push Merlin images on Wyse 5010, 5040, and 7010 thin clients with 4 GB or higher flash size, the RTME and Horizon packages are formatted.

To upgrade the ThinOS firmware, use any of the following:

- File Transfer Protocol (FTP) Windows server
- HTTP/HTTPS Windows server
- Dell Wyse Management Suite

IMPORTANT: To avoid uncertain issues, ensure that when you upgrade your firmware, you do not skip versions.

NOTE: To downgrade the ThinOS firmware, ensure that you set the INI parameter Autoload=2, and follow the procedure using the FTP server.

Table 1. Firmware images

Platform	ThinOS	ThinOS with PCoIP
Wyse 3010 thin client	DOVE_boot	Not available
Wyse 3020 thin client	T10D_wnos	Not available
Wyse 3030 LT thin client	U10_wnos	PU10_wnos
Wyse 3040 thin client	A10Q_wnos	PA10Q_wnos
Wyse 5010 thin client	ZD10_wnos	PD10_wnos
Wyse 5040 AIO thin client	ZD10_wnos	PD10_wnos
Wyse 5060 thin client	D10Q_wnos	PD10Q_wnos
Wyse 7010 thin client	ZD10_wnos	Not available
Wyse 5070 thin client-Celeron processor	X10_wnos	PX10_wnos
Wyse 5070 thin client-Pentium processor	X10_wnos	PX10_wnos

Platform	ThinOS	ThinOS with PCoIP
Wyse 5070 Extended thin client-Pentium processor	X10_wnos	PX10_wnos

Table 2. Package information

Package name	Details
Base.i386.pkg	Automatically updated upon firmware upgrade.
Pcoip.i386.pkg	Automatically updated upon firmware upgrade of a PCoIP client.
RTME.i386.pkg	Upload the new package to central configuration, and system can update without INI configuration.
Horizon.i386.pkg	Upload the new package to central configuration, and configure the INI parameter to update this package.
JVDI.i386.pkg	Upload the new package to central configuration, and configure the INI parameter to update this package.
FR.i386.pkg	Upload the new package to central configuration, and configure the INI parameter for update this package.
TCX.i386.pkg	Upload the new package to central configuration, and configure the INI parameter to update this package.

NOTE:

- When the packages fail to update, or cannot function after update with new version firmware, or if there is further failure, the workaround is to remove all packages and reinstall the packages upon reboot.
- For information about the ThinOS build number, and package versions, see the latest *Dell Wyse ThinOS Release Notes*.

Firmware upgrade using FTP server

Ensure that you have set up a Windows PC or Server with Microsoft Internet Information Services (IIS) and FTP services installed. If you do not have the FTP server installed, then refer to the article about how to setup an FTP server at support.microsoft.com.

Installing the Windows IIS creates the directory **C:\inetpub\ftproot**, which is known as the FTP root. In the **ftproot** directory, create a folder **wyse** and a sub folder **wnos**. The directory structure must read as **C:\inetpub\ftproot\WYSE\wnos**.

To upgrade the ThinOS firmware using FTP server:

1. Go to www.dell.com/support.
2. Download the latest ThinOS firmware and latest ThinOS packages that corresponds to your thin client model. If the firmware and packages are in the form of a compressed self-extracting (.EXE) or zipped file (.ZIP), then extract the files. When you download the JVDI.zip package, the **README WITH EULA.txt** and **JVDI.i386.pkg** files are unzipped. Ensure that you open the readme file and read the EULA agreement.
3. Place the extracted firmware files in the **C:\inetpub\ftproot\WYSE\wnos** folder, and the packages to **C:\inetpub\ftproot\WYSE\wnos\pkg** on your FTP server.
4. Create a wnos.ini text file (using a text editor) in the **C:\inetpub\ftproot\WYSE\wnos** folder with the following INI parameters:

   ```
   Autoload=2 loadpkg=1 Addpkg=TCX,FR,horizon,JVDI
   ```

   NOTE: JVDI package is introduced from ThinOS version 8.6 to support Cisco Jabber. However, if you intend to use only horizon package, then do not load the JVDI package to avoid unknown user trap issue.

   The option `Autoload=2`, ensures that the thin client uses the firmware installed on the server to upgrade, only if the firmware on the thin client is older than the version on the server. The option `LoadPkg` specifies how to update the external packages. If `LoadPkg` is not in the statement, it will inherit the value of `AutoLoad`.

Base package and the PCoIP package are integrated into the ThinOS firmware image. Installing the latest ThinOS firmware image automatically installs the latest version of these packages on the ThinOS client. If you set `AutoLoad=1 LoadPkg=0`, the firmware is checked, but the packages are not checked. The packages check is performed after firmware check. From ThinOS 8.3, the external packages update mechanism is changed. Some packages are default, and loaded according to value of `LoadPkg`. For example RTME. Some packages need additional parameter `AddPkg` to add. For example, FR, Horizon, TCX and JVDI. The option `AddPkg` is for adding packages. It depends on the value of `LoadPkg`. For more information about the INI parameter usage, see *Dell Wyse ThinOS INI Reference Guide*.

5 Save the wnos.ini file.

6 On the ThinOS client desktop, navigate to **System Setup** > **Central Configuration** > **General**.

7 In the **General** tab, enter the IP address of the FTP server or directory. For example: 150.00.0.260/wyse. The **Username** field must have the value `Anonymous` and the **Password** field is already pre-configured.

NOTE:

- If there is no default password or if the password is changed, then you must set your password. For example, abe@abc.com.

  You can also reset the thin client to factory default settings. When you reset the thin client to factory default settings, the anonymous user is configured with the default password. However, you need to reconfigure the thin client.
- You can also use DHCP option tags 161 and 162 to configure the ThinOS client, file server and path information. You must create these options on your DHCP server, configure them with the correct server information, and enable the DHCP server scope in your environment.

8 Click **OK**.

9 Restart the thin client and wait until the auto-installation of packages is complete.

To verify that the thin client is upgraded, on the ThinOS desktop, navigate to **System Information** > **General**, and check the System Version.

Firmware upgrade using HTTPS

Ensure that you have set up a Windows PC or Server with Microsoft Internet Information Services (IIS) and HTTPS services installed. If you do not have the HTTPS server installed, then refer to the article about how to setup an HTTPS server at support.microsoft.com.

Ensure that the web server can identify the file types used by ThinOS. Create two MIME types under IIS. The MIME's option needs to be configured on a per site basis. On a default IIS, install:

1 Launch the IIS admin console.

2 Browse to the default website, right-click and select **Properties**.

3 Click the **HTTP Headers** tab, and in the **MIME Map** section, select **File types** > **New Type**.

4 Add the two MIME types. Use **.INI** and **.** for the associated extension fields.

5 Apply the settings and close the IIS admin console.

Installing IIS creates the default directory **C:\inetpub\WWWroot**, which is known as the WWW root. In the **WWWroot** directory, create a folder **WYSE** and a sub folder **wnos**. The directory structure must read as **C:\inetpub\wwwroot\WYSE\wnos**.

To upgrade the ThinOS firmware using HTTPS server:

1 Go to www.dell.com/support.

2 Download the latest ThinOS firmware and latest ThinOS packages that corresponds to your thin client model. If the firmware and packages are in the form of a compressed self-extracting (.EXE) or zipped file (.ZIP), then extract the files. When you download the JVDI.zip package, the **README WITH EULA.txt** and **JVDI.i386.pkg** files are unzipped. Ensure that you open the readme file and read the EULA agreement.

3 Place the extracted firmware files in the **C:\inetpub\wwwroot\WYSE\wnos** folder, and the packages to **C:\inetpub\wwwroot\WYSE\wnos\pkg** on your HTTPS server.

4 Create a wnos.ini text file (using a text editor) in the **C:\inetpub\wwwroot\WYSE\wnos** folder with the following INI parameters:

```
Autoload=2 loadpkg=1 Addpkg=TCX,FR,horizon,JVDI
```

NOTE: JVDI package is introduced from ThinOS version 8.6 to support Cisco Jabber. However, if you intend to use only horizon package, then do not load the JVDI package to avoid unknown user trap issue.

The option `Autoload=2`, ensures that the thin client uses the firmware installed on the server to upgrade, only if the firmware on the thin client is older than the version on the server. The option `LoadPkg` specifies how to update the external packages. If `LoadPkg` is not in the statement, it will inherit the value of `AutoLoad`.

Base package and the PCoIP package are integrated into the ThinOS firmware image. Installing the latest ThinOS firmware image automatically installs the latest version of these packages on the ThinOS client. If you set `AutoLoad=1 LoadPkg=0`, the firmware is checked, but the packages are not checked. The packages check is performed after firmware check. From ThinOS 8.3, the external packages update mechanism is changed. Some packages are default, and loaded according to value of `LoadPkg`. For example RTME. Some packages need additional parameter `AddPkg` to add. For example, FR, Horizon, TCX, and JVDI. The option `AddPkg` is for adding packages. It depends on the value of `LoadPkg`. For more information about the INI parameter usage, see *Dell Wyse ThinOS INI Reference Guide*.

5 Save the wnos.ini file.

6 On the ThinOS client desktop, navigate to **System Setup** > **Central Configuration** > **General**.

7 In the **General** tab, enter the IP address of the file server or directory. For example: **https://IPaddress/wyse**.

NOTE: You can also use DHCP option tags 161 and 162 to configure the ThinOS client, file server and path information. You must create these options on your DHCP server, configure them with the correct server information, and enable the DHCP server scope in your environment.

8 Click **OK**.

9 Restart the thin client and wait until the auto-installation of packages is complete.

Firmware upgrade using Wyse Management Suite

Ensure that you have created a custom group and assigned the ThinOS devices to that group in Wyse Management Suite—see Dell Wyse Management Suite Administrator's Guide.

Ensure that your ThinOS clients are registered to Wyse Management Suite.

To upgrade the ThinOS firmware using Wyse Management Suite:

1 Go to www.dell.com/support.

2 Download the latest ThinOS firmware and ThinOS packages that corresponds to your thin client model. When you download the JVDI.zip package, the **README WITH EULA.txt** and **JVDI.i386.pkg** files are unzipped. Ensure that you open the readme file and read the EULA agreement.

NOTE: JVDI package is introduced from ThinOS version 8.6 to support Cisco Jabber. However, if you intend to use only horizon package, then do not load the JVDI package to avoid unknown user trap issue.

3 Log in to Wyse Management Suite using valid credentials.

4 On the **Apps & Data** page, in the **OS Image Repository** section, click **ThinOS**.

5 Click **Add Firmware File**.

The **Add File** dialog box is displayed.

6 Browse and select the downloaded firmware file. Enter an appropriate description.

7 Click **Upload**.

The ThinOS firmware file is uploaded, and the firmware file is listed on the **Apps & Data - ThinOS OS Image Repository** page.

8 Select the check box that corresponds to your ThinOS firmware file.

9 On the **Groups & Configs** page, select a custom group, and click **Edit Policies** > **ThinOS**.

The **Select ThinOS Configuration Mode** screen is displayed.

10 Click **Advanced Configuration**.

11 In the **Device Configuration** pane, click **Firmware Upgrade**, and then click **Configure this item**.

12 From the **Platform type** drop-down list, select your thin client model.

13 From the **Firmware to auto deploy** drop-down list, select the firmware file that corresponds to your thin client model.

14 Click **Save & Publish**.
The thin client restarts, and the firmware version is upgraded.

Firmware installation using Dell Wyse USB Imaging Tool

Use the Dell Wyse USB Imaging Tool version 3.1.0 to install the ThinOS merlin image on your thin client. For information about installation instructions, see the *Dell Wyse USB Imaging Tool version 3.1.0 User's Guide* at downloads.dell.com/wyse/USBFT/3.1.0/.

BIOS upgrade

BIOS upgrade is the process of updating your existing BIOS version to the latest version.

Table 3. BIOS binary files

Platform	BIOS binary filename
Wyse 3010 thin client	Not available
Wyse 3020 thin client	Not available
Wyse 3030 LT thin client	U10_bios.bin
Wyse 3030 LT thin client with PCoIP	PU10_bios.bin
Wyse 3040 thin client	A10Q_bios.bin
Wyse 3040 thin client with PCoIP	A10Q_bios.bin
Wyse 5010 thin client	D10G_bios.bin
Wyse 5010 thin client with PCoIP	PD10G_bios.bin
Wyse 5040 AIO thin client	AIO10G_bios.bin
Wyse 5040 AIO thin client with PCoIP	PAIO10G_bios.bin
Wyse 5060 thin client	D10Q_bios.bin
Wyse 5060 thin client with PCoIP	PD10Q_bios.bin
Wyse 7010 thin client	Z10G_bios.bin
Wyse 5070 thin client-Celeron	X10_bios.bin
Wyse 5070 thin client-Pentium	X10_bios.bin
Wyse 5070 Extended thin client	X10_bios.bin

When you use a file server to update BIOS for Wyse 5060 and 3030 LT thin clients, the BIOS update progress bar disappears after the BIOS update process is complete, and the system reboots after one minute. You must not manually reboot the thin client. During reboot, a black screen is displayed for one minute, and then the device resumes the BIOS update.

NOTE: For information about the BIOS versions, see the latest *Dell Wyse ThinOS Release Notes*

Upgrading BIOS on Wyse 5060 thin client and Wyse 3030 LT thin client

This section describes the procedure to update BIOS on Wyse 5060 thin client with ThinOS, and Wyse 3030 LT thin client by using Wyse Management Suite version 1.3.

1 Download the Dell BIOS file at www.dell.com/support.

For example, Wyse_5060_version.bin. The BIOS version may be updated in each release. For the latest version of BIOS, see the latest Dell Wyse ThinOS Release Notes.

2 Log in to Wyse Management Suite.

3 Click **Apps & Data**.

4 In the **OS Image Repository** section, click **ThinOS**.

5 Click **Add BIOS file**.

The **Add File** screen is displayed.

6 To select a BIOS file, click **Browse** and navigate to the location where your BIOS file is located.

7 Enter the description for the BIOS file.

8 If you want to override an existing BIOS file, select the **Override existing file** check box.

9 From the **BIOS platform** type, select either **Wyse 5060 thin client** or **Wyse 3030 LT** thin client based on your device type. You can also select multiple platforms.

10 Click **Upload**.

NOTE: The BIOS file is added to the repository. However, the BIOS file is not assigned to any groups or devices. You must make assignments on the Device Configuration page.

11 Click **Groups & Configs**.

12 Select a group, and click **Edit Policies**.

13 Click **ThinOS**.

The **Select ThinOS Configuration Mode** window is displayed.

14 Click **Advanced Configuration**.

15 In the **Device Configuration** section, click **Firmware Upgrade**.

16 Select the **Enable BIOS Upgrade** check box.

17 Select one or more BIOS files.

NOTE:

- When deploying a group policy, you can select multiple BIOS files. However, the policy must reject any duplicate platforms.
- If two BIOS files are selected, the policy cannot be saved and an error `Firmware Upgrade policy contains duplicate platforms for BIOS upgrade` is displayed.
- At Device Level Exception, only BIOS files that have the same platform as the selected device are listed. You can select only a single file.

18 Click **Save & Publish**.

If BIOS is already applied, the ThinOS client ignores the BIOS update process. If the BIOS version of the uploaded file does not match the existing BIOS version on the thin client, the BIOS file is successfully downloaded and updated on the thin client.

Upgrading BIOS on Wyse 3040 thin client

This section describes the procedure to update BIOS on Wyse 3040 thin client with ThinOS, and Wyse 3040 thin client with PCoIP by using file server.
The Dell Standard BIOS file is converted to BIN file format for signature and security purposes. The format of the BIN file is Wyse_3040_version.bin.

Upgrading BIOS by using file server

To upgrade BIOS using file server, do the following:

1 Download the Dell BIOS file at the www.dell.com/support.

For example, **Wyse_3040_version.bin**. The BIOS version may be updated in each release. For the latest version of BIOS, refer to the latest Dell Wyse ThinOS Release Notes.

2 Rename the Dell BIOS file as **A10Q_bios.bin**.

3 Upload the renamed BIOS file to folder **WNOS** in the file server—ftp or http(s).

4 Ensure that the INI parameter **autoload** is enabled for firmware update in **WNOS.INI**.

5 Restart the thin client.

BIOS is updated automatically.

To verify whether the new BIOS is updated correctly, from the desktop menu, click the **System Information** option, or click the **System Information** icon in zero mode. In the **Event Log** tab, the BIOS version log is displayed.

For example, **System Version: 8.5_017 (ROM 1.2.1)**.

This log indicates that the BIOS version is updated to v1.2.1.

BIOS version can be viewed on the BIOS setup screen. To access the BIOS setup, do the following:

1 Restart the thin client, and during system boot press the `F2` key.

2 Enter the BIOS password, if admin password is set.

3 Click **Settings** > **General** > **System Information**.

The BIOS version is displayed on the screen.

BIOS can be updated by using the Wyse Management Suite console. For more information about Wyse Management Suite, see Dell Wyse Management Suite Administrator's Guide.

Upgrading BIOS on Wyse 5070 thin client

This section describes the procedure to update BIOS on Wyse 5070 thin client with ThinOS, and Wyse 5070 thin client with PCoIP by using file server. The Dell Standard BIOS file is converted to BIN file format for signature and security purposes. The format of the BIN file is **Wyse_5070_version.bin**.

To upgrade BIOS using the file server:

1 Download the Dell BIOS file from the Dell support site.

For example, **Wyse_5070_1.0.3.bin**. The BIOS version may be updated in each release. For the latest version of BIOS, see the latest Dell Wyse ThinOS Release Notes.

2 Rename the Dell BIOS file as **X10_bios.bin**.

3 Upload the renamed BIOS file to folder **WNOS** in the file server—ftp or https.

4 Ensure that the INI parameter **autoload** is enabled for firmware update in **WNOS.INI**.

5 Restart the thin client.

The BIOS is updated automatically.

To verify whether the new BIOS is updated correctly, from the desktop menu, click the **System Information** option, or click the **System Information** icon in zero mode. In the **Event Log** tab, the BIOS version log is displayed.

For example, **System Version: 8.5_108—ROM 1.0.3**.

This log indicates that the BIOS version is updated to v1.0.3.

BIOS version can be viewed on the BIOS setup screen. To access the BIOS setup, do the following:

1 Restart the thin client, and during system boot, press the `F2` key.

2 Enter the BIOS password, if admin password is set.

3 Click **Settings** > **General** > **System Information**.

The BIOS version is displayed on the screen.

BIOS can also be updated by using the Wyse Management Suite version 1.2 console. For more information about Wyse Management Suite, see *Dell Wyse Management Suite Administrator's Guide*.

System configuration and deployment

- USB redirection must be disabled for audio and video devices to use RTME, RTAV, SFB, and JVDI. By default, the USB redirection is disabled on ThinOS. Dell recommends that you do not modify the default settings unless you need the USB redirection for audio and video devices.
- ThinOS BIOS policy can be configured using Wyse Management Suite Console, Wyse Management Suite group INI, Wyse Management Suite advanced settings and FTP INI. Dell recommends that you use any one of the methods to configure the BIOS policy. Setting the BIOS policy simultaneously using different methods may cause a policy mismatch, and the device reboots repeatedly. This reboot loop issue is observed when you select the **reboot immediately** option in the **BIOS policy** settings section on the Wyse Management Suite console.
- All the installed packages are deleted when you update the ThinOS image version between major releases using FTP, WDM, or Wyse Management Suite.

  Solution for updating firmware using FTP and WDM—Ensure that you have set the PKG install parameters in the WNOS.ini, and the pkg files are uploaded in the directory. After the device reboot, the packages are re-installed automatically.

  Solution for updating firmware using Wyse Management Suite—Wyse Management Suite App policy works only once after the policy is created. The deleted package cannot be reinstalled using the same policy. Dell recommends that you create a new App policy to install the package after the firmware update is complete.
- WDM vulnerability is fixed in this release. You must configure either the DHCP or the DNS option/record of the WDM server fingerprint to automatically fetch and validate the fingerprint before checking in to the WDM server. However, there is no impact to the ThinOS device functionality if you do not to configure the fingerprint validation environment. For more information about how to set up fingerprint using WDM, see How to set up WDM fingerprint using Wyse Device Manager.
- Boot up unit without monitor or with monitor power-off.
  - Wyse 5010 thin client, Wyse 5040 thin client, Wyse 7010 thin client, and Wyse 3030 LT thin client—If the thin client waits for 15 to 20 seconds and the monitor is attached or powered on within 20 seconds, the display is turned on. If the monitor is attached or powered on after 20 seconds, the monitor displays the black screen. Turn on the monitor first, and then turn on the thin client.
  - Wyse 3040 thin client and Wyse 5060 thin client: The client waits until the monitor is attached or turned on.

How to set up fingerprint using Wyse Device Manager

To set up your fingerprint using WDM, do the following:

1 Export the WDM server certificate from the WDM server that you want to access.

2 Extract the fingerprint value from the WDM certificate in the required format.

You must use a system with OpenSSL installed. OpenSSL can be used to extract the fingerprint in required format from the WDM certificate itself.

The fingerprint is generated from the following command:

```
openssl x509 -in <your certificate name>.crt -pubkey -noout | openssl pkey -pubin -outform
der | openssl dgst -sha256 -binary | openssl enc -base64
```

NOTE: If cert.crt is in DER format instead of the PEM format, you must add `-inform` to the first command. The certificate supports SHA256 in base64 encoded format.

3 Configure either the DHCP option or the DNS TXT record.

- If you want to use the DHCP option, configure the following option tags defined in the DHCP server:
  - Option ID—200
  - Name—WDM_Fingerprint

- Type—String

- If you want to use the DNS TXT record, enter the name as **WDM_Fingerprint**, and provide the fingerprint string value.

NOTE: If the DNS TXT record for fingerprint cannot be retrieved, the device fetches the values from the DHCP scope option. If the fingerprint certificate is already available, the device checks in to the WDM server. If the connection fails, the failure logs are registered on the ThinOS client.

Automating updates and settings using central configuration

ThinOS is centrally managed and configured using INI files to automatically push updates and any desired default configuration to thin clients in your environment. This section describes how to set up your environment to provide your thin clients running ThinOS with automatic updates and configurations in three simple steps. If no INI files are detected, you can use local dialog boxes on each thin client to configure the settings. Many of these locally configured settings such as resolution, mouse, and keyboard are saved on ThinOS to persist after reboot. However, once INI files are detected, rebooting the client causes ThinOS to become stateless, and ignores the locally configured settings after a reboot. The settings contained in the INI file are used.

NOTE: Dell Wyse thin clients do not require device management software. They are configured to obtain their IP address, as well as the location of firmware and configuration instructions, from a DHCP server. However, you can use Wyse Device Manager (WDM) or Wyse Management Suite for a more hands-on management of your thin clients. For information about configuring your thin clients to communicate with a WDM server or Wyse Management Suite, see the related INI parameters in *Dell Wyse ThinOS INI Guide*.

How to set up automatic updates and configurations

For a thin client running ThinOS to successfully access INI files and update itself from a server, you must set up the server with the correct folder structure where the INI files and other update files are located, direct the thin client to the server, and then reboot or start the thin client

Once DHCP and servers are configured and available, the thin client checks (at each boot up) to see whether or not any updates are available on a predefined server DHCP Option **#161** specifies the server URL, DHCP Option **#162** specifies the root path to the server. If updates are available, the updates are automatically installed.

Using DHCP options

This table contains the DHCP options available for use.

Table 4. DHCP options

Option	Description	Notes
1	Subnet Mask	Required. However, it is not required unless the thin client must interact with servers on a different subnet. MS DHCP requires a subnet mask and is always send one.
2	Time Offset	Optional.
3	Router	Optional, but recommended. It is not required unless the thin client must interact with servers on a different subnet.
6	Domain Name Server (DNS)	Optional, but recommended.
15	Domain Name	Optional, but recommended. See Option 6.
28	Broadcast Address	Optional.

Option	Description	Notes
44	WINS servers IP Address	Optional.
51	Lease Time	Optional, but recommended.
52	Option Overload	Optional.
53	DHCP Message Type	Recommended.
54	DHCP Server IP Address	Recommended.
55	Parameter Request List	Sent by thin client.
57	Maximum DHCP Message Size	Optional (always sent by thin client).
58	T1 (renew) Time	Optional, but recommended.
59	T2 (rebind) Time	Optional, but recommended.
61	Client identifier	Always sent.
161	File server (ftp/http/https)	Optional string. Can be either the name or the IP address of the file server. If a name is given, the name must be resolvable by the DNS servers specified in Option 6. If the option provided by the server is blank or the server provides no value for the field, the machine on which the DHCP server resides is assumed to also be the file server.
162	Root path to the file server (ftp/http/https)	Optional string. If the option provided by the server is blank and the server provides no value for the field, a null string is used. \wyse\wnos is automatically appended to the search path. For example, if you enter pub\serversoftware, the path searchedare pub\serversoftware\wyse\wnos. **NOTE: You can have the \wyse automatic component of the search path omitted by appending a dollar sign ($) to the entered path. For example, if you enter `pub \serversoftware$`, the path searched will be `pub \serversoftware\wnos`.**

Option	Description	Notes
		NOTE: The usage or omission of a leading slash (\) on the path is critical on some servers. Some servers limit access to the root path of the user specified at login. For those servers, the usage of the leading slash is optional. Some *NIX servers can be configured to allow the file user access to the entire file system. For those servers, specifying a leading slash specifies that access is to start at the root file system. Proper matching of the file specification to the file server in use is critical to ensuring proper operation. A secured Windows server requires the slash to be specified in order to complete proper access.
165	WMS Server	Optional string. Specifies the IP address of the Wyse Management Suite Server.
166	WMS MQTT Server	Optional string. Specifies the IP address of the MQTT Server.
167	WMS CA Validation	Optional string.
181	PNAgent/ PNLite server list	Optional string. The thin client uses the server to authenticate the Windows credentials of the user and to obtain a list of ICA published applications valid for the validated credentials. The user supplies those credentials when logging in to the thin client.
182	NT domain list for PNAgent/ PNLite	Optional string. The thin client creates a pull-down list of domains from the information supplied in option 182. This list is presented at thin client login in the order specified in the DHCP option (for example, the first domain specified becomes the default). The selected domain is the one which must authenticate the user ID and password. Only the selected domain is used in the authentication process. If the domain list is incomplete and the user credentials must be verified against a domain not in the list, assuming that the server in option 181 is capable of authenticating against a domain not in the list, the user has the option of not using any of the domains specified in option 182 and typing a different domain name at the time of login.
184	File server Username	Optional string. Username to use when authenticating to the server specified in Option 161.
185	File server Password	Optional string. Password to use when authenticating to the server specified in Option 161.

Option	Description	Notes
186	WDM server list	Optional binary IP addresses of WDM. This option can specify up to two WDM servers. If two are specified, at boot time the thin client attempts to check-in to the first server. If it cannot contact the first server, it tries to check-in to the second server.
187	WDM server port	Optional number. Byte, word, or two-bytes array. **NOTE: The value of this option tag, when not embedded in Vendor Class Specific Information option, is interpreted in reverse order when it is sent as 2-bytes example, the value of 0x0050 was interpreted as 0x5000. This option tag was used by old ThinOS releases. New ThinOS releases still accept this option tag for backward compatibility.**
188	Virtual Desktop Broker server	Optional string.
190	WDM secure port	Optional number, word or two-bytes array. Specifies to use HTTPS to communicate with WDM instead of HTTP.
192	WDM server port	Optional number, word or two-bytes array. **NOTE: The value of this option tag represents the same information as option tag 187. The difference is that ThinOS interprets the value of this option tag in correct order (for example, the value of 0x0050 is interpreted as0x0050). If the DHCP server provides both option tag 192 and 187, option tag 192 takes precedence.**
194	WDM FQDN	Optional Fully Qualified Domain Name for the WDM.
199	Wyse Management Suite Group Key	Optional string. Can provide a Wyse Management Suite Group Registration Key for the Wyse Management Suite agent. When Wyse Management Suite is disabled and the Group Key of Wyse Management Suite is null, this option takes effect. Wyse Management Suite uses the optional string as the Group Registration Key. If the Wyse Management Suite server or MQTT server is null, the Wyse Management Suite agent sets the values to the default server values.

3

Getting started

This chapter helps you quickly learn the basics and get started with your thin client.

Configuring ThinOS using the First Boot Wizard

The First Boot Wizard runs the first time you start a new thin client with ThinOS. The thin client starts the First Boot Wizard application before you enter the ThinOS system desktop, and allows you to perform a set of tasks, such as, configuring system preferences, setting up the internet connectivity, loading USB configurations, configuring management software, and configuring broker connections.

If you are an existing thin client user, and you have upgraded to the ThinOS version 8.5 or later, then you can reset your thin client to factory default settings to enter the First Boot Wizard.

The following flowcharts depict the workflow of First Boot Wizard:

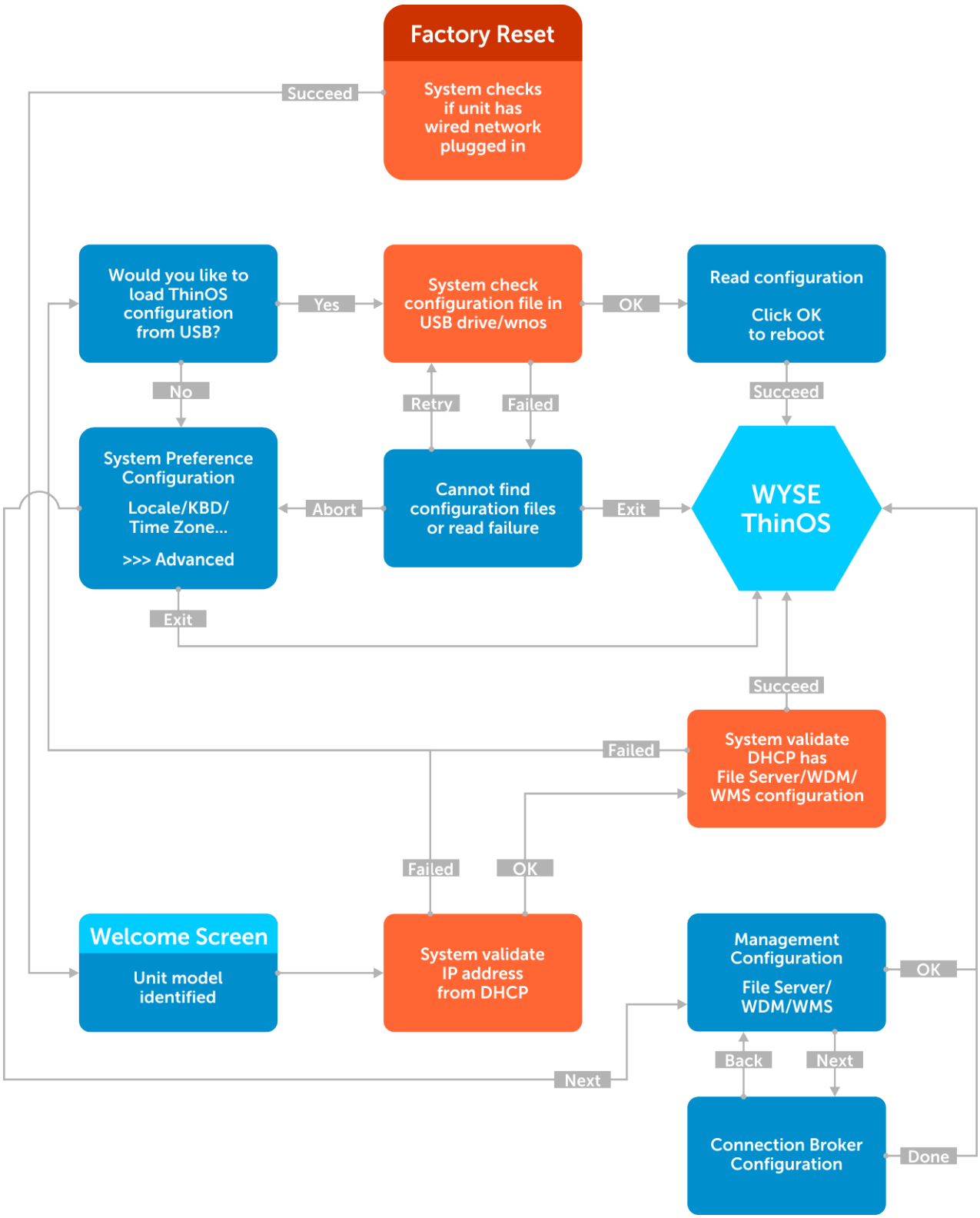


Figure 1. First Boot Wizard—network successful

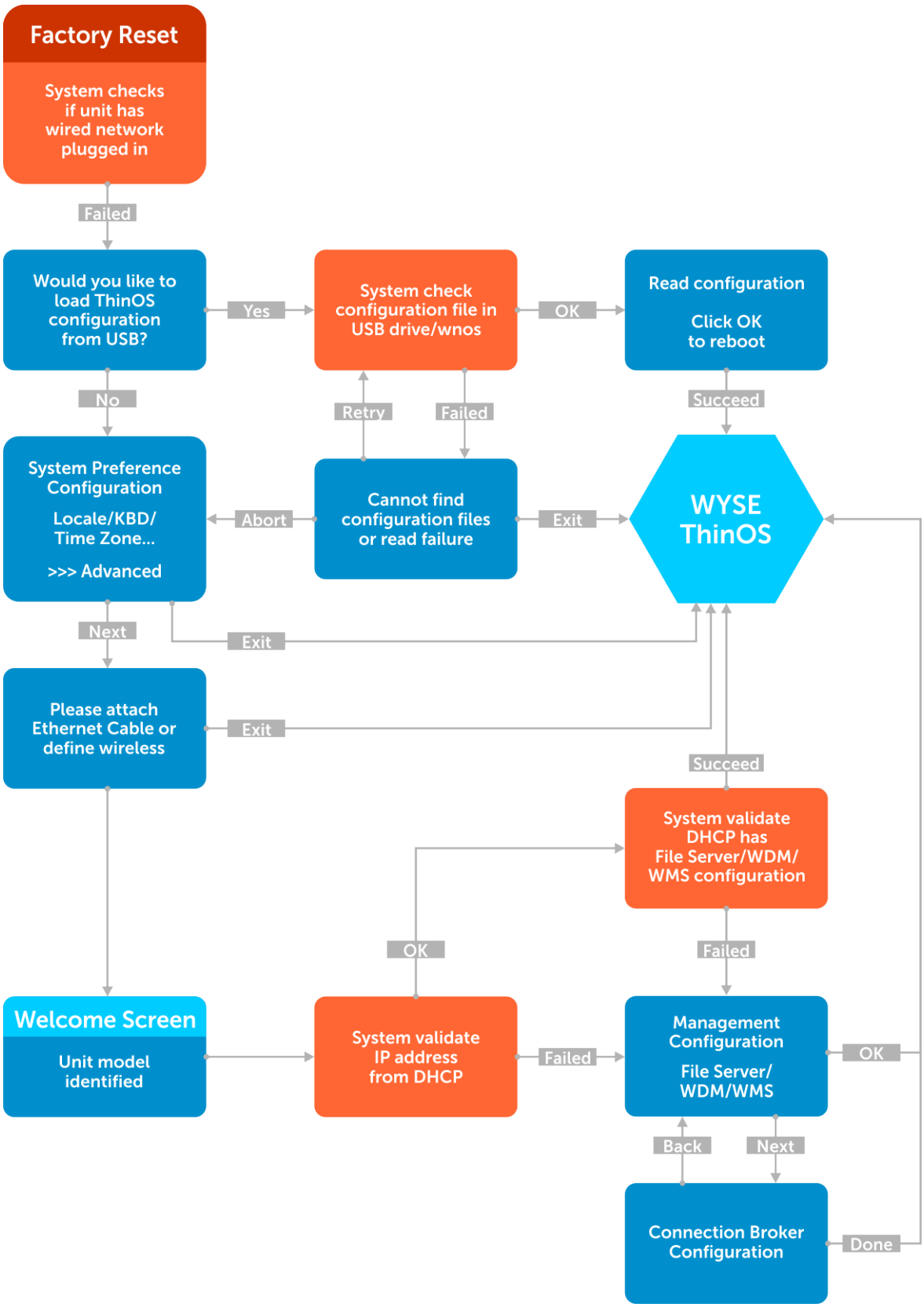


Figure 2. First Boot Wizard—network failure

To configure the First Boot Wizard:

1 Connect a new thin client or existing thin client to the Ethernet using a wired connection. The existing thin client must be reset to factory default settings to enter the First Boot Wizard.

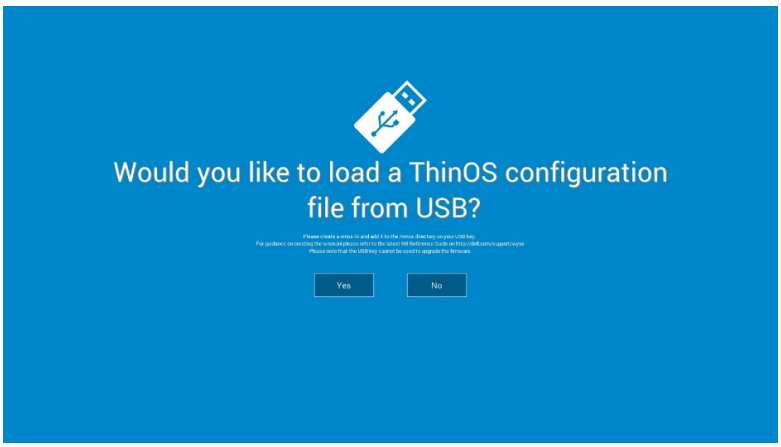
2 Turn on your thin client.

The thin client checks for a wired network connection. If the network connection is successful, a welcome screen with the model name of your thin client is displayed.

The thin client validates the IP address from DHCP. If the DHCP contains the file server or the Wyse Device Manager or Wyse Management Suite configurations, then the ThinOS system desktop is loaded without entering the First Boot Wizard. If the DHCP validation fails or if you have not connected to Ethernet, then follow the next step.

NOTE: To exit the First Boot Wizard during the network connection status check on the welcome screen, press the Ctrl + Esc key.

3 On the **Would you like to load a ThinOS configuration file from USB?** screen, do either of the following:



- To load a ThinOS configuration file from the USB drive, ensure that you create a **wnos.ini** file and add the file to the **/wnos directory** on the USB drive. Using this option, you can load packages, and wallpapers that are specified in the INI file. Plug in the USB drive to thin client, and click **Yes**.

  NOTE: Only FAT, FAT32, and ExFAT file systems on the USB disk are supported. NTFS file system is not supported.

  The thin client validates the configuration file in the USB drive.

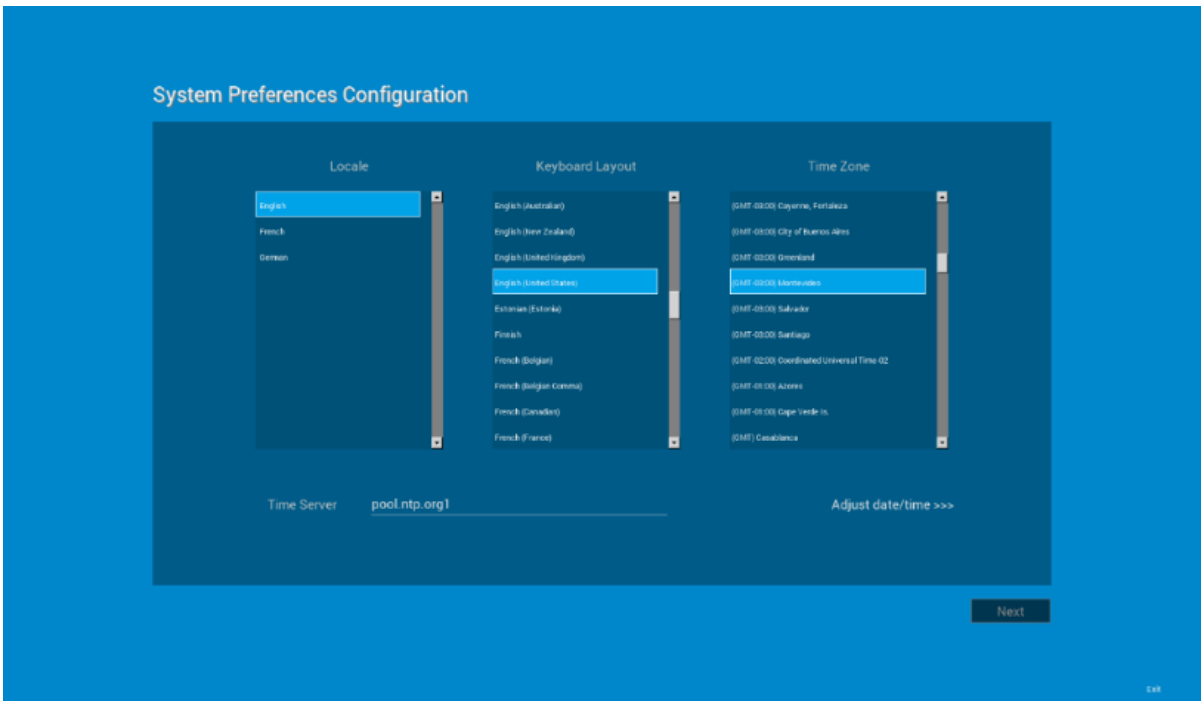
  - If the ThinOS configuration file in the USB drive is correct, the **Read configuration success** message is displayed. Click **OK** to exit the First Boot Wizard, and log in to the ThinOS system desktop.
  - If the ThinOS configuration file in the USB drive is corrupted or the appropriate file is not available, then the **Cannot find configuration files, or read configuration failure** message is displayed. Upload the correct file on the USB drive, plug the USB drive again, and then click **Retry**. If the file is correct, the **Read configuration success** message is displayed. Click **OK** to exit the First Boot Wizard, and log in to the ThinOS system desktop.

    If you do not want to use the **Retry** option to load the ThinOS configuration file, then click **Abort** to enter the **System Preferences configuration** setup.

    NOTE: To exit the Cannot find configuration files, or read configuration failure message screen, and load the ThinOS system desktop, click Exit.

- To enter the **System Preferences configuration** setup, click **No**.

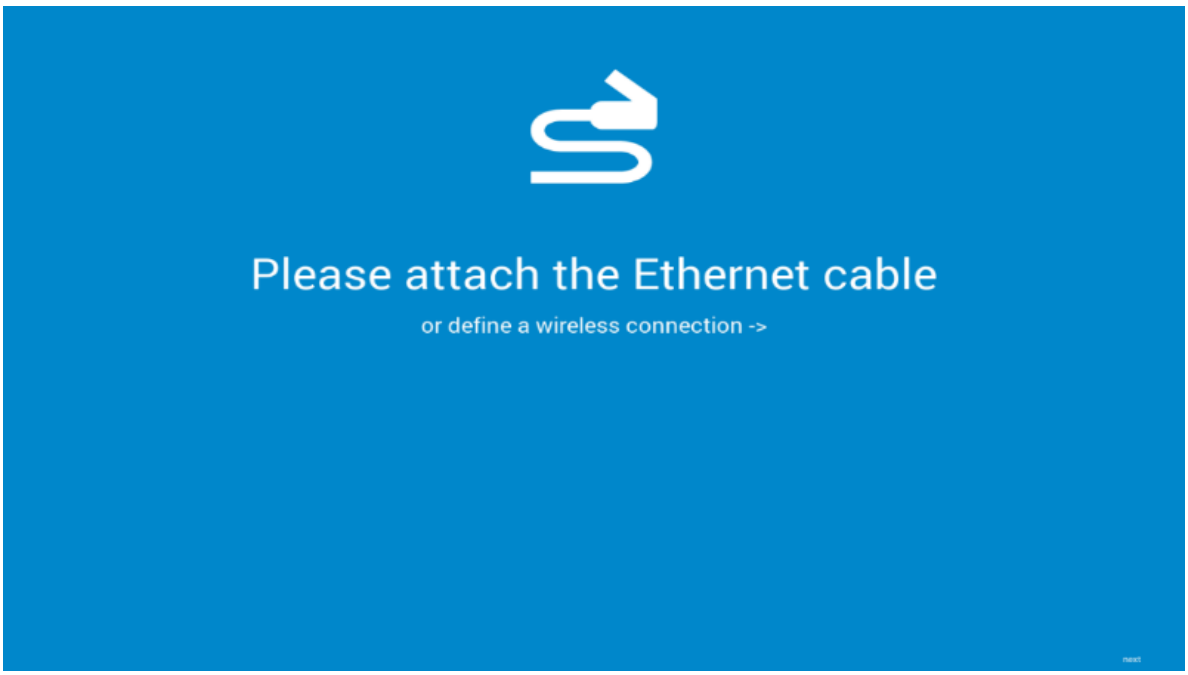
4 On the **System Preferences Configuration** screen, configure the following options:



- **Locale**—Select a language to start ThinOS in the regional specific language.
- **Keyboard Layout**—Select a keyboard layout to set the keyboard layout in the regional specific language.
- **Time Zone**—Select a time zone to set the time zone for your thin client.
- **Time Server**—Displays the IP addresses or host names with optional port number of time servers.
- **Advanced**—Click **Advanced** to configure settings, such as daylight saving, time format, date format, and time servers.

NOTE: To exit the System Preferences Configuration screen, and load the ThinOS system desktop, click Exit.

If you are not connected to Ethernet, you cannot continue with the setup, and the **Attach the Ethernet cable** screen is displayed.



Do either of the following:

- Connect the Ethernet cable to the thin client.

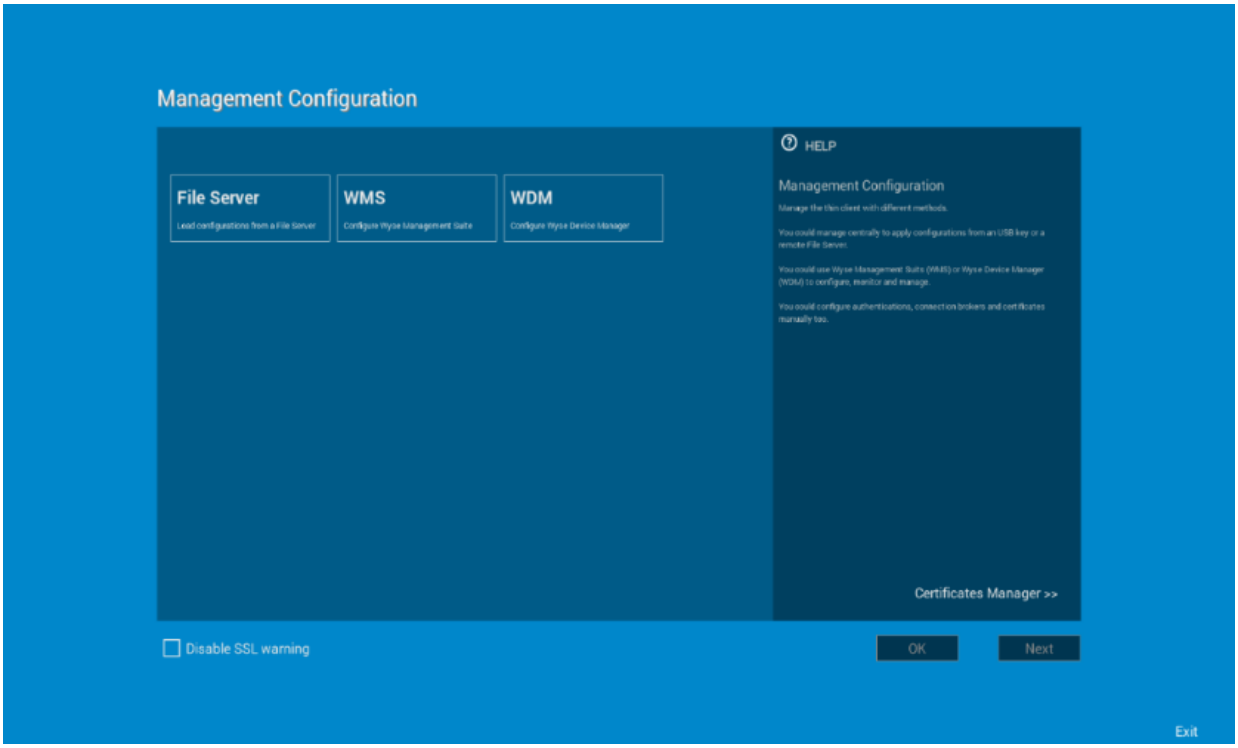
- Click **Define a wireless connection**. From the list, select a wireless network, and click **Connect**.

  NOTE:
  - The option to define a wireless connection is not available on thin clients without a WLAN module.
  - To exit the **Attach the Ethernet cable** screen, and load the ThinOS system desktop, click **Exit**.

After the connection is established, the thin client validates the IP address from DHCP. If the DHCP contains the file server or the Wyse Device Manager or Wyse Management Suite configurations, then the ThinOS system desktop is loaded. If the DHCP validation fails, or the network connection fails, then the **Management Configuration** screen is displayed. Follow steps 6–9.

5 Click **Next** to enter the **Management Configuration** setup.

6 On the **Management Configuration** screen, configure the following:

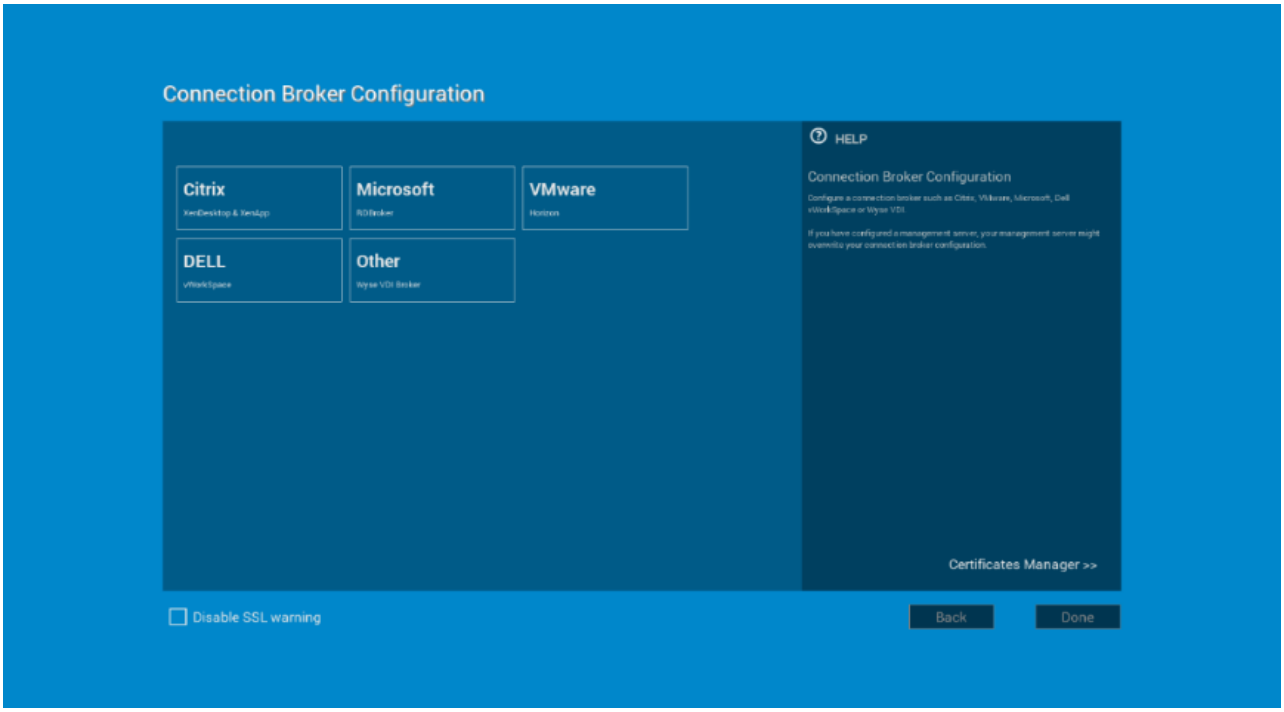


- **File Server**—Enter the file server details to apply configurations including INI files, firmware, packages, and so on, from a file server.
- **WMS**—Enter the group registration key and the Wyse Management Suite server URL to register the thin client to the Wyse Management Suite.
- **WDM**—Enter the IP addresses or host names.
- **Disable SSL warning**—Select this check box to disable the SSL (Secure Sockets Layer) connection warnings.
- **Certificates Manager**—Click **Certificates Manager** to import or request a certificate.

  NOTE: To exit the Management Configuration screen, and load the ThinOS system desktop, click Exit.

7 Click **Done** to exit the First Boot Wizard or click **Next** to enter the **Connection Broker Configuration** setup.

8 On the **Connection Broker Configuration** screen, configure the following:



- **Citrix**—The broker allows you to connect to full desktops using Citrix Virtual Apps and Desktops (formerly Citrix XenDesktop) or individual applications using Citrix Virtual Apps (formerly Citrix XenApp) from a centralized host through Citrix Receiver Client.
  - **Server Address**—Enter the host name or IP address of the broker connection.
  - **Enable theme: ThinOS Lite**—Select this check box to boot the thin client in ThinOS Lite mode.
  - **StoreFront style**—Select this check box to enable the Citrix StoreFront based layout of published applications and desktops on the thin client.
- **Microsoft**—The broker allows you to connect to the virtual desktops using RemoteApp and Desktop connection. Enter the host name or IP address of the broker connection.
- **VMware**—The broker allows you to connect to the remote desktops using VMware Horizon Client.
  - **Server Address**—Enter the host name or IP address of the broker connection.
  - **Enable theme: VMware View**—Select this check box to set the ThinOS desktop theme to VMware View mode.
- **DELL**—The broker allows you to connect to the virtual desktops or applications using Dell vWorkspace. Enter the host name or IP address of the broker connection.
- **Amazon WorkSpaces**—The broker allows your PCoIP clients to connect to virtual desktops that run on AWS. Enter the host name/IP address/FQDN of the broker connection.

  NOTE: Amazon WorkSpaces option is applicable only to the PCoIP clients.
- **Other**—The broker allows you to connect to the virtual desktops or applications using other supported protocols. Enter the host name or IP address of the broker connection.
- **Certificates Manager**—Click **Certificates Manager** to import or request a certificate.
- **Disable SSL warning**—Select this check box to disable the warnings for your SSL (Secure Sockets Layer) connection.

9 Click **Done**.

NOTE: To configure the Management Configuration setup again, click Back, and follow steps 6 and 7.

The device exists from the First Boot Wizard mode, and the ThinOS desktop is displayed.

Connecting to a remote server

On your initial connection to central configuration, we recommended that you connect using a **wired connection** plug in the network-connected Ethernet cable to your thin client before starting the thin client to obtain the configurations desired by the administrator. This **wired connection** will also provide any wireless configurations provided by the administrator through INI files.

If you must initially connect to central configuration through wireless, use the Wireless tab in the **Network Setup** dialog box to enter the SSID and encryption configurations required or set up by the network administrator. For more information, see Configuring the Network Settings.

Central Configuration — If you are configured for automatic detection using INI files — see *Dell Wyse ThinOS INI Guide* , your thin client will automatically detect and connect to the configured remote services during the boot-up process. Press the power button to turn on your thin client to see the **Login** dialog box. Enter your User name, Password, and Domain, and then click **Login**. After authentication is successful, your available connections are presented.

NOTE:
Although the thin client will default to the Classic Desktop for INI backward compatibility, you can configure the thin client to display the Zero Desktop by using the SysMode=VDI parameter in the INI files or by selecting the desktop option in the dialog box. For more information, see Using Your Desktop.

Manual Connection — If you are not yet set up for central configuration, you will see the Zero Toolbar, where you can configure the initial server connection you want using the **Remote Connections** dialog box before you can log in. For more information, see Connecting to a Remote Server manually.

You only need to complete this manual configuration once or after reboot to factory defaults. After the thin client knows the location of your server, it automatically connects to the server for login when you start the thin client in the future. After you confirm that your environment is ready for deployment, you can create INI files for central configuration.

Connecting a remote server manually

To connect a remote server manually, complete the following tasks:

1 Click the **System Settings** icon on the Zero Toolbar to open the System Settings menu, and then click **Remote Connections** to open the **Remote Connections** dialog box.

2 Click the **Broker Setup** tab of the **Remote Connections** dialog box to configure one of the following connections:

- ICA or RDP connection —Select **None**, select **ICA** or **RDP**, click **Configure Connection**, and then follow the wizard.
- A specific broker server connection — Select Microsoft, Citrix Xen, Dell vWorkspace, VMware View, Amazon WorkSpaces or Other, and then enter the IP Address for the server in the **Broker Server** box.

NOTE: For more details, see Configuring the Remote Connections.

3 Click **OK**, and then restart the thin client.

Click the **Shutdown** icon on the Zero Toolbar to open, and use the **Shutdown** dialog box to restart the thin client.

NOTE:

- If an ICA or RDP connection is configured— After thin client restarts, click the **Home** icon on the Zero Toolbar to open the list of available connections. Click the ICA or RDP connection you created, and then log in.
- If a specific Broker Server connection is configured— After thin client restart, the **Login** dialog box appears for your server. Enter the User name, Password, and Domain and click **Login**. After authentication is successful, your Zero Toolbar is presented with your assigned connections defined by the broker server.

Using your desktop

What you see after logging on to the server depends on the administrator configurations.

- **Users with a Classic Desktop**—will see the classic ThinOS desktop with full taskbar, desktop, and Connect Manager familiar to ThinOS users. This option is the default out-of-the-box experience and is recommended for terminal server environments with published applications and for backward compatibility with ThinOS 6.x versions. For more information on using the Classic Desktop, see Classic Desktop Features.

- **Users with a Zero Desktop—**will see the Zero Desktop with the Zero Toolbar showing the assigned list of connections from which to select. This option is recommended for VDI and any full-screen only connections. For more information on using the Zero Desktop, see Zero Desktop Features.

In any desktop case, you can select the desktop option you want (Classic Desktop or Zero Desktop) and create the connections you need using the Visual Experience tab on the **Remote Connections** dialog box.To open the **Remote Connections** dialog box, perform one of the following tasks:

- **Classic Desktop** — Click User Name, and then select **System Setup** > **Remote Connections**.

  NOTE: User Name is the user who is logged-on and is located at the lower-left pane of the taskbar
- **Zero Desktop** — Click the **System Settings** icon on the Zero Toolbar, and then select **Remote Connections**.

Configuring thin client settings and connection settings

While the use of INI files is recommended to configure thin client settings and connection settings available to users, see How to set up automatic updates and configurations, you can use dialog boxes on a thin client to:

- Set up your thin client hardware, look and feel, and system settings, see Configuring thin client settings locally.
- Configure connection settings, see Configuring thin client settings locally.

Connecting to a printer

To connect a local printer to your thin client, be sure you obtain and use the correct adapter cables which are not included. Before use, you may need to install the driver for the printer by following the printer driver installation instructions. For information on connecting to printers, see Configuring the printer setup.

Connecting to a monitor

Depending on your thin client model, connections to monitors can be made using either a VGA (analog) monitor port, a DVI (digital) monitor port, or a DisplayPort (digital) and the proper Dell monitor cables/splitters/adapters.

NOTE:

For dual-monitor supported thin clients— when using a DVI to DVI/VGA splitter, ensure that the DVI monitor will be the primary monitor; when using a DisplayPort, ensure that the DisplayPort monitor will be the primary monitor.

Locking the thin client

To help ensure that no one else can access your private information without permission, ThinOS allows you to lock your thin client so that credentials are required to unlock and use the thin client after you do one of the following:

- **Unplug a signed-on smart card** — If an administrator has set `SCRemovalBehavior=1`for the signing parameter in the INI files and you unplug the smart card that you used to sign on to the thin client, then the thin client will lock. To unlock the thin client for use, you must use the same smart card and your correct PIN. Note that removing a signed-on smart card can also cause the thin client to log-off, if an administrator has set the INI files to do so in this case you must sign-on as usual to use the thin client.
- **Use Lock Terminal from the Shortcut Menu and Shutdown dialog box** — On the Classic Desktop, right-click on the desktop and select **Lock Terminal**, or use the **Shutdown** dialog box. On the Zero Desktop, use the **Shutdown** dialog box. To use the thin client, you must use your correct password.
- **Use the screensaver** — If an administrator has set `LockTerminal=2` for the ScreenSaver parameter, and when the screensaver is activated, then the thin client is locked. To unlock the thin client, enter the login password in the unlock dialog box. However, you cannot see the wallpaper while using the unlock dialog box.

Signing off and shutting down

Use the **Shutdown** dialog box to select the available option you want:

- **Classic Desktop**—Click **Shutdown** in the Connect Manager or Desktop Menu.
- **Zero Desktop**—Click the **Shutdown** icon on the Zero Toolbar.

NOTE: You can also configure automatic behavior after all desktop sessions are closed by using the Remote Connections dialog box, see Central configuration: Automating updates and configurations.

Sleep mode

The sleep mode enables the power-saving state and quickly resumes full power operations without loss of data.

The sleep mode feature is supported on the following platforms:

- Wyse 5040 AIO client with ThinOS (5212)
- Wyse 5040 AIO client with PCoIP (5213)

The USB interface is closed in sleep mode. All USB devices such as USB drives, Bluetooth, audio devices, video devices, and camera are reinitialized after resuming from sleep mode.

The wired network, wireless network, and VPN are disconnected in sleep mode. However, the network configurations are saved.

All the ThinOS configurations—file server, INI, VDI configuration, network configuration, and so on—are saved automatically in sleep mode. The INI parameters are not reloaded from the file server after resuming from sleep mode.

The following windows are not closed in sleep mode:

- **Performance Monitor**
- **Troubleshooting**
- **System Information**
- **System Tools**
- **VPN Manager**
- **Central Configuration**
- **System Preferences**
- **Display**
- **Printer Set Up**
- **Remote Connections**

  NOTE: You are logged off from the ThinOS VDI broker and sessions in sleep mode. You must log in to broker sessions again after resuming from sleep mode.
- **Network Set Up**

NOTE: Peripherals windows are closed in sleep mode to reinitialize any peripheral devices after resuming from sleep mode.

Enable sleep manually

To enable the **Sleep** option manually, use either of the following options:

- **ThinOS lock window**—To enter sleep mode using the ThinOS lock window, do the following:
  a Lock your thin client.
  b In the ThinOS lock window, click **Sleep**.
  c Click **OK**.
- **Shutdown dialog box**—To enter sleep mode using the **Shutdown** dialog box, do the following:
  a Open the **Connect Manager** or the **Desktop Menu**.
  b Click **Sleep**, and then click **OK**.

You can wake the thin client from sleep mode by using the mouse, keyboard, power button, or the Wake-On-LAN feature.

Enable automatic sleep

To enable the thin client to automatically enter sleep mode, do the following:

1 From the desktop menu, click **System Setup**, and then click **System Preferences**.
2 Click the **General** tab.
3 From the **Screensaver** drop-down list, select the **Turn Off Screen** option.
4 From the **After Turn Off screen** drop-down list, select the **Sleep** option. The default value is 20 minutes.
5 From the **Timer** drop-down list, select the idle time after which you need the thin client to enter sleep mode.
6 Click **OK**.

Sleep mode timer starts after screen is turned off by the screensaver. The device automatically enters sleep mode when the ThinOS client is left idle for the specified idle time.

You can wake the thin client from sleep mode by using the mouse, keyboard, power button, or the Wake-On-LAN feature.

Additional getting started details

This section includes details about zero desktop, classic desktop, login dialog box, and system information.

Zero desktop features

This section includes information on:

- Zero interactive desktop guidelines
- Zero toolbar
- List of connections

Zero interactive desktop guidelines

The Zero Desktop has a default background with the Zero Toolbar at the left of the screen.

The following table lists the available Zero Desktop shortcuts:

Table 5. Zero Desktop shortcuts

Action	Press
Display the Zero Toolbar	Ctrl+Alt+UpArrow
Open a selection box for toggling between the desktop and currently-active connections	Ctrl+Alt+DownArrow
Lock the thin client	Ctrl+Alt+LeftArrow or Ctrl+Alt+RightArrow
Keyboard shortcuts to menu commands	Left-Alt+UnderlinedLetter or Right-Alt+UnderlinedLetter
Capture the full desktop to the clipboard	Print Screen

Action	Press
Capture the active window to the clipboard	Alt+PrintScreen

NOTE:

- You can copy and paste between application sessions and between sessions and the desktop, however, this function depends on session server configurations.
- In addition to the standard two-button mouse, the thin client supports a Microsoft Wheel Mouse used for scrolling. Other similar types of a wheel mouse may or may not work.

To switch the left and right buttons, use the **Peripherals** dialog box, see Configuring the peripherals settings.

Zero toolbar

The Zero toolbar usually appears at the left corner of the Zero Desktop. However, depending on administrator configurations, the toolbar can be removed or hidden. It is shown only when a user moves the mouse pointer over the left edge of the desktop screen.

Administrators can configure the toolbar settings using either a dialog box, or the SysMode parameter in the wnos.ini file.

Table 6. Toolbar icons

Icon	What It Does
Home	Opens the list of available connections.
System Information	Displays thin client system information.
System Settings	Opens the System Settings menu to configure thin client system settings and perform diagnostics.
Shutdown Terminal	Click the **Shutdown Terminal** icon to use the Shutdown options available on the thin client. **NOTE: The Shutdown Terminal icon does not display on the toolbar when using the Admin Mode button to configure system settings.**

NOTE: If configured to display by an administrator, the current date and time are shown on the Zero Toolbar. The thin client is capable of synchronizing its clock to time provided by a Simple Network Time Protocol (SNTP) server.

List of connections

On the Zero Toolbar, you can click the **Home** icon to open your list of assigned connections. Sometimes, the list contains only default connections.

Use the following guidelines depending on user privilege level, some options may not be available for use:

Table 7. Connection options

Option	What It Does
Name of the connection	Opens the connection you want to use. **NOTE: All open connections display a blue icon to the left of the connection name in the list.**
Reset icon	Resets the connection.

Option	What It Does
	NOTE: It is useful when a connection is not functioning properly or you need to reboot the connection.
Close icon	Closes the connection. **NOTE: The Close icon is grayed out for connections that are not open.**
Edit icon	Opens the **Connection Settings** dialog box to change the connection options. **NOTE: Depending on user privilege level, editing options may not be available for use.**
Add Connection	Allows you to configure or add new connections.
Configuring Global Connection Settings	If you do not use INI files to provide global connection settings, you can click **Global Connection Settings** to open and use the **Global Connection Settings** dialog box to configure settings that affect all the connection in the list.

Using Zero theme

Use the zero theme option to customize the look and feel of your ThinOS for Citrix, VMware, Classic or VDI mode. To enable a zero theme, deploy the INI parameters based on your zero theme preference, and restart your thin client. The **Visual experience settings are changed** message is displayed, and the thin client loads the selected zero theme.

```
ZeroTheme={Classic,VDI,Citrix,VMware}
```

```
SysMode={Classic,VDI,Citrix,VMware}
```

INI parameters work with wnos.ini file. You can also use Wyse Management Suite to manage the configuration.

- **Citrix zero mode**—When you configure ThinOS in Citrix zero mode, the device searches for xen.ini file, and loads the Citrix zero mode. If the xen.ini file is not available, then the wnos.ini file is used during configuration. If you need to switch from the Citrix zero mode, then you must use the wnos.ini file during configuration.
- **VMware zero mode**—When you configure ThinOS in VMware zero mode, the device loads the VMware zero mode.

  NOTE: VMware wallpaper is used in the VMware zero mode.

Classic desktop features

This section includes information about classic interactive desktop, shortcut menu, desktop menu, and Connect Manager.

Classic interactive desktop guidelines

The Classic desktop has a Dell Wyse default background with a horizontal task bar at the bottom of the screen.

Use the following guidelines:

- Icons representing available server connections and published applications are displayed on the background. If you pause the mouse pointer over an icon, the information about the connection will be displayed. Right-clicking on an icon opens the **Connection Settings** dialog box which displays additional information about the connection. The number of icons that can be displayed on the desktop depends on the desktop resolution and administrator configuration.
- A server connection and published application can be opened by double-clicking a desktop icon or a user can navigate to the desktop icon they want by using tab key and pressing **Enter** to initiate the connection.

- Right-clicking on the desktop provides a shortcut menu, see Using the shortcut menu.
- Clicking the User Name or clicking on the desktop, opens the desktop menu, see Using the desktop menu.

NOTE:

- User Name is the user who is logged-on and is located at the lower-left pane of the task bar.
- If configured to display by an administrator, the volume control is displayed in the right corner of the taskbar and the current time and date are shown when the cursor is placed on the time; the thin client is capable of synchronizing its clock to time provided by a Simple Network Time Protocol (SNTP) server.

Using the Shortcut menu

To use the Shortcut menu:

1 Log in as administrator.

2 Right-click on your desktop

The **Shortcut** menu is displayed.

3 On the **Shortcut** menu, you are able to view and use the following options:

a **Administrator Mode**—Allows administrators to configure various settings locally on thin client.

b **Hide all windows**—Brings the full desktop to the foreground.

c **Copy to clipboard**—Copies an image of the full screen, current window or event log to the clipboard. The clipboard contents can then be pasted to an ICA or an RDP session. You can copy full screen or current window to clipboard, and can export the screenshots using the **Export Screenshot** option in Troubleshooting.

d **Purge clipboard**—Discards the contents of the clipboard in order to free up memory.

e **Lock Terminal**—Puts the thin client in a locked state if the user has signed on to the system with a password. The thin client can only be unlocked using the same password.

f **Group Sessions**—Enables you to open more than three ICA, RDP, PCoIP, Blast or ICA seamless sessions. The sessions are displayed as a group on the taskbar.

Using the desktop menu

To use the desktop menu:

1 Click your desktop or click your User Name.

User Name is the user who is logged-on and is at the lower left side of the taskbar.

The Desktop menu is displayed.

2 On the desktop menu, you are able to view and use the following options:

a **System Setup** —Provides access to the following local system setup dialog boxes:

- **Network Setup** —Allows selection of DHCP or manual entry of network settings, as well as entry of locations of servers essential to thin client operation. This menu selection is disabled for Low-privileged users.
- **Remote Connections**—Allows you to configure thin client broker connections including Microsoft, Citrix Xen, Dell vWorkspace, VMware View, Amazon WorkSpaces or Other broker server connections.
- **Central Configuration**—Allows you to configure thin client central connection settings such as file server and optional WDA server settings.
- **VPN Manager** —Allows you to configure thin client VPN manager.
- **System Preference**—Allows user selection of thin client parameters that are matter of personal preference.
- **Display**—Allows you to configure the monitor resolution and refresh rate.
- **Peripherals**—Allows you to select the peripherals settings such as audio, keyboard, mouse, serial, camera, bluetooth, and touchscreen settings.
- **Printer**—Allows configuration of network printers and local printers that are connected to the thin client.

b **System Information**—Provides thin client system information.

c **System Tools**—Provides information about devices, certificates, packages, global INI, user INI, wdm or ccm.ini.

d **Troubleshooting options**—Displays Performance Monitor graphs that display client CPU, Memory and Networking information, Trace and Event log settings, CMOS management extract and restore settings, and other options that are useful for ThinOS troubleshooting.

e **Applications**—Contains a submenu of all locally configured applications and is populated with published applications when a user is signed on using either PNLite or PNAgent.

f **Shutdown**—Opens the **Sign-off/LockTerminal/Shutdown/Restart the System** dialog box.

Using the Connection Manager

To use the Connection Manager:

1 Click **Connect Manager** on the taskbar.

- The Connect Manager has a list of connection entries and a set of command buttons available for use with the connections.
- Non-privileged users cannot view the Connect Manager.

The **Connection Manager** dialog box is displayed.

2 In the Connection Manager dialog box, use the following buttons to configure the Connection Manager settings:

a Click **Connect** to select a connection from the list and make a connection.

b Click **New** to open the **Connection Settings** dialog box either directly or through the Connection Protocol menu selection for creating a new connection definition.

The locally defined connections are added to the connection list. Be aware of the following information:

- **High-privileged user**—Typically, all locally defined connection definitions are temporary and are lost when the user logs off and when the thin client restarts or is shut down. However, if configured by an administrator (enablelocal=yes), locally defined connection definitions can be saved in these cases.
- **Stand-alone user**—Locally defined connections are retained when the thin client restarts or is shut down and there is no individual logon. Network configuration settings must be made locally.

c Click **Properties** to open the **Connection Settings** dialog box for the selected connection.

Be aware of the following information:

- **High-privileged user**—Can view and edit the definitions for the currently selected connection. Edits are not permanently retained when the user signs-off.
- **Low-privileged user**—Cannot create or edit connections, but can view connection definitions. However, you can enable a low-privileged user to create a connection using INI parameters.
- **Stand-alone user**—Can permanently modify the persistent connections except when PNAgent/PNLite services are used.

d Click **Sign-off** to sign off from the thin client.

e Select a connection from the list, and click **delete** to delete the selected connection.

f Select a Virtual connection from the list, and click **Reset VM** to reset a selected virtual connection.

g Click **Global Connection Settings** tab to open and use the **Global Connection Settings** dialog box to configure settings that affect all the connections in the list.

Login dialog box features

While the **Login** dialog box allows you to log on to the server, it also allows you to:

- Obtain system information.
- Access Admin Mode to configure thin client settings.
- Change or reset your own password, and unlock your account.
- Open the **Shutdown** dialog box by using CTRL+ALT+DELETE.

In the **Login** dialog box, use the following guidelines:

- **System Information**—Click the **Sys Info** button to open the **System Information** dialog box. You can view the thin client system information such as System Version, IP Address, information on devices connected to your thin client, event logs and so on.
- **Admin Mode**—Click the **Admin Mode** button to configure various settings locally on the thin client other than broker desktop configurations. For example, you can choose to manually configure the Citrix XenBroker Server URL or override the URL that is centrally defined by file servers by using the **Remote Connections** dialog box as described in **Remote Connections**.

- **Classic desktop**—Use the **Leave Administrator Mode** option in the Shutdown dialog box.
- **Zero desktop**—Use the **Leave Administrator Mode** option in the Shutdown dialog box, or use the **Leave Administrator Mode** icon (X) in the upper-right pane of the **System Settings** menu.

  NOTE: By default the Admin Mode button is not displayed on the log on dialog box. You can display it by selecting the Show local admin button check box in the Shutdown dialog box.

  NOTE: By default there is no password needed for the Admin Mode button use. You can password protect the Admin Mode button (to require login credentials) by using the `AdminMode` parameter in a wnos.ini file, see Dell Wyse ThinOS INI Guide.

- **Shutdown**—Click the **Shutdown** button to open and use the **Shutdown** dialog box to sign off, shut down, restart, reset the system setting to factory defaults, and so on.
- **Account Self-Service**—Click the **Account Self-Service** icon shown when configured using the `AccountSelfService`option of the `PasswordServer` INI parameter to open and use the **Account Self-Service** dialog box to change or reset your own password and unlock your account. For information on INI parameter, see Dell Wyse ThinOS INI Guide.

This process assumes that the security questions and answers have been pre-registered by the user inside their Windows environment. Users must use HTTPS (not HTTP) for an account self-service server address such as Https://IPAddress, in the **Broker Setup** tab. After the security questions are answered, your new password will be set or your account will be unlocked.

Accessing system information

Use the **System Information** dialog box to view system information.

- **Classic desktop**—Click **System Information** from the desktop menu.
- **Zero desktop**—Click the **System Information** icon on the zero toolbar.

The **System Information** dialog box includes:

- **General tab**—Displays general information such as System Version, Serial Number, Memory Size (Total and Free), CPU Speed, ROM Size, Monitor, Parallel ports, Terminal Name, Boot from, Memory speed, SSD size, Resolution, and the Serial ports.
- **Copyright tab**—Displays the software copyright and patent notices.

  Acknowledgments button is added in the **Copyright** tab in System Information. This button is related to third party software.
- **Event Log tab**—Displays the thin client start-up steps normally beginning from system version to checking firmware or error messages that are helpful for debugging problems. The details about the monitors and USB connected to the thin client, and bluetooth initialization are also displayed.

  When you install packages or restart the ThinOS device, the ThinOS client verifies the version of the installed package. If you have not installed the latest package version, the details about the current package version and the recommended package version are displayed.
- **Status tab**—Displays status information about TCP performance related parameters, UDP performance related parameters, CPU Busy, System Up Time, Wyse Management Suite status, Free Memory, Active sessions, and WDM status.
- **IPv6 tab**—Displays IPv6 information such as Link-local Address, IPv6 Address, and IPv6 Default Gateway.

  NOTE: This tab is displayed when IPv6 is enabled in the General tab of the Network Setup dialog box.
- **ENET tab**—Displays information about wired network connections.
- **WLAN tab**—Displays information about wireless network connections.
- **About tab**—Displays information about the ThinOS operating system. The following attributes are listed:
  - Platform name
  - Operating system type
  - ThinOS build name
  - ThinOS build version
  - BIOS name
  - BIOS version
  - Citrix Broker or Receiver version—This represents ICA revisions between the ThinOS versions.
  - Dell vWorkspace version
  - VMware Horizon version—This represents the Horizon revisions between the ThinOS versions.

- Microsoft Broker or RDP version
- Teradici PCoIP version—This represents the PCoIP revisions between the ThinOS versions, and is applicable to the PCoIP devices only.
- Imprivata version
- Caradigm version
- SECUREMATRIX version
- HealthCast version

NOTE:

- **Kernel mode**—The components are implemented in Kernel according to the specification. The version is displayed as [max].[min], which is the base version of protocol or server or client of the component. For example, the Microsoft RDP protocol version is 10.0, the Imprivata version is 5.2, and so on.
- **User mode**—The components are from the source, or binaries from third party that are compiled or integrated into ThinOS. The version is displayed as [max].[min].[svn_revision]. The [max] and [min] is the base version of the third component, and the [svn_revision] is the source control revision of ThinOS. Using the ThinOS specified version, you can identify the changes between different revisions. For example, the Citrix Receiver version is 14.0.44705, the VMware Horizon version is 4.8.x, and so on. The components are matched to the installed packages. If the packages are removed, the field remains empty in the **About** tab.

ENERGY STAR compliance

ENERGY STAR is a standard label on devices that meet energy-efficiency requirements by Environmental Protection Agency (EPA). Wyse 5070 thin clients with ThinOS are ENERGY STAR compliant. For more information about the ENERGY STAR program, see www.energystar.gov.

IPv6 certification

All networks are required to be Internet Protocol version 6 (IPv6) capable. Wyse 5070 thin clients with ThinOS are certified for IPv6 capability.

4

Global Connection settings

Use the **Global Connection Settings** dialog box to configure the connection settings such as ICA, RDP, Horizon, and PCoIP.

- Zero desktop—Click **Global Connection Settings** in the list of connections.
- Classic desktop—Click **Global Connection Settings** in Connect Manager.

To configure the Global Connection settings:

1 On the desktop taskbar, click **Connect Manager** > **Global Connection Settings**.
The **Global Connection Settings** dialog box is displayed.

2 Click the **Session** tab to configure the options that are available to all sessions.
The Smart Card check box specifies the default setting for connecting to a smart card reader at system startup.

> **NOTE:**
> ICA sessions automatically connect when you connect the smart card readers. If you want to use the **Disks** option to automatically connect to ICA sessions, use the following guidelines:
>
> - More than one disk can be used simultaneously. However, the maximum number of USB drives including different subareas is 12.
> - Ensure that you save all data and sign off from the session before removing the USB drive.

> **NOTE: USB devices redirection—By default, audio, video, and printer devices do not use HDX USB for redirection. You can make selections for USB device redirection on the Session tab of the Global Connection Settings dialog box.**

3 Click the **ICA** tab, and do the following:
   a Select the check boxes for the options that are available to all ICA sessions.
   b Select an audio quality optimized for your connection.
   c Use the **Map to** option to map a disk. When a drive is entered, the disk is mapped in the corresponding drive.

4 Click the **RDP** tab, and do the following:
   a Select the **Enable Network Level Authentication (NLA)** check box if you want to verify users before connecting to a full RDP connection.
   b Select the **ForceSpan** check box to span the session horizontally across two monitors. This option enables you to use two monitors as one large monitor.
   c Select the **Enable TSMM** check box if you want to enable the Terminal Service Multimedia Redirection.
   d Select the **Record From Local** check box if you want to enable recording from a local microphone.
   e Select the **RemoteFX** check box to enable RemoteFX. RemoteFX is used to remotely deliver Windows virtual desktops over a network connection.
   f From the **USB Redirection Type**, select either TCX USB or RDP USB. TCX USB is the default option. To use RDP USB, you must use a RemoteFX session for Windows 7/Windows 2008 R2 session. However, RDP USB is not supported using a standard Windows 7/Windows 2008 R2 session. For Windows 8 session and later, RDP USB is supported.
   g In the **Desktop Scale Factor** box, enter the DPI value in percentage. This option enables you to define the desktop DPI remotely. The Desktop Scale Factor is only applicable for the RDP connection. Setting this option does not impact the display scale of the thin client locally. The DPI range is 100–500. If you enter a nonnumeric character, the value is automatically set to 100. If you enter a value less than 100, the value is automatically set to 100. If you enter a value higher than 500, the value is automatically set to 500.

> **NOTE: The desktop scale factor is applicable only to RDP version 8, and RDP 10 or higher versions. RDP version 7 is not supported.**

5 Click the **Horizon** tab, and do the following:
   a Select the **Enable H264** check box. This option enables the H.264 decoding in Horizon Client. Enabling this option, improves the performance of high-end applications. To validate the H.264 decoding, add an INI parameter **setenv BlastDebugClientH264=yes**, and verify if the H264 basic watermark is displayed in the upper-left corner of the VMware Blast session window.

The following table describes the performance of H.264 decoder in VMware Horizon sessions that use the VMware Blast display protocol:

Table 8. Blast H.264 decoding

Screen resolution within VMware Horizon Blast session	Blast H.264 decoding in VMware Horizon Blast session	Summary
Session display width is less than or equal to 1920 resolution.	Blast H.264 decoding is always enabled.	Horizon client uses Blast H.264 decoding even if the H.264 decoder setting is disabled using GUI or INI options.
Session display width is greater than 1920 resolution.	Blast H.264 decoding is disabled by default. You can enable Blast H.264 decoding either on the ThinOS GUI or by deploying the INI parameter.	By default, Horizon client does not use Blast H.264 decoding. If the Blast H.264 decoder setting is enabled on ThinOS, the Horizon client uses H.264 decoding. Enabling H.264 may downgrade the session performance.

NOTE:

- Blast H.264 feature is not supported on Wyse 5010 thin clients, Wyse 5040 thin clients, and Wyse 7010 thin clients. Blast H.264 is automatically disabled on Wyse 5060 thin client for 1920 x 1200 resolution due to hardware limitation.
- A performance tracker is introduced by VMware for performance evaluation and data collection.

b From the **Network Condition** drop-down list, select whether to use a condition for your Blast connection.

NOTE: Blast Extreme protocol is part of Blast Extreme Advanced Transport (BEAT).

- Select **Excellent** to enable the Blast connection to use Transmission Control Protocol (TCP).
- Select **Typical** to enable the Blast connection to use Transmission Control Protocol (TCP). By default, this value is selected.
- Select **Poor** to enable the Blast connection to use User Datagram Protocol (UDP). UDP uses the available bandwidth to deliver the user experience.

  To enable UDP, you must modify the VMware View Connection Server, the Agent host desktop, and the VMware Horizon Client settings. For information about the necessary configuration on server and agent desktop, see the *VMware Certificate Guide* at code.vmware.com/group/euc/thin-client/certs/4.6.

c Select the **High Color Accuracy** check box. This option enables Horizon Client to use a superior color fidelity when H.264 decoding is enabled.

The **High Color Accuracy** option is available on the following platforms:

- Wyse 3030 LT thin client
- Wyse 3040 thin client
- Wyse 5060 thin client
- Wyse 5070 thin client

In PCoIP-enabled clients, the **PCoIP** tab is available. Select the **USB device redirection** type from the drop-down list. The available values are **PCoIP USB** and **TCX USB**.

5

Configuring connectivity

This chapter helps you to understand various configuration settings for a secure connection.

To configure the settings on Classic desktop, click **System Setup** from the desktop menu, and use the configuration tabs. To configure the settings on Zero desktop, click the **System Settings** icon on the zero toolbar, and then use the configuration tabs.

Configuring the network settings

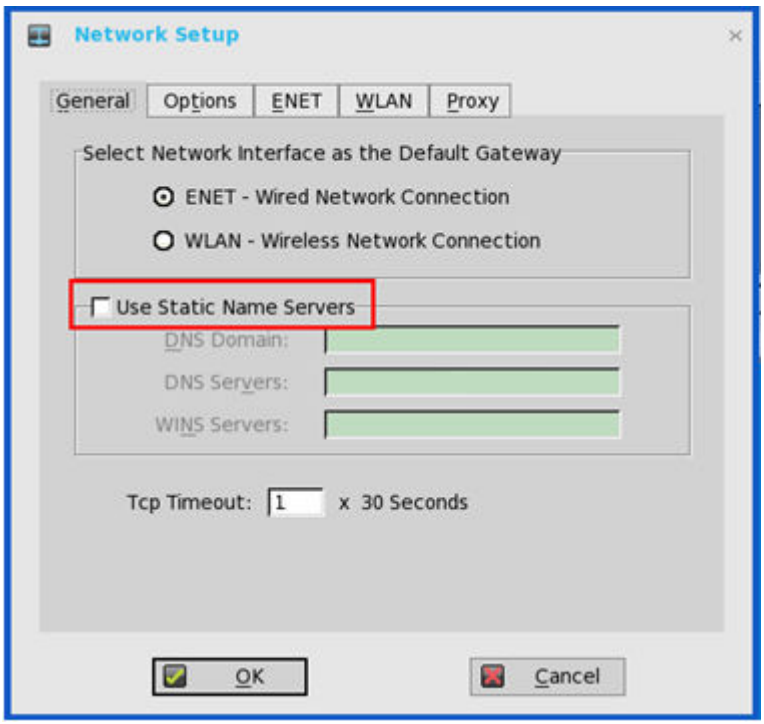
Use the network options to configure the network based on your requirement.

Configuring the general settings

NOTE: This section is applicable to supported ThinOS platforms and Wyse 5070 thin client with Wireless LAN (WLAN) module.

To configure the general network settings:

1 From the desktop menu, click **System Setup**, and then click **Network Setup**.
The **Network Setup** dialog box is displayed.



2 Click the **General** tab, and use the following guidelines:
   a To set the default gateway, select the type of network interface from the available options.
      1 **Single Network support**—Either wireless or wired network is connected.
         - **ENET**—Click this option, if you want set up the Ethernet Wired Network Connection.

- **WLAN**—Click this option, if you want set up the Wireless Network Connection.
- If the user use wireless network after selecting ENET connection or wired network after selecting WLAN connection, then the system log "WLAN: set default gateway xx.xx.xx.xx" for first case and "ENET: set default gateway xx.xx.xx.xx" for second case are printed to ensure that the UI setting reflects the actual usage.

NOTE: The User Interface (UI) will not be changed automatically.

2 **Dual Network support**—Both wireless and wired networks are connected. The default gateway is determined by the UI settings.

b **Use Static Name Servers**—By default, this check box is not selected, and thin client fetches the server IP address from DHCP. Select this check box to manually assign static IP addresses.

If name servers are changed using GUI, INI or link down/up, then the details are displayed in Event Logs.

In dynamic mode, the DNS/WINS can be merged from Ethernet and Wireless, if network is not working.

1 Enter the URL address of the DNS Domain in the **DNS Domain** box.

2 Enter the IP address of the DNS Server in the **DNS Server** box.

Use of DNS is optional. DNS allows you to specify remote systems by their host names rather than IP addresses. If a specific IP address (instead of a name) is entered for a connection, it is used to make the connection. Enter the DNS Domain and the network address of an available DNS Server. The function of the DNS Domain entry is to provide a default suffix to be used in name resolution. The values for these two boxes may be supplied by a DHCP server. If the DHCP server supplies these values, they replace any locally configured values. If the DHCP server does not supply these values, the locally configured values will be used.

NOTE: You can enter up to 16 DNS Server addresses, separated by a semicolon, comma, or space. The first address is for the primary DNS server and the rest are secondary DNS servers or backup DNS servers.

3 Enter the IP address of the WINS Server in the **WINS Server** box.

Use of WINS is optional. Enter the network address of an available WINS name server. WINS allows you to specify remote systems by their host names rather than IP addresses. If a specific IP address (instead of a name) is entered for a connection, it is used to make the connection. These entries can be supplied through DHCP, if DHCP is used. DNS and WINS provide essentially the same function, name resolution. If both DNS and WINS are available, the thin client attempts to resolve the name using DNS first and then WINS.

You can enter two WINS Server addresses (primary and secondary), separated by a semicolon, comma, or space.

c Enter the digit multiplier of 30 seconds in the **TCP Timeout** box to set the time-out value of a TCP connection. The value must be **1** or **2** which means the connection time-out value is from 1x30=30 seconds to 2x30=60 seconds. If the data for connecting to the server is not acknowledged and the connection is time out, setting the time-out period retransmits the sent data and again tries to connect to the server till the connection is established.

3 Click **OK** to save the settings.

Configuring the general settings

NOTE: This section is applicable if the Wyse 5070 thin client contains any of the optional modules—Registered Jack 45 (RJ45) or Small form-factor pluggable (SFP) module.

To configure the general network settings:

1 From the desktop menu, click **System Setup**, and then click **Network Setup**.

The **Network Setup** dialog box is displayed.

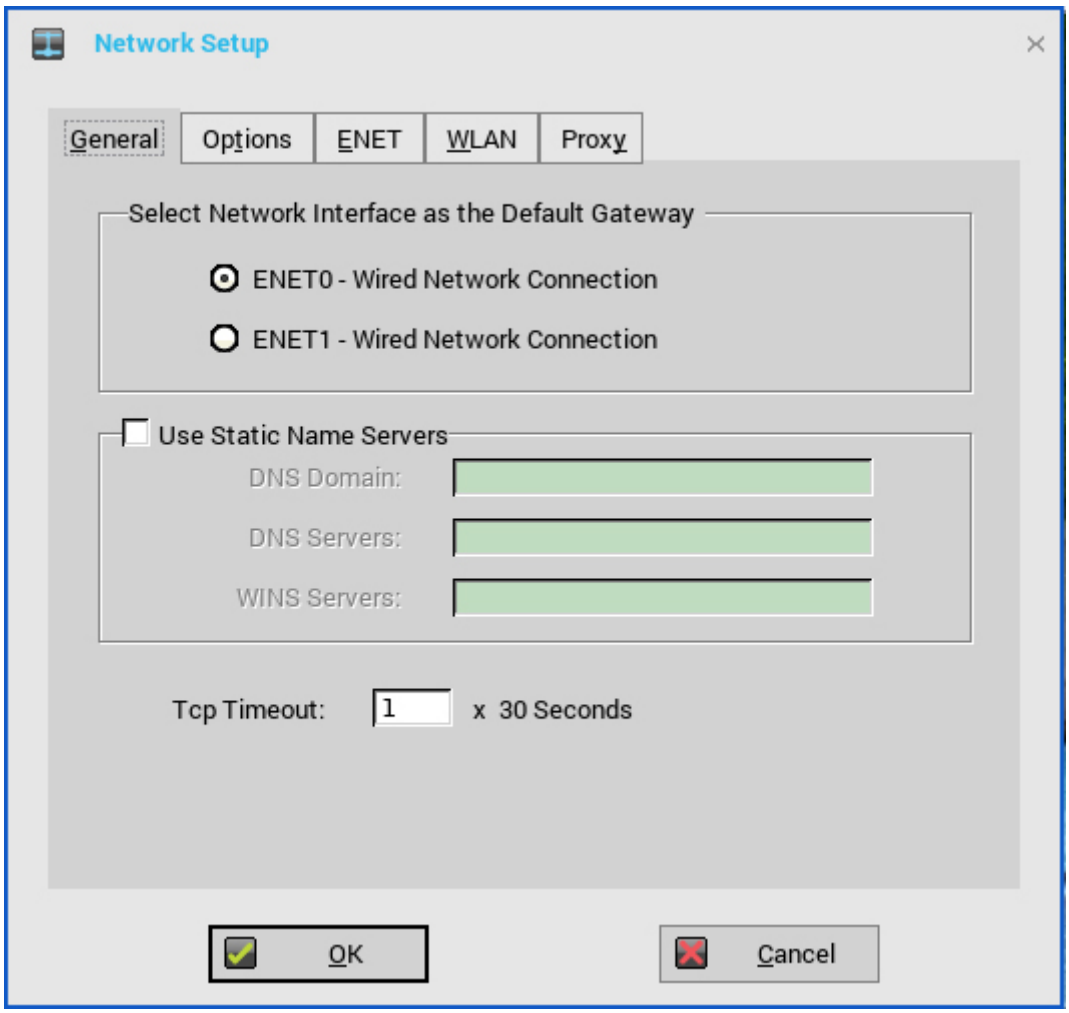


Figure 3. General settings

2 Click the **General** tab, and use the following guidelines:

a To set the default gateway, select the type of network interface from the following options:

- **ENET0**— Enables you to set up the first Ethernet Wired Network connection.
- **ENET1**—Enables you to set up the second Ethernet Wired Network connection.

> **NOTE: You can connect your thin client to two wired network connections at the same time. The default gateway is determined by the UI settings. However, UI will not be changed automatically.**

b **Use Static Name Servers**—By default, this check box is not selected, and thin client fetches the server IP address from DHCP. Select this check box to manually assign static IP addresses.

If name servers are changed using GUI, INI or link down/up, then the details are displayed in Event Logs.

In dynamic mode, the DNS/WINS can be merged from Ethernet 0 and Ethernet 1, if network is not working.

1 Enter the URL address of the DNS Domain in the **DNS Domain** box.

2 Enter the IP address of the DNS Server in the **DNS Server** box.

Use of DNS is optional. DNS allows you to specify remote systems by their host names rather than IP addresses. If a specific IP address (instead of a name) is entered for a connection, it is used to make the connection. Enter the DNS Domain and the network address of an available DNS Server. The function of the DNS Domain entry is to provide a default suffix to be used in name resolution. The values for these two boxes may be supplied by a DHCP server. If the DHCP server supplies these values, they replace any locally configured values. If the DHCP server does not supply these values, the locally configured values will be used.

NOTE: You can enter up to 16 DNS Server addresses, separated by a semicolon, comma, or space. The first address is for the primary DNS server and the rest are secondary DNS servers or backup DNS servers.

3 Enter the IP address of the WINS Server in the **WINS Server** box.

Use of WINS is optional. Enter the network address of an available WINS name server. WINS allows you to specify remote systems by their host names rather than IP addresses. If a specific IP address (instead of a name) is entered for a connection, it is used to make the connection. These entries can be supplied through DHCP, if DHCP is used. DNS and WINS provide essentially the same function, name resolution. If both DNS and WINS are available, the thin client attempts to resolve the name using DNS first and then WINS.

You can enter two WINS Server addresses (primary and secondary), separated by a semicolon, comma, or space.

c Enter the digit multiplier of 30 seconds in the **TCP Timeout** box to set the time-out value of a TCP connection. The value must be **1** or **2** which means the connection time-out value is from 1x30= 30 seconds to 2x30= 60 seconds. If the data for connecting to the server is not acknowledged and the connection is time out, setting the time-out period retransmits the sent data and again tries to connect to the server till the connection is established.

3 Click **OK** to save the settings.

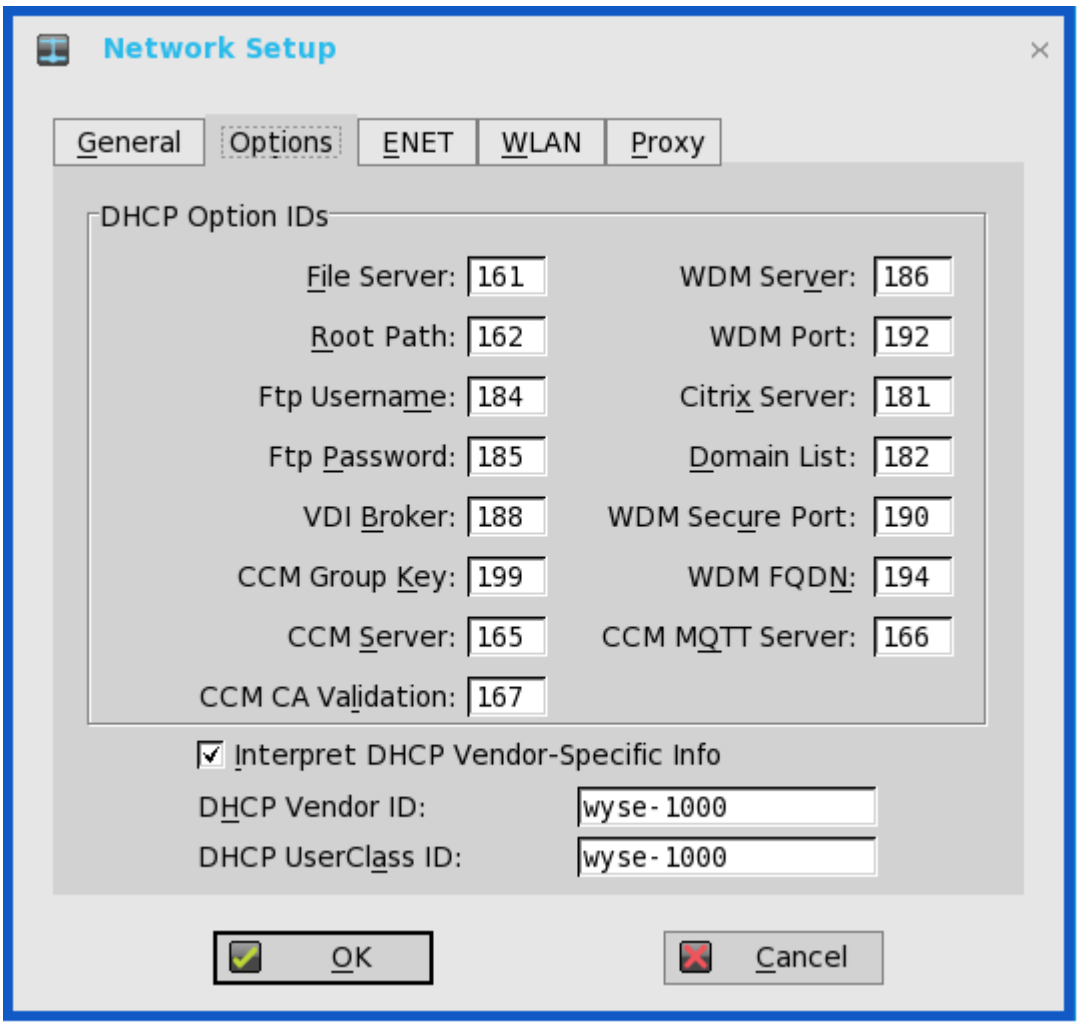
Configuring the DHCP options settings

To configure the options settings:

1 From the desktop menu, click **System Setup**, and then click **Network Setup**.

The **Network Setup** dialog box is displayed.

2 Click the **Options** tab, and use the following guidelines:



a **DHCP Option IDs** — Enter the supported DHCP options. Each value can only be used once and must be between **128** and **254**. For information about DHCP options, see DHCP options.

b **Interpret DHCP Vendor-Specific Info** — Select this check box for automatic interpretation of the vendor information.

c **DHCP Vendor ID** — Shows the DHCP Vendor ID when the dynamically allocated over DHCP/BOOTP option is selected.

d **DHCP UserClass ID** — Shows the DHCP UserClass ID when the dynamically allocated over DHCP/BOOTP option is selected.

3 Click **OK** to save the settings.

Configuring the ENET settings

To configure the ENET settings:

1 From the desktop menu, click **System Setup**, and then click **Network Setup**.
The **Network Setup** dialog box is displayed.

2 Click the **ENET** tab, and use the following guidelines:

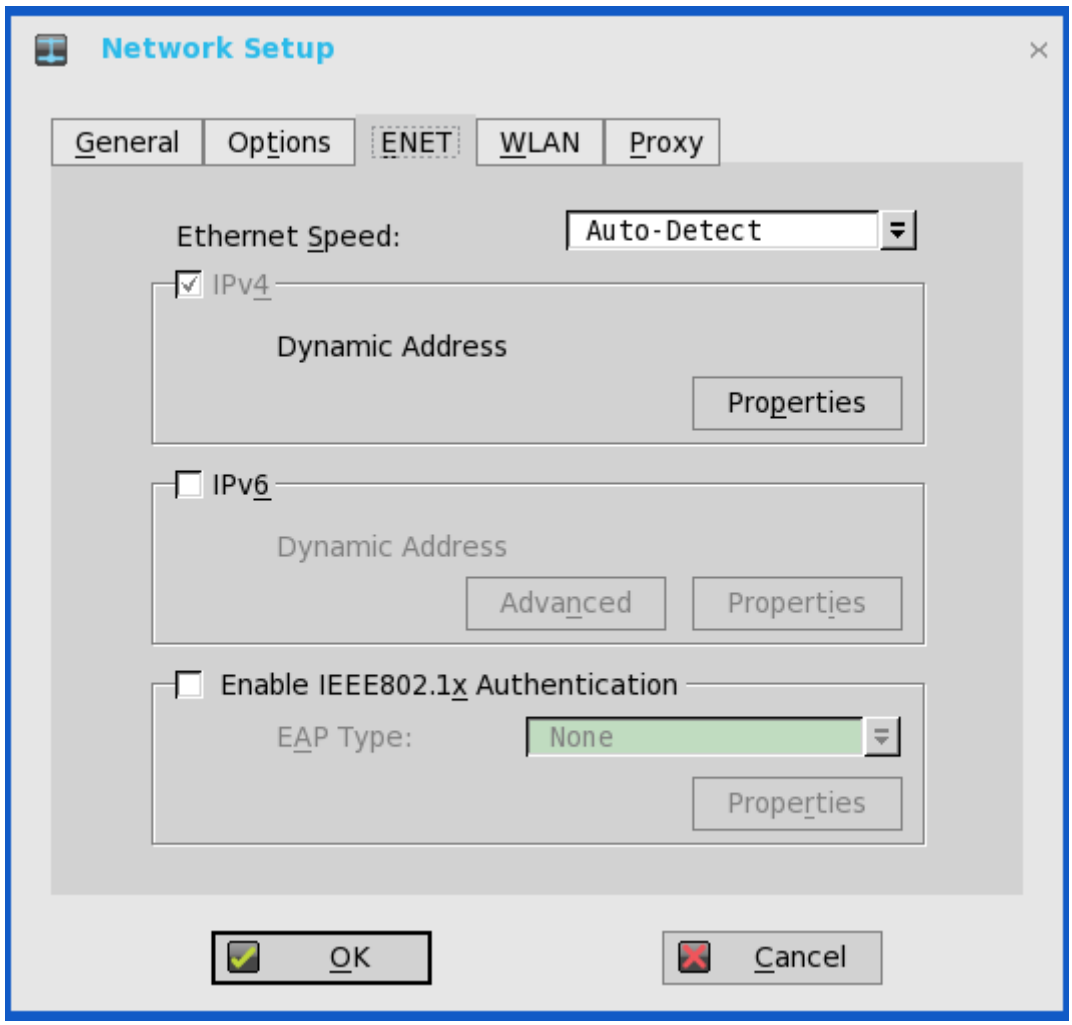


Figure 4. ENET tab

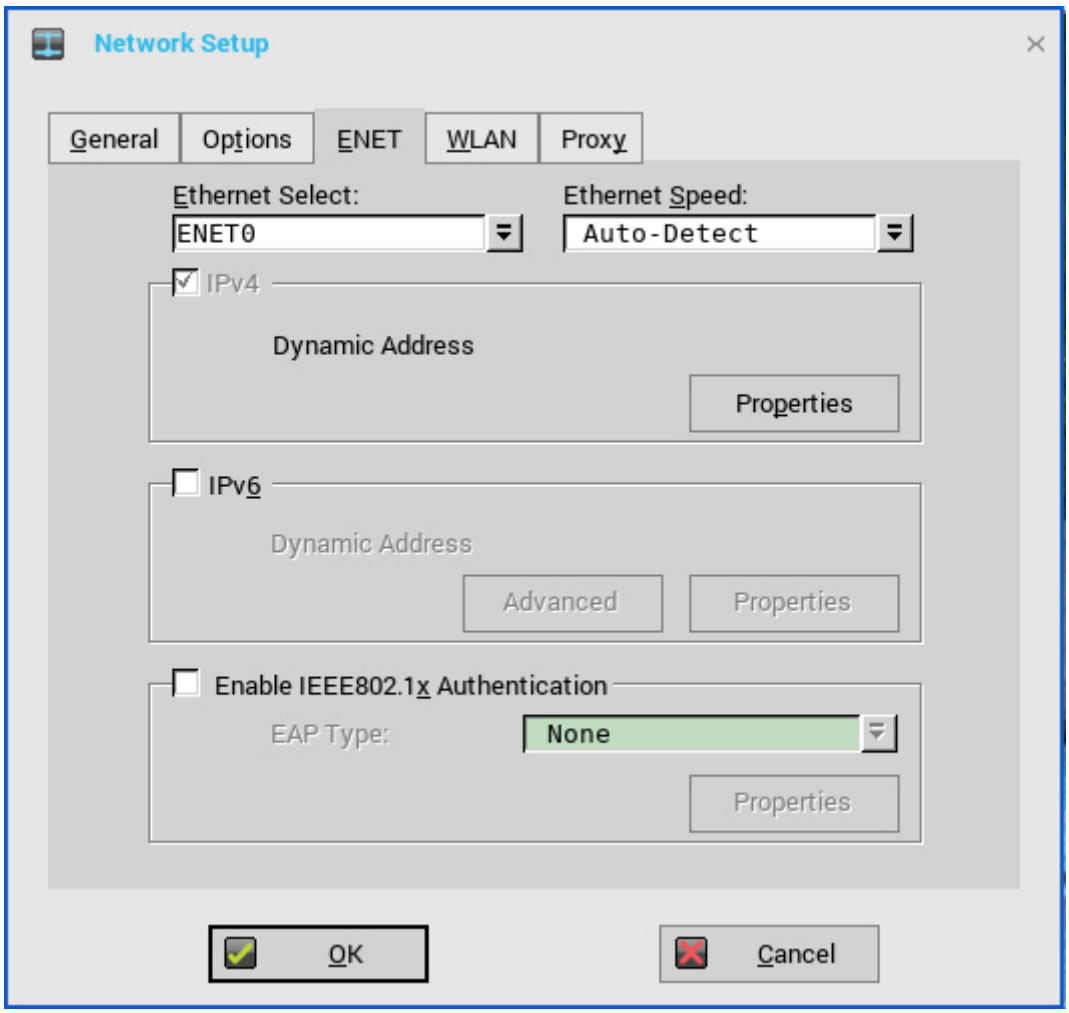


Figure 5. ENET tab

a **Ethernet Select**—Allows you to select the wired network connection. For Wyse 5070 thin client without SFP or RJ-45 module, the **ENET0** option is selected by default. For Wyse 5070 thin client with SFP or RJ-45 module, select either **ENET0** or **ENET1** based on your network preference.

b **Ethernet Speed**—The default value is **Auto-Detect**. If your network equipment does not support the automatic negotiation, select any of the available options—**10 MB Half-Duplex**, **10 MB Full-Duplex**, **100 MB Half-Duplex**, **100 MB Full-Duplex**, or **1 GB Full-Duplex**.

The **10 MB Full-Duplex** option can be selected locally. However, this mode can be negotiated through **Auto-Detect**.

c The **IPv4** check box is selected by default. Click **Properties** to configure the following options:

- **Dynamically allocated over DHCP/BOOTP**—Select this option to enable your thin client to automatically receive information from the DHCP server. The network administrator must configure the DHCP server by using DHCP options to provide information. Any value that is entered locally in the **Options** tab is replaced by the DHCP value. If the DHCP server fails to provide replacement values, the locally entered value is used.
- **Statically specified IP Address**—Select this option to manually enter the IP address, subnet mask, and default gateway.
  - **IP Address**—Enter a valid network address in the server environment. The network administrator must provide this information.
  - **Subnet Mask**—Enter the value of the subnet mask. A subnet mask is used to gain access to machines on other subnets. The subnet mask is used to differentiate the location of other IP addresses with two choices—**same subnet** or **other subnet**. If the location is a different subnet, messages that are sent to that address must be sent through the default gateway. This does not depend on the value that is specified through local configuration or through DHCP. The network administrator must provide this value.

- **Default gateway**—Use of gateways is optional. Gateways are used to interconnect multiple networks—routing or delivering IP packets between them. The default gateway is used for accessing the Internet or an Intranet with multiple subnets. If no gateway is specified, the thin client can only address other systems on the same subnet. Enter the address of the router that connects the thin client to the Internet. The address must exist on the same subnet as the thin client as defined by the IP address and the subnet mask. If DHCP is used, the address can be supplied through DHCP.

d Select the **IPv6** check box, and then click **Advanced** to select various IPv6 supported setting options from the available check boxes.

The following check boxes are displayed in the **IPv6 Advanced Settings** dialog box:

- **Allow IPv4 to be disabled when IPv6 is enabled**
- **Prefer IPv4 over IPv6 when both are available**
- **Disable Stateless Address autoconfiguration (SLAAC)**
- **Disable Duplicate Address Detection (DAD)**
- **Disable ICMPv6 Echo Reply**
- **Disable ICMPv6 Redirect Support**
- **Use Standard DHCPv6 timers**

Click **Properties**, and use the following guidelines:

- **Wait DHCP**—Select this option to enable your thin client to consider IPv6 DHCP before you log in. If you do not select this option, and DHCP is enabled, the system still waits for IPv4 DHCP.
- **Dynamically allocated over DHCP/BOOTP**—Select this option to enable your thin client to automatically receive information from the DHCP server. The network administrator must configure the DHCP server (using DHCP options) to provide information. Any value that is entered locally in the **Options** tab is replaced by the DHCP value. If the DHCP server fails to provide replacement values, the locally entered value is used.
- **Statically specified IP Address**—Select this option to manually enter the IP address, subnet mask, and default gateway.
  - **IP** Address—Enter a valid network address in the server environment. The network administrator must provide this information.
  - **Subnet Prefix Len**—Enter the prefix length of the IPv6 subnet.
  - **Default gateway**—Use of gateways is optional. For more information, see various IPv4-supported options in this section.
- **DNS servers**—Use of DNS is optional. DNS allows you to specify remote systems by their host names rather than IP addresses. If a specific IP address (instead of a name) is entered for a connection, it rather than DNS is used to make the connection. Enter the network address of an available DNS server. The value for this box may be supplied by a DHCP server. If the DHCP server provides this value, it replaces any locally configured value. If the DHCP server does not provide this value, the locally configured value is used.

> **NOTE: If you enable IPv6 for both ENET0 and ENET1, IPv6 routes through the Ethernet connection that fetches the IPv6 address first.**

e Select the **Enable the IEEE802.1x authentication** check box, and from the **EAP type** drop-down list, select **TLS**, **LEAP**, **PEAP** or **FAST**.

- **TLS**—Select this option, and click **Properties** to configure the **Authentication Properties** dialog box.
  - Select the **Validate Server Certificate** check box because it is mandatory to validate your server certificate.

    > **NOTE: The CA certificate must be installed on the thin client. The server certificate text field supports a maximum of approximately 255 characters, and supports multiple server names.**
  - Select the **Connect to these servers** check box, and enter the IP address of server.
  - Click **Browse** to find and select the client certificate file and the private key file you want.

    > **NOTE: Ensure that you select the PFX file only.**
  - From the **Authenticate** drop-down list, select either user authentication or machine authentication that is based on your choice.

    The following kinds of server names are supported—all examples are based on Cert Common name **company.dell.com**:

    - ***.dell.com**
    - ***dell.com**
    - ***.com**

NOTE: Using only the FQDN, that is, company.dell.com does not work. Use one of the options, for example servername.dell.com (*.dell.com is the most common option as multiple authentication servers may exist).

- **LEAP**—Select this option, and click **Properties** to configure the **Authentication Properties** dialog box. Be sure to use the correct username and password for authentication. The maximum length for the username or the password is 31 characters.
- **PEAP**—Select this option, and click **Properties** to configure the **Authentication Properties** dialog box. Be sure to select either **EAP_GTC** or **EAP_MSCHAPv2**, and then use the correct username, password, and domain. Validate Server Certificate is optional.
- **FAST**—Select this option, and click **Properties** to configure the **Authentication Properties** dialog box. Be sure to select either **EAP_GTC** or **EAP_MSCHAPv2**, and then use the correct username, password, and domain. Validate Server Certificate is optional.

  To configure EAP-GTC, enter the username only. The password or PIN is required during the authentication process. To configure EAP-MSCHAPv2, enter the username, password, and domain.

  NOTE: The domain\username in the username box is supported, but you must leave the domain box blank.

  The CA certificate must be installed on the thin client, and the server certificate validated forcibly. When EAP-MSCCHAPV2 is selected for PEAP or FAST authentication, an option to hide the domain is available. Username and Password boxes are available for use, but the **domain** text box is disabled.

  When EAP-MSCHAPV2 is selected for PEAP or FAST authentication, a check box to enable the Single Sign-On feature is available.

  From ThinOS 8.3, EAP-FAST authentication is supported. During the initial connection, when there is a request for a Tunnel PAC from the authenticator, the PAC is used to complete the authentication. The first-time connection always fails, and the subsequent connections succeed. Only automatic PAC provisioning is supported. The user/machine PAC provisioning that is generated with CISCO EAP-FAST utility is not supported.

3 Click **OK** to save the settings.

IMPORTANT: From ThinOS version 8.5, client reboot is not required to change the network settings. All the changes take effect immediately.

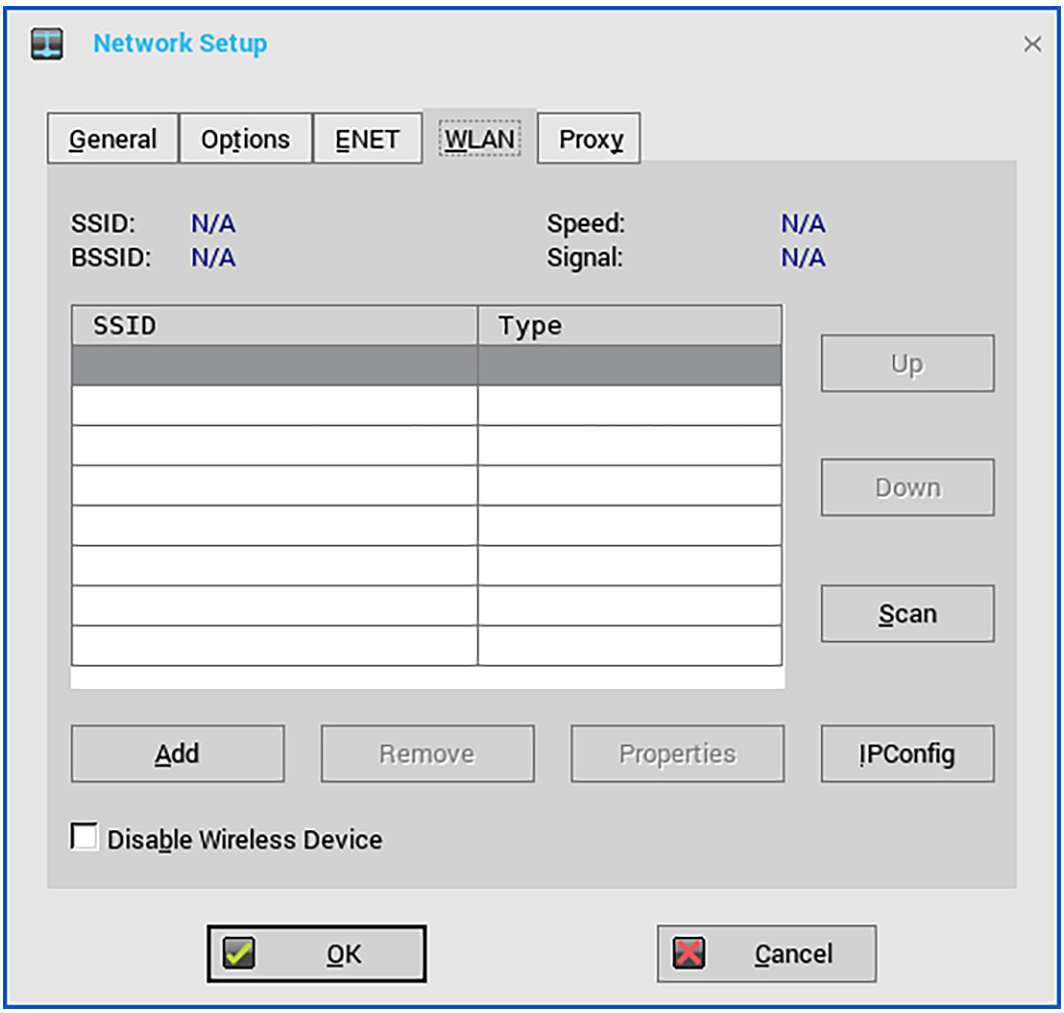
For example, ThinOS connects to the new wireless SSID immediately without reboot.

Configuring the WLAN settings

NOTE: On Wyse 5070 thin client with an optional SFP module or RJ45 module, you cannot configure the wireless settings.

To configure the WLAN settings:

1 From the desktop menu, click **System Setup**, and then click **Network Setup**.
The **Network Setup** dialog box is displayed.



2 Click the **WLAN** tab, and do the following:

a **Add**—Use this option to add and configure a new SSID connection.

You can configure the SSID connection from the available security type options.

After you configure the SSID connection, the added SSID connection is listed on the **WLAN** tab.

b **Remove**—Use this option if you want to remove an SSID connection from the list.

c **Properties**—Use this option to view and configure the authentication properties of an SSID connection that is displayed in the list.

d Select the **Disable Wireless Device** check box if you want to disable a wireless device.

- **Always**—Click this radio button if you want to disable the wireless device always.
- **EnetUp**—Click this radio button if you want to disable the wireless device whenever the wired network is connected.

e Click **IPConfig** to configure the IPv4 settings for the wireless connection. To use either DHCP or static IP address, do the following:

1 Click **Properties**.

The **Network Setup** dialog box is displayed.

2 To set the IPv4 connection, configure any one of the following options:

- If you want to allow your thin client to automatically receive information from the DHCP server, click **Dynamically allocated over DHCP/BOOTP**.
- If you want to manually configure the IP address, click **Statically specified IP Address**, and provide the IPv4 details.

3 Click **OK** to save the settings.

IMPORTANT: Device reboot is not required to change the network settings. All the changes take effect immediately.

For example, ThinOS connects to the new wireless SSID immediately without reboot. However for ARM platforms—Wyse 3010 thin client, and Wyse 3020 thin client—requires reboot.

Configuring the proxy settings

The network **Proxy** tab supports Wyse Management Suite, HDX Flash Redirection, and RealTime Multimedia Engine (RTME).

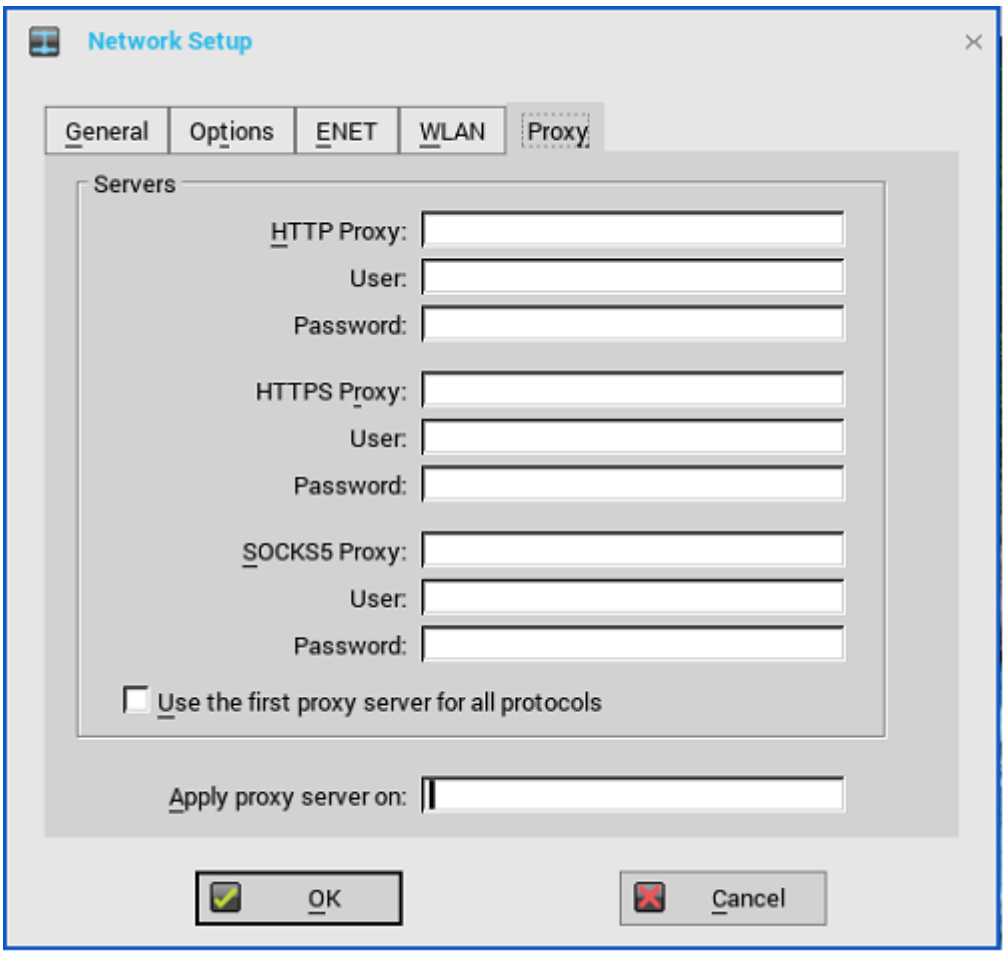
Supported protocols—HDX FR, WMS and RTME

- For **HDX FR**: HTTP and HTTPS protocols are supported.
  - If both HTTP and HTTPS are configured, the HDX FR works with HTTPS proxy.
  - User credential pass through is possible with $UN/$PW.
- For **Wyse Management Suite**: HTTP, HTTPS and Socks5 (recommended) protocols are supported.
- For **RTME**: HTTP, and HTTPS protocols are supported.

1 From the desktop menu, click **System Setup**, and then click **Network Setup**.

The **Network Setup** dialog box is displayed.

2 Click the **Proxy** tab, and do the following:



a Enter the **HTTP proxy** port number or **HTTPS proxy** port number, **User** name and **Password** in the respective fields. However, credential pass through ($UN/$PW) is not recommended because it starts before user sign on.

Wyse Management Suite uses both HTTP/HTTPS and MQTT protocols to communicate with the WMS/MQTT server. However, the HTTP proxy cannot redirect TCP packages to the MQTT server which requires a SOCKS5 proxy server. If there is only HTTP server available, then the real-time command that requires MQTT does not work.

HTTP/HTTPS proxy default port is 808, and **SOCKS5 proxy** default port is 1080.

b Select the **Use the first proxy server for all protocols** check box to allow all the protocols to use the same server in the **HTTP Proxy** fields. Both HTTP and HTTPS proxy use the same host and port, and SOCKS5 proxy agent uses HTTP host with default Socks5 port (1080).

If **SOCKS5 proxy** is configured, then WMS proxy uses the SOCKS5 only. If SOCKS5 is not configured, then WMS proxy searches for alternative protocols, for example, HTTP in the configuration.

c Specify the supported applications as Wyse Management Suite, FR and RTME separated by a semicolon in the **Apply proxy server on** field.

3 Click **OK** to save the settings.

User scenario

1 Configure correct proxy server host and port.

2 Configure the user credentials according to the proxy server settings.

On system restart, the client checks in to the Wyse Management Suite server through SOCKS5 proxy server. MQTT connection is established through SOCKS5 proxy server. Real-time commands work fine through SOCKS5 proxy server.

3 Connect to the Citrix desktop, configure proxy in internet options of the browser, and then playback HDX FR through the HTTP/HTTPS proxy authentication.

Configuring the remote connections

Use the **Remote Connections** dialog box to configure thin client remote connections including ICA, RDP, Citrix Virtual Apps and Desktops (formerly Citrix XenDesktop), Microsoft, VMware View, Dell vWorkspace, and other broker server connections. This dialog box also enables you to configure visual options, and general connection settings.

NOTE: In the Classic Desktop option, the Remote Connections dialog box allows you to create the default RDP connections for use. If you want to create more than the default connections, use the Connect Manager, For more information see Using the Connect Manager.

Configuring the broker setup

To configure the broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.

The **Remote Connections** dialog box is displayed.

2 In the **Broker Setup** tab, from the drop-down list, select the **Broker type**.

a Select **None**, and click either of the following connection protocols:

- **ICA**—For more information, see Configuring ICA connections.
- **RDP**—For more information, see Configuring RDP connections.

b Select any one of the available broker connections, and configure the broker setup to connect to the respective virtual desktop environments. For instructions about configuring a particular broker setup, see Configuring the connection brokers.

The available broker connections that you can configure on ThinOS are:

- **Citrix Xen**
- **VMware View**
- **Microsoft**
- **Dell vWorkspace**
- **Amazon vWorkspace**—This is applicable only to the PCoIP clients.
- **Teradici Cloud Access**

c Select **Other**, and use the following guidelines:

- **Broker Server**—Enter the IP address of the Broker server.
- **Auto Connect List**—Enter the name of the desktops that you want to launch automatically after logging in to the respective broker. More than one desktop can be listed. Each desktop name is separated by a semi-colon, and is case-sensitive.

3 Click **OK** to save the settings.

Multiple logins with Citrix and VMware Horizon

ThinOS supports PNA multiple login feature. You can log in to multiple Citrix StoreFront or PNAgent using different credentials. From this release onwards, you can simultaneously log in to Citrix StoreFront/PNAgent and the VDM server.

To configure the multiple login feature, do the following:

1 Configure the Pnlite server and VDI broker in the INI file as follows:

```
SelectServerList=vdm; \
description="description" host=<fqdn of Horizon Server>
SelectServerList=pna; \
description="description" host=<fqdn of StoreFront Server>
```

Or

```
multilogon=yes
pnliteserver=<fqdn of StoreFront Server>
VDIBroker=<fqdn of Horizon Server>
```

Or

```
multilogon=yes
SelectServerList=vdm; \
description="description" host=<fqdn of Horizon Server>
SelectServerList=pna; \
description="description" host=<fqdn of StoreFront Server>
```

2 In the login window, select either the Citrix or VMware broker to log in, or log in to both Citrix and VMware brokers with different credentials.

Limitation

ThinOS supports a single VDM login even if the `MultiLogon` parameter is set to yes. When you log in to the first VDI broker successfully, the succeeding VDI brokers are ignored.

For example:

```
multilogon=yes
VDIBroker=<fqdn of Horizon Server 1>;
VDIBroker=<fqdn of Horizon Server 2>
```

If the first VDI broker login is successful, the second VDI broker is ignored. If the first VDI broker login fails, the second VDI broker is considered.

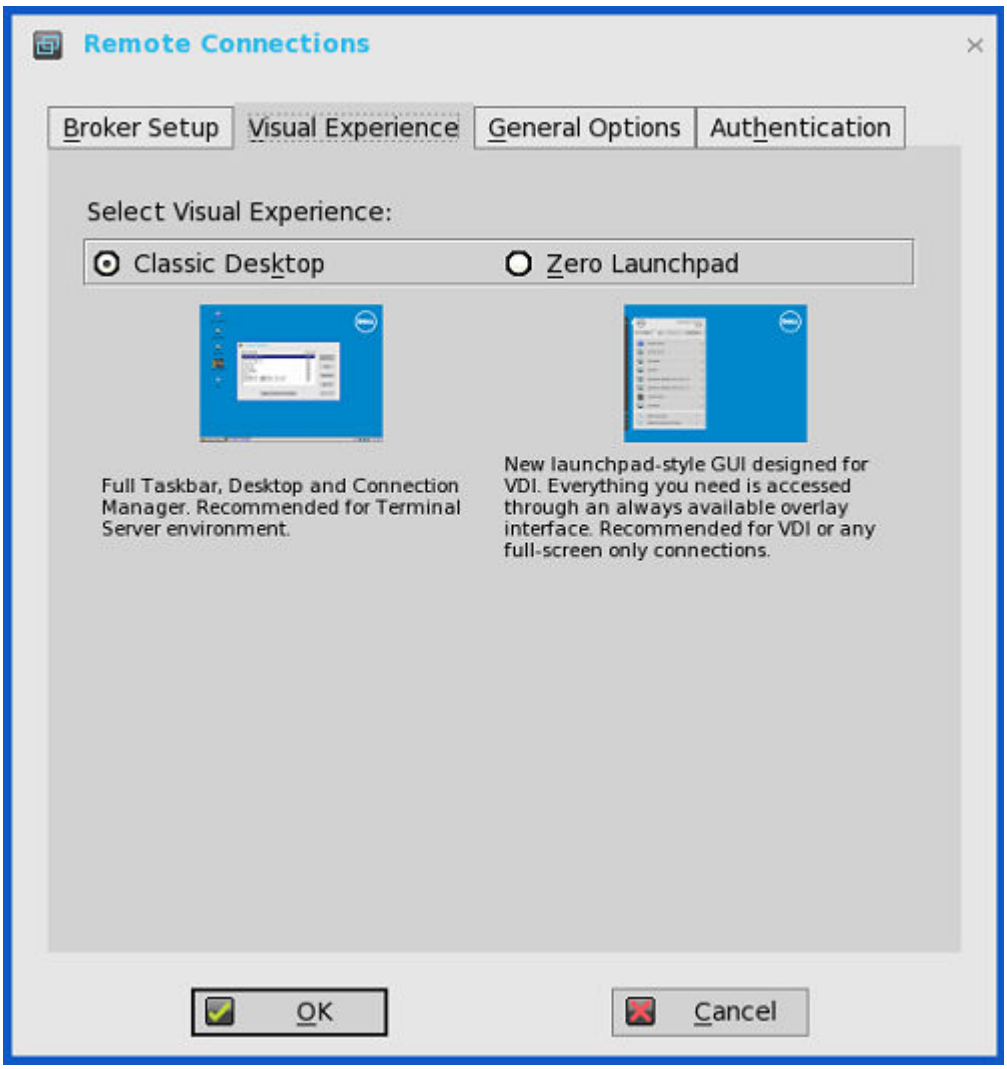
Configuring the visual settings

To configure the visual settings:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.

The **Remote Connections** tab is displayed.

2 Click **Visual Experience** tab, and use the following guidelines:



NOTE: The Visual Experience tab is grayed out, if the StoreFront Style check box is selected for a Citrix Broker Server entered in the Broker Setup tab.

a **Classic Desktop** — Displays the full taskbar, desktop and Connect Manager familiar to ThinOS users. This option is recommended for terminal server environments and for backward compatibility with ThinOS 6.x versions.

b **Zero Launchpad** — Displays the new launch pad style GUI designed for VDI use. Functionality is accessed through an always available interface. This option is recommended for VDI and any full-screen only connections. Toolbar, hotkey and connection icon options are also available for configuration.

If you select the **Zero Launchpad**, then use the following guidelines:

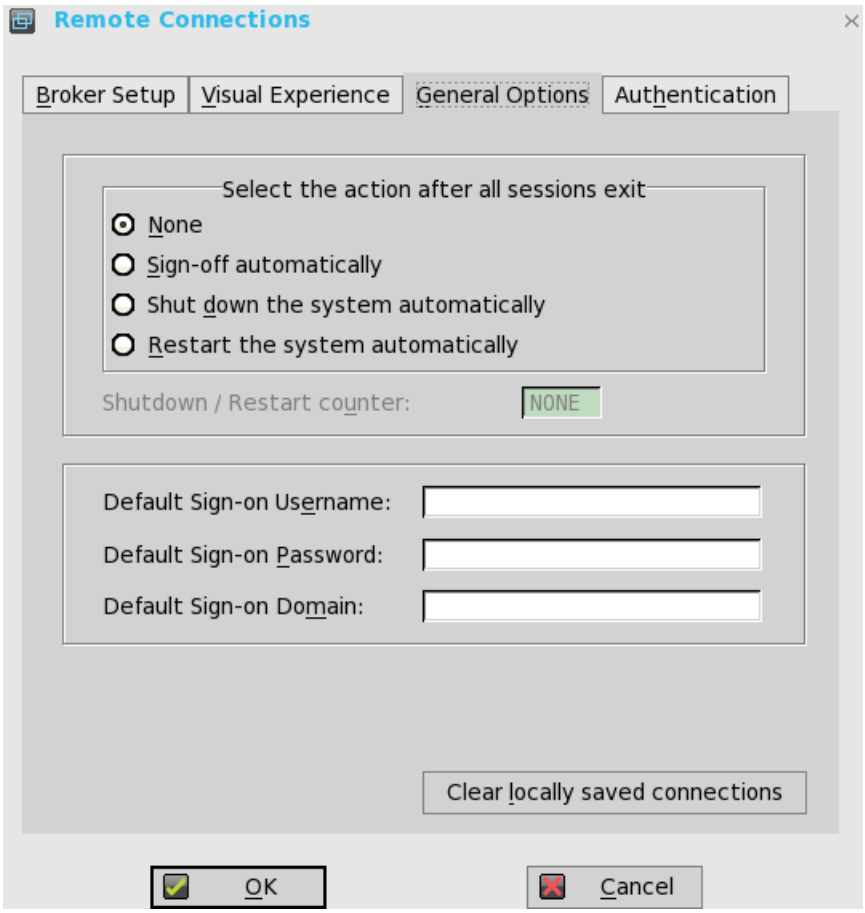
- Select the check box to enable Zero Toolbar activation in left pane.
  - Select the button if you want to enable Zero Toolbar activation in left pane when you pause a mouse on the screen. You must select the time duration—0. 0.5 or 1 second—after which the Zero toolbar is activated.
  - Select the button if you want to enable Zero Toolbar activation in left pane only after clicking.
- Select the check box to disable hotkey to show toolbar.
- Select the check box to always disable toolbar when you have one session available.
- Select the check box to disable the Home icon.

3 Click **OK** to save the settings.

Configuring the general options

To configure the general options:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.



2 Click the **General Options** tab, and use the following guidelines:
   a Click the available options to select the action after you exit all open desktops. The available options are **None**, **Sign-off automatically**, **Shut down the system automatically** and **Restart the system automatically**.

   NOTE: By default, None is selected and the thin client automatically returns to the terminal desktop.

   b **Default Sign-on Username**— Enter the Default user name.
   c **Default Sign-on password**— Enter the Default password.
   d **Default Sign-on Domain**— Enter the Default Domain.
   e Click **Clear locally saved connections** to clear locally saved connections.

   NOTE: If you enter all three default sign-on credentials (Username, Password and Domain), you are automatically logged on to your desktop upon system start.

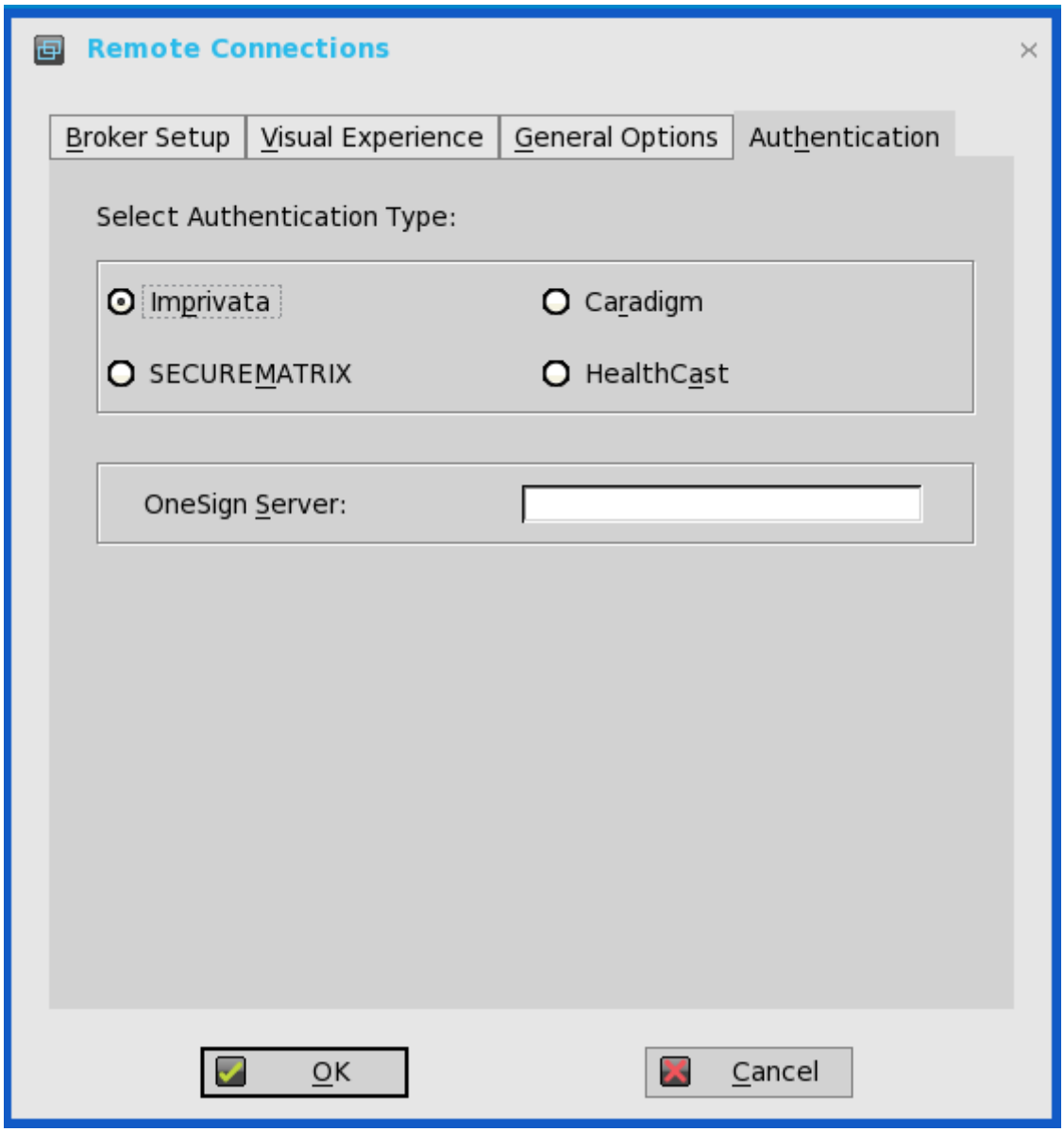
Configuring the authentication settings

To configure the authentication settings:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

2 Click the **Authentication** tab, and select the authentication type.
The following authentication options are displayed:

- Imprivata— Configuring Imprivata OneSign server.
- Caradigm—Configuring Caradigm server.
- SECUREMATRIX— Configuring SECUREMATRIX.
- HealthCast—Introduction to HealthCast.



3 After configuring your preferred authentication, click **OK** to save the settings.

Configuring Imprivata OneSign server

OneSign Virtual Desktop Access provides a seamless authentication experience and can be combined with single sign-on for No Click Access to desktops and applications in a virtual desktop environment.

To configure the OneSign Server, enter the details of the OneSign Server (either https://ip or https://FQDN values), reboot the client to display the logon dialog box, and then enter credentials to open the VDI broker dialog box for logon use. You can also set this feature in your INI file, see *Dell Wyse ThinOS INI Reference Guide*.

The following OneSign features or actions are supported:

- Client and Broker authentication
  - Citrix Virtual Apps (formerly Citrix XenApp)
  - Citrix Virtual Apps and Desktops (formerly Citrix XenDesktop)
  - VMware View
- Kiosk Mode
- Fast User Switching
- Non-OneSign user VDI access
- Hotkey Disconnect
- Proximity card reader redirection
- Guided Question and Answer login
- Authenticate w/Password
- Authenticate w/Password + Password Change
- Authenticate w/Password + Password Change | New Password is Invalid
- Authenticate w/Proximity Card + Password
- Authenticate w/Proximity Card + Pin
- Authenticate w/Proximity Card + Pin | Pin not enrolled
- Authenticate w/Proximity Card Alone | Retrieve Password
- Retrieve User Identity Password
- Reset User Identity Password
- Update User Identity Password
- Enroll Proximity Card
- Lock/Unlock Terminal with Proximity CardLock/Unlock Terminal with Proximity Card

ThinOS supports latest Imprivata WebAPI version 5. It includes OneSign Objects (WebAPI v4) and Fingerprint Authentication (WebAPI v5).

From ThinOS 8.3.1 Hot Fix release, Imprivata SSO solution is supported for ARM platforms—Wyse 3010 thin client and Wyse 3020 thin client series.

Configuring objects on Imprivata Server

Imprivata WebAPI is updated from version 4 to version 5. From earlier version, supports configuration objects are supported that enables you to control different aspects of client behavior. The Imprivata WebAPI feature is available on OneSign server 4.9 and later versions. The Configuration objects control different aspects of the client behavior.

Use the following guidelines to configure the objects on Imprivata Server:

1 **Configuring the General configuration object**

a On the Imprivata server, click **Computer policy**, and then click **General** tab.

b Select the check box to allow users to shut down and restart workstation from lock screen.

NOTE: Display shutdown button and restarts commands to the user on the OneSign GINA.

The following configuration objects are supported on Imprivata server:

- **Shutdown Allow**

- If you enable this feature by selecting the check box, the **shutdown** and **restart** icon is shown in ThinOS login and locked windows.

  - If you clear the check box, the **shutdown** and **restart** icon is grayed out.
- **FailedOneSignAuth Allow**—Only yes or no options are supported. Non-OneSign user can log in to the Broker by clicking **No** radio button.
- **Logging Allow**
  - OneSign logs could output on ThinOS with this feature. An INI configuration is needed correspondingly.
  - Loglevel=0/1/2/3. The default value is 0. If set to 0, logs are not displayed.
- **Display name format**— Account name can be shown correctly with different formats in pop-up notifications.

2 **Configuring the Walkway configuration object**

On the Imprivata server, click **Computer policy**, and then click the **Walk Away** tab.

- **Key mouse inactivity enabled and behavior** — The check box **in addition to keyboard and mouse inactivity** is not supported.
- **Passive proximity cards**
  - If you want to use proximity card to lock the computer, select the **Tap to lock** check box.
  - If you want to lock the computer and log in as a different user. select the **Switch users** check box.
  - INI parameter is `TapToLock=0/1/2`.
- **Lock warning enabled and type—**The three types that are supported are: none, notification balloon and Screensaver.
  - None—No warning messages are displayed.
  - Notification balloon—ThinOS displays a notification window.
  - Screensaver—Hide the display contents before the workstation locks.
- **Warning message**—The message can be customized.
- **Lock Screen type**—Only obscure type is supported.
- **Hot key to lock workstation or log off user**—ThinOS can support following keys:

  “F1 ~ F12”, "BKSP", “DEL”, “DOWN”, “END”, “ENTER”, “ESC”, “HOME”, “INS”, “LALT”, “LEFT”, “LCONTROL”, “NUMLOCK”, “PGDN”, “PGUP”, “RCONTROL”, “RIGHT”, RTALT”, “SPACE”, “TAB”, “UP”, “a~z”, “A~Z”, “0~9” and modifier “+”, “%”, “^” (Shift, Alt and Control)

- **Suspend action**—The server configuration controls this feature on ThinOS. Therefore a new INI is added—`SuspendAction=0/1`; 0 means lock, 1 means signoff.

3 **Configuring the SSPR Configuration Object**

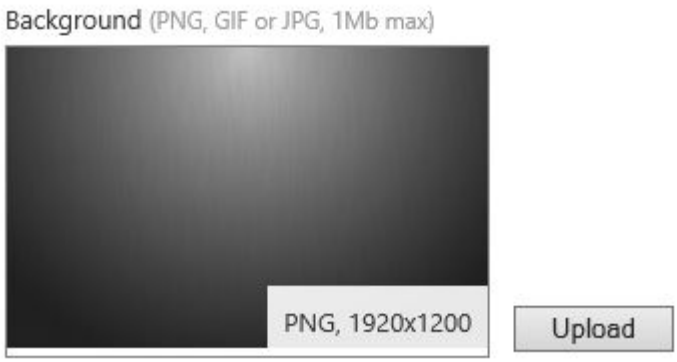
The SSPR configuration object controls the Self-Service Password Reset behavior for a user. The enabled attribute specifies whether the user is allowed to reset their password as part of emergency access. The mandatory attribute specifies whether the user must reset their password as part of emergency access.

4 **Configuring the RFIDeas configuration object**

The RFIDeas configuration object controls the behavior of the RFIDeas readers. The configuration can be configured by two ways, the computer policy of OneSign server and ThinOS INI.

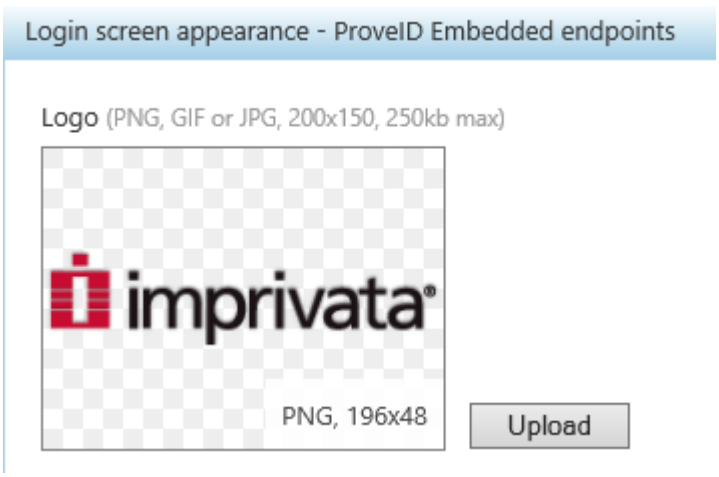
5 **Configuring the Custom background configuration object**

On the Imprivata server, click **Computer policy**, and then click the **Customization** tab.



6 **Configuring the Co-Branding configuration object**

On the Imprivata server, click **Computer policy**, and then click **Customization**.



Logo image impacts all the dialog boxes in ThinOS with raw logo.

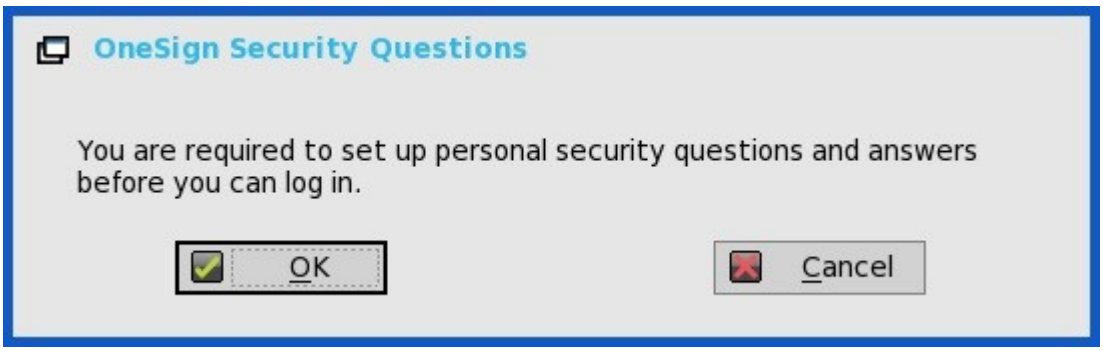
7 **Configuring the SSPR Customization configuration object**

- The text displayed in sign-on UI and lock window can be customized.
- The largest size supported by ThinOS is 17 characters.

ThinOS UI:

8 **Password Self-Services force enrollment feature**

Selecting this check box allows you to reset the primary authentication password.

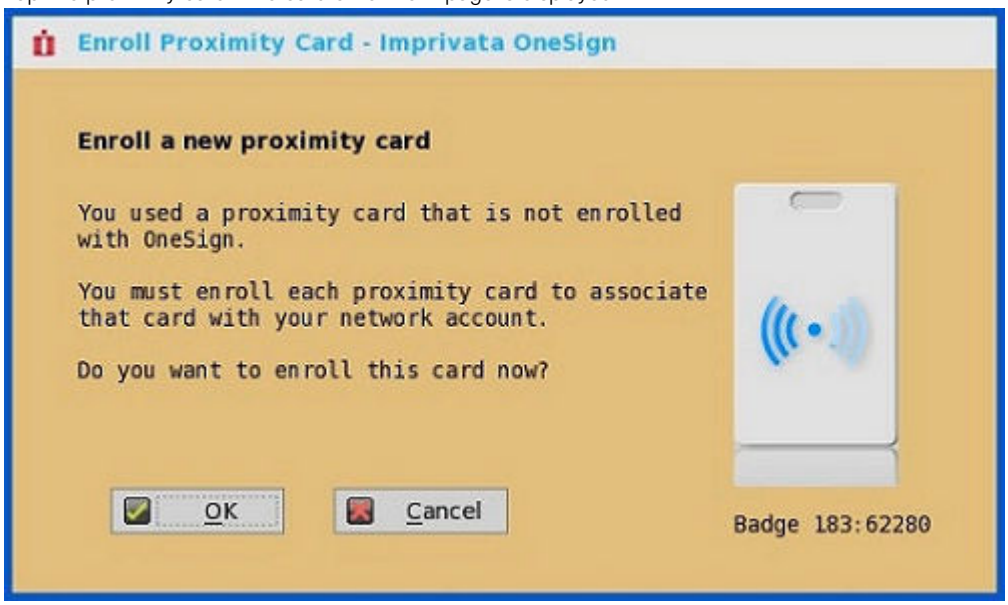


INI configuration for Imprivata OneSign Server

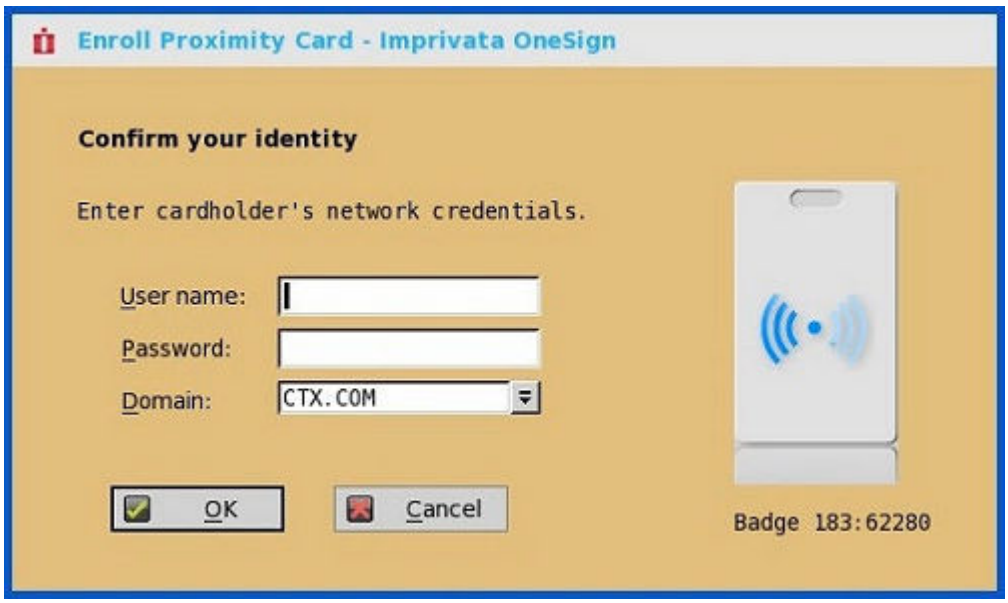
A new INI parameter `AutoAccess=command` is added. The new value is `AutoAccess=Local`. When `AutoAccess`is set to local, the ThinOS ignores the brokers that are set on the Imprivata OneSign Appliance and starts the broker/connections which are defined in wnos.ini or local defined on the client. You can start the vWorkspace, Microsoft, and other ThinOS connections while supporting Imprivata user authentication.

Proximity card enrollment

1 Tap the proximity card. The card enrollment page is displayed.



2 Enter the credentials and then click **OK**.



Proximity card is enrolled successfully.

Imprivata Bio-metric Single Sign-On

Fingerprint identification feature is highly reliable, and cannot be easily replicated, altered, or misappropriated.

The prerequisites of OneSign server are:

- Imprivata v4.9 or later appliance version is needed that supports the WebAPI v5 and later versions.
- Fingerprint identification license is required.

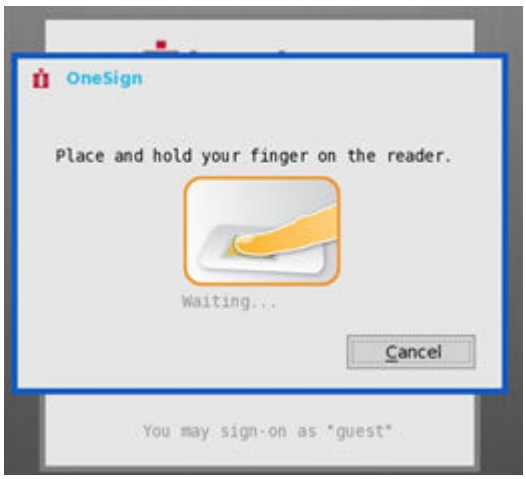
NOTE:

- Supported protocols are Microsoft RDP, Citrix ICA, PCoIP, and VMware Blast.
- Required Fingerprint reader devices are:
  - ET710 (PID 147e VID 2016)
  - ET700 (PID 147e VID 3001)

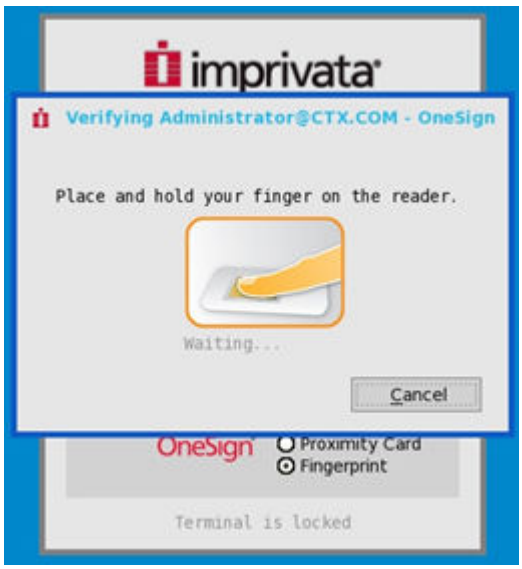
Supported scenarios

1 Signing in or unlocking the ThinOS devices using Fingerprint Authentication.

- Configure the OneSign server on ThinOS, and then plug-in the fingerprint reader device.
- The ThinOS Fingerprint window is displayed automatically after OneSign server is initialized.

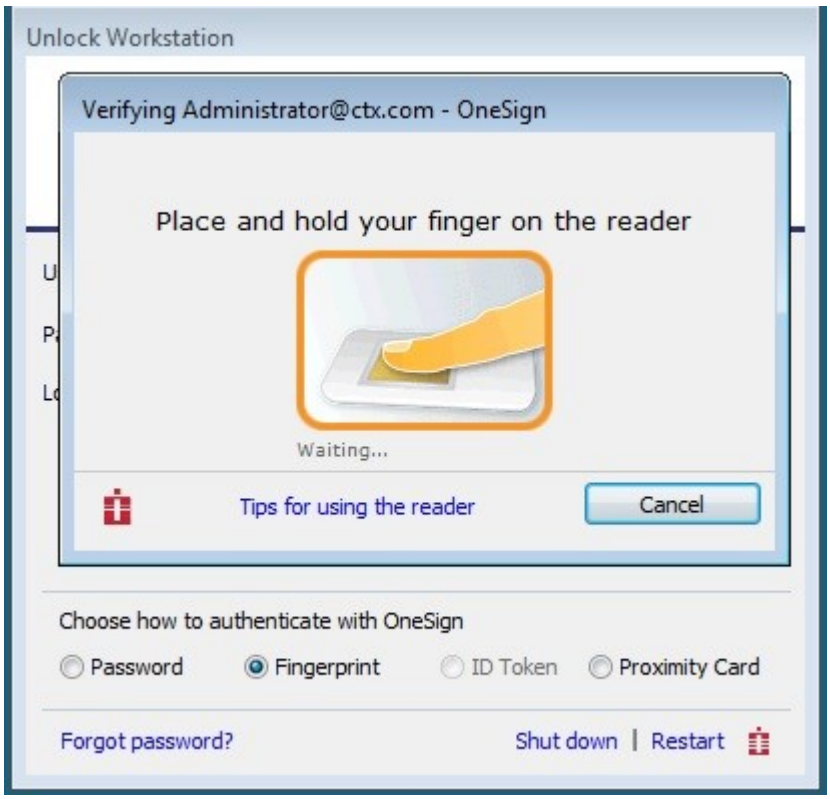


- Fingerprint authentication works on the ThinOS unlock window.



2 Unlocking the Virtual Desktop using Fingerprint Authentication.

- Enable the Imprivata Virtual Channel from the ThinOS Global Connection settings.
- When you lock the virtual desktop in the session, the Fingerprint window is displayed automatically.



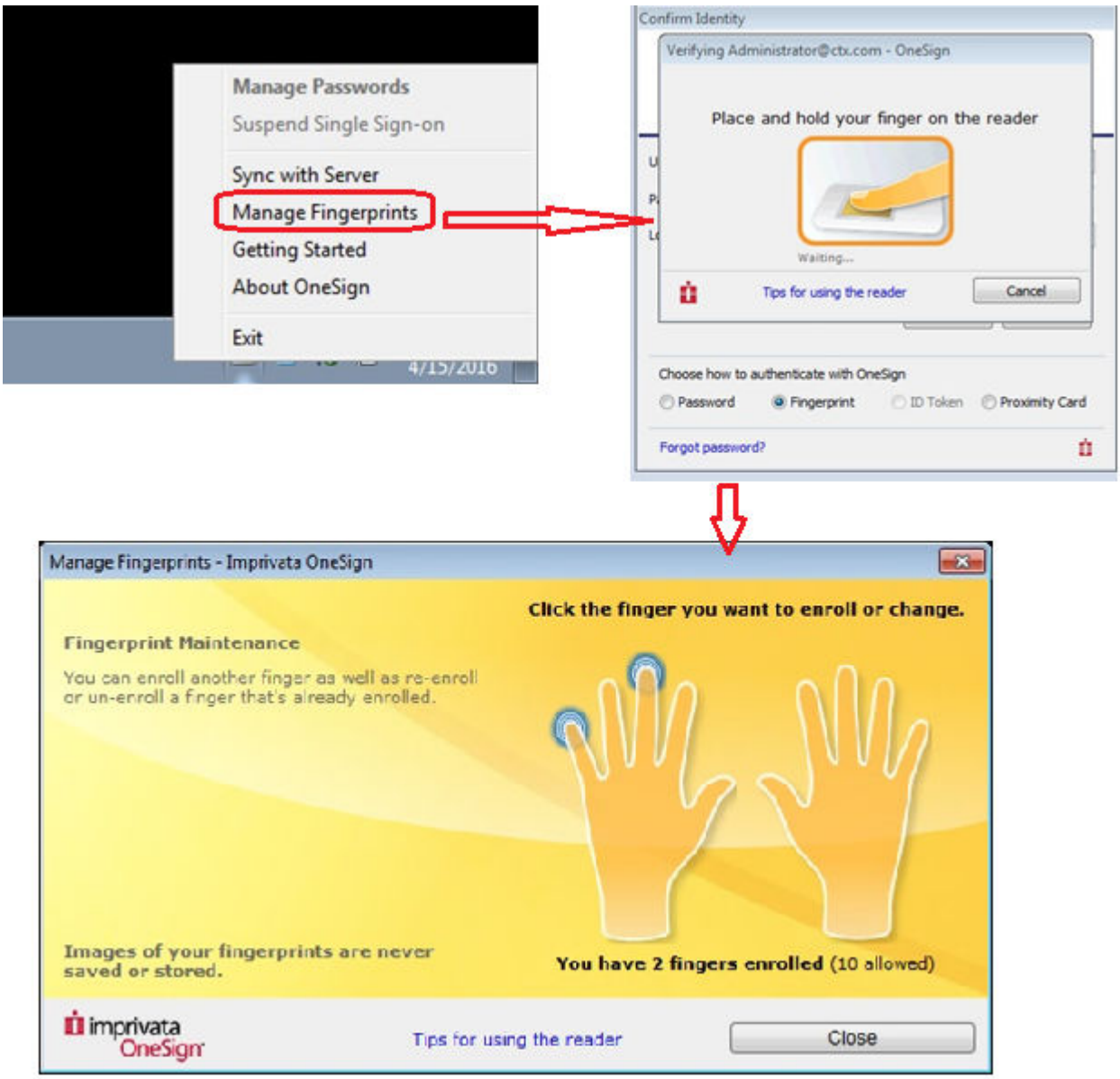
3 Managing Fingerprints on virtual desktop.

- Legend Fingerprint Management is supported.
- Fingerprint management with Imprivata Confirm ID enabled is not supported. This requires both supervisor and user to finish the enrollment and it is recommended to use Windows platform to perform this action.

To manage fingerprints, do the following:

a Right-click the OneSign agent icon in System tray.

b Click **Manage Fingerprints**, and enter the correct credentials in the displayed window to manage your Fingerprints.



Grace period to skip second authentication factor

Grace period enables you to specify a time limit on OneSign server for logging in without the second authentication factor after the first login session.

NOTE: After you specify the grace period, you must first use the proximity badge, and then enter password or OneSign PIN for the initial login.

If you use the proximity card after the time limit that you specified for grace period, the second authentication factor window is displayed with the message *Grace period expired*.

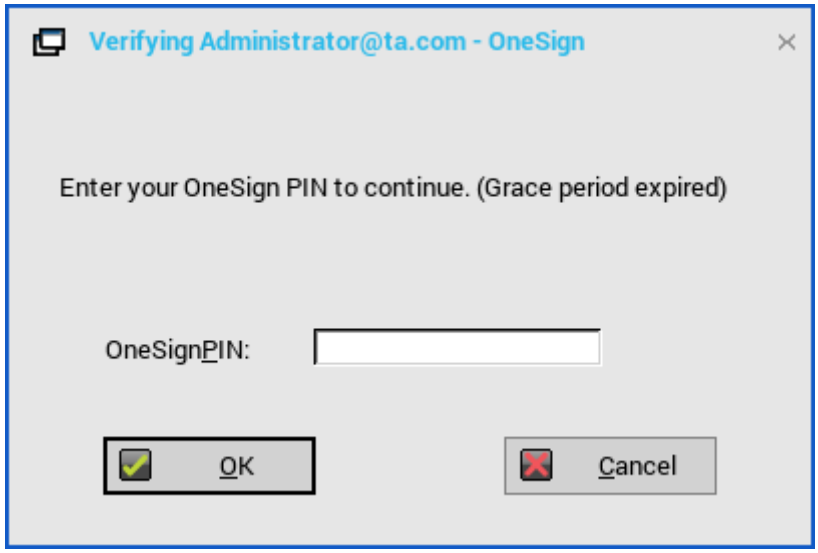


Figure 6. Second authentication factor window with the message

If you enter a wrong password or PIN, the second authentication factor window is displayed with the warning message *OneSign could not authenticate you. Try again.*

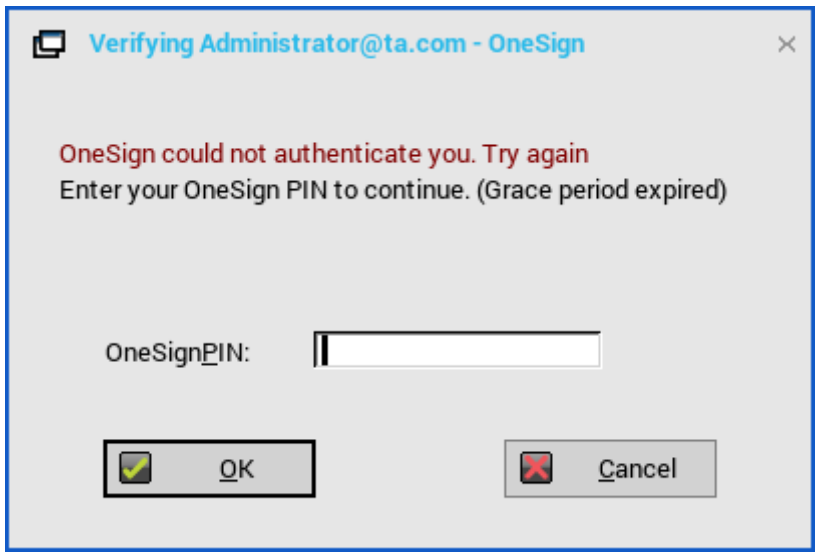


Figure 7. Second authentication factor window with the warning

Use smart card as proximity card

You can use a smart card as a proximity card to authenticate the user. When you tap the smart card on the smart card reader, the Imprivata agent uses the smart card unique serial number as the Unique ID (UID) of the proximity card.

To use a smart card as proximity card, do the following:

1 Log in to the OneSign Administrator console.

2 Go to the **Policies** page and click **Computer Policy**.

3 In the **Smart card readers** section, select the **Treat smart card authentications as proximity card authentications** check box.

To authenticate the user using a proximity card, connect a supported reader to the thin client. Before you tap the card, ensure that your card is already enrolled to the user. When you tap your card on the reader, the thin client authenticates the user and starts the VDI connection.

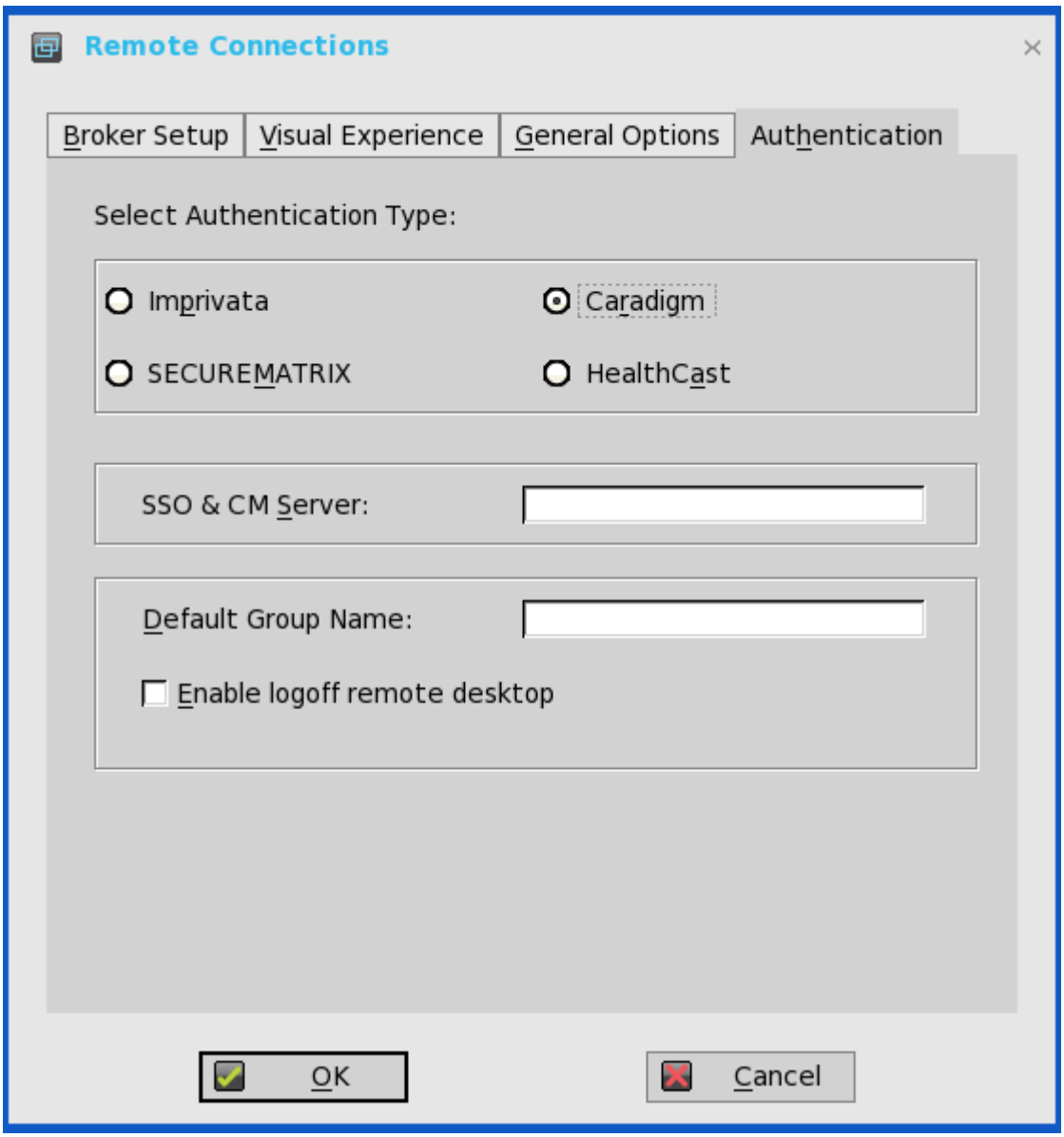
Configuring the Caradigm server

Caradigm Single Sign-on and Context Management (SSO & CM) is the product of the Caradigm Company which provides Single Sign-on and Context Management Services. Caradigm solution has been integrated since ThinOS 8.1.

To configure the Caradigm integration on ThinOS, do the following:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

2 Click the **Authentication** tab, and then click **Caradigm**.



a **SSO & CM Server**—Enter the IP addresses of the Single Sign-On (SSO) and Context Management (CM) Servers.
b **Default Group Name**—Type the name of the default group in the **Default Group Name** box.
c **Enable logoff remote desktop**
- Select the check box to log off the current user from the session before system sign-off.
- Clear the selection to disconnect from the session.

3 Click **OK** to save the settings.

Configuring the Caradigm Vault server

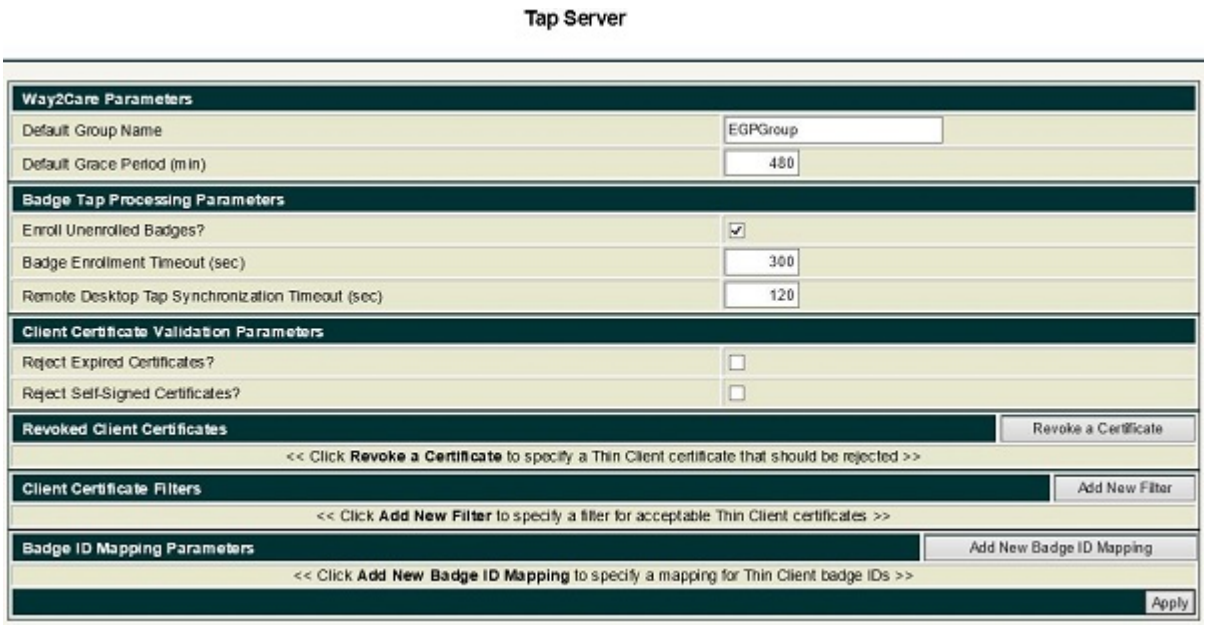
To configure the Caradigm Vault server on ThinOS:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

2 Click the **Authentication** tab, click the **Caradigm** button, enter the IP address of the **SSO & CM Server**, and then click **OK**.

3 On the Caradigm Vault Server, use the following guidelines:

- Ensure that the **Enroll unenrolled badges** option is checked.
- Make sure that all Badge ID mapping entries are deleted.



4 Click **SSO&CM** > **Advanced Configurations** , and use the following guidelines:

a Ensure that the **Enable Proximity Support** check box is selected.

b Ensure that the **Enable way2care** check box is selected.

5 To prepare a certificate to the Caradigm Vault Server, use the following guidelines:
The Caradigm Vault Server uses the certificate to validate the connection between the Tap Server and the thin client.

a To raise a request for the certificate:
- The certificate should be issued by your Certificate Authority.
- Prepare the certificate in two formats:
  - PFX format which has a private key.
  - The other is PEM format which is text-based, Base64-encoded DER file. For Example, Caradigm.cer, Caradigm.pfx.

b To import a certificate to the thin client, use either of the following two options:
- Click **System Setup** > **System tools** > **Certificates** to import certificates from USB storage or file server.

- Use INI file to import certificate.

  ```
  AddCertificate=client_cert.pfx password=passpass
  ```

c To add a certificate to Vault server:

Thin Client Certificates

Client Certificates				Import a Certificate
Owner Name	Issuer Name	Valid From	Valid Until	Delete
CN=CaradigmClient,OU=bj,O=bj,L=bj,ST=bj,C=US	CN=SSO-SSODC-CA,DC=SSO,DC=COM	04/07/2015 08:15 UTC	04/06/2017 08:15 UTC	☐
CN=Test client,O=Caradigm,L=Andover,ST=Massachusetts,C=US	CN=Test client,O=Caradigm,L=Andover,ST=Massachusetts,C=US	02/19/2014 19:30 UTC	02/14/2034 19:30 UTC	☐
CN=sqawireless2,CN=Users,DC=sqawireless,DC=com	CN=sqawireless.com,DC=sqawireless,DC=com	09/17/2013 09:30 UTC	09/17/2014 09:30 UTC	☐
		Select All	Select Expired	Reset Apply

Use the **Thin Client Certificates** page to add certificates for the thin client devices. The certificate must be a text in PEM format, that is, a text-based Base64-encoded DER file.

- Open the DER cert file on Notepad.
- Log in to the Vault Server Admin Console, and then click **Appliance** > **Thin Client Certificates**.
- Copy the Notepad text to the Vault server

Configuration on VDI server and desktops

Caradigm solution of ThinOS supports the multi-types of VDI server such as VMware View Horizon 6, Citrix Virtual Apps 6.5, Citrix Virtual Apps and Desktops 5.6, and Citrix Virtual Apps and Desktops 7.6.

To configure the VDI server and desktop:

- Install the Caradigm desktop components in the servers and desktops.
- Indicate vault server IP, and then provide a valid security token.
- Add following lines to Service section of the **\programdata\sentillion\vergence\Authenticator.ini configuration file**.

  ```
  TapServerIdentification=True
  RemotePromptForPassword=Badge
  ```

NOTE: At present, the following PCoIP enabled thin clients offer Caradigm SSO over PCoIP:

- Wyse 3030 LT with PCoIP
- Wyse 3040 with PCoIP
- Wyse 5010 with PCoIP (D10DP)
- Wyse 5040 AIO with PCoIP (5213)
- Wyse 5060 with PCoIP

SSO and CM client installed on your VDI server and desktops must be upgraded to latest version 6.2.5 in order to support this feature.

Caradigm Way2Care

Way2Care is part of Caradigm Identity and Access Management (IAM) portfolio, and is designed to securely access patient information from multiple clinical applications.

In ThinOS version 8.6, a new INI parameter `CaradigmServer=xxx UseWay2Care=yes` is added to support Way2Care. You can also set `DisableManualLogon=yes EGPGroup=xxx` along with the Caradigm Server parameter. This feature uses Way2Care API that is different from the TapServer API. Way2Care uses the decimal UID format.

For more information about the INI parameter, see the *Dell Wyse ThinOS Version 8.6 INI Reference Guide* at www.dell.com/support.

For more information about the Caradigm Way2Care feature, go to www.caradigm.com.

Configuring SECUREMATRIX

SECUREMATRIX enhances the security of enterprise and cloud-based applications while providing seamless end user experience for a one-time password (OTP) that can be used for authentication with desktops, Windows, VPNs, intranets, extranets, web servers, e-commerce and other network resources.

To configure the **SECUREMATRIX Server**, enter either https://ip or https://FQDN values, reboot the client to display the **log on** dialog box, and then enter credentials to open the **VDI broker** dialog box for logon use. You can also set this feature in your INI file, see Dell Wyse ThinOS INI Guide. For details see SECUREMATRIX documentation.

Introduction to HealthCast

HealthCast Single Sign-On (SSO) solution is designed to improve user convenience, streamline workflow, and strengthen security compliance in demanding environments. The same proximity cards used for physical access are used to tap-in and tap-out of unique user sessions and to tap-over any sessions unintentionally left open on the ThinOS devices. Typically, you must type in your password only one time each day and use your proximity cards to streamline workflow and save time as they move between shared computers securely. Also, proximity cards can be secured with a PIN, if configured by the organization. The HealthCast SSO solution also supports user self-service password reset so that you can reset your own passwords without the need to call the help desk.

NOTE: HealthCast SSO Solution on ThinOS is a client-server solution. ThinOS provides the client-side functionality, but you must also install and configure the HealthCast Server components on a server system in order for the solution to work properly. Contact HealthCast on HealthCast website for one or more server installation executables, server requirements, and configuration information.

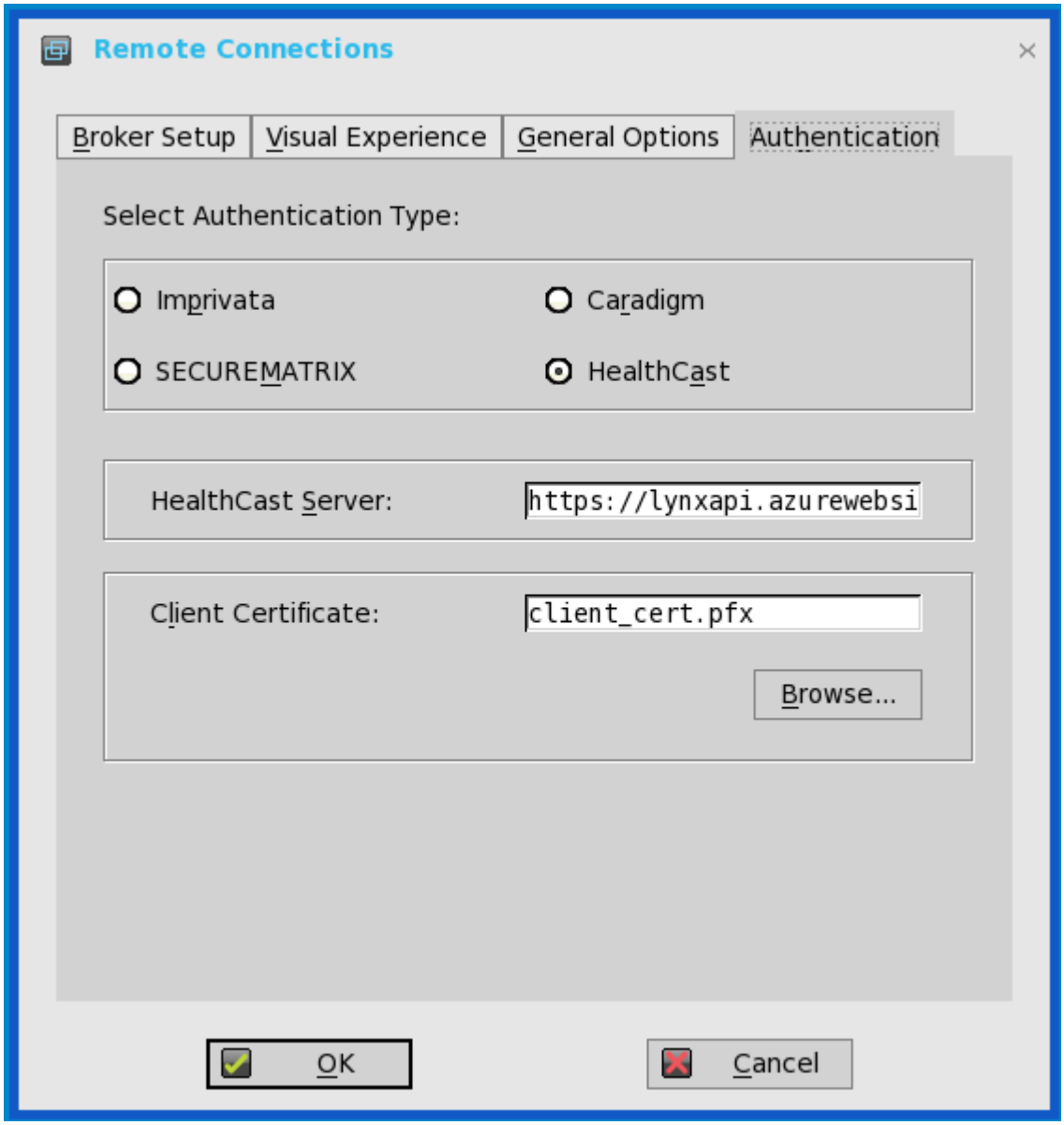
Configuring HealthCast on ThinOS

HealthCast Web API Server is integrated with ThinOS release to implement the HealthCast SSO solution. To use the HealthCast SSO solution, ThinOS must be configured to use the HealthCast Web API Server. You can do this by using the INI file (wnos.ini), or using the ThinOS UI. Dell recommends you to use the INI file for large deployments.

ThinOS UI configuration

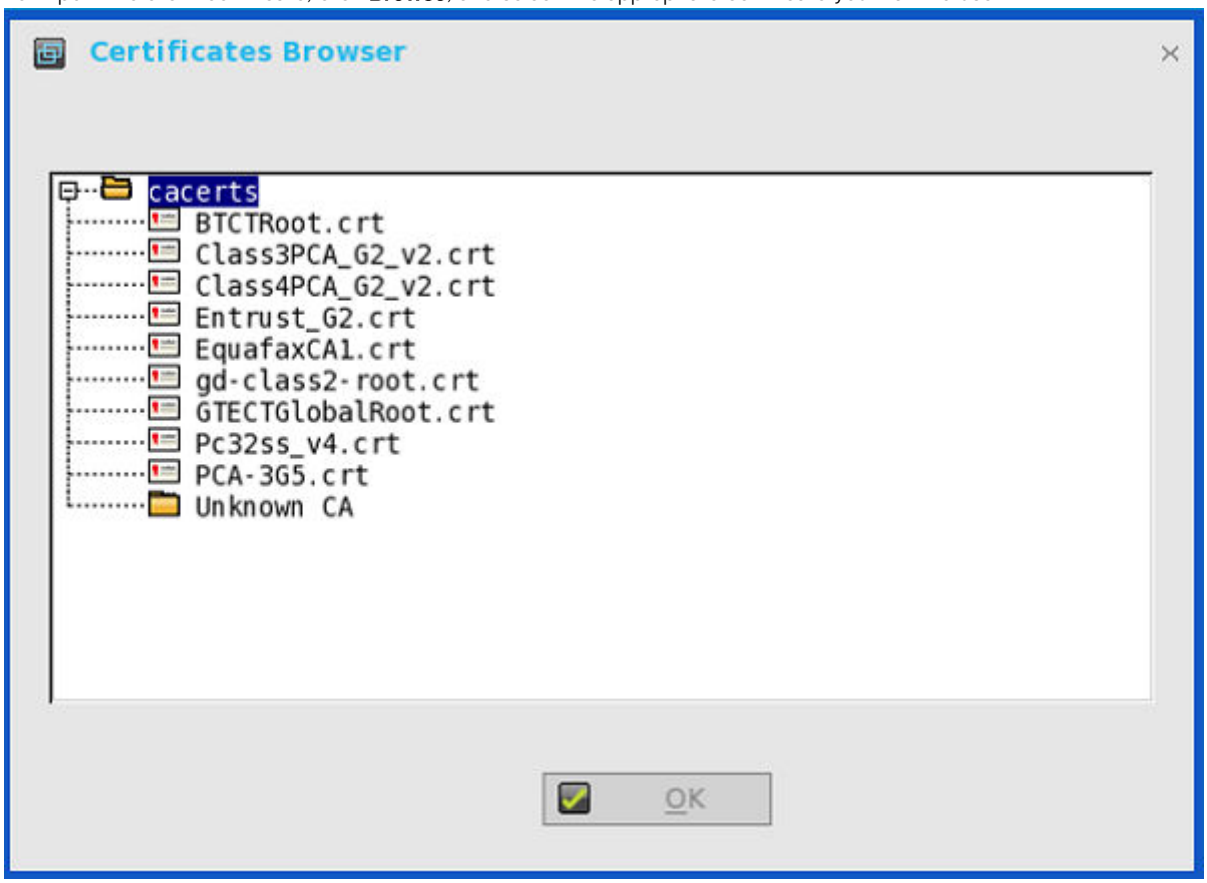
- To use the HealthCast Web API, configure the HealthCast settings on the thin client side. To configure, do the following:
  a From the desktop menu, click **System Setup**, and then click **Remote Connections**.
  The **Remote Connections** dialog box is displayed.

b Click the **Authentication** tab, and then click **HealthCast**.



c Enter the HealthCast server details in the box provided.

d To import the client certificate, click **Browse**, and select the appropriate certificate you want to use.



e Click **OK** to save the settings.

INI configuration

To configure using INI parameters, add the following INI parameters to your wnos.ini file:

HealthCastServer— The server address and options needed for the client to connect to the HealthCast Web API Server.
HealthCastServer=<https address> SecurityMode=<default, full, warning, low> ClientCertificate=<cert-pfx-file-name>
For example: **HealthCastServer=https://server1.example.com SecurityMode=full ClientCertificate=client-cert.pfx**.

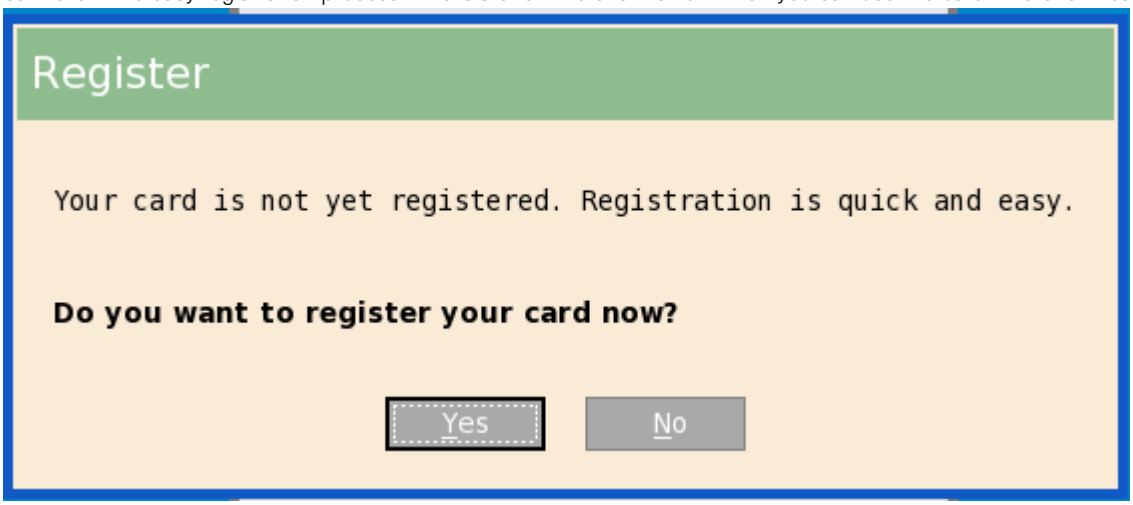
For more information on INI parameters, see Dell Wyse INI Reference Guide.

HealthCast SSO features and functionality on ThinOS

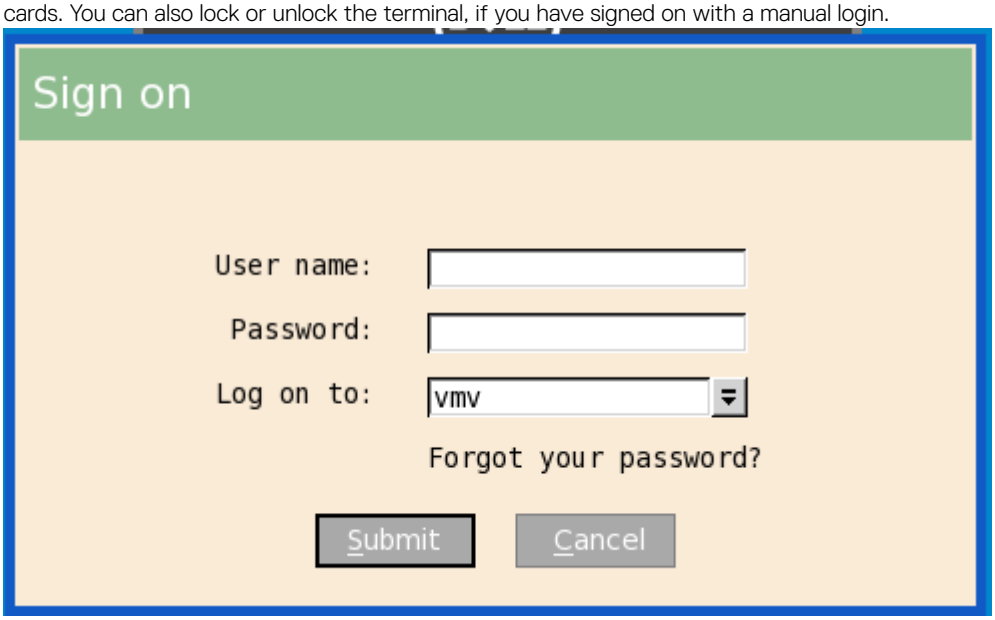
The following are the HealthCast SSO features and functionality on ThinOS:

- **Proximity card enrollment**—HealthCast supports user self-enrollment. Therefore, there is no need to bring the proximity card to a special registration station, or for IT staff to be involved. Instead, you must only tap the disenrolled proximity card at a terminal and you

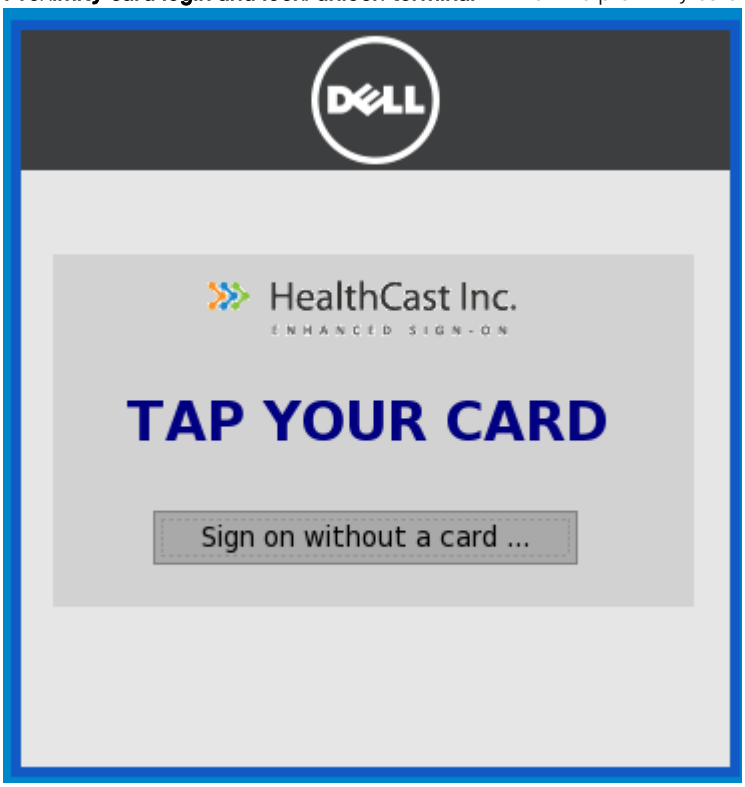
can follow the easy registration process. This is a one-time event after which you can use the card wherever HealthCast is installed.



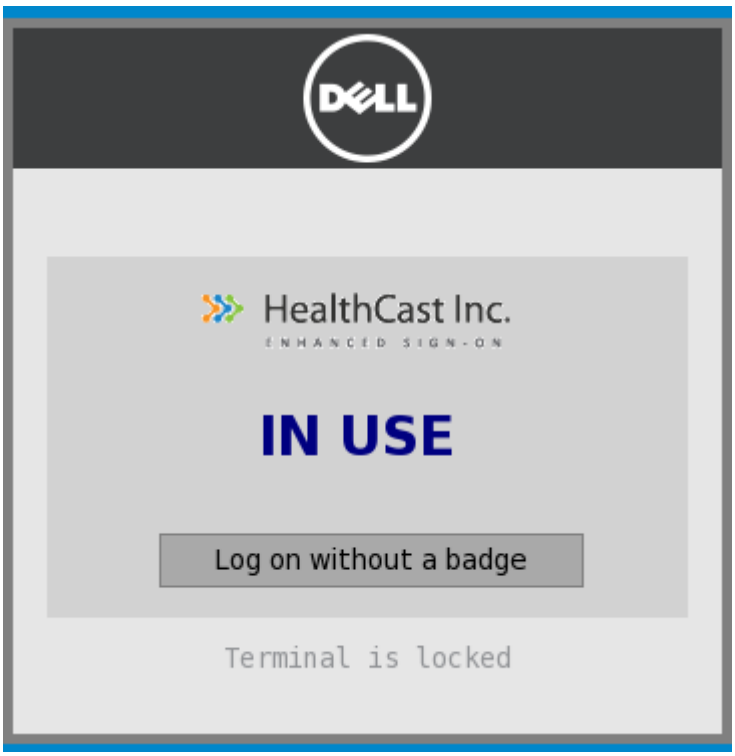
- **Manual login and lock/unlock terminal**—If you do not have a card, or choose not to use your card, then you can manually log in using your user name and password. Administrators can disable manual login, if they wish, so that users can sign on with their proximity cards. You can also lock or unlock the terminal, if you have signed on with a manual login.



- **Proximity card login and lock/unlock terminal**—After the proximity card is registered, tap the card at a terminal to login.



You can lock the session to secure it, but leave the remote session connected for fast access when you return. To do this, tap the proximity card and the session is locked.



To resume the session, tap the card again.

- **Walk away**—Terminals can be configured to lock or log off sessions that have been left open. The time that will elapse before automatic lock or log off can be set by an administrator using the convenient web administration application.
- **Tap-Over**—If a session is locked or left open, a second user can tap their own proximity card and this will disconnect the first session and log the second user into their own unique session.

- **Forgotten card**—If you forget your card at home, you can receive a temporary card and register it for the day using the same easy registration process mentioned in this section.
- **Lost or stolen card**—If you report a card as lost or stolen, an administrator can immediately disable the card using the convenient web administration application. This prevents anyone else from using it.
- **Self-Service Password Reset (SSPR)**—If SSPR enabled by an administrator, you can register for SSPR and reset your passwords without calling the help desk.

- **Easy to use web-based administration tool**—Administrators can quickly and easily configure settings, manage proximity cards, and users using a web-based administration tool.

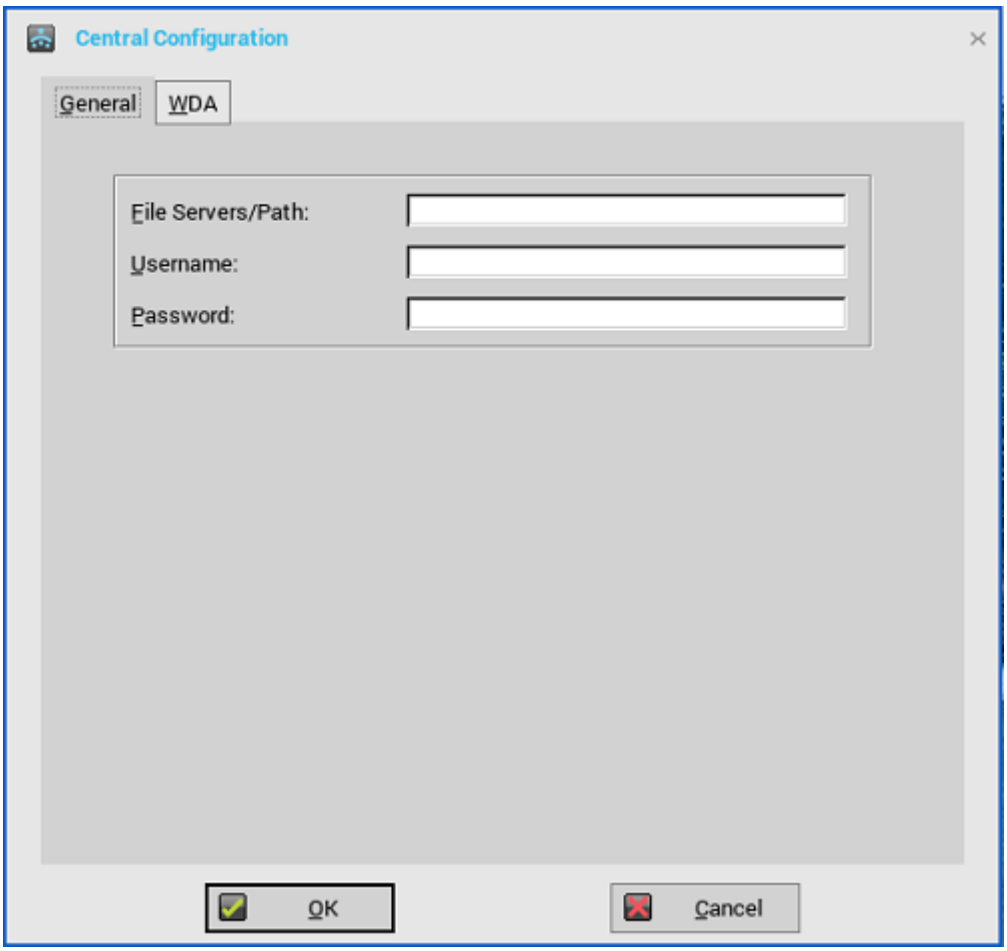
Configuring the central configurations

Use the **Central Configuration** dialog box to configure the file server, WDM server settings, and Wyse Management Suite server settings.

Configuring the general central configurations

To configure the general central configurations:

1 From the desktop menu, click **System Setup**, and then click **Central Configuration**.
The **Central Configuration** dialog box is displayed.
2 Click **General** tab, and use the following guidelines:



File Servers/Path, **Username** and **Password** — Enter the IP address or host name of the file server that provides the system software and update images. The address can be supplied through DHCP, if DHCP is used.

a **File Servers/Path** — Allows maximum of 127 characters for file server, and maximum of 127 characters for root path. The data specifies part of the path to be used when the server is accessed.

File server supports failover list. A failover list consists of one or more file server pairs specified in the order of preference. You can provide multiple file servers separated by either a semicolon or colon. The list must not exceed 127 characters. When connecting to a file server, the client attempts to connect to each pair in an order until it finds a working file server pair.

b **Username** — Enter the username to log in to the file server. Use maximum of 31 characters.

c **Password** — Enter the password to log in to the file server. Use maximum of 31 characters.

3 Click **OK** to save the settings.

Configuring the Wyse Device Agent settings

Use this tab to configure the Wyse Device Manager and Wyse Management Suite settings.

ThinOS supports all the Wyse Management Suite Group Policy settings.

Dell Wyse Device Agent (WDA) has been enhanced to support the following three types of customer security environments:

- **Highly secured environment**—Administrators must log in to each device, and use the USB device or File Server to import the server certificate. The server certificate is retained in the device until you reset the device to factory default settings. The device is secured and is not susceptible to a rouge DHCP or DNS server for a new device discovery. Administrators can use either CA-signed or self-signed server certificates.
- **Secured environment**—Administrators can configure the server certificate fingerprint as a DNS_Text record or a DHCP_Scope option. If WDA detects the DNS_Text record or the DHCP_Scope option, the server certificate fingerprint is distributed over the network and

added locally to the device. When the device is reimaged, the server certificate fingerprint is removed from the device. Administrators can use either CA-signed or self-signed server certificates.

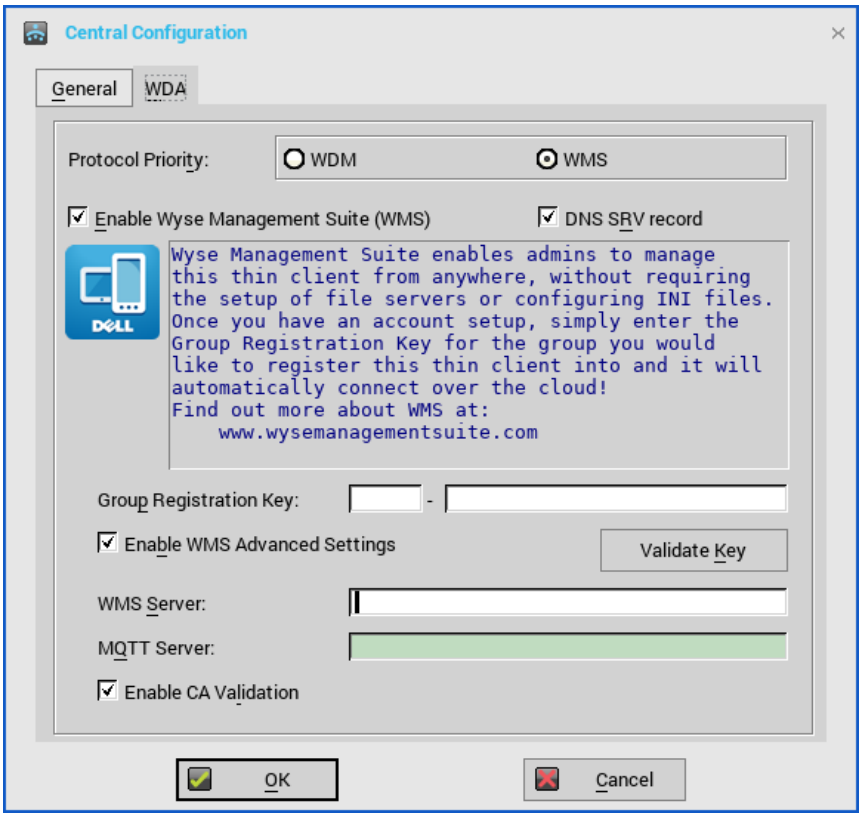
- **Normal environment**—You can use either CA-signed or self-signed server certificates for device discovery. The device must establish a connection with CA for certificate validation. This applies when there is no option of DNS_Text record or DHCP_Scope but the server certificate is CA-signed. If the certificate is a self-signed certificate, you must accept the certificate security warning message.

To configure the Wyse Management Suite settings, do the following:

1 From the desktop menu, click **System Setup**, and then click **Central Configuration**.

The **Central Configuration** dialog box is displayed.

2 Click **WDA** > **WMS**, and use the following guidelines:



By default, the **WMS** option is selected. Wyse Management Suite service automatically runs after the client boot up.

If the first discovery, for example, the Wyse Management Suite service is not successful, it seeks for the next priority, for example, WDM service. This continues until a discovery is successful. If all discoveries fail, it is started again automatically after a fixed time—24 hours.

a **Enable Wyse Management Suite (WMS)**—Select the check box to enable the Wyse Management Suite to discover your thin client.

b **DNS SRV record**—Select this check box if you want the thin client to obtain the Wyse Management Suite values through DNS server, and then try to register into the Wyse Management Suite server. By default, the check box is selected. If the check box selection is canceled, the thin client cannot obtain the Wyse Management Suite values through DNS server.

To create DNS records in DNS server, use the following information:

WMS server URL

DNS Record Type: `DNS SRV`

Record Name: `_WMS_MGMT._TCP.<Domain>`

Value Returned: `WDMNG Server URL`

Example: _WMS_MGMT._TCP.WDADEV.com

MQTT Server URL

DNS Record Type: `DNS SRV`

Record Name: `_WMS_MQTT._TCP.<Domain>`

Value Returned: `WMS Server URL`

Example: _WMS_MQTT._TCP.WDADEV.com

Group Token

DNS Record Type: `DNS Text`

Record Name: `_WMS_GROUPTOKEN.<Domain>`

Value Returned: `Group Token` (as String)

Example: _WMS_GROUPTOKEN .WDADEV.com

CA Validation

DNS Record Type: `DNS Text`

Record Name: `_WMS_CAVALIDATION.<Domain>`

Value Returned: `TRUE or FALSE` (as String)

Example: _WMS_CAVALIDATION.WDADEV.com

c **Group Registration Key**—Enter the **Group Registration Key** as configured by your Wyse Management Suite administrator for the desired group. To verify the key, click **Validate Key**.

A Group Registration Key is not required for the private Wyse Management Suite server. You can provide the Wyse Management Suite server details to enable the device to check in to Wyse Management Suite. ThinOS registers to a quarantine tenant in Wyse Management Suite.

d **Enable WMS Advanced Settings**—Select this check box to enter the Wyse Management Suite server, MQTT server details, and to enable the CA validation. By default, the MQTT server option is disabled. The MQTT server value is populated after the ThinOS device is checked in to the Wyse Management Suite.

> **NOTE: If you enable the Wyse Management Suite, ensure that you have entered the Group Registration Key and configured the Wyse Management Suite advanced settings.**

The **CA validation** is required when you import certificates into your Wyse Management Suite server. By default, the CA Validation check box is selected to improve the security when using the Wyse Management Suite cloud. This change affects connections to any of the following servers:

- *.dellmobilitymanager.com
- *.cloudclientmanager.com
- *.wysemanagementsuite.com

Table 9. CA validation

Wyse Management Suite deployment	CA Validation
Private cloud	When you deploy Wyse Management Suite on a private cloud, the **Enable CA Validation** check box is available to configure after you specify the server details in the **WMS Server** field. By default, the check box is selected.
Public cloud	When you deploy Wyse Management Suite on a public cloud, the **Enable CA Validation** check box is selected by default. You cannot disable the **Enable CA Validation** option.

For more information about using Wyse Management Suite to manage the ThinOS devices, see the Wyse Management Suite Administrator's Guide at www.dell.com/manuals.

3 Click **OK** to save the settings.

When you modify the ThinOS policy of the registered thin client using Wyse Management Suite, a dialog box is displayed prompting you to postpone or restart the thin client. To apply the settings immediately, click **Restart Now**. If you want to delay this task, click **Postpone**.

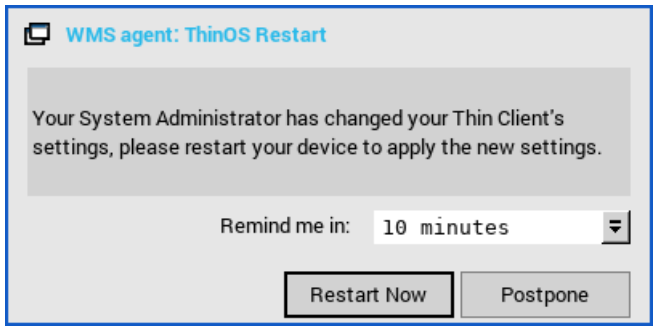
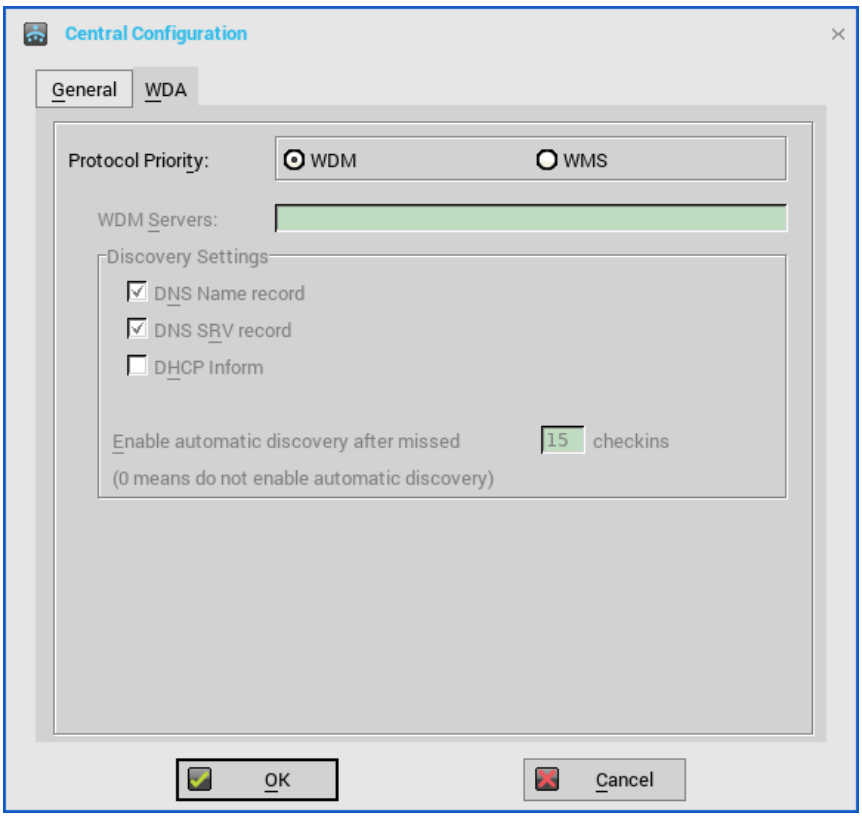


Figure 8. Wyse Management Agent: ThinOS restart

To configure the WDM settings, do the following:



1 Click **WDM**, and use the following guidelines:

   a **WDM Servers**—If WDM is used, enter the IP addresses or host names. If user INI profiles are used, locations can be supplied through user profiles.

   b **DNS Name Record**—(Dynamic Discovery) Allows devices to use the DNS hostname lookup method to discover a WDM server.

   c **DHCP Inform**—(Dynamic Discovery) Allows devices to use DHCP Inform to discover a WDM server.

   d **Enable Automatic Discovery After Missed Check-ins**—Select the number of missed check-ins after which you want the auto discovery options enabled.

2 Click **OK** to save the settings.

The Wyse Device Manager option can be disabled using the following INI parameters:

- WMSService=no
- Service=wdm disable=yes
- RapportDisable=yes

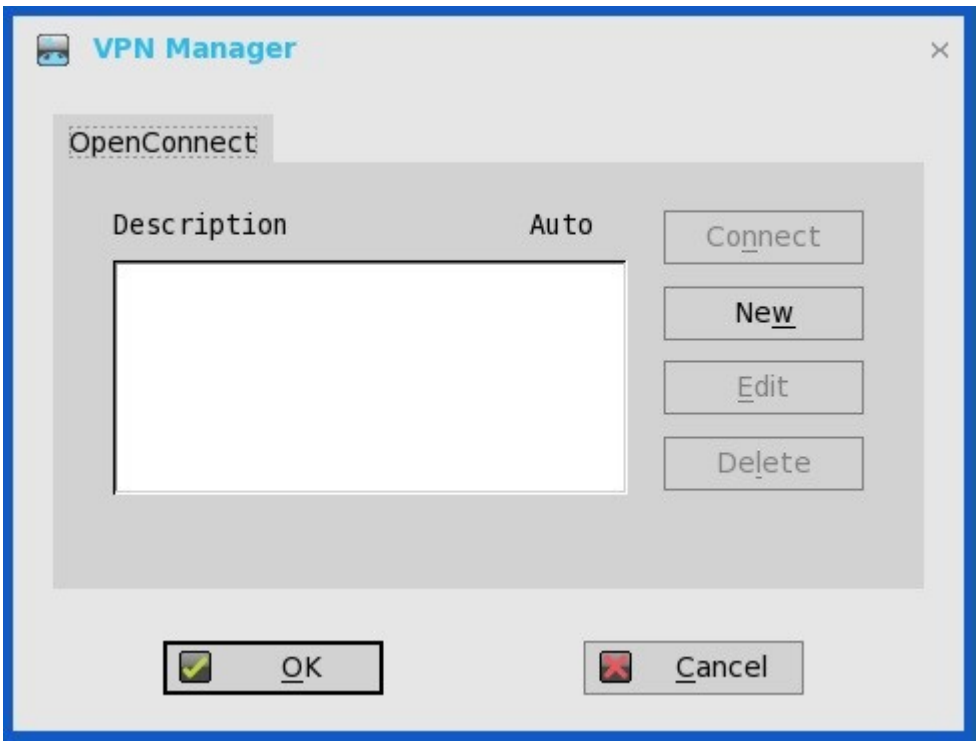
Configuring the VPN Manager

VPN Manager is included to manage Virtual Private Network connections. ThinOS uses the OpenConnect client that is based on SSL protocol for connecting to VPN. A virtual private network (VPN) extends a private network across a public network such as the Internet. It enables a computer or Wi-Fi-enabled device to send and receive data across shared or public networks as if the devices are directly connected to the private network, while benefitting from the functionality, security and management policies of the private network.

To configure the VPN Manager, use the following guidelines:

1 In Classic Mode, from the desktop menu, click **System Setup** > **VPN Manager**.
   In Zero Mode, user can view the **VPN Manager** tab in System Settings panel.

2 Click **VPN Manager**.
   The **VPN Manager** dialog box is displayed.



3 Click **New** to create a new session.

a Session Name (up to 21 characters)—Enter the name of the Session Name. This is not a mandatory option. If the field is left blank, the VPN server name will be used as the session name.

b VPN server (up to 63 characters)—Enter the IP address of the VPN Server. This is defined as either an IP address or a host name. This is a mandatory option.

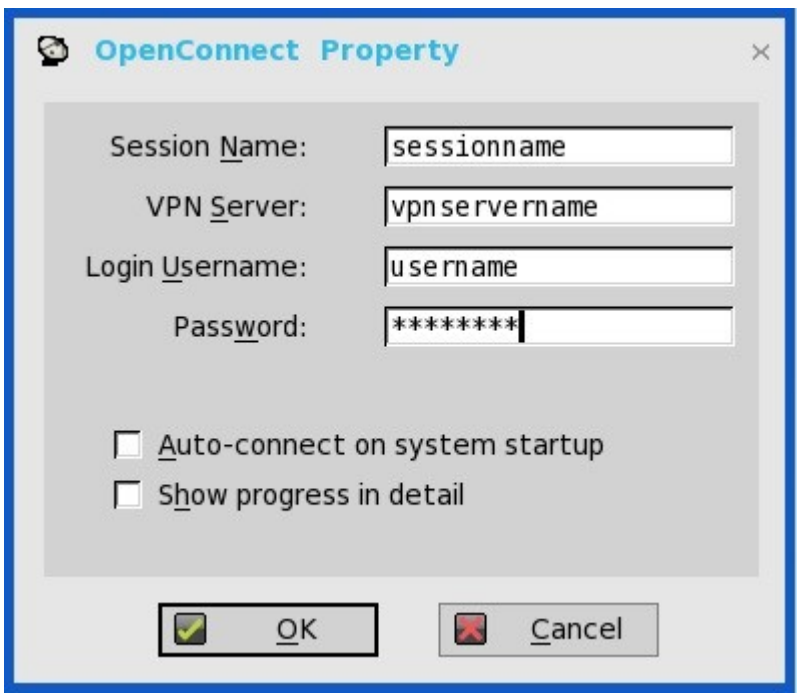
c Login Username (up to 31 characters)—Enter the Login Username. This is a mandatory option.

d Login Password (up to 31 characters)—Enter the password of the user. This is not a mandatory option.

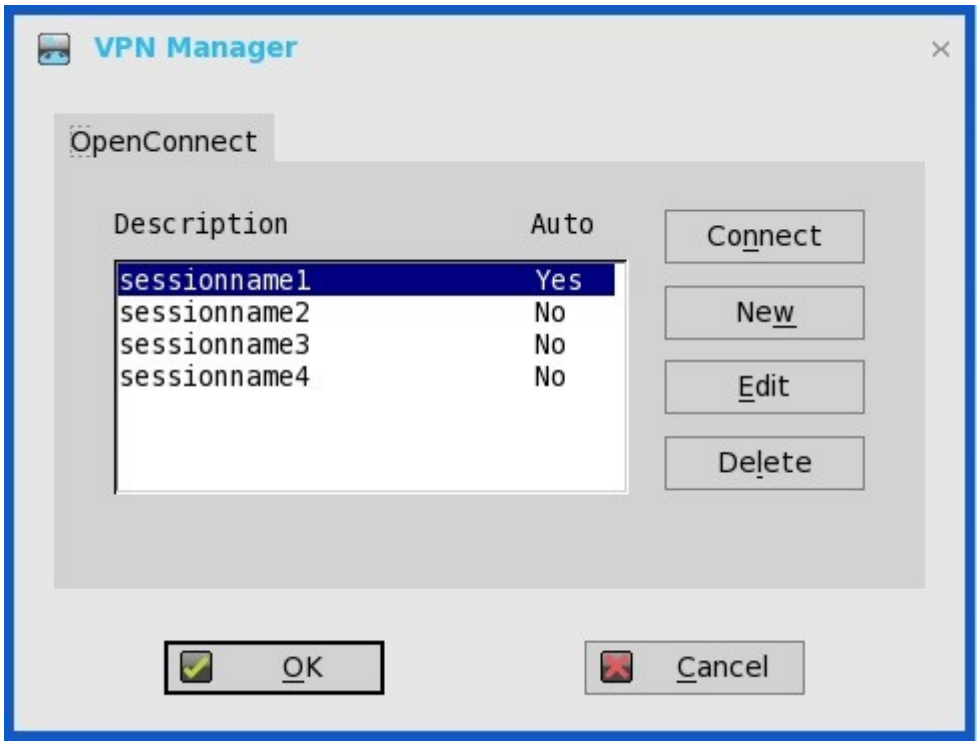
e Select the check box to Auto-connect on system startup.

f Select the check box to show progress in detail.

g Click **OK**.



When the connections are created, the description column lists the session name and the Auto column shows which connection is automatically connected when the unit restarts. Only one session can be set to auto-connect.



4 Click **Connect**.

The connection status is displayed.

6

Configuring the connection brokers

In a Virtual Desktop Infrastructure (VDI) environment, a connection broker is a software entity that allows you to connect to an available desktop. The connection broker facilitates the VDI environment to securely and efficiently manage the centrally hosted desktop environments.

NOTE:

- Linux hosted desktop in Citrix, VMware, and Dell vWorkspace brokers are supported.
- Multimedia redirection (MMR) is not supported when you use RDP protocol to connect Windows 10 VM created in Microsoft RDS.
- Multimedia redirection (MMR) is supported when you use RDP protocol to connect Windows 10 VM created in Citrix Xen or VMware View.
- ThinOS does not support ICA multicast over VDMM.
- ThinOS supports ICA multimedia URL redirection (QUMU).
- ThinOS does not support Browser Content Redirection (HTML5 Redirection v2).

Configuring Citrix

Citrix offers a complete virtualization solution, where all applications and resources are deployed on a centralized server, and published to remote devices. The Citrix Receiver client software installed on the thin client allows you to interact with the application GUI, while all of the application processes are performed on the server.

This section provides information about how to configure a Citrix broker connection on your ThinOS device, and other Citrix features that you can configure on ThinOS.

Configuring the Citrix broker connection

To configure the Citrix broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

2 In the **Broker Setup** tab, from the drop-down list, select **Citrix Xen**, and do the following:
- Select the check box to enable the **StoreFront style**.
- **Broker Server**— Enter the IP address/Hostname/FQDN of the Broker Server.
- **Auto Connect List**—Enter the name of the desktops that you want to launch automatically after logging in to the respective broker. More than one desktop can be entered. Each desktop name is separated by semi-colon, and is case-sensitive.
- Select the check box to enable automatic reconnection at logon.

  NOTE: If you enable the automatic reconnection, you are able to select from the reconnection options. Click either of the options where you can connect to the disconnected sessions only or connect to both active and disconnected sessions.
- Select the check box to enable automatic reconnection from the button menu.

  NOTE: If you enable the automatic reconnection, you are able to select from the reconnection options. Click either of the options where you can connect to the disconnected sessions only or connect to both active and disconnected sessions.
- **Account Self-Service Server**— Enter the IP address of the Account self-service server.
- **XenApp** — Use this option, if you want to set default settings to **XenApp**.
- **XenDesktop**— Use this option, if you want to set default settings to **XenDesktop**.

3 Click **OK** to save the settings.

Citrix Receiver feature matrix

Table 10. Citrix Receiver feature matrix

Features		Operating System—ThinOS
Content	Citrix Virtual Applications	Supported
	Citrix Virtual Apps and Desktops	Supported
	Follow Me Apps/Subscriptions	Supported
	Offline Apps (App V)	Not applicable
	File Open in Receiver	Not applicable
	Desktop Viewer/Toolbar	Not supported
	Multitasking	Supported
	Follow Me Sessions (Workspace Control)	Supported
	URL Redirection	Not supported
HDX	Audio Playback	Supported
	UDP Audio	Supported
	Bidirectional Audio (VoIP)	Supported
	Web Cam (Video Chat)	Supported
	Video Playback	Supported
	Flash Redirection	Supported (x86 only)
	Skype for business Optimization pack	Supported (x86 only)
	Cisco Jabber Unified Communications Optimization	Supported (x86 only)
	Windows Multimedia Redirection	Supported
	Local Printing	Supported
	H.264-enhanced SuperCodec	Supported
	Adaptive Transport	Limited support[1]
	Framehawk	Not supported
	Client hardware acceleration	Limited support
	Desktop Composition redirection	Not supported
	3DPro Graphics	Supported
	Remote FX	Not supported
	Location-Based Services	Not supported
	Client drive mapping/File Transfer*	Supported
	Generic USB redirection	Supported
	SDWAN Support	Verification needed

Features		Operating System—ThinOS
	Local App Access	Not applicable
	Multi-touch	Not supported
	Mobility Pack	Not applicable
	HDX Insight	Supported
	Experience Metrics	Supported
	External Monitor	Supported
	True Multi Monitor	Supported
	Session Sharing	Supported
	Session Reliability	Supported
	Auto Client reconnect	Supported
	Multi-port ICA	Supported
Security and communication	Receiver for Web Access	Not applicable
	Remote Access via NetScaler Gateway	Supported
	NetScaler Full VPN	Supported
	RSA Soft Token	Supported
	Challenge Response SMS	Supported
	User Cert Auth via NetScaler Gateway	Supported
	Smart Card (CAC, PIV and so on)	Supported
	Proximity/Contact less Card (Fast Connect)	Supported
	Pass Through Authentication	Supported
	SAN Cert	Verification needed
	SHA2 Certs	Supported
	TLS 1.1/1.2	Supported
	AES and 3DES Encryption	Supported
	Smart Access	Supported
	IPv6	Supported
Updates	Auto Discovery/Configuration	Not supported
	App Store Updates/Citrix updates	Not supported

*File transfer feature applies to HTML5/Chrome Receiver only.

[1]Adaptive transport is a data transport mechanism for Citrix Virtual Apps and Desktops. This mechanism enables the underlying protocol to switch between the Citrix protocol called Enlightened Data Transport (EDT) and Transmission Control Protocol (TCP) for better performance. EDT is added on top of UDP and enhances the data throughput for all ICA virtual channels. ThinOS supports adaptive transport using Transmission Control Protocol (TCP), and does not support adaptive transport through User Datagram Protocol (UDP) except the audio channel. For more information about Adaptive transport, see docs.citrix.com/en-us/citrix-virtual-apps-desktops/technical-overview/hdx/adaptive-transport.html.

For more information about Citrix Receiver features, see the Citrix documentation at www.citrix.com.

Citrix HDX RealTime Multimedia Engine or RealTime Optimization Pack

HDX RealTime Optimization Pack (RTOP) provides a scalable solution to deliver audio-video conferencing and Voice over Internet Protocol (VoIP) enterprise telecommunication by using Microsoft Skype for Business. The Optimization Pack supports XenDesktop and XenApp environments to users on ThinOS devices. For more information about HDX RealTime Optimization Pack, see Citrix documentation.

This section provides information about supported platforms for RealTime Multimedia Engine (RTME), installation of RTME package, Citrix remote server/Desktop host preparation, configuration on ThinOS, and RTME status check and troubleshooting.

Introduction

Citrix HDX RealTime Optimization pack offers high-definition audio and video calls. In every ThinOS release, the RTME version may be updated to newer version.

For more information about the Citrix RTME 1.8 feature, see the HDX RealTime Optimization Pack article at docs.citrix.com.

For more information about the Citrix RTME 2.x feature, see the latest RealTime Optimization Pack article at docs.citrix.com.

Supported environments

- Citrix environment: Citrix Virtual Apps and Desktops 5.6/6.5/7.x.
- Desktop with RTME connector 1.8 (Lync server and client version 2010 and 2013; Skype for Business client in Lync 2013 GUI is supported).
- Desktop with RTME connector 2.x (Both Skype for Business 2015 and Skype for Business 2016 are supported).
- Supported networks: LAN, WAN (VPN), wireless and so on.
- Supports calls between RTME clients or between RTME and standard Lync clients.
- Supports Microsoft Office 365 or Skype for Business Online. For more information, See the Citrix documentation.

RTME supported platforms

- Wyse 5010 with ThinOS (D10D), Wyse 5010 thin client with PCoIP (D10DP)
- Wyse 3030 LT thin client with ThinOS, Wyse 3030 LT thin client with PCoIP
- Wyse 3040 thin client with ThinOS, Wyse 3040 thin client with PCoIP
- Wyse 5060 thin client with ThinOS, Wyse 5060 thin client with PCoIP
- Wyse 5040 AIO thin client with ThinOS (5212 AIO), Wyse 5040 AIO thin client with PCoIP (5213)
- Wyse 5070 thin client with ThinOS, Wyse 5070 Extended thin client with ThinOS, Wyse 5070 thin client with PCoIP
- Wyse 7010 thin client with ThinOS (Z10D)

Installing RTME package on ThinOS

You are required to install the RTME.i386 package for the RTME feature to work on ThinOS.

To install the RTME.i386 package:

1. Upload the **RTME.i386.pkg** to directory **\wnos\pkg**.
2. You must ensure that the INI `autoload` is not set to value 0.
3. Restart the thin client and wait till the auto-installation of packages is complete.

The installed RTME package is displayed in the **Packages** window in System Tools.

Setting up the RealTime Multimedia Engine connector

This section describes how to install and use Lync or Skype for Business (SFB) on a Citrix desktop.

1 Install Citrix HDX RealTime Connector on Citrix desktop VDA/Server. HDX RealTime Multimedia Engine (RTME) is the package installed on ThinOS. It is HDX RealTime Connector that needs to be installed or upgraded on the remote server and VDA.

NOTE: The following are applicable to RTME 1.8 only:

- The Upgrade option from 1.7 to 1.8 is discussed at docs.citrix.com/en-us/hdx-optimization/1-8/upgrade-1-7-to-1-8.html.
- The Firewall configuration is required on remote server and VDA. For more information, refer to docs.citrix.com/en-us/hdx-optimization/1-8/hdx-realtime-optimization-pack-configure-firewall.html.
- The RTME 1.8 feature on ThinOS supports only HDX RealTime Connector 1.8 due to Citrix limitation.

2 Update the ThinOS firmware, and install the **RTME.i386.pkg** on the ThinOS client.

IMPORTANT: Since ThinOS 8.3.1 HF release, the RTME 1.8 and 2.1 co-exist in the release package, supporting both versions of RTME connectors. In every ThinOS release, the RTME version may be updated to newer version and the latest RTME version co-exists with RTME 1.8 version in the corresponding release packages.

3 (This step is for RTME 1.8 only) Configure the Domain Name Server (DNS) settings on ThinOS for Lync Server.

NOTE: You must ensure that the thin client does not have USB redirection for video/audio devices in order to have RTME working correctly.

4 Log in to your Citrix Desktop, and sign in to Lync client or Skype for Business (SFB) client.

- For RTME 1.8, the RTME icon is displayed in the lower-left corner of the Lync client window.
- For RTME 2.x, the RTME icon is displayed on taskbar.

Use the Lync Application or Skype for Business application to perform the following tasks:

- Start an audio or video call
  - Select user to call
  - Call from the IM window
  - Type a name or number to call
- Answer the call
  - Audio call
  - Video call
  - Headset button to answer the call
- Transfer call/ mute/ hold call
- Control the video: Pause/ End/ Picture in Picture (PiP)
- Set the volume levels
- Use Dial Pad
- Make a conference call
- Help and Hang up
- Minimize/maximize or close the call video window
- Perform Network Health check:
  - For RTME 1.8, press **Ctrl+N** to open the **Network Health** window.
  - For RTME 2.x, right-click the RTME icon on taskbar and select **Call Statistics**.

  The attributes, such as received packets, sent packets, video frame rate, video resolution, audio codec, and video codec are displayed in the above described window.

Verifying the RTME 1.8 status

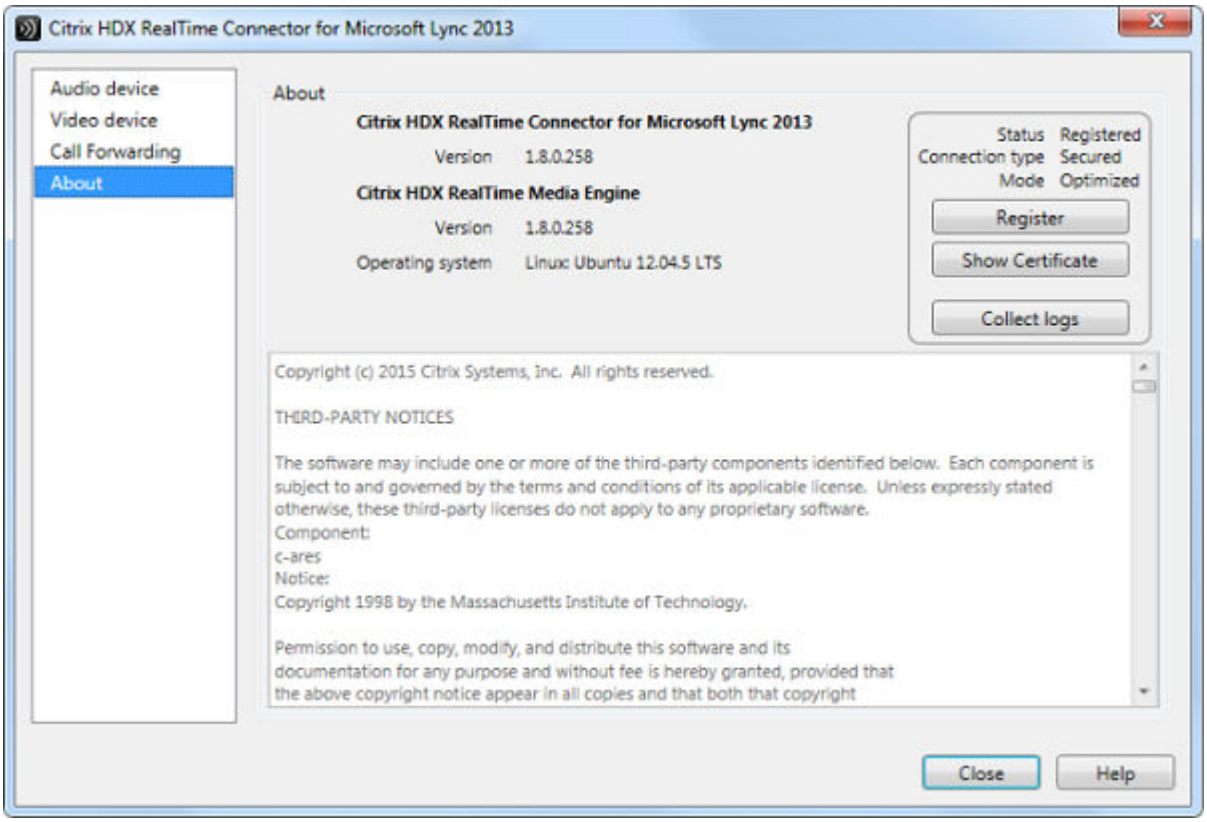
The **Citrix HDX RealTime Connector for Microsoft Lync 2013** dialog box enables you to verify the RTME 1.8 status.

To view the **Citrix HDX RealTime Connector for Microsoft Lync 2013** dialog box:

1 Do any of the following to view the **Citrix HDX RealTime Connector for Microsoft Lync 2013** dialog box:

- Click the **RTME** icon in the lower-left corner of the Lync application window, and click **Audio Video Settings**.
- Click the **Lync menu** icon in the upper-right corner of the Lync application window, and click **Tools** > **Audio Video Settings**.

The **Citrix HDX RealTime Connector for Microsoft Lync 2013** dialog box is displayed.



2 Click the **About** tab in the **Citrix HDX RealTime Connector for Microsoft Lync 2013** dialog box.

The RTME status is displayed in the upper-right pane of the dialog box. If the RealTime Multimedia Engine is successfully initiated between the ThinOS client and Citrix desktop, the RTME status is displayed as follows:

Table 11. RTME status

Attribute	Value
Status	Registered
Connection Type	Secured
Mode	Optimized

You can also view the **Citrix HDX RealTime Connector for Microsoft Lync 2013** version and **Citrix HDX RealTime Media Engine** version in the dialog box.

3 Click the **Audio Device** tab to configure the RTME audio settings, such as speakers, microphone, and ringer settings.

> **NOTE: The RTME audio device on ThinOS shows only one device from ThinOS local playback device. It can actually work the way they are configured at ThinOS local playback device and record device. The RTME audio device for ringtone is limited to use ThinOS local playback device. This is a known Issue.**

4 Click the **Video Device** tab to configure the RTME video settings. From the drop-down list, select the webcam that you want to use for video calls.

5 Click the **Call Forwarding** tab to configure the call forwarding settings.

You can configure the following options:

- Turn off call forwarding
- Forward any call to a specific number
- Simultaneously ring

NOTE: The latest call forwarding settings configured by you are displayed in the lower pane of the dialog box.

For more information about trouble shooting, go to docs.citrix.com/en-us/hdx-optimization/1-8/hdx-realtime-optimization-pack-troubleshooting.html.

For information about the tested devices for RTME, see the latest Dell Wyse ThinOS release Notes.

Known issues

- RTME operation system on ThinOS is displayed as Linux.
- The RTME 1.8 feature on ThinOS does not work with other versions of HDX RealTime connector due to known Citrix limitation.
- If you change the audio device during an RTME call, the audio input or output might stop responding.
- In a video conference call, when different user is speaking, the on-screen video switches to the active user, but takes a few seconds to switch over.

Verifying the RTME 2.x status

This section describes the working of RTME 2.x and how to verify the RTME status.

Salient features

- Native Skype For Business client menus and operations are available.
- Better initialization eliminates DNS confusions.
- Supports more call features, such as call delegation, and response group.
- Supports video codec H.264-UC, and audio codec SILK introduced by RTME 2.1.
- Call Admission Control support
- Bandwidth Policy Control
- DSCP/ QoS Configuration
- Ability to turn off version mismatch warnings for acceptable combinations of RealTime Connector and RealTime Media Engine.

To verify the RTME status, do the following:

1 Install the correct connector on the remote desktop.
2 Install the correct package on the ThinOS device.
3 Connect the audio or video devices.

NOTE: USB redirection needs to be disabled for audio or video devices.

4 Connect to the remote desktop using SFB client.
5 Verify the RTME connector icon on taskbar. The status is displayed as **Connected**.
6 Verify the **About and Settings** option from the RTME connector menu.
7 Verify the audio/video devices from SFB client menus.
8 Establish the video/audio calls.
9 Pick up the calls by either clicking the mouse or using the headset button.
10 Verify the Call Statistics from the RTME connector menu.

NOTE: RTME 2.2 and later versions support various call scenarios. For more information, refer to Citrix documentation.

USB Video Class (UVC) 1.1 and 1.5 camera hardware encoding / H.264 (CAM) are supported in RTME 2.2 and later versions. This is applicable for qualified cameras only, for example Logitech C930e.

In the **Call Statistics** window, **Video Codec = H.264-UC (CAM))** is displayed for P2P RTME video call in the **Sent** column. For group calls with standard SFB, the call statistics displays **Video Codec = H.264-UC (CAM)** in the **Sent** column. This improves video call quality/resolution compared to Video Codec H.264 (SW); for example: P2P video call resolution upgrade from 480 x 270 to 640 x 360.

Limitations

- The video sent from client in call is decided by capabilities of both endpoints in the call. Sending higher video from one client does not mean that the client has better capability than the other one in call.
- RTME status dialog displays operation system as Linux.
- Changing the video/audio device during RTME call results in issue with audio input or output.
- Volume: Dell recommends you to adjust the speaker volume in audio settings of SFB client to high. By default, the SFB client audio volume is set to 40 percent. The default volume is a bit low.
- Camera/Video: The local camera setting does not affect/impact the RTME video output because of the RTME design.
- In Citrix RTME version 2.3, the video performance of applications is designed for a lower CPU consumption. Therefore, the video resolution may be downgraded compared to version 2.2.
- ThinOS RTME package update does not support hardware acceleration. For more information, see the Citrix documentation at docs.citrix.com.

Citrix RTME call statistics

Table 12. Citrix RTME call statistics

Platform name	RTME version	Call statistics*			Camera
		Video resolution	Video codec	Video frame rate	
Wyse 5070 Thin Client	2.7	1280 x 720	H.264-UC (CAM)	30	Logitech C930e
Wyse 5060 Thin Client	2.7	848 x 480	H.264-UC (CAM)	30	Logitech C930e
Wyse 3040 Thin Client	2.7	848 x 480	H.264-UC (CAM)	30	Logitech C930e
Wyse 3030 LT Thin Client	2.7	848 x 480	H.264-UC (CAM)	30	Logitech C930e
Wyse 5010 Thin Client	2.7	424 x 240	H.264-UC (CAM)	15	Logitech C930e
Wyse 7010 Thin Client	2.7	424 x 240	H.264-UC (CAM)	15	Logitech C930e
Wyse 5040 AIO Thin Client	2.7	320 x 180	H.264-UC (SW)	15	On-board camera
Wyse 3020 Thin Client	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Wyse 3010 Thin Client	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

*The call statistics data is displayed in the **Call Statistics** window in the **Sent** column.

Cisco Jabber Softphone for VDI

Cisco Jabber Softphone for VDI (JVDI) is the Unified Communications solution offered by Cisco for virtual deployments. It supports audio-video conferencing, and instant messaging on the hosted virtual desktops (HVD). The Cisco Jabber Softphone for VDI software offloads the audio or video processing from the virtual desktop servers to the thin client. All audio and video signals are routed directly between the endpoints without entering the HVD.

Introduction

Cisco Jabber Softphone for VDI enables you to make and receive calls using the Cisco Unified Communications application. Cisco Jabber Softphone for VDI consists of the following two components:

- Cisco JVDI Agent
- Cisco JVDI Client

Cisco JVDI Agent is the JVDI connector that runs on the Citrix desktop or server. Cisco JVDI client is the JVDI package that runs on the thin client. The Jabber client that runs on the Citrix server handles the authentication and the media processing is achieved on the thin client.

Supported environment

Table 13. Supported environment

Component	Supported platforms/supported versions
Thin client	• Wyse 5070 thin client • Wyse 5060 thin client • Wyse 3040 thin client
Connection broker for the hosted virtual desktops	• Citrix Virtual Apps and Desktops (formerly XenDesktop) 7.15 LTSR and later • Citrix Virtual Apps (formerly XenApp) 7.15 LTSR and later
Cisco Jabber application on the hosted virtual desktop	Cisco Jabber 12.1
Cisco JVDI agent on the hosted virtual desktop	Cisco JVDI Agent 12.1
Cisco JVDI client on the thin client	JVDI.i386.pkg

Installing the JVDI package on ThinOS

This section describes how to install the JVDI package on ThinOS. You must install the JVDI package to use Cisco Jabber Softphone for VDI.

To install the JVDI package:

1 Extract the JVDI.zip package.
The **README WITH EULA.txt** and **JVDI.i386.pkg** files are unzipped to a valid location.
2 Open the readme file and read the EULA agreement.
3 Upload the **JVDI.i386.pkg** to directory **\wnos\pkg** on the file server.
4 Ensure that the value of the INI parameter **autoload** is not set to 0.
5 Restart the thin client and wait until the automatic installation of packages is complete.
The installed JVDI package is displayed in the **Packages** window in System Tools.

Setting up the Cisco Jabber Softphone for VDI

This section describes how to install and use the Cisco Jabber Softphone for VDI on a Citrix desktop.

1 Go to www.cisco.com, and download the following software:
- Cisco JVDI Agent 12.1

- Cisco Jabber application 12.1

2 On the Citrix virtual desktop, install Cisco JVDI Agent. Double-click the file and follow the installation wizard steps.

3 On the Citrix virtual desktop, install Cisco Jabber.

For information about the installation procedure, see the installation guide at www.cisco.com.

4 Update the ThinOS firmware, and install the **JVDI.i386.pkg** on the ThinOS client.

For more information about installing the JVDI package, see Installing JVDI package on ThinOS.

> **NOTE: If ThinOS running Cisco Jabber (JVDI) fails to register with Cisco Unified Communications Manager, add the DNS servers and DNS domains that are used by the Citrix host and the Cisco Unified Communications Manager servers to ThinOS. You can either specify the domain name and server IP on the General tab in Network Setup, or add the DNS server and domain value to the DHCP server by providing the IP address information to the ThinOS client. For issues related to Cisco Unified Communications, contact the Cisco support.**

5 Log in to the Citrix virtual desktop, and sign in to Cisco Jabber using your user credentials.

When you log in for the first time, do the following:

a On the Cisco Jabber interface, click **Advanced Settings**.
b Select your account type as **Cisco Communications Manager 9 or later**.
c Enter the login server address.

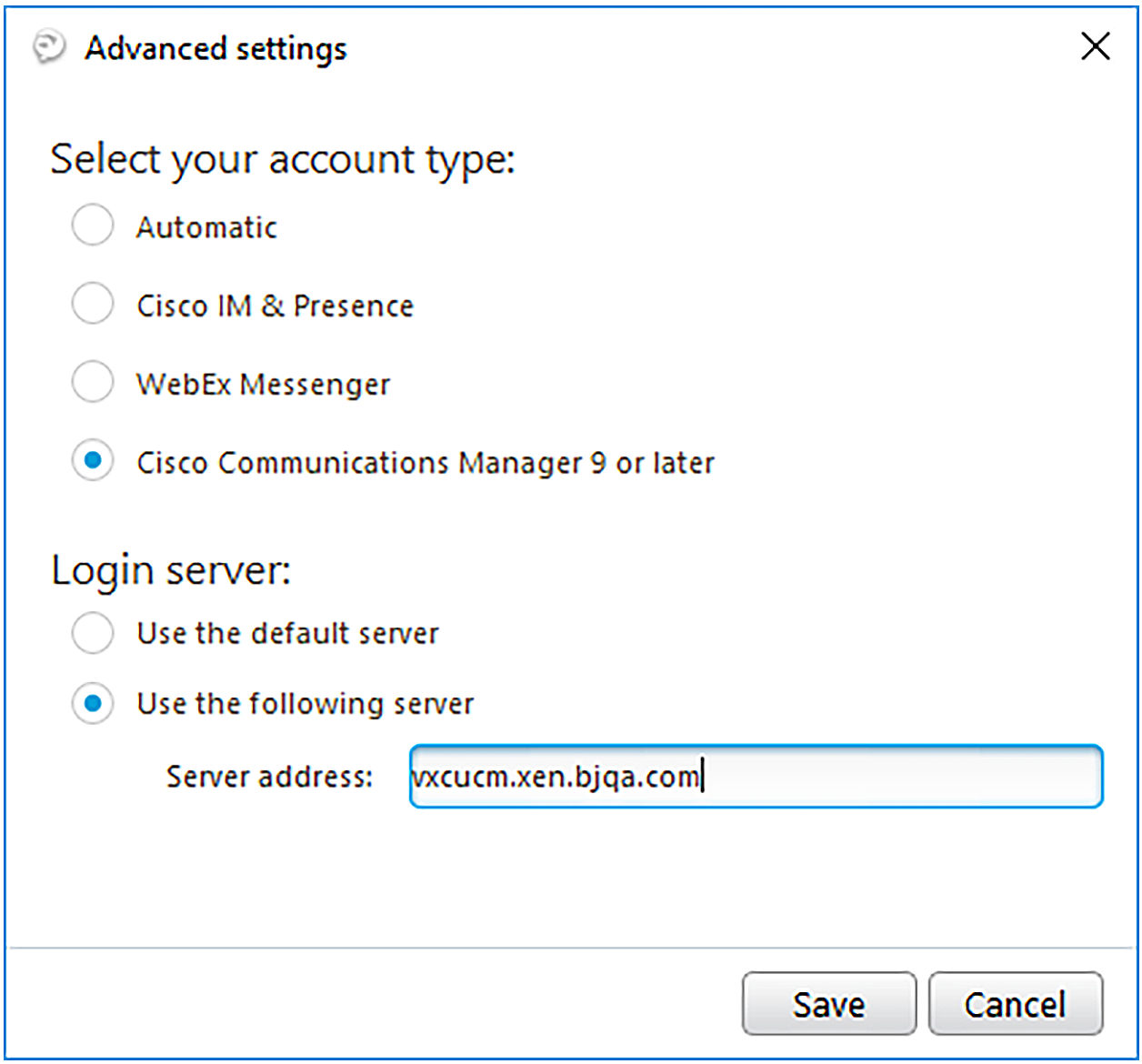


Figure 9. Advanced Settings

NOTE: If the Use my computer for calls option is selected, the Cisco Jabber is automatically registered with Cisco Unified Communications Manager. This option enables Jabber to work as a Softphone, and use the microphone or speaker that is connected to the thin client for phone calls.

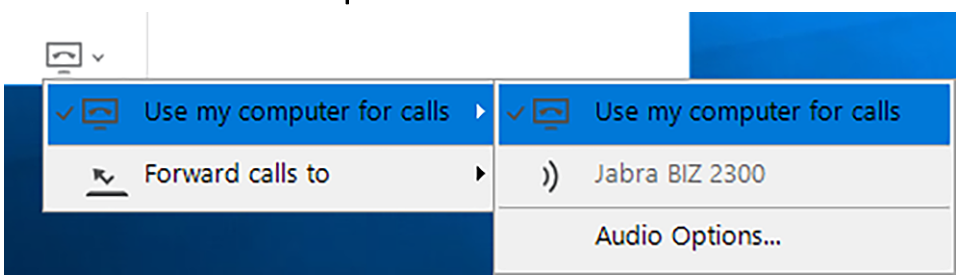


Figure 10. Use my computer for calls

Using Device Selector

Cisco Jabber Softphone for VDI consists of a component called **Device Selector**. Use the **Device Selector** menu to manage your audio devices and cameras.

If you have multiple devices connected to the thin client, you can view your active device, or select a different device. To enable a device, do the following:

1 In the Windows notification area, click the **Device Selector** icon.

The available devices are listed.

Figure 11. Device Selector

2 Click a device to make it active.

Using Cisco Jabber

Use the Cisco Jabber application to perform the following tasks:

- Start an audio or video call
- Answer the call
- Hold or resume the call
- Stop the video
- Mute or unmute the audio
- Turn on or turn off the self view
- Enter or exit the full screen
- Merge the calls
- Audio conferencing
- Transfer the call
- Play voice mail
- Forward the call to voicemail
- Forward the call to another number
- Forward voice messages directly

- Use the Device Selector menu to switch between headsets
- Use the Device Selector menu to switch between cameras
- Set up secure phone capabilities
- Answer the call on multiple phone devices (Shared Line feature)

NOTE: Dell recommends that you reduce the video resolution to 640 x 360p with 30fps on Wyse 3040 thin client.

For information about the performance data statistics and limitations, see the *Dell Wyse ThinOS Version 8.6 Release Notes* at www.dell.com/support.

For information about troubleshooting your Cisco Jabber, see the *Deployment and Installation Guide for Cisco Jabber Softphone for VDI* at www.cisco.com.

For information about Cisco Jabber-related issues, see the *Release notes for Cisco Jabber Softphone for VDI* document at www.cisco.com.

For information about accessories for camera, headsets, and speakers, see the *Unified Communications Endpoint and Client Accessories* article at www.cisco.com.

Limitations

- JVDI package cannot be installed on Dell Wyse 3030 LT, 5040, 5010, and 7010 thin clients.
- Dell Wyse 3040 thin client supports video call up to 360p. The video call with 720p is not supported due to high CPU cost with multimedia playback simultaneously. Dell recommends that you restrict the video up to 360p in the server settings.
- Dell does not recommend video call in 4K display resolution on all platforms due to low performance.
- JVDI version in ThinOS 8.6 must be compatible with JVDI agent and Jabber version. For example, JVDI version 12.1 in ThinOS 8.6 supports JVDI agent and Jabber version 12.1.
- Audio output is poor when you enable the JVDI audio during the full screen video call on Wyse 5060 and 3040 thin clients. This is due to hardware performance limitation. Wyse 5070 thin client supports full screen video call with good audio output.

Known issues

Table 14. Known issues

Description	Workaround
JVDI audio volume slider does not change the audio volume in Wyse 3040 thin client. This issue is due to Cisco Jabber limitation. For more information about the Cisco Jabber issues, see the *Release Notes for Cisco Jabber Softphone for VDI—Release 12.1* document at www.cisco.com.	Adjust audio volume by using either the ThinOS volume bar, session sound volume, or headset button.
Self-camera or remote video does not work, or a black screen is displayed when you play a video. For more information about the Cisco Jabber issues, see the *Release Notes for Cisco Jabber Softphone for VDI—Release 12.1* document at www.cisco.com.	Sign out of the session or reboot the ThinOS client and register the JVDI again.
ICA session cannot be launched and `WdReceiv: trap 14` error occurs when you enable the ICA session reliability with multi-port in the JVDI environment.	Enable ICA session reliability without enabling multiport in JVDI environment.
Answer/End/Hold options in headset do not work during the JVDI call.	You can Answer/End/Hold the call by using the Jabber application in the VDI session.
DP audio does not work in JVDI. When you switch the DP audio in the JVDI device selector, the JVDI may re-register again and a redundant DP audio is listed in device selector. JVDI VXC process should not restart when you hotplug or turn off/on the monitor when using the DP audio in JVDI.	Sign out of the ICA session or reboot the ThinOS client. If you require DP audio, Dell recommends that you first set the DP audio in the ThinOS client and then launch the ICA session.
Audio output is poor when you enable the JVDI audio during the full screen video call on Wyse 5060 and 3040 thin clients. This is due to the hardware performance limitation.	Use the JVDI video call with window mode on Wyse 5060 and 3040 thin clients.

Description	Workaround
JVDI troubleshooting logs show incorrect information.	There is no workaround in this release.

Using Citrix ADC

ThinOS supports Citrix application delivery controller (ADC), formerly known as Citrix NetScaler. The following authentication methods are supported on ThinOS:

- Lightweight Directory Access Protocol (LDAP)
- RSA
- DUO
- SMS PASSCODE
- OKTA

Configuring Citrix NetScaler Gateway using LDAP and RSA

To configure the Citrix NetScaler Gateway using LDAP and RSA authentication, do the following:

1 Go to **NetScaler** > **NetScaler Gateway** > **Virtual Servers**, and click **Edit**.
2 Set the primary and secondary authentications based on the following scenarios:
   - If you use LDAP and RSA login, ensure that the primary authentication is LDAP and secondary authentication is RADIUS.
   - If you use RSA and LDAP login, ensure that the primary authentication is RSA and secondary authentication is LDAP.
   - If you use only LDAP login, ensure that the primary authentication is LDAP and secondary authentication is none.
3 Add the following INI parameter in the wnos.ini file, and configure your file server:
   `pnliteserver=<fqdn of NS Server> CAGAuthMethod={LDAP,LDAP+RSA,RSA+LDAP} Storefront={yes,no}`

For more information about configuring Citrix NetScaler Gateway with LDAP, RSA authentication, see the *Citrix NetScaler Gateway Guide* at www.citrix.com.

Configuring Citrix NetScaler Gateway using DUO

To configure the Citrix NetScaler Gateway using DUO authentication, do the following:

1 Go to **NetScaler** > **NetScaler Gateway** > **Virtual Servers**, and click **Edit**.
2 Ensure that the primary authentication is RADIUS that is configured with the DUO authentication RADIUS.
3 Ensure that the secondary authentication is none.
4 Add the following INI parameter in the wnos.ini file, and configure your file server:
   `pnliteserver=<fqdn of NS Server> Storefront={yes,no}`

For more information about configuring Citrix NetScaler Gateway with DUO authentication, see the *Citrix NetScaler Gateway Guide* at www.duo.com.

Using Citrix NetScaler with CensorNet MFA authentication

SMS PASSCODE is re-branded as CensorNet MFA. You can configure NetScaler Gateway to use a One Time Passcode/Password (OTP) in the form of a personal identification number (PIN) or passcode. To obtain this one-time password, you must install CensorNet app on your mobile. After you enter the passcode or PIN, the authentication server invalidates the one-time password. You cannot enter the same PIN or password again. For more information about configuring one-time passcode, see the Citrix documentation.

Prerequisites

- NetScaler v12.0 and later is installed on your client.

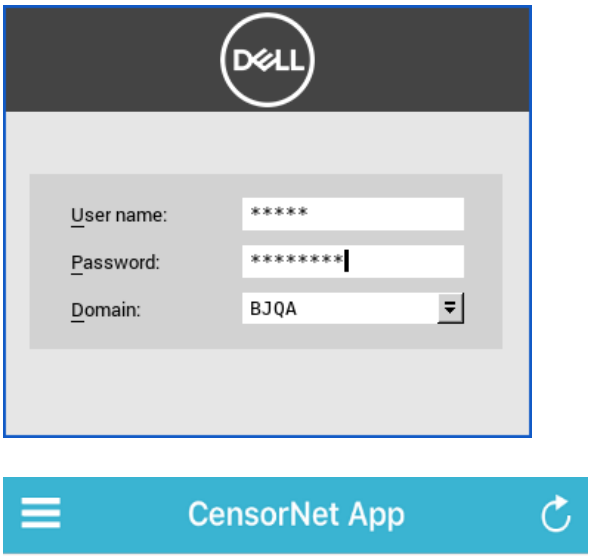
- SMS PASSCODE v9.0 SP1 is installed and configured in your network. You can download the SMS PASSCODE v9.0 file from download.smspasscode.com/public/6260/SmsPasscode-900sp1.
- Remote Authentication Dial-In User Service (RADIUS) authentication policy is configured and bind to the NetScaler gateway server.
- CensorNet app is installed and configured on your mobile device.

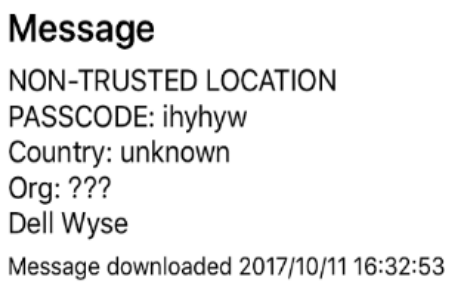
To use the one-time passcode on ThinOS, do the following:

1 Log in to ThinOS, and connect to the NetScalar Gateway URL.

2 Enter your credentials (user ID and password), and press Enter.

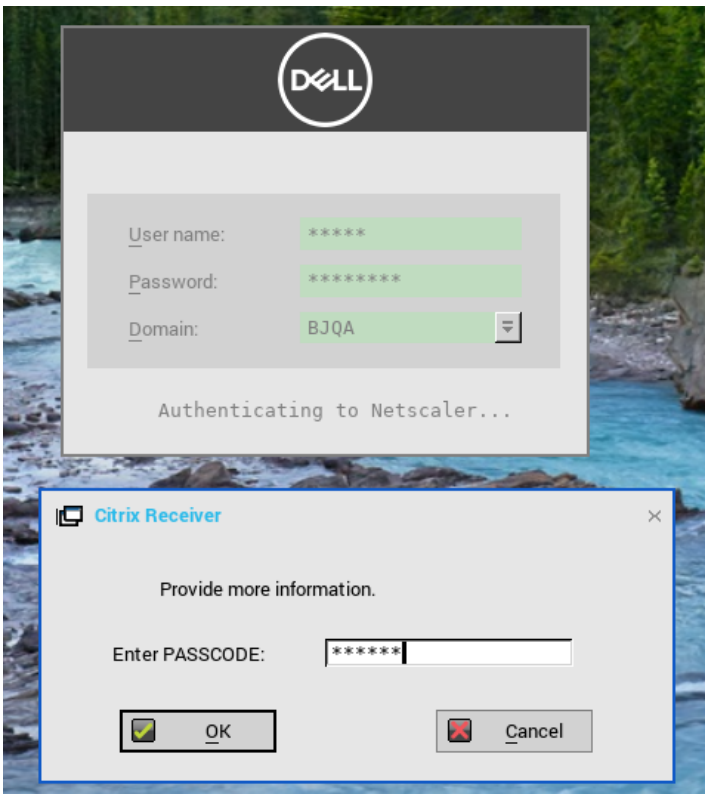
The PASSCODE dialog box is displayed. You will receive a push notification from the CensorNet App on your phone with the code.





3 Click **OK**.

If the authentication is successful, then you are logged into the Citrix session.



Configuring Citrix NetScaler using Okta

Okta provides Single Sign-On (SSO) capability using Remote Authentication Dial-In User Service (RADIUS) for Citrix Virtual Apps and Desktops. ThinOS supports Okta through the Citrix NetScaler Gateway 11.0 or later. The Okta RADIUS Agent is used for user authentication. The Okta RADIUS server agent assigns the user authentication to Okta using single-factor authentication (SFA) or multifactor authentication (MFA).

For more information about configuring Citrix NetScaler Gateway to use the Okta RADIUS Agent, see the *Citrix NetScaler Gateway Radius Configuration Guide* at help.okta.com.

NOTE:

- On the ThinOS client, you need FQDN at the login window. If you do not use `username@fqdn` during login, you must set the following INI parameter:

  ```
  pnliteserver=https://<fqdn of NS Server> CAGUserAsUPN=yes
  ```

  After you enable this INI parameter, the domain must use the **domain.com** format in the login window.
- Phone authentication by using Okta is supported only in US and Canada.

Limitation

ThinOS version 8.6 supports only Okta with NetScaler Radius mode.

Citrix Cloud services

ThinOS supports Citrix Cloud services. It acts as a single management console to deploy applications or desktops on any virtual or cloud setup for a secure digital workspace. For more information about Citrix Cloud services, see the Citrix Cloud article at docs.citrix.com.

Citrix icon refresh

Citrix applications can be refreshed by clicking **Refresh** from PNMenu.

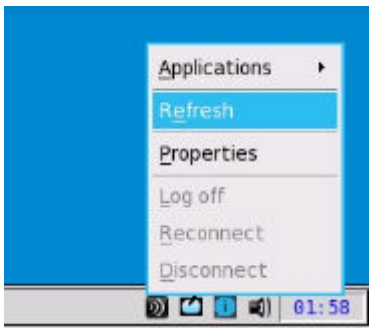
There are two methods to refresh the Citrix applications:

- Manual refresh
- Auto refresh using the INI parameter

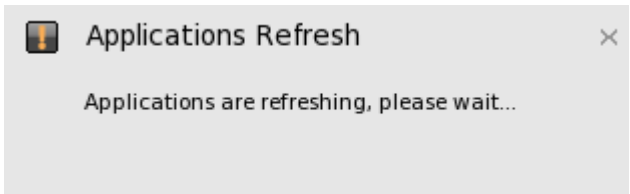
Refreshing Citrix applications manually

To refresh the Citrix application manually, do the following:

1 For single StoreFront or PNAgent server, change the application in broker, and click **Refresh** from PNMenu.



The following message is displayed in the lower right pane during application refresh.

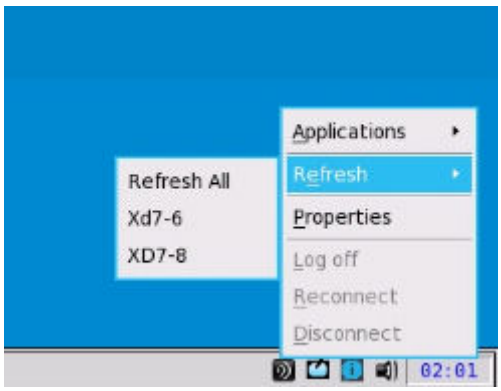


2 Applications are refreshed in Session bar list, Connect Manager list and App menu list.

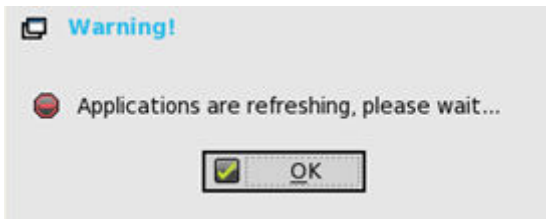
The following log is displayed in the Event Log window:

```
ICA: refresh store "xxx"…" or "ICA: refresh PNAgent"xxx"…
```

3 For MultiFarm (StoreFront or PNAgent servers) or Multilogon (StoreFront or PNAgent servers), select a single server to refresh or click **Refresh All** to refresh all servers.



NOTE:
Warning message is displayed when you open, edit, or remove applications when you refresh the applications.



4 Refresh scope covers the aspects such as, application removed, added, duplicated, disabled, enabled, icon/title change, and on/off desktop.

Active sessions that are started are not affected by application refresh.

5 The disconnect session can be reconnected after application refresh, if **Automatic reconnection at logon** is enabled in remote connection.

Refreshing the Citrix applications automatically by using INI parameter

To automatically refresh the Citrix application, set the following INI parameter:

```
SessionConfig=ICA RefreshTimeOut=dd:hh:mm
```

For example, 01:01:22, means the application will start refresh automatically, every 1 day: 1 hour: 22 minutes.

Limitations of Citrix icon refresh

Following are the limitations of Citrix icon refresh:

- Citrix icon refresh is supported in classic mode and storefront mode only.
- Virtual Desktop Infrastructure (VDI) mode is not supported.

Using multiple audio in Citrix session

ThinOS supports multiple audio device utilizations in the XenDesktop or XenApp version 7.6 and later. You can connect or disconnect the audio devices anytime during the session, but the behavior is similar to a local desktop. With multiple device support, you can connect multiple audio devices and select a specific device for a specific application.

The **Audio Plug N Play** policy must be enabled on the Citrix Remote Desktop Session (RDS) desktop. The **Audio Plug N Play** policy setting allows or prevents the use of multiple audio devices to record and play sound. This setting is enabled by default.

NOTE: On the Citrix Virtual Desktop Infrastructure (VDI) desktop, pre-configuration is not required.

Supported devices—USB headset, webcam (without USB redirection), and analog headset devices are supported.

The following are valid working conditions for multiple audio:

- Using Citrix HDX generic audio
  a Select the audio device as **PC Mic and Speaker**.
  b Configure the speaker or microphone.
  c For secondary ringer, select the audio devices excluding the devices that are already selected.
- Using Citrix RealTime Multimedia Engine (RTME)
  a Select the audio device as **HID headset with PC Mic and Speaker**.
  b Set **PC Mic and Speaker** to configure the speaker or microphone.
  c For secondary ringer, select the audio devices excluding the devices that are already selected.

The following scenarios must be considered during multiple audio settings:

- ThinOS default audio is set to the latest plug-in audio device.
- Session default audio is set to the ThinOS default audio. However, this option can be changed.
- Restart Skype for Business/Lync client after you plug in and remove the device.
- ICA RTP audio is supported with multiple audio connections.
- During a call, the audio device settings can be switched without plugging in or plugging out the device.
- Multiple audio can be shared across sessions.

Limitations

- Wyse 3010 thin client with ThinOS and Wyse 3020 thin client with ThinOS are not supported.
- In Wyse 3030 LT thin client with ThinOS, set the DP audio as the default audio device to use DP audio in a session.

Configuring ICA connections

To configure the ICA connections:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.
2 In the **Broker Setup** tab, from the drop-down list, select the **Broker type** as **None**.
3 Click **ICA** connection protocol, and click **Configure**.
The **Default ICA** dialog box is displayed.

NOTE: Default ICA is always used for direct connection to a published application and not for StoreFront or PNAgent.

4 Click the **Connection** tab.
To configure the ICA connections, do the following:

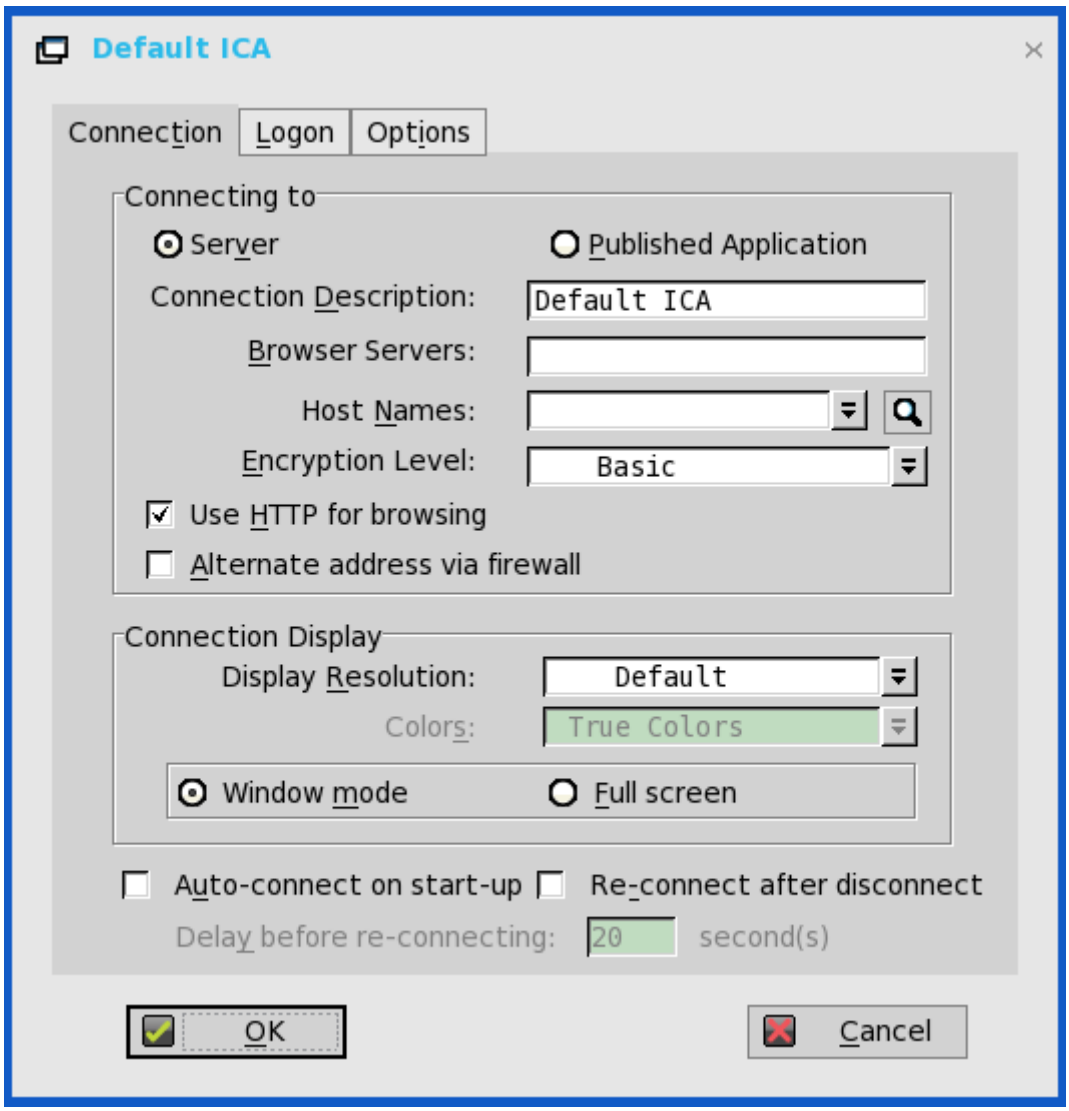


Figure 12. Default ICA

a **Server** or **Published Application**—Select the type of connection to which the settings apply.

b **Connection Description**—Enter the descriptive name that is to be displayed in the connection list (38 characters maximum).

c **Browser Servers**—Enter a delimited (comma or semicolon) list of IP addresses or DNS-registered names of ICA servers that contain the master browsers list, or that can direct to another server that contains the list.

The master browsers list is generated automatically by a browsing program on one of the ICA servers (selected by negotiation between servers). It is used to provide the information that is displayed in the Server Name or IP box. No entry is needed if the list is on an ICA server in the same network segment as the thin client. No entry is necessary if the connection is to a server, or if the server name or IP contains the IP address of the server.

d **Host Name or Application Name** (title depends on the Server or Published Application option that is selected)—You can enter a delimited semicolon or comma-separated list of server host names or IP addresses, or you can select from the list of ICA servers or published applications that are obtained from the ICA master browser. You can also use **Browse** next to the box to make the selection you want.

If you enter a delimited list of servers, the thin client will attempt to connect to the next server on the list if the previous server attempt fails. If you use the list and the selected connection fails, the thin client will attempt to connect to the next one on the list.

NOTE: The Host Name may be resolved using one of three mechanisms: ICA master browser, DNS, or WINS. Master browser is the only mechanism that can resolve a published application unless manual entry is made in DNS for the application. DNS uses the default domain name in the network control panel to attempt to construct an FQDN. However, it tries to resolve the name without using the default value.

e **Encryption Level**—Allows you to select the security level of communications between the thin client and the ICA server.

Basic (the default option) is the lowest level of security. Basic enables faster communication between the device and the ICA server because it requires less processing than the higher levels of encryption.

NOTE: The encryption selection applies to the security of communications between the thin client and the ICA server only. It is independent of the security settings of individual applications on the ICA server. For example, most web financial transactions require the thin client to use 128-bit encryption. However, transaction information could be exposed to a lower level of security if the thin client encryption is not also set to 128–bits.

f **Use HTTP for browsing**—When selected, the thin client, by default, uses HTTP when browsing.

g **Alternate address via firewall**—When selected, the thin client uses an alternate IP address that is returned from the ICA master browser to get through firewall. This is used for the Windows login when the connection is activated.

h **Display Resolution**—Select the display resolution for this connection.

If you select the **Published Application** option, the Connection Display allows you to select the **Seamless Display Resolution** option.

i **Colors**—Select the color depth of the ICA session. If High Colors (16-bits) or True **Colors** is selected and the ICA server does not support this color depth, the thin client sets the color depth to the lower value, for example, 256 Colors (8-bits).

j **Window mode** and **Full screen mode**—Select the initial view of the application and desktop in a windowed screen or full screen.

k **Auto-connect on start-up**—When this option is selected, the thin client automatically connects the session on start-up.

l **Reconnect after disconnect**—When this option is selected, the thin client automatically reconnects to a session after a non operator-initiated disconnect. The wait interval is the value that you set in the **Delay before reconnecting** box (enter the number of seconds 1–3600). The default is 20 seconds, if there is no INI parameter used for this connection, or if you are a stand-alone user.

5 Click **logon** tab, and use the following guidelines:

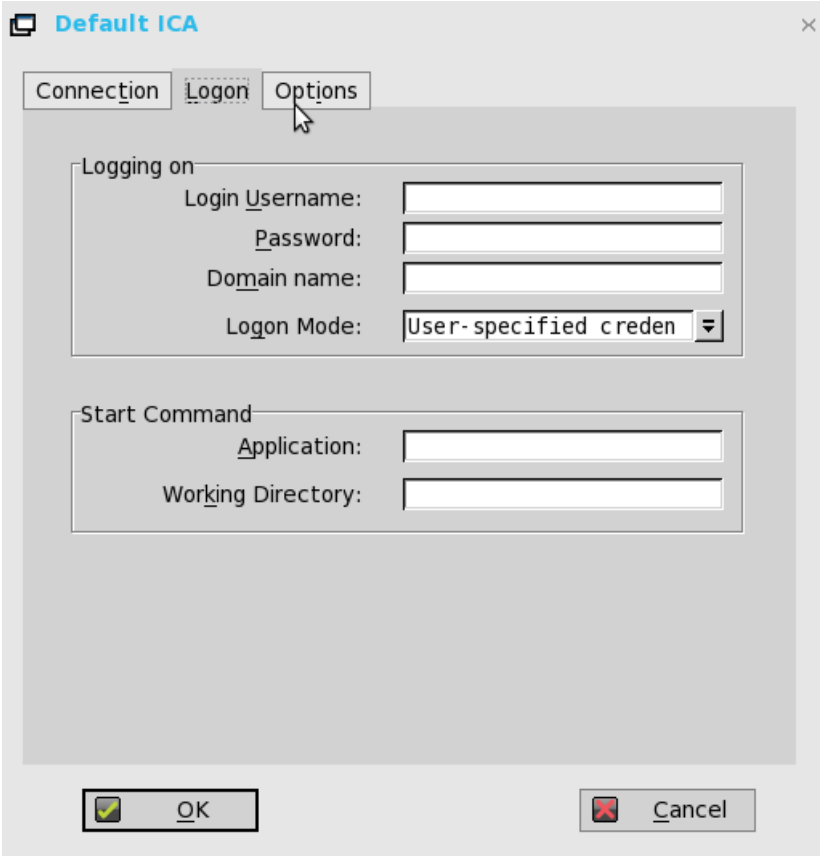


Figure 13. Default ICA—Logon

a **Logging on area**—Enter username, password, domain name, and logon mode.

If the login username, password, and domain name boxes are not displayed, enter the information manually in the ICA server login screen.

- **Login Username**—Maximum of 31 characters is allowed.
- **Password**—Maximum of 19 characters is allowed.
- **Domain Name**—Maximum of 31 characters is allowed.
- **Logon Mode**—Select **User-specified credentials**, **Smart Card**, or **Local User**.

b **Start Command area**—Server Connection Option Only—This area is disabled for a Published Application option.

Application (127 characters maximum) and **Working Directory** (63 characters maximum)—Enter an initialization string and arguments, including an associated working directory, that you want to start automatically on the server when the connection is made.

6 Click the **Options** tab, and use the following guidelines:

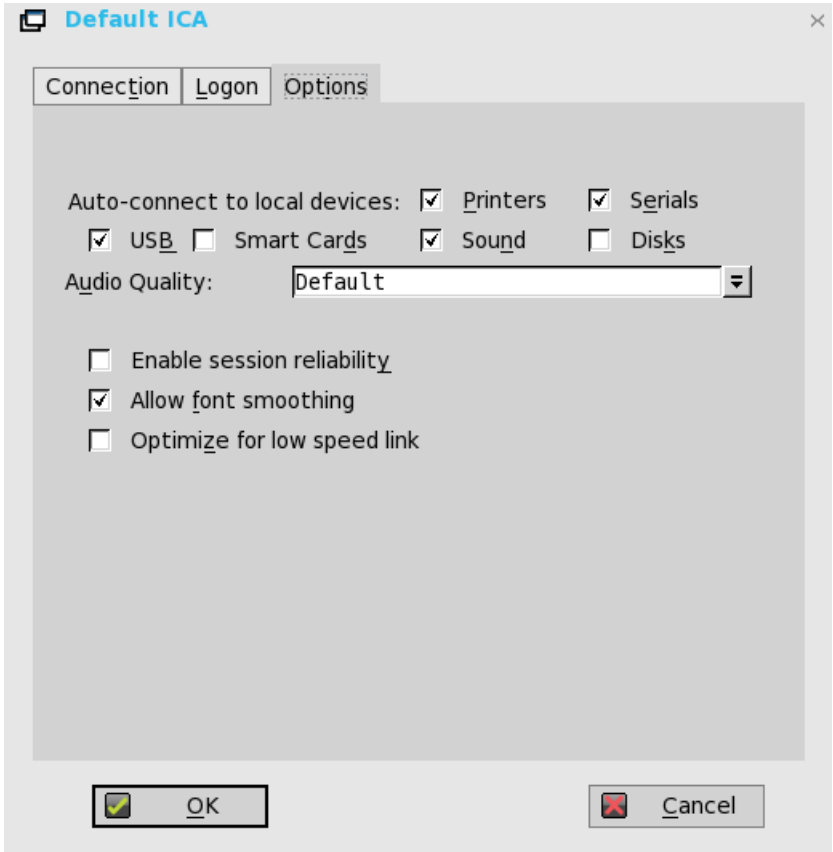


Figure 14. Default ICA—Options

a **Autoconnect to local devices**—Select any options (Printers, Serials, USB, Smart Cards, and Disks) to have the thin client automatically connect to the devices.
b **Allow font smoothing**—When selected, enables font smoothing (smooth type).
c **Optimize for low speed link**—When selected, allows optimization for low-speed connections, such as reducing audio quality and/or decreasing protocol-specific cache size. Intended for a connection spanning a WAN link or using dial-up.
d **Enable session reliability**—When enabled, session reliability allows you to momentarily lose connection to the server without having to re-authenticate upon regaining a connection. Instead of the connection time out, the session is kept alive on the server and is made available to the client upon regaining connectivity. Session reliability is most relevant for wireless devices.

7 Click **OK** to save the settings.

If the session reliability is enabled in an active session, and your network connection is not configured properly, a warning message is displayed with time elapsed after warning issuance.

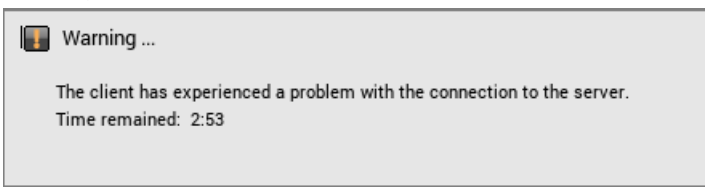


Figure 15. Warning

Support for multi-monitors in Citrix session

This section is applicable to Wyse 5070 thin client. ThinOS supports ICA desktop multiple monitors in XenDesktop/XenApp 7.6 and later versions.

Prerequisites:

- Increase the value of **MaxVideoMemoryBytes** REG_DWORD to support one or more 4K resolution monitors. For more information, see Citrix documentation at support.citrix.com.
- Increase the display memory limit to support more color depth and higher resolution. For more information, see Citrix documentation citrix.com.

User scenario:

1 Connect multiple monitors to ThinOS device.
2 In the **Display Setup** dialog box, disable **Mirror Mode**, and configure the display layout.
3 Launch an ICA desktop with full screen.

Table 15. Display details

Platforms	Best Display resolution	Maximum number of system displays	
		Standard or RDS desktop—Windows 10 /2012 R2/ 2016	HDX 3D Pro desktop—Windows 10 with GRID K1/K2 GPU
Wyse 5070 Extended thin client	1920 x 1080	6	4
	2560 x 1440	6	4
	3840 x 2160	6	Not supported, due to GRID K1/K2 vGPU profile limitation.
Wyse 5070 thin client—Pentium processor	1920 x 1080	3	3
	2560 x 1440	3	3
	3840 x 2160	3	Not supported, due to GRID K1/K2 vGPU profile limitation.
Wyse 5070 thin client—Celeron processor	1920 x 1080	2	2
	2560 x 1440	2	2
	3840 x 2160	2	Not supported, due to GRID K1/K2 vGPU profile limitation.

Limitations

- For standard or RDS desktop (Windows10/ 2012 R2 /2016) on Wyse 5070 Extended thin client, Dell recommends that you use up to four 4K monitors and remaining monitors with 1920 x 1080 resolution.
- For HDX 3D Pro desktop using vGPU or GPU Passthrough, the supported resolution and number of supported monitors is based on the NVIDIA's GRID support matrix.

NOTE: For more information about the Citrix official multiple monitors support, see Citrix documentation at support.citrix.com.

ICA Self Service Password Reset

You can do reset the password or unlock the account after you complete the security questions enrollment.

Supported Environment

- Citrix Virtual Apps and Desktops 7.11 and later versions
- Support Storefront server 3.7 and later versions
- Self-Service Password Reset server 1.0 and later versions

Supported platforms—All platforms are supported

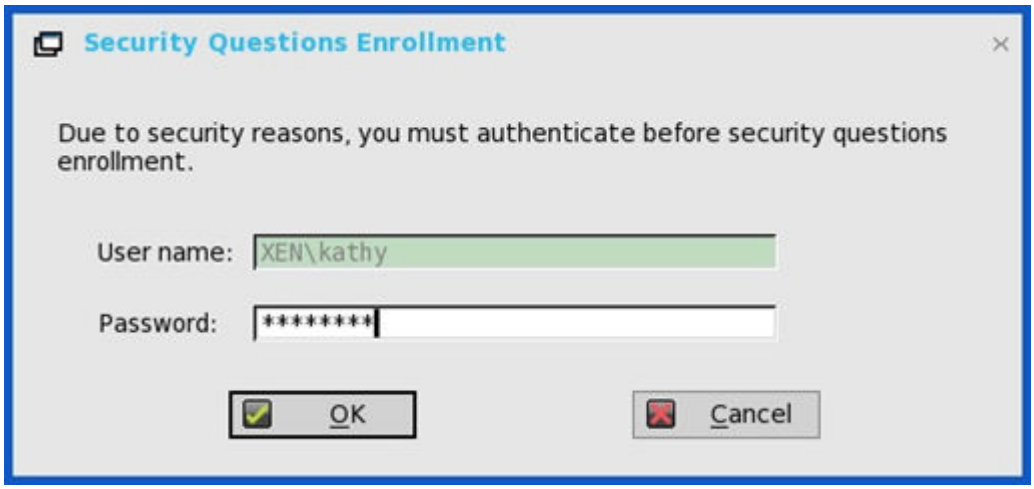
Limitations

- Supports only storefront server.
- The Legacy Account Self-Service (which needs Account Self-Service Server configured in ThinOS Remote Connections) is independent with this storefront version. Storefront version will cover Legacy Account Self-Service.
- The security question enrollment is not supported in Virtual Desktop Infrastructure (VDI) mode.

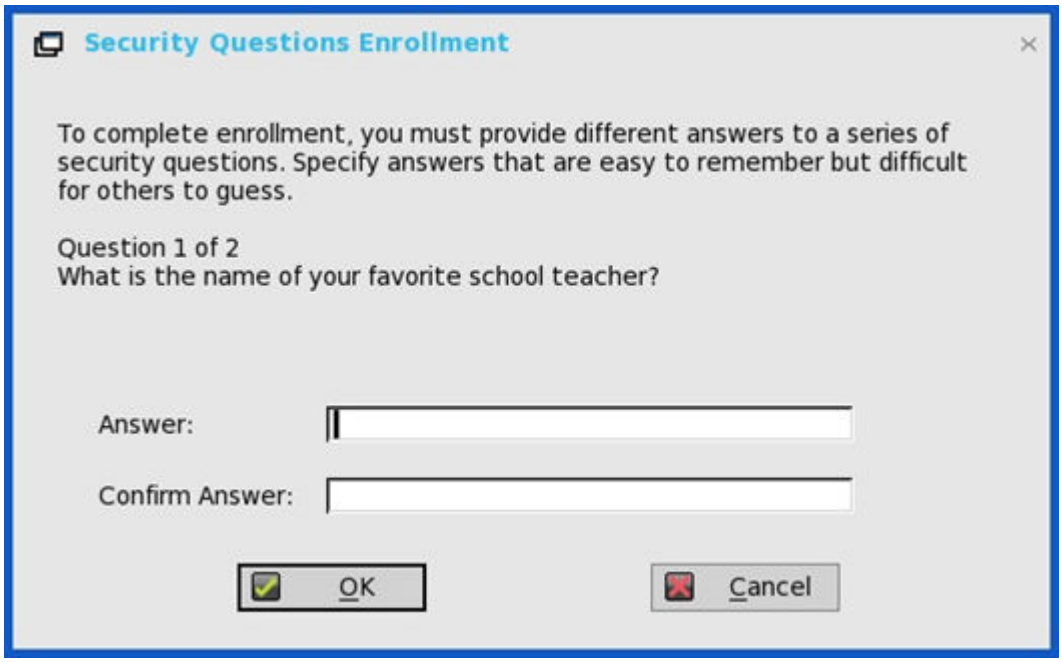
Before resetting password or Unlocking account

Before resetting your password or unlocking your account, you must register for the security questions enrollment. To register your answers for the security questions, do the following:

1 From the PNMenu, click the **Manage Security Questions** option (Classic and StoreFront only).
The **Security Questions Enrollment** window is displayed.



2 Enter the appropriate answers to the question set.



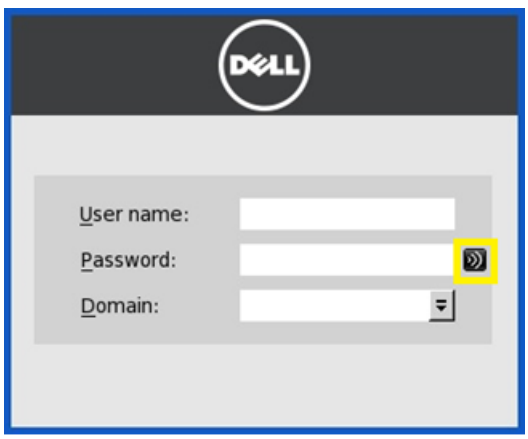
3 Click **OK** to register the security questions.

Using Account Self-Service

After the security questions enrollment is complete, when ThinOS is connected to a StoreFront server with Self-Service Password Reset enabled, the **Account Self-Service** icon is displayed in the sign-on window.

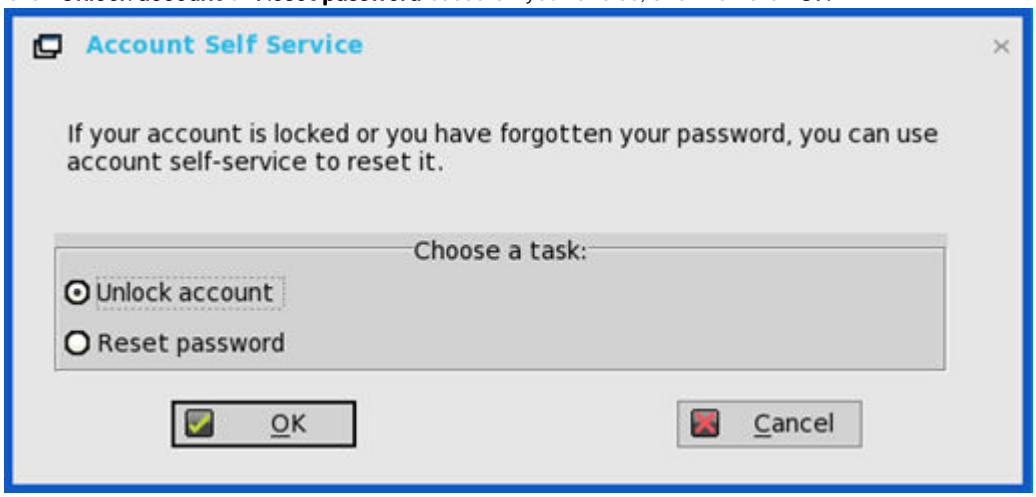
NOTE: If you enter wrong password more than four times in the Sign-on window, the client automatically enters the unlock account process.

1 Click the **Account Self-Service** icon to unlock your account or reset your password.



NOTE: You need to register the security questions for the users before using unlock account or reset password.

2 Click **Unlock account** or **Reset password** based on your choice, and then click **OK**.



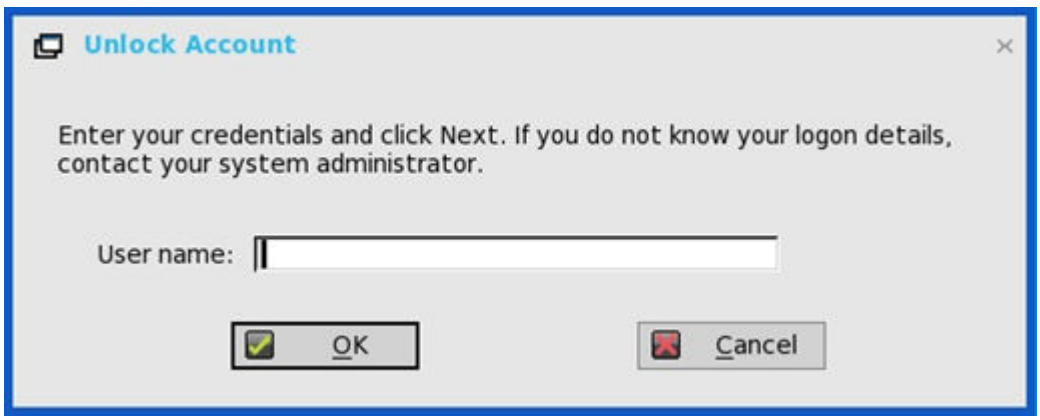
Unlocking account

After you register the security questions, do the following to unlock your account:

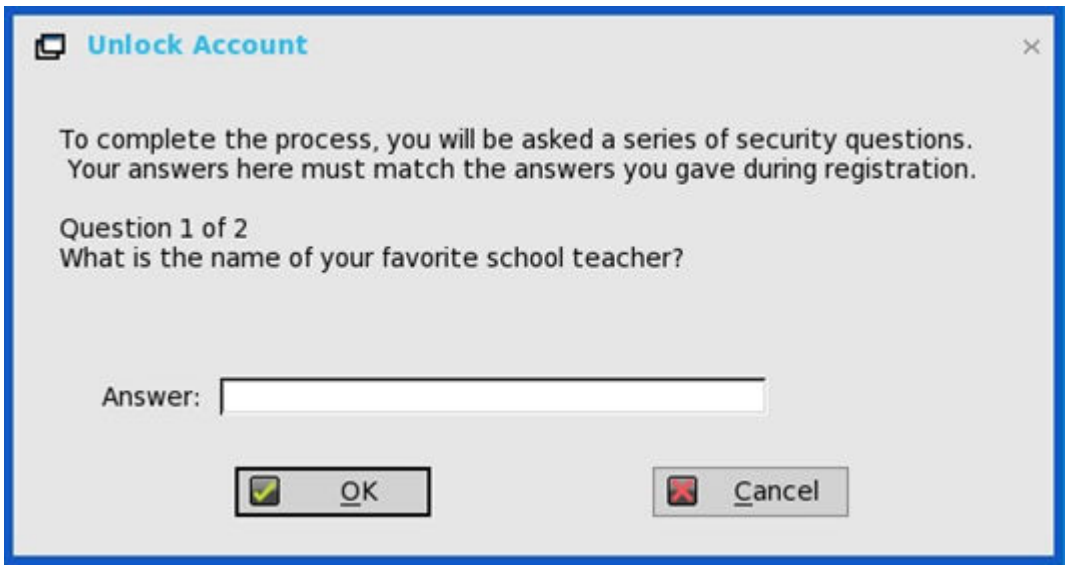
1 Choose a task (Unlock account) in **Account Self-Service** window.

2 Enter the user name.

The **Unlock Account** dialog box is displayed.



3 Enter the registered answers to the security questions.

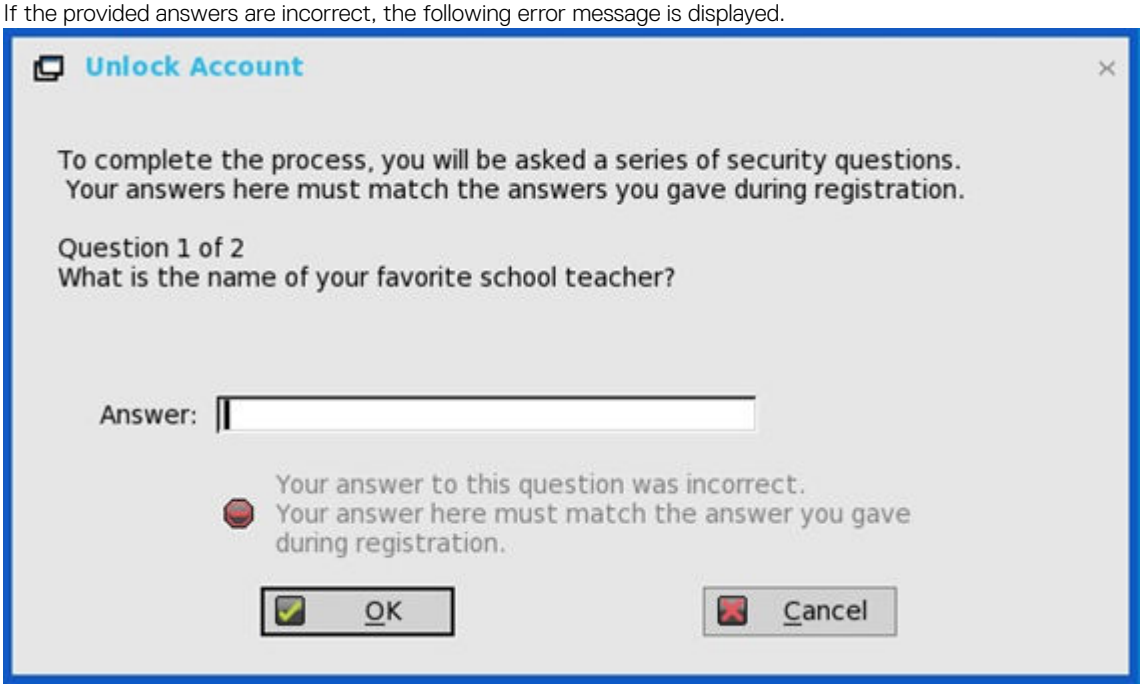


If the provided answers match the registered answers, then the **Unlock Account** dialog box is displayed.

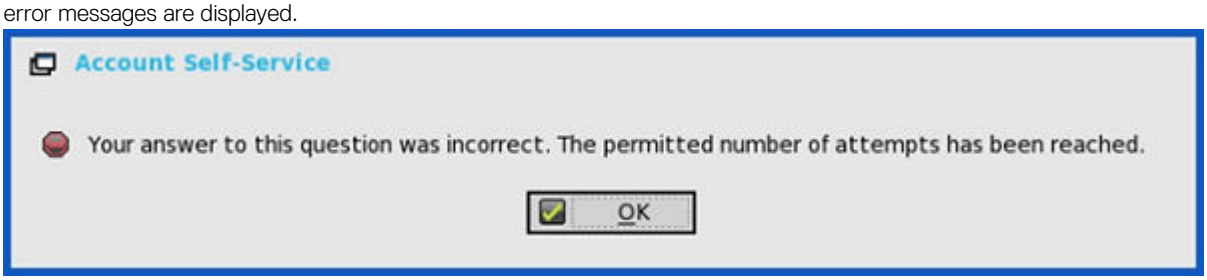
4 Click **OK** to successfully unlock your account.

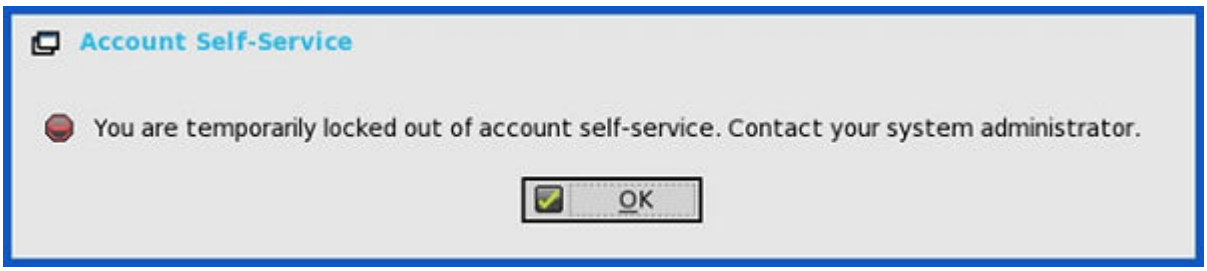
NOTE:

- If the provided answers are incorrect, the following error message is displayed.



- If you provide the wrong answers more than three times, you cannot unlock the account or reset the password, and the following error messages are displayed.





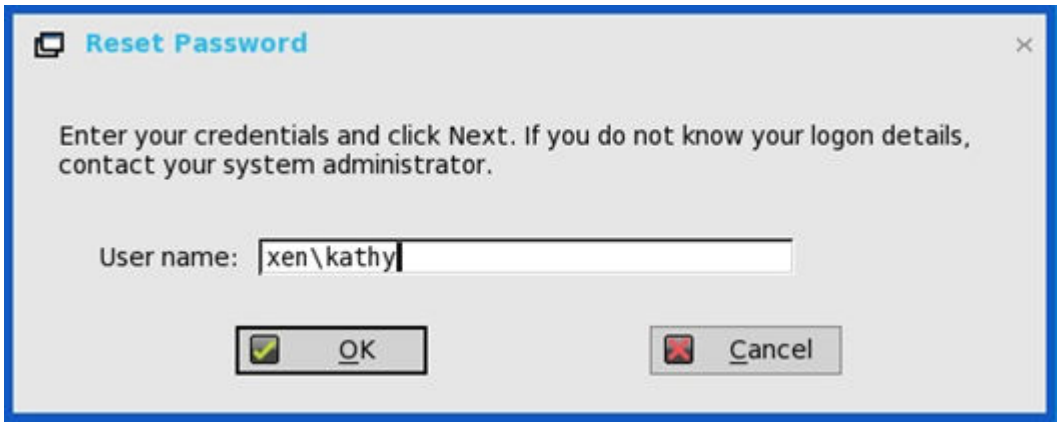
Resetting password

After you register the security questions, do the following to reset your password:

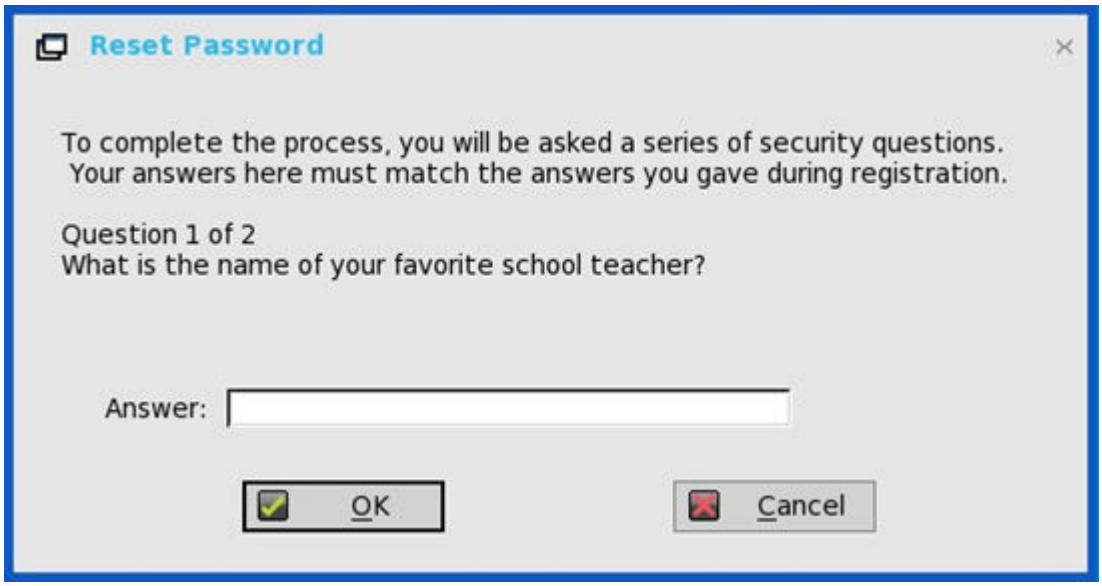
1 Choose a task (Reset password) in **Account Self-Service** window.

2 Enter the user name.

The **Reset Password** dialog box is displayed.

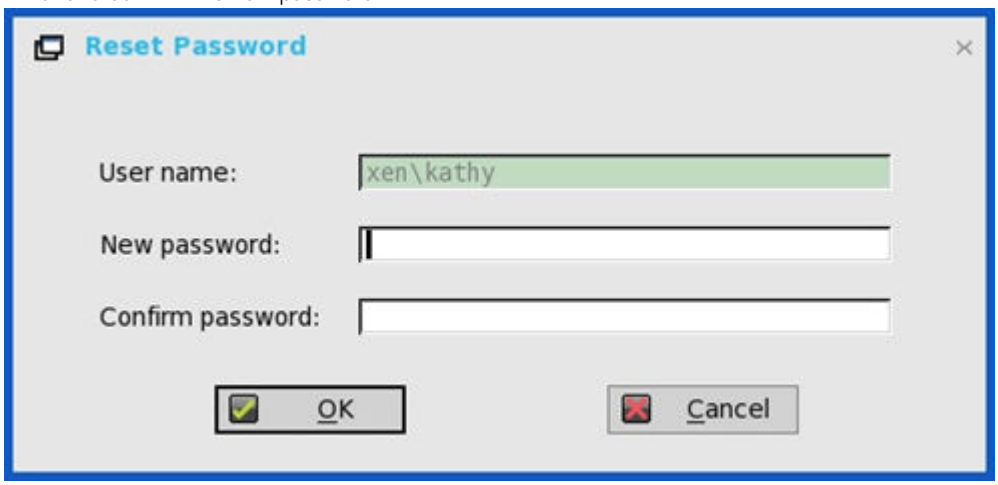


3 Enter the registered answers to the security questions.



If the provided answers match the registered answers, then the **Reset Password** dialog box is displayed.

4 Enter and confirm the new password.



5 Click **OK** to successfully change the password.

If you provide the wrong answers, you cannot reset the password, and an error message is displayed.

QUMU or ICA Multimedia URL Redirection

QUMU utilizes ICA Multimedia URL Redirection. You are required to install a browser plug-in for this feature to work.

In earlier ThinOS releases, ICA Multimedia URL Redirection was partially supported. From ThinOS 8.4 release, a few enhancements are made to ICA multimedia URL redirection for better performance.

Supported protocols:

- RTPS HLS
- HTTP

Verifying QUMU Multimedia URL Redirection: While the video is playing, a noticeable lag or jump in the video window is observed when you move the browser on the screen or scroll the browser. This behavior indicates that the video is being redirected.

HTML5 Video Redirection

HTML5 Video Redirection controls and optimizes the way XenApp and XenDesktop servers deliver HTML5 multimedia web content to users. From XenApp and XenDesktop 7.12, this feature is available for internal web pages only. It requires the addition of JavaScript to the web pages where the HTML5 multimedia content is available, for example, videos on an internal training site.

The following server policies must be enabled:

- Windows Media redirection—By default this option is enabled.
- HTML5 video redirection—By default this option is disabled.

Verifying HTML5 Video Redirection—While the video is playing, a noticeable lag or jump in the video window is observed when you move the browser on the screen or scroll the browser. This behavior indicates that the video is being redirected.

ThinOS event log for RAVE MMR is also displayed.

Sometimes, the initial playback does not work. After several seconds, the video is refreshed automatically, and you need to click playback from start again. During this time, the video will redirect.

Reference documents

- Citrix sample video—www.citrix.com/virtualization/hdx/html5-redirect.html.
- ICA Multimedia policy settings—www.docs.citrix.com/en-us/xenapp-and-xendesktop/7-12/policies/reference/ica-policy-settings/multimedia-policy-settings.html.

ICA SuperCodec

ICA SuperCodec is a H.264 decoder integrated on ThinOS ICA client side. Server encodes the session image into H.264 stream and sends it to client side. Client decodes the H.264 stream by SuperCodec and display the image on screen. This feature improves user experience especially for HDX 3D Pro desktops.

Supported Environment

Citrix Virtual Apps and Desktops (formerly XenDesktop) and Citrix Virtual Apps (formerly XenApp) version 7.5 or later versions

Prerequisities

In Citrix Virtual Apps and Desktops (formerly XenDesktop) and Citrix Virtual Apps (formerly XenApp) version 7.9 and later, the default setting for **Use video codec for compression** is **Use when preferred**. For best performance on ThinOS device, Dell recommends that you set the **Use video codec for compression** policy to **For the entire screen**. Alternatively, you can also set the policy to **Do not use video codec**. This allows ThinOS to use **ThinWire Plus** that saves bandwidth and reduces CPU overhead.

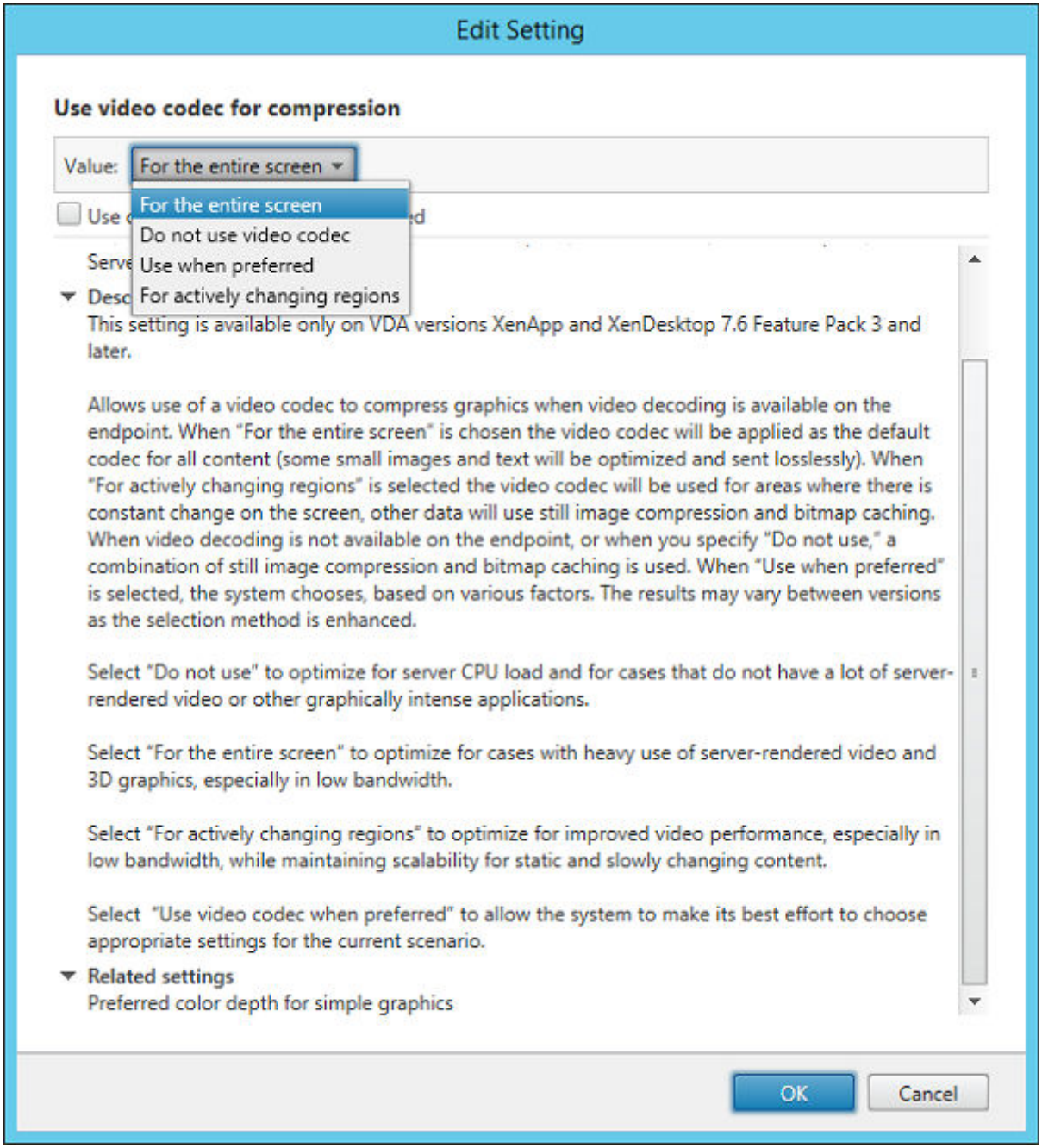


Figure 16. Use video codec for compression setting

- **ThinWire Plus**—Equivalent to **Do not use video codec** option
- **Fullscreen H.264**—Equivalent to **For the entire screen** option
- **Selective H.264**—Equivalent to **For actively changing** regions

Verifying the working status of the ICA connections

- **For Dell Wyse 3010, 3020 and 3040 thin clients**—By default, ICA SuperCodec is enabled when the ThinOS display resolution is lesser than or equal to 1920 x 1080. If display resolution is higher than 1920 x 1080, the following ThinOS event log is displayed:

  ```
  System resolution exceeds hardware limitation (1920 x 1080), disable SuperCodec
  ```

- **For Dell Wyse 3040 thin client**—By default, ICA SuperCodec is enabled when the ThinOS display resolution is lesser than or equal to 1920 x 1200. If ThinOS resolution is higher than 1920 x 1200, the following ThinOS event log is displayed:

  ```
  System resolution exceeds hardware limitation (1920 x 1200), disable SuperCodec
  ```

- **For Dell Wyse 5040, 5060, 5070 thin clients**—ICA SuperCodec is always enabled without any limitation. The following ThinOS event log is displayed:

```
ICA: SuperCodec enabled
```

NOTE: For ICA connections, there is no INI parameter.

If you set the **Use video codec for compression** policy to **Do not use video codec**, ICA SuperCodec is disabled, and ThinOS does not print any log.

Anonymous logon

Anonymous logon feature enables the users to log into the StoreFront server configured with unauthenticated store without Active Directory (AD) user credentials. It allows unauthenticated users to access the applications instead of AD accounts.

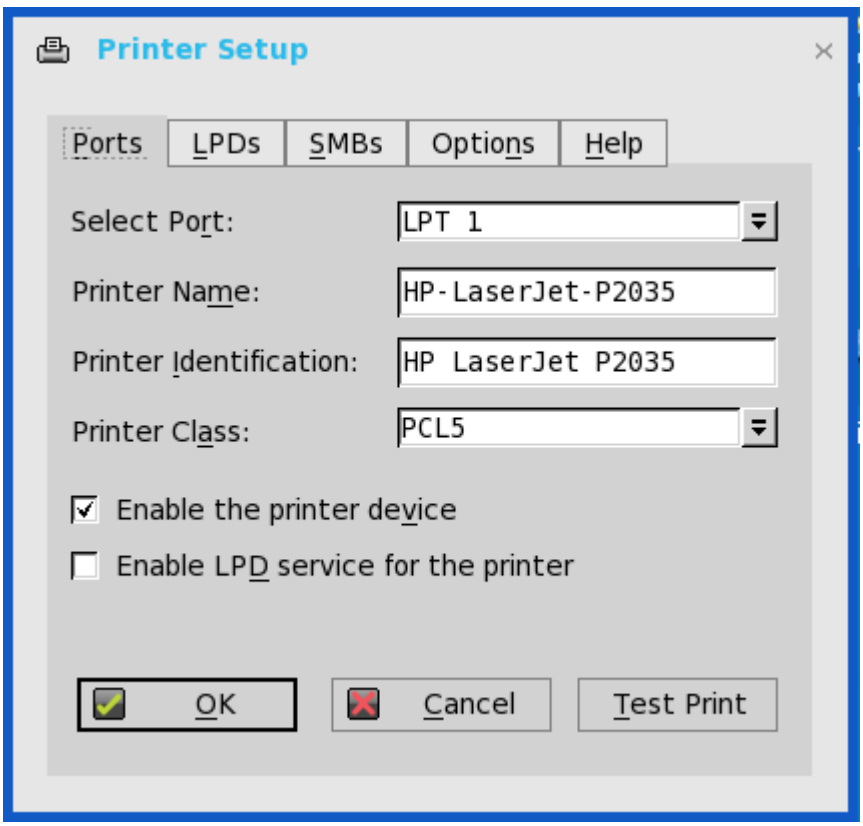
NOTE: Anonymous logon is not supported with legacy mode of StoreFront server.

Configuring the Citrix UPD printer

Use of Citrix Universal Printer Driver (Citrix UPD) ensures that all printers connected to a client can also be used from a virtual desktop or application session without integrating a new printer driver in the data center. Citrix UPD is the base of Citrix Universal Printer. It is an auto-created printer object that uses the Citrix UPD and is not tied to any specific printer defined on the client.
To configure the Citrix UPD usage on ThinOS:

1 Connect a printer to ThinOS client.

2 From the desktop menu, click **System Setup**, and then click **Printer**.
The **Printer Setup** dialog box is displayed.



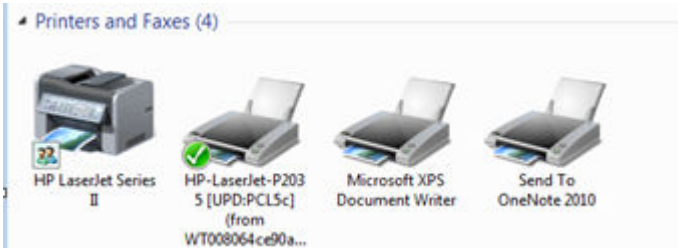
3 Enter the name of the printer in the **Printer Name** box.

4 Enter any string of the Printer identification in the **Printer Identification** box.

5 Select the type of the printer class from the drop-down list, select the check box to enable the **printer device** and then click **OK**.

6 Start a Citrix Virtual Apps and Desktops (formerly Citrix XenDesktop) or Citrix Virtual Apps (formerly Citrix XenApp) application connection.

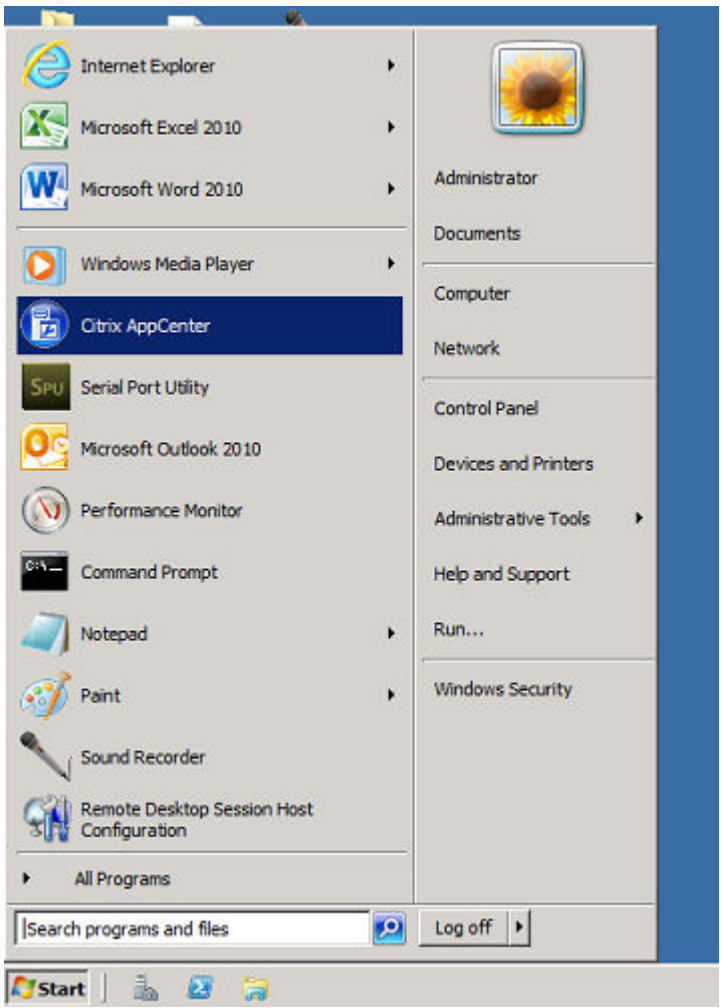
7 Open the Devices and Printers in the desktop or application, notice the printer is mapped as UPD printer by default. You can use the HP-LaserJet-P2035 [UPD:PCL5c] to perform the print job.



Citrix UPD configuration on server

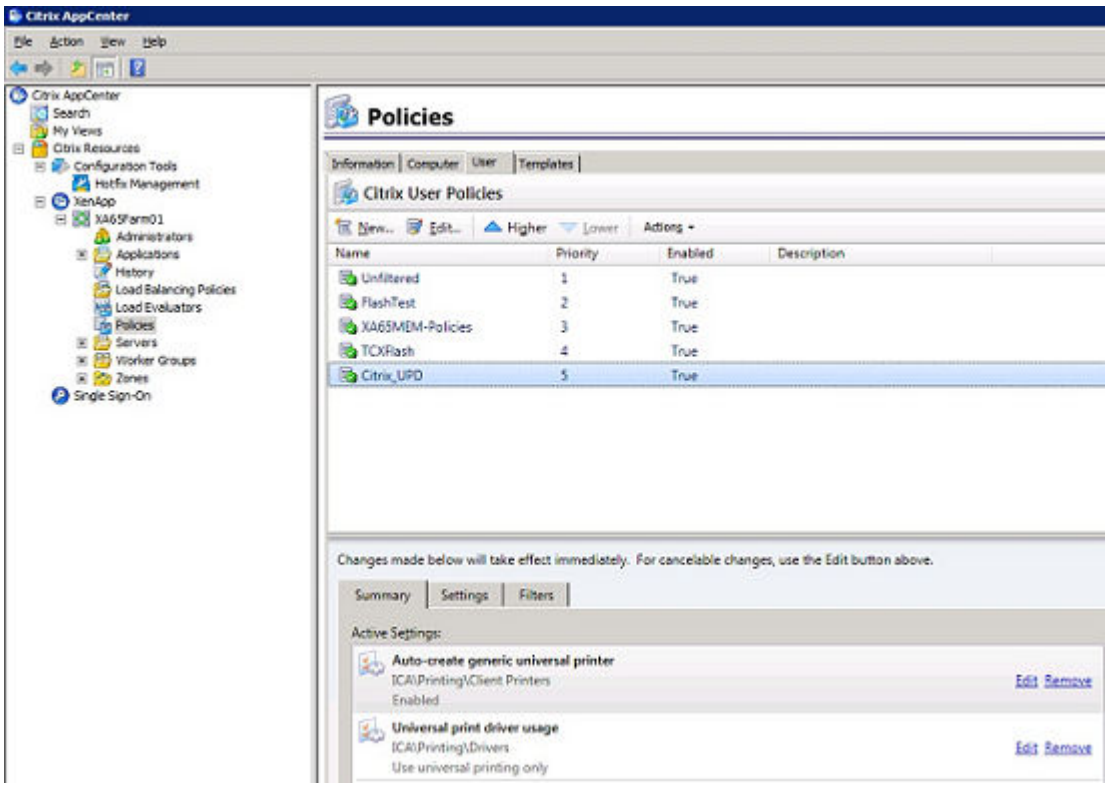
a To enable the printer policy, use the following guidelines:

1 To enable the printer policy in Citrix Virtual Apps 6.5– Go to the DDC Server, click **Start** > **Citrix AppCenter** .



2 Click **Citrix Resources** > **XenApp** > **Policies** > **User** > **Settings** > **Printing** > **Client Printers** and enable the **Auto-create generic universal printer**.

3 Click **Printing** > **Drivers** and set the **Universal print driver usage** to **Use universal printing only** from the drop-down menu available.

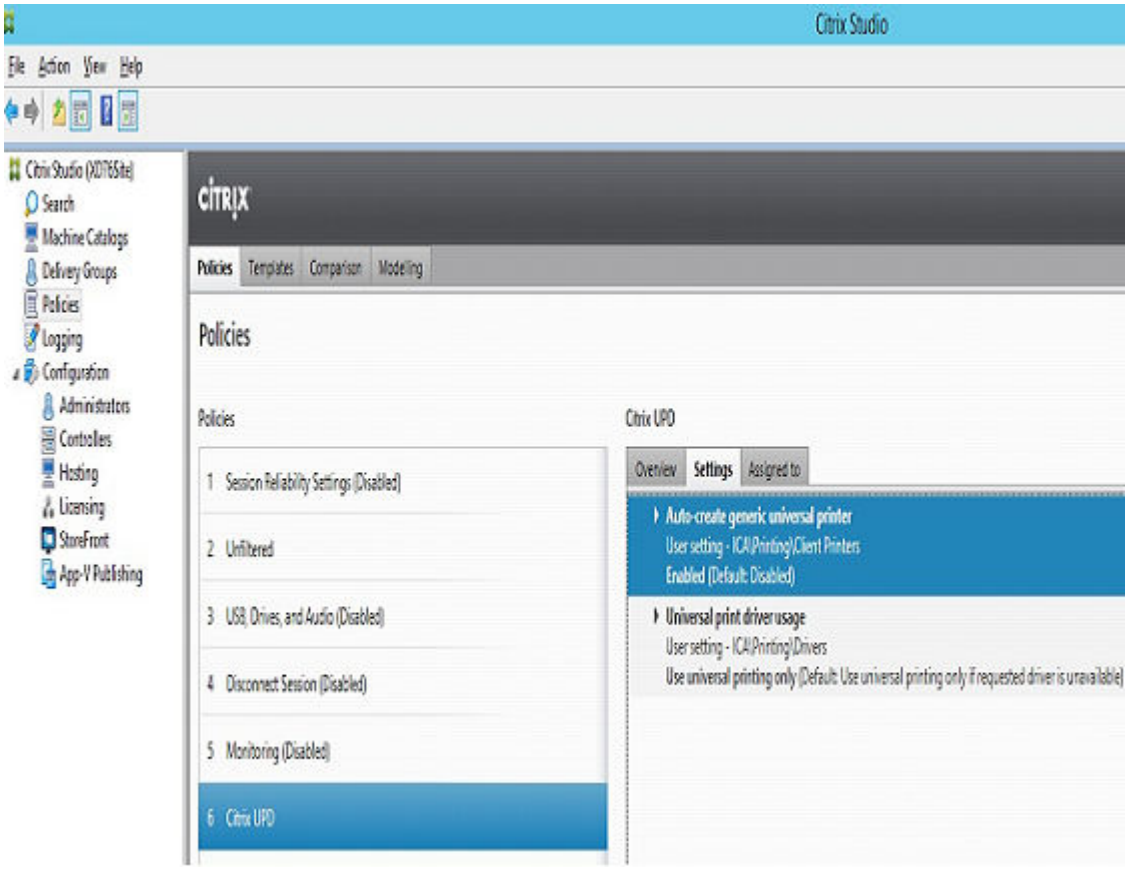


4 To enable the printer policy in Citrix Virtual Apps and Desktops 7.5 and later versions, do the following:

a Go to the Citrix DDC server,

1 Click **Citrix studio** > **policies** and add a policy. Enable the **Auto-create generic universal printer** option.

2 Set the **Universal print driver usage** to **Use universal printing only** from the drop-down menu.



b Check registry and make sure the same driver has been installed.

1 Check the drivers in registry of the server or desktop which you want to connect. The server or desktop must have ps, pcl5, pcl4 drivers in the registry and the same driver must be installed on the server or desktop.

2 Go to HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\UniversalPrintDrivers\. ThinOS does not support EMF and XPS.

NOTE: The supported drivers in the following table are one of the supported drivers for Citrix UPD used in ThinOS. One of the recommended driver is provided here as an example.

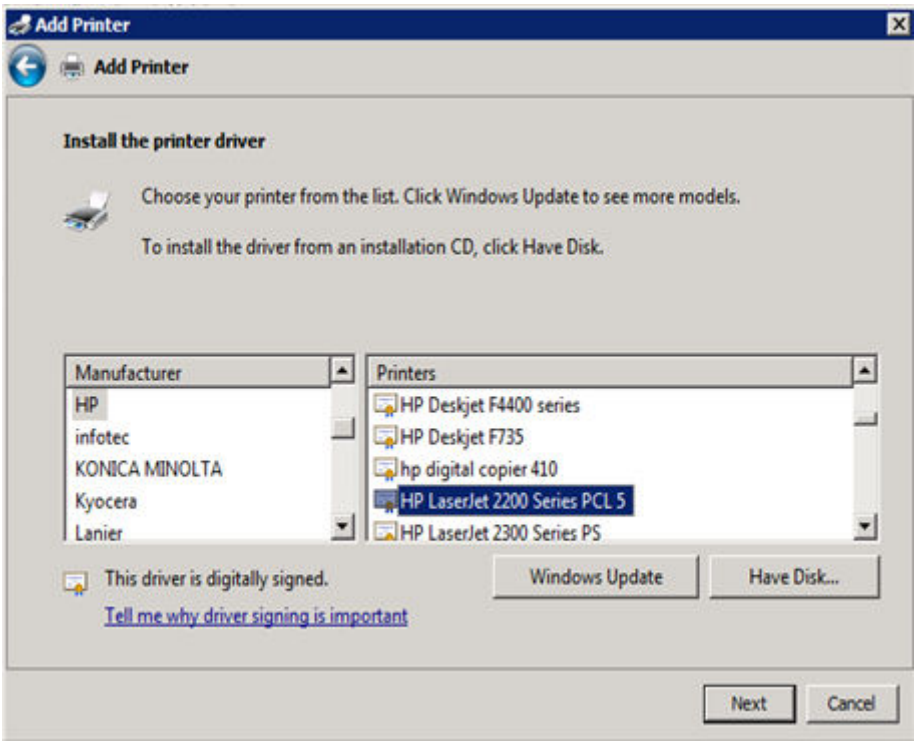
The supported drivers are listed in the following table:

Table 16. Supported drivers

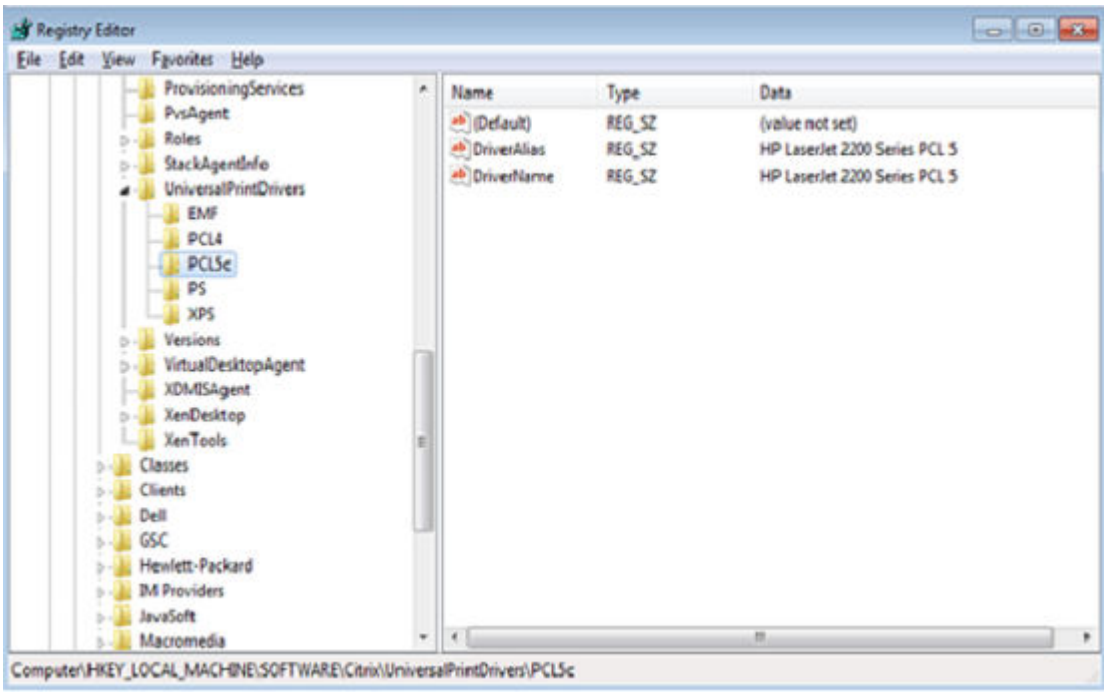
Printer class	Printer driver
PS	HP Color LaserJet 2800 Series PS
PCL5	HP LaserJet 2200 Series PCL 5
PCL4	HP LaserJet Series II

c If the server or desktop which you want to connect does not have these drivers, follow the steps mentioned here:

1 For example, in Citrix Virtual Apps 6.5 for Windows Server 2008 R2, add PCL driver in Server. Go to **Device and Printers** > **Select any printer** > **Click Printer server properties** > **Driver tab** and then add **HP LaserJet 2200 Series PCL 5 driver**.



2 Under HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\UniversalPrintDrivers\PCL5c\, change DriverAlias and DriverName **HP LaserJet 2200 Series PCL 5**.



Flash Redirection

The Flash Redirection solution is to off-load flash content to the ThinOS client, and locally render and decode the flash playback. The off-loading is conducted by Citrix HDX Flash Redirection. The local rendering and decoding process are conducted by customized flash player and other multimedia process that runs locally on ThinOS.

Supported Environment— Supports only Citrix Connections with XenApp 6.5 and later versions and XenDesktop 7.0 and later versions.

Supported Platforms:

- Wyse 3030 LT with ThinOS
- Wyse 3030 LT with PCoIP
- Wyse 3040 with ThinOS
- Wyse 3040 with PCoIP
- Wyse 5010 with ThinOS (D10D)
- Wyse 5010 with PCoIP (D10DP)
- Wyse 5040 AIO thin client (5212)
- Wyse 5040 AIO with PCoIP (5213)
- Wyse 5060 with ThinOS
- Wyse 5060 with PCoIP
- Wyse 7010 with ThinOS (Z10D)

Flash Redirection

Required packages

User must install the `FR.i386.pkg` package for the feature to work:

Installation of packages

To install the required packages, follow the steps mentioned here:

1 Upload packages to directory `\wnos\pkg\`.

2 Ensure that the INI autoload is not set to 0. Set INI `AutoLoad=1 AddPkg=FR` in wnos.ini.

3 Restart the client to read the file server and wait till the auto installation of packages is complete.

You can view the installed packages in the **Packages** tab in the **System Tools** dialog box.

4 **Server configuration for Flash redirection**

a To ignore the differences in flash player versions, user must add the `FlashPlayerVersionComparisonMask` and `ClientFlashPlayerVersionMinimum` registry key on the desktop.

If it is Citrix Virtual Apps 6.5, `IEBrowserMaximumMajorVersion` registry key is required to ignore the differences in IE Browser versions.

For more information, see docs.citrix.com/en-us/xenapp-and-xendesktop/7-9/hdx/flash-redirection.html.

From Citrix Virtual Apps and Desktops 7.9, you must add more entries in registry for HDX FR to work. For information about these additional entries, refer to Citrix Technical documents.

5 **Client configuration for Flash redirection**

By default, no client configuration is required. New INI parameters are added to support HDX FR Client configurations, for example, to fetch the server side content. The newly added INI parameters are:

```
SessionConfig=ICA\
HDXFlashUseFlashRemoting=Never | Always (default) \
HDXFlashEnableServerSideContentFetching=Disabled (default) | Enabled \
```

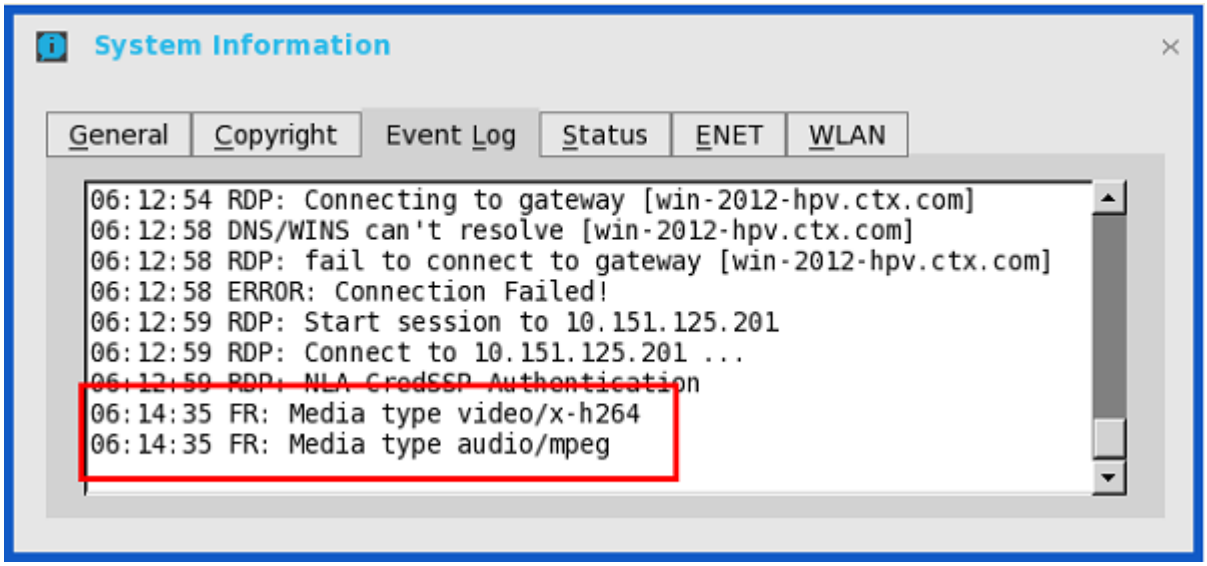
How to verify it is working or not working

a Right-click the flash video to know the flash player version. It displays version information of the customized player at ThinOS client side which is 11.1.102.59. If the flash player version is different, then it is unsuccessful server rendering.

b During the flash playback, it will display ThinOS event logs for HDX FR in the **System Information** dialog box.

1 FR: Media type video/x-264

2 FR: Media type audio/mpeg



For information about basic operations on Citrix HDX flash redirection and policies configurations, see Citrix documentation.

Known Issues

a Playback flash videos in Internet Explorer browser with normal security settings.

b Playback with videos ≤ 720p; the 1080p video may show graphic issue.

c Playback full screen video with resolution ≤ 1920 x 1200. For example, full screen playback with ThinOS resolution 1920 x 1200; in 2560 x 1600 full screen video there could be graphic issues.

d After flash video is loaded, the video content remains in the initial size. For example, resizing browser does not resize the video content.

e Only English font is supported. For example, subtitles in other languages are not properly displayed.

f Playback YouTube.com videos may run into some issues. For example, cannot show video unless you copy the URL and paste it to the browser.

Limitation—Non-Latin URLs are not supported.

Configuring VMware

VMware virtualization enables you to run multiple virtual machines on a single physical machine. VMware Horizon Client is a locally installed software application that communicates between View Connection Server and thin client operating system. It provides access to centrally hosted virtual desktops from your thin clients.

In every ThinOS release, the Horizon Client version may be updated to newer version. For information about the latest Horizon Client version, see the latest *Dell Wyse ThinOS Release Notes* at www.dell.com/manuals.

NOTE: If you are upgrading your thin client to the latest ThinOS version, you must ensure that the Horizon server or agent version is updated to support the latest horizon client version. For more information about the client and server/agent version compatibility, see the *VMware Product Interoperability Matrices* page at www.vmware.com.

This section provides information about how to configure a VMware broker connection on your ThinOS device, and other VMware features that you can configure on ThinOS.

Configuring the VMware broker connection

To configure the VMware broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.

The **Remote Connections** dialog box is displayed.

2 In the **Broker Setup** tab, from the drop-down list, select **VMware view**, and do the following:

- **Broker Server**—Enter the IP address/Hostname/FQDN of the Broker Server.
- **Auto Connect List**—Enter the name of the desktops that you want to launch automatically after logging in to the respective broker. More than one desktop can be entered. Each desktop name is separated by semicolon, and is case-sensitive.
- **Security mode**—Select the preferred security mode from the following options:
  - **Warning**—Warn Security requires FQDN address with self-signed certificate, or without any certificate, but corresponding warning message is displayed for user to continue.
  - **Full**—Full Security requires FQDN address with domain certificate.
  - **Low**—Security allows FQDN/IP address with/without certificate.
  - **Default**—Follows global security mode settings.
- **Connection Protocol**—From the drop-down list, select the type of protocol connection. By default, the option is set to **Server Default**.

  NOTE: The PCoIP only connection protocol is applicable only to PCoIP clients. If you do not install Horizon package, then the Blast only protocol option is not available for selection. PCoIP protocol is required for PCoIP session. Horizon package is required for Blast session.

  The available options are:

  - **Server default**—Select this protocol connection to display the desktop with default protocol as configured in the VMware View Admin console, for each pool in the broker. If a desktop pool is configured with default protocol as **RDP** in the View Admin console, then only the RDP connection of the desktop is displayed in ThinOS after users sign in to the device.
  - **All Supported**—Select this protocol connection to display the desktop in all the available connections, when a desktop pool is configured to allow users to select protocol as **yes**. If a desktop is configured with default protocol as **PCoIP** and allow user to select protocol as **no**, then ThinOS only displays the desktop in the PCoIP connection.
  - **RDP only**—Select this protocol connection to display the desktop in RDP connection only. If a desktop pool is configured with default protocol as **PCoIP** in the View Admin console, and allow user to select protocol as **no**, then this desktop is not displayed in ThinOS after user signs in to the device.
  - **PCoIP only**—This option is available only for PCoIP enabled clients. Select this protocol connection to display only the desktop in the PCoIP connection, for each pool in the broker. If a desktop pool is configured with default protocol as **RDP** in the View Admin console, and allow user to select protocol as **no**, then this desktop is not displayed in ThinOS after user signs in to the device.
  - **Blast only**—VMware Blast display protocol can be used for remote applications and for remote desktops that use virtual machines or shared-session desktops on an RDS host. Select this protocol connection to display the desktop with the Blast protocol.
  - **Blast and RDP**—This option is available on both PCoIP enabled clients and non-PCoIP clients. Select this protocol connection to display the desktop in either Blast or RDP connections.
  - **Blast and PCoIP**—This option is available only for PCoIP enabled clients. Select this protocol connection to display the desktop in either Blast or PCoIP connections.
  - **PCoIP and RDP**—This option is available only for PCoIP enabled clients. Select this protocol connection to display the desktop in either PCoIP or RDP connections.
- **Log in anonymously using Unauthenticated Access**—Select this check box to anonymously log in to the VMware session with application remoting.

3 Click **OK** to save the settings.

Limitations

- ThinOS supports four displays with 4K resolution in a Horizon blast session. Due to low performance, Dell recommends that you do not use four displays with 4K resolution.

- Vertical Synchronization does not work in Blast session with four 4K resolution.
- Video performance is low when you play a video in Blast session with 4K resolution.
- ThinOS supports audio device USB redirection. However, Dell does not recommend using audio device USB direction due to low audio quality.
- The text copy and paste functionality between local and Blast sessions works only after you perform a session switch.

VMware Horizon Client feature matrix

Table 17. VMware Horizon Client feature matrix

	Client type	ThinOS
Client Appearance and Workflow	Customer branding	Not supported
	Kiosk mode	Supported
	In-product help	Not supported
	Online help	Not supported
	English localization	Supported
	French localization	Supported
	German localization	Supported
	Japanese localization	Supported
	Traditional Chinese localization	Supported
	Simplified Chinese localization	Supported
	Korean localization	Not supported
	Spanish localization	Not supported
Broker Connectivity	XML-API version	13
	SSL	Supported
	SSL certificate verification	Supported
	Disclaimer dialog	Supported
	Security Server compatibility	Supported
	UAG compatibility	Supported
	Multi-broker/Multi-site redirection - DaaS	Not supported
	Client info	Supported
	Phonehome	Not supported
Broker Authentication	Password authentication	Supported
	Password change	Supported
	RSA authentication	Supported
	Radius	Supported
	Integrated RSA SecurID token generator	Not supported
	Single Sign On	Supported
	Log in as current user	Not supported
	Nested log in as current user	Not supported

	Client type	ThinOS
	Biometric authentication	Not supported
	Unauthentication access	Supported
Smart card	x.509 certificate authentication (Smart Card)	Supported
	CAC support	Supported
	.Net support	Supported
	PIV support	Not supported
	Java support	Not supported
	Purebred derived credentials	Not supported
Desktop Operations	Reset	Supported
	Restart	Not supported
	Log off	Supported
Session Management (Blast Extreme and PCoIP)	Switch desktops	Supported
	Multiple Connections	Supported
	App Launch on Multiple end points	Supported
	Auto-Retry	Supported
	Auto-Retry 5+ minutes	Supported
	Fullscreen mode	Supported
	Fullscreen toolbar	Not supported
	Windowed mode	Supported
	Time Zone Synchronization	Supported
	Jumplist integration (Windows 7-Windows 10)	Not supported
Client Customization	Command Line Options	Not supported
	URI Schema	Not supported
	Preference File	Supports only Blast
	Non Interactive Mode	Not supported
	GPO-based customization	Not supported
Protocols supported	Blast Extreme	Supported
	H.264 - HW decode	Supported
	H.265 - HW decode	Not supported
	JPEG/PNG	Supported
	Blast Extreme Adaptive Transportation	Supported
	RDP 6.x	Supported
	RDP 7.x	Supported
	RDP 8.x, 10.x	Supported
	PCoIP	Supported

	Client type	ThinOS
Protocol Enhancements Protocol Enhancements	RDP-VC Bridge	Supports only Blast
	Session Enhancement SDK	Not supported
Features / Extensions Monitors / Displays	Dynamic Display Resizing	Supported
	Multiple Monitor Support	Supported
	External Monitor Support	Supported
	Display Pivot	Supported
	Multiple Aspect Ratio support	Supported
	Number of displays supported	4
	Maximum Resolution	3840x2160
	Video out	Supported
	High DPI scaling	Not supported
	DPI Sync	Supported
	Exclusive Mode	Not supported
	Multiple Monitor Selection	Supported
Input Device (Keyboard / Mouse)	Relative mouse	Supported
	External Mouse Support	Supported
	Local buffer text input box	Not supported
	Keyboard Mapping	Supported
	Unicode Keyboard Support	Not supported
	International Keyboard Support	Supported
	Input Method local/remote switching	Not supported
	IME Sync	Not supported
Clipboard Services	Clipboard Text	Supports only Blast
	Clipboard Graphics	Not supported
	Clipboard memory size configuration	Not supported
	Drag and Drop	Not supported
Client Caching	View Agent to Client-side caching	Supports only Blast
Connection Management	Blast network recovery	Supported
	IPv6 support	Supported
	PCoIP IP roaming	Supported
High-Level Device Redirection	Serial (COM) Port Redirection	Not supported
	Client Drive Redirection/File Transfer	Not supported
	Scanner (TWAIN/WIA) Redirection	Not supported
	x.509 Certificate (Smart Card)	Supported
	Gyro Sensor Redirection	Not supported
Real-Time Audio-Video	Analog in (input)	Supported
	Real-Time Audio-Video	Supported

	Client type	ThinOS
	Multiple webcams	Not supported
USB Redirection	Generic USB/HID	Supported
	Policy: ConnectUSBOnInsert	Supported
	Policy: ConnectUSBOnStartup	Supported
	Connect/Disconnect UI	Not supported
	USB device filtering (client side)	Supported
	Isochronous Device Support	Supported
	Split device support	Supported
	Bloomberg Keyboard compatibility	Not supported
	Smartphone sync	Supported
	USB 3.0	Supported
	USB Redirection USB storage devices	Supported
Unified Communications	Cisco UC Jabber	Not supported
	Avaya UC One-X Desktop	Not supported
	Mitel UCA	Not supported
	Microsoft Lync 2013	Not supported
	Skype for business	Supports only Blast
Multimedia Support	Multimedia Redirection (MMR)	Not supported
	Flash URL Redirection (Unicast/Multicast)	Not supported
	Flash Redirection	Not supported
	HTML5 Redirection	Not supported
Graphics	vDGA	Supported
	vSGA	Supported
	NVIDIA GRID VGPU	Supported
	Intel vDGA	Supported
	AMD vGPU	Supported
Mobile Support	Client-side soft keyboard	Not supported
	Client-side soft touchpad	Not supported
	Full Screen Trackpad	Not supported
	Gesture Support	Not supported
	Multi-touch Redirection	Not supported
	Presentation Mode	Not supported
	Unity Touch	Not supported
Printing	Printer Redirection	Supports only Blast
	Location Based Printing	Supports only Blast
	Native Driver Support	Not supported
	PDF Download	Not supported

	Client type	ThinOS
Security	FIPS-140-2 Mode Support	Not supported
	Imprivata Integration	Supported
	TLS 1.0	Supported
	TLS 1.1	Supported
	TLS 1.2	Supported
	Client Device Authentication	Not supported
Session Collaboration	Session Collaboration	Not supported
	Read-only Collaboration	Not supported
Update	Automatic Updates	Not supported
	App Store update	Not supported
Other	Smart Policies	Not supported
	File Type Association	Not supported
	URL content redirection	Not supported
	Remember credentials	Supported
	Access to Linux Desktop - Blast Protocol	Supported
	Audio Playback	Supported
	Seamless Window	Not supported
	Launching multiple client instances using URI	Not supported
	One-click Install of Client	Not supported
	Parameter pass-through to RDSH apps	Not supported
	Performance Tracker	Supported
	Shortcuts from server	Not supported
	Workspace ONE mode	Not supported

Supported—Both PCoIP and Blast protocols are supported.

Not supported—Both PCoIP and Blast protocols are not supported.

Using VMware Horizon View broker and desktop

VMware Horizon View Broker timeout—The VMware Horizon View Broker timeout does not force the user to sign out from the broker anymore when the secure tunnel is enabled.

In earlier version of ThinOS, when the broker times out, the user session is disconnected and the user is logged out from the broker. From ThinOS 8.2 release, ThinOS disconnects the user session from the broker, but does not force user logout. This is because the user has local connections other than the broker desktop, and these connections are active when the broker timeout is reached.

PCoIP session NUM/CAP keyboard status synchronizes with session instead of thin client—This is applicable for session startup only. The PCoIP session keyboard NUM/ CAP status synchronizes from remote session to client, whereas RDP/ ICA synchronizes status from local to remote session.

For example:

1 Set keyboard `NUM=off` in current PCoIP session.
2 Disconnect the session.
3 Set client keyboard `NUM=on`.
4 Reconnect to the PCoIP session.
5 The keyboard NUM status in both session and client is updated to `NUM=off`.

RDS desktop through PCoIP/Blast—You can view and connect to the Remote Desktop Service (RDS) desktop through the PCoIP/Blast protocol in the broker using PCoIP/Blast enabled the ThinOS clients. In VMware Horizon View 6.0 and later versions, the RDS desktop has RDP, PCoIP, or Blast connections based on server configurations.

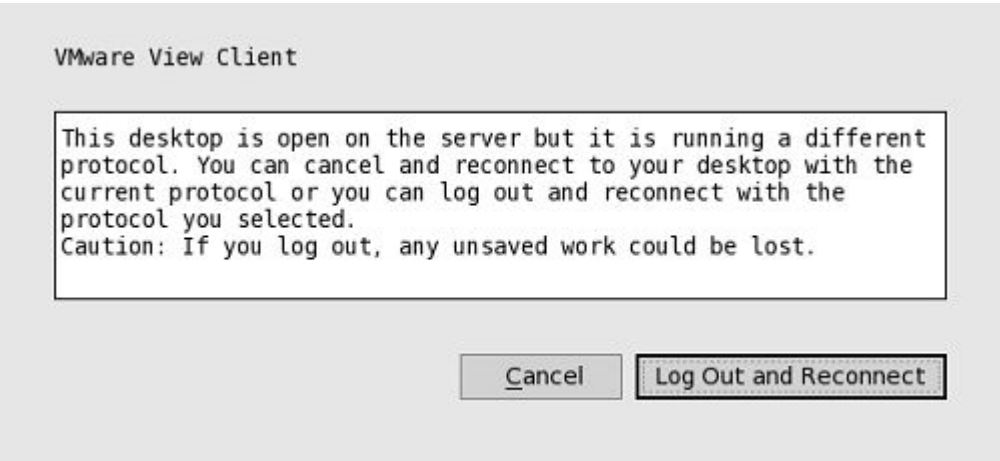
NOTE: The Horizon application is supported on both PCoIP and Blast. RDP is not supported.

The **RDS desktop protocol switch message** dialog box is provided in this release. A typical user scenario is as follows:

1 Connect to the RDS desktop through protocol. For example, RDP.
2 Disconnect from the desktop.
3 Connect to the same RDS desktop through another protocol. For example, PCoIP.
The message dialog box is displayed, allowing you with an option to continue.

The options available are:

- **Cancel**—You can end the PCoIP connection, and connect to the desktop in RDP again.
- **Log Out and Reconnect**—You can connect to the desktop through PCoIP, and the earlier session in RDP is logged out.



USB redirection RDS desktop through PCoIP/Blast—This feature is supported.

USB audio redirection—USB audio redirection enables you to use USB audio devices in the remote session. However, Dell does not recommend that you enable the USB audio redirection because of sound quality.

Using unauthenticated access—You can anonymously log in to the VMware session with application remoting.

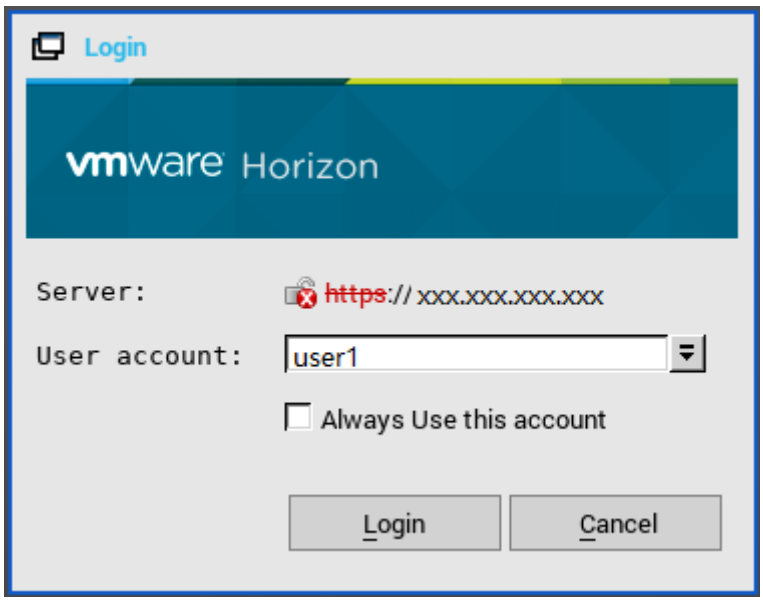
To use the unauthenticated option, do the following:

1 On your AD server, create two anonymous users, for example, anonymous1 and anonymous2.
2 Log in to your View Admin web portal.
3 Navigate to **Users and Groups** > **Unauthenticated Access**, and add the two new anonymous users to the View Connection Manager.
4 Navigate to **View Configurations** > **Select Servers** > **Connection Servers**, and select your connection server.
5 Click **Edit** > **Authentication** tab, and select the **Enabled for unauthenticated access** check box. Do not select any users for the default unauthenticated user.
6 Go to **Application Pools**, add a few applications that you have installed on the Virtual Machine, and entitle the applications to anonymous1 and anonymous2 user.

7 On the ThinOS broker setup dialog box for VMware View, select the **Log in anonymously using Unauthenticated Access** check box.

8 Restart your thin client.

The following dialog box is displayed:



9 Select the **Always use this account** check box to use the login account that you have specified. You cannot change this login account for other users.

Hide Server URL—The server URL can be hidden in the Horizon View broker UI. You can configure this setting using any of the following methods:

- **Using View Connection Server web portal**
  a Log into your View Connection Server web portal.
  b Navigate to **View Configuration** > **Global Settings** > **Edit**, select the **Hide server information in client user interface** check box, and clear the **Hide domain list in client user interface** check box.
  c Click **OK**.
  d Log in to the VMware Horizon broker.
  The server URL is hidden, and the domain list is displayed.
- **Using INI parameter**
  Use the INI parameter, ConnectionBroker=vmware DisableShowServer=yes.

Hide Domain List—The domain list can be hidden in the Horizon View Broker logon UI. To configure this setting, do the following:

1 Log in to your View Connection Server web portal.

2 Navigate to **View Configuration** > **Global Settings** > **Edit**, select the **Hide domain list in client user interface** check box, and clear the **Hide server information in client user interface** check box.

3 Click **OK**.

4 Log in to the VMware Horizon broker.
The domain list is hidden, and the server URL is displayed.

Enable username hint for smart card login

You can enable users to specify the account to be used in the **Username hint** field when you log in to a Horizon View session using a smart card. Enabling this option allows you to use a single smart card certificate to authenticate to multiple user accounts.

To enable the username hint field, do the following:

1 Log in to the View Administrator Admin console, and click **View Configuration** > **Servers**.
2 On the **Connection Servers** tab, select the View Connection Server instance, and click **Edit**.
The **Edit Connection Server** settings page is displayed.
3 Click the **Authentication** tab.
4 In the **View Authentication** section, select the **Allow smart card user hints** check box.
You cannot configure the smart card user name hints feature when you set the smart card authentication to **Not Allowed**.
5 Click **OK**.
On the ThinOS client, log in to a Horizon View session with a smart card. In the VMware Horizon View broker sign-on window, enter the username and the smart card PIN to authenticate the user.

NOTE: If the user name does not match the smart card certificate user, an error message `No user could be found for your Certificate` is displayed.

Supporting VMware Real Time Audio-Video

Use the Real-Time Audio-Video feature to run Skype and other online conference applications on the remote desktop. Using this feature, both audio and video devices that are connected to your thin client are available to use for VoIP in remote desktop.

To know more about the VMware Real Time Audio-Video support, go to pubs.vmware.com/horizon-62-view/topic/com.vmware.horizon-view.desktops.doc/GUID-D6FD6AD1-D326-4387-A6F0-152C7D844AA0.html.

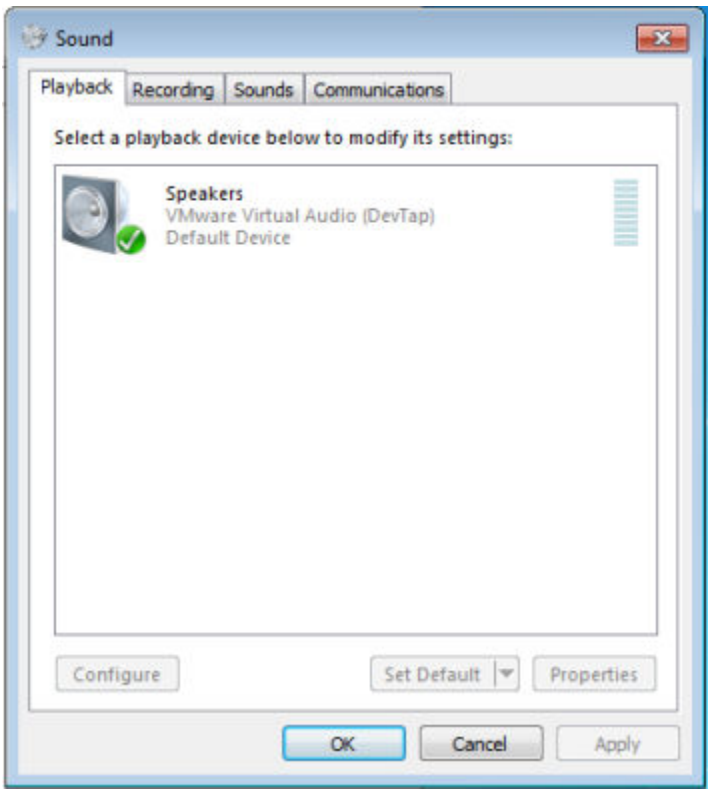
NOTE: There is no additional configuration for ThinOS. RTAV video requires RTME package to be installed on your device.

To validate the VMware Real Time Audio-Video, do the following:

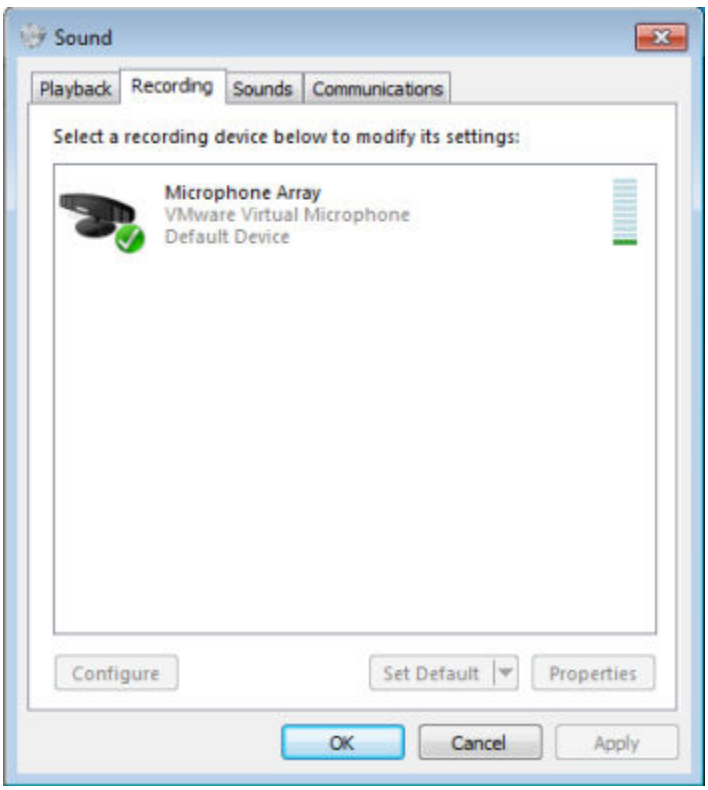
1 Connect to the VMware PCoIP or Blast desktop with the audio and video devices.

NOTE: USB redirection must be disabled for the audio/video devices.

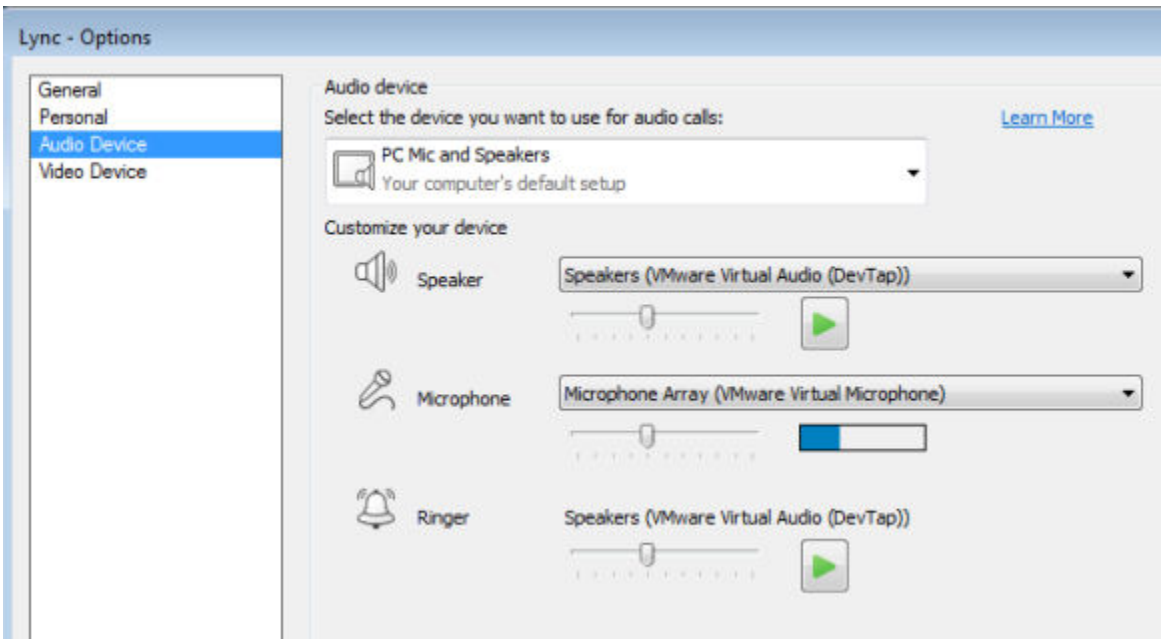
2 Verify the audio playback of the system using the VMware virtual audio.



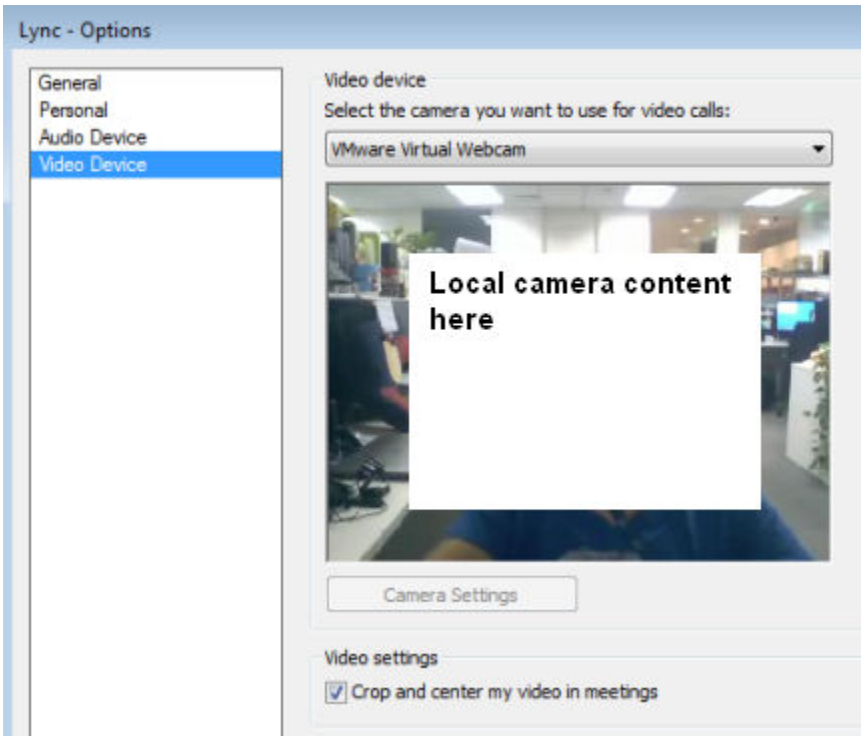
3 Verify the system audio recording using the VMware virtual microphone.



4 Verify the audio settings in VoIP application.



5 Verify the video settings in VoIP application using the VMware virtual webcam.



6 Start the audio or video calls.

Dependencies and known issues

- Dependency: `RTME.i386.pkg` needs to be installed for RTAV video.
- The answer call button of the local audio device, supported by HDX RTME, is not supported by RTAV.
- RTAV does not support RDS desktop, for example, 2008 R2/ 2012 R2 according to VMware.
- Support for PCoIP and Blast protocol only. RDP protocol is not supported according to VMware.
- Webcam preferences are not supported. For example, the first webcam displayed in the Camera tab in local peripheral settings is used always.
- Camera/Video: High Definition video is not supported because of the RTAV limitation. The local camera setting does not affect RTAV video because of the application design. Dell recommend users not to interfere with the local camera settings.

VMware Blast

VMware Blast display protocol can be used for remote applications and for remote desktops that use virtual machines or shared-session desktops on an RDS host. Select this protocol connection to display the desktop with the Blast protocol.

NOTE: When you pause the pointer over the connection icons, the corresponding connection protocols are displayed in tooltip. This is designed for RDSH applications. From ThinOS 8.4 release, RDSH application is supported for both PCoIP and Blast protocol. These two protocols share the same application icon, and hence it is necessary for you to pause the pointer over the connection icons to identify its protocol.

Blast feature matrix on ThinOS

Table 18. Blast feature matrix

Blast features	Support on ThinOS	Comments/ Known issues
H.264 offload	Yes	Blast H.264 is not supported on Wyse 5010 thin client, Wyse 5040 AIO thin client, and Wyse 7010 thin client.
VDI desktops	Yes	N/A
RDSH desktops	Yes	N/A
RDSH applications	Yes	Application window does not support Seamless mode. For example, all applications open in single window because of the VMware limitation.
		RDSH application supports the PCoIP protocol from ThinOS 8.4, with same limitation.
Unified communication	No	Third-party plug-ins are not available.
Microsoft Lync VDI plug-in	No	N/A
Real-Time Audio-Video (RTAV)	Yes	N/A
Skype for Business	Yes	N/A
Windows Media MMR	No	N/A
Flash URL multicast	No	N/A
Printer redirect	Yes	Supports printer redirection, and printer mapping with virtual print.
Smartcard redirect	Yes	N/A
Scanner redirect	No	N/A
Serial port redirect	No	N/A
USB redirect—VDI/ RDSH	Yes	Enabled by default.
Client drive redirect	No	N/A

Blast features	Support on ThinOS	Comments/ Known issues
Linux desktop	Yes	N/A
Copy Paste text	Yes	See, VMware Horizon server and client configurations/documentation.
VPN connect	Yes	N/A
AES 128/256	Yes	See, ThinOS AES design.
Multi-display/ 4K/ 32-bit	Yes	See, VMware Blast support information. For example, the prerequisite is VM video RAM.
ClearType fonts support	No	ThinOS supports TrueType fonts.
3D display	Yes	See, VMware Blast support information.
Blast recovery from network interrupt	Yes	Requires Horizon View agent 7.0.1.

For more information about VMware Horizon Blast, see VMware documentation.

For information about Blast Virtual Printing on ThinOS, see Blast Virtual Printing.

VMware Horizon Virtualization Pack for Skype for Business

The VMware Horizon Virtualization Pack for Skype for Business enables you to use Skype for Business in a VMware Horizon desktop. Microsoft Skype for Business is a unified communications platform that delivers an optimized user experience for online messaging, audio, and video calling and so on.

ThinOS supports VMware Horizon Virtualization Pack for Skype for Business in a Blast session only. PCoIP and RDP protocols do not support this feature.

Installing the horizon package on ThinOS

You must install the **horizon.i386** package on ThinOS to use the VMware Blast protocol. For information about the latest version of the horizon package delivered in ThinOS version 8.6, see the *Dell Wyse ThinOS version 8.6 Release Notes* at www.dell.com/support.
To install the horizon package:

1 Extract the horizon package.
The **horizon.i386.pkg** files are unzipped to a valid location.
2 Upload the horizon.i386.pkg to directory **\wnos\pkg** on the file server.
3 Ensure that the value of the INI parameter `autoload` is not set to 0.
4 Restart the thin client and wait until the automatic installation of packages is complete.
The installed horizon package is displayed in the **Packages** window in **System Tools**.

Setting up the Skype for Business in VMware Blast session

This section describes how to install and use the Microsoft Skype for Business (SFB) on a VMware Blast desktop.

1 Log in as horizon administrator, and start the VMware Horizon Agent installation on the virtual desktop.
2 During the VMware Horizon Agent installation, select the **VMware Horizon Virtualization Pack for Skype for Business** option to install the VMware Horizon Virtualization Pack for SFB.

For Horizon Agent installation information, see the *Setting Up Virtual Desktops in Horizon 7* document at docs.vmware.com.

The VMware Horizon Virtualization Pack for Skype for Business contains the following components:

- Horizon Media Proxy—This component is installed on the virtual desktop.
- Horizon Media Provider—This component is installed on the thin client.

3 Install the Skype for Business application on the VMware Blast desktop.

4 Update the ThinOS firmware, and install the **Horizon.i386.pkg** on the ThinOS client.

For more information about installing the Horizon package, see Installing Horizon package on ThinOS.

5 On ThinOS, log in to the VMware Blast desktop, and sign in to Skype for Business.

To verify if the VMware Horizon Virtualization Pack for Skype for Business is installed on the deployed virtual machines, check if the following registry keys exist:

- `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Office\Lync\VdiMediaProvider - GUID (REG_SZ)`
- `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\Office\Lync\VdiMediaProvider - GUID (REG_SZ)`

For information about pairing modes for a session, see the *Configuring Skype for Business* document at docs.vmware.com.

For information about configuring Skype for Business group policy settings, see the *VMware Virtualization Pack for Skype for Business Policy Settings* document at docs.vmware.com.

For information about the performance data statistics, see the *Dell Wyse ThinOS Version 8.6 Release Notes* at www.dell.com/support.

NOTE: To check the Skype for Business call statistics, right-click the virtualization pack icon on the lower-right of the virtual desktop, and click Call statistics.

Limitations

- Horizon Client 4.8 or later and Horizon Agent 7.5 and later are not compatible with older Client and Agent releases. Due to this limitation, when you use the Horizon Client 4.8 and Horizon Agent 7.5 with older client and agent releases, Skype for Business calls run in fallback mode and calls are not optimized. For information about compatibility of Horizon Virtualization Pack for SFB components, see the article *54773* at kb.vmware.com.
- ThinOS uses the VMware binary. For information about the Skype for Business limitations, see the *Configuring Skype for Business* document at docs.vmware.com.

Known issues

Table 19. Known issues

Description	Workaround
If the Blast session resolution is higher than 1920 x 1080 during SFB calls with full screen, the mouse stops responding.	Do not use full screen during SFB calls in the blast session with resolution greater than or equal to 2560 x 1440.
On Wyse 5010, 5040, and 7010 thin clients, the performance is low during the Horizon SFB video call.	Do not use Horizon SFB video call on Wyse 5010, 5040, and 7010 thin clients.
After you install the JVDI package, the Trap 14 error occurs if you switch the playback device from HD audio to DP audio during the Horizon SFB call.	Do not load the JVDI package if you want to use only the Horizon package.
You cannot use the key on the headset to pick up or end a call.	There is no workaround in this release.

Optimized mode and Fallback mode

In **Optimized mode**, the Skype for Business delivers an optimal performance. In **Fallback mode**, the Skype For Business calls are not optimized. On the lower right of the virtual desktop, the tooltip of the Virtualization Pack icon indicates the VMware Horizon Virtualization Pack for Skype for Business mode.

The following screenshot displays the Virtualization pack for Skype for Business in Optimized mode:

Figure 17. Optimized mode

If the Optimized mode icon is not displayed, the Virtualization Pack is running in Fallback mode. This is because of the version mismatch between the Horizon Client on the thin client and the Horizon Agent on virtual desktop.

For information about compatibility of Horizon Virtualization Pack for SFB components, see the *Horizon Client 4.8 or later and Agent 7.5 or later Virtualization Pack for Skype for Business is not compatible with older Client and Agent releases* article at kb.vmware.com.

Change Optimized mode to Fallback mode

To change the Optimized mode to Fallback mode, or to disable the Virtualization pack for Skype for Business on the Horizon desktop, do the following:

1 On the VMware Horizon desktop, open the Windows Registry Editor.

2 Rename the registry keys based on the following deployment scenarios:

Table 20. Registry keys

Deployment scenario	Registry key
View Desktops (64-bit) with Skype for Business (64-bit)	Rename `HKLM/Software/Microsoft/Office/Lync/VdiMediaProvider` to `HKLM/Software/Microsoft/Office/Lync/VdiMediaProviderDisabled`.
View Desktops (64-bit) with Skype for Business (32-bit)	Rename `HKLM/Software/Wow6432Node/Microsoft/Office/Lync/VdiMediaProvider` to `HKLM/Software/Wow6432Node/Microsoft/Office/Lync/VdiMediaProviderDisabled`.
View Desktops (32-bit) with Skype for Business (32-bit)	Rename `HKLM/Software/Microsoft/Office/Lync/VdiMediaProvider` to `HKLM/Software/Microsoft/Office/Lync/VdiMediaProviderDisabled`.

3 Close the Windows Registry Editor.

4 Restart Skype for Business.

Skype for Business is set to Fallback mode, and Real-Time Audio-Video (RTAV) is used for SFB calls.

Using multi-monitors in PCoIP session

This section is applicable to Wyse 5070 thin client. ThinOS supports multiple-monitor display to run virtual machines on each monitor.
User scenario:

1 Connect multiple monitors to the ThinOS device.

2 In the **Display Setup** dialog box, disable **Mirror Mode**, and configure the display layout.

3 Launch a full screen PCoIP session.

- **Display numbers**—A virtual machine needs sufficient video memory to support three or four monitors. The default video memory on VMware vSphere supports only two monitors.

- Supports one session up to four monitors in span mode with resolution up to 2560 x 1600.
- Supports one session up to two monitors in span mode with resolution up to 3840 x 2160.

The maximum number of monitors that can be stacked vertically is two. If you use more than two monitors, the monitors must be in the same mode and have the same screen resolution. For instance, if you use three monitors, all three monitors must be either in portrait mode or landscape mode, and must use the same screen resolution.

- **Display layout**—The display layout of the monitors must be aligned up and down, or left and right. Improper alignment results in unusual display.
- **3D rendering**—You can configure 3D graphics rendering for connected desktops. To use the 3D rendering feature, use up to two monitors with resolution up to 1920 x 1200.

Table 21. Matrix for multi screen support

PCoIP Multi-monitor support																
Wyse 5070 Extended thin client																
Display layout	Resolution	1920 x 1200					2560 x 1440					3840 x 2160				
	No. of displays	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six
	Horizontal	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	NA	NA	Yes	NA	NA	NA	NA
	Vertical	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	NA	NA	Yes	NA	NA	NA	NA
	Grid	NA	Yes	Yes	NA	NA	NA	Yes	Yes	NA	NA	NA	NA	NA	NA	NA
Wyse 5070 thin client—Pentium																
Display layout	Resolution	1920 x 1200					2560 x 1440					3840 x 2160				
	No. of displays	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six
	Horizontal	Yes	Yes	NA	NA	NA	Yes	Yes	NA	NA	NA	Yes	NA	NA	NA	NA
	Vertical	Yes	Yes	NA	NA	NA	Yes	Yes	NA	NA	NA	Yes	NA	NA	NA	NA
Wyse 5070 thin client—Celeron																
Display layout	Resolution	1920 x 1200					2560 x 1440					3840 x 2160				
	No. of displays	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six
	Horizontal	Yes	NA	NA	NA	NA	Yes	NA	NA	NA	NA	Yes	NA	NA	NA	NA
	Vertical	Yes	NA	NA	NA	NA	Yes	Na	NA	NA	NA	Yes	NA	NA	NA	NA

Using Multi-monitors in VMware Blast session

This section is applicable to Wyse 5070 thin client. ThinOS supports multiple-monitor display to run virtual machines on each monitor.
Prerequisite: Update the VMware Blast package to the latest version. For more information, see the latest *Dell Wyse ThinOS Release Notes*.
User scenario:

1 Connect multiple monitors to the ThinOS device.
2 In the **Display Setup** dialog box, disable **Mirror Mode**, and configure the display layout.
3 Launch a full screen VMware Horizon Blast session.

- **Display numbers**—A virtual machine needs sufficient video memory to support multiple monitors. You can use up to four monitors with sufficient RAM.

Table 22. Display Layout matrix

Resolution	1920 x 1080					2560 x 1440				
No. of displays	Two	Three	Four	Five	Six	Two	Three	Four	Five	Six
Horizontal	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	NA	NA
Vertical	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	NA	NA
Grid	Yes	Yes	Yes	NA	NA	Yes	Yes	Yes	NA	NA

- **4K display**—ThinOS supports four displays with 4K resolution in a Horizon blast session. Due to low performance, Dell recommends that you do not use four displays with 4K resolution.

Table 23. 4K display support

Hardware version	Windows version	Number of 4K displays supported
10 (ESXi 5.5.x compatible)	7, 8, 8.x, and 10	1
11 (ESXi 6.0 compatible)	7—3D rendering feature and Windows Aero are disabled.	3
11	7—3D rendering feature is enabled.	1
11	8, 8.x, and 10	1

- **3D rendering**—You can configure 3D graphics rendering for connected desktops. To use the 3D rendering feature, use up to two monitors with a resolution of up to 1920 x 1200. For a resolution of 4K (3840 x 2160), only one monitor is supported.
- **Blast H.264**—The following table describes the performance of H.264 decoder in VMware Horizon sessions that use the VMware Blast display protocol:

Table 24. Blast H.264 decoding

Screen resolution within VMware Horizon Blast session	Blast H.264 decoding in VMware Horizon Blast session	Summary
Session display width is less than or equal to 1920 pixels.	Blast H.264 decoding is always enabled.	Horizon client uses Blast H.264 decoding even if the H.264 decoder setting is disabled using GUI or INI options.
Session display width is greater than 1920 pixels.	Blast H.264 decoding is disabled by default. You can enable Blast H.264 decoding either on the ThinOS GUI or by deploying the INI parameter.	By default, Horizon client does not use Blast H.264 decoding. If the Blast H.264 decoder setting is enabled on ThinOS, then the Horizon client uses H.264 decoding. Enabling H.264 may downgrade the session performance.

For more information about the monitors and screen resolution, see the Monitors and Screen resolution section in the *Horizon 7 Architecture Planning* article at docs.vmware.com. However, Dell does not recommend that you use four displays with 4K resolution due to low performance.

Blast Virtual Printing

Virtual printing with VMware Blast allows you to use local or network printers from the Blast desktop without the need of installing the additional print drivers on the remote desktop. For each printer configured locally on ThinOS, you must map the printer to the VMware Blast desktop. ThinOS Blast printer mapping is equivalent to VMware Blast virtual printing.

To map your printer, do the following:

NOTE: LPT printer is considered as an example to explain the printer mapping scenario. Printer mapping in ThinOS works similar to LPT for LPD and SMB printers.

1 Power on the ThinOS client with the VMware View broker configured in the **Broker Setup** tab. Set the connection protocol as **All Supported** from the **Connection Protocol** drop-down list.

2 Go to **Global Connection Settings** > **Session**, and retain the **Exclude printer devices** check box selection. This option is selected by default.

3 Plug in a USB printer to the ThinOS client terminal.

4 Go to **System Setup** > **Printer**.

The **Printer Setup** dialog box is displayed.

5 In the **Printer Setup** dialog box, do the following:

a From the **Select Port** drop-down list, select **LPT 1**.

b Enter valid printer name and printer identification.

c Select the **Enable the printer device** check box.

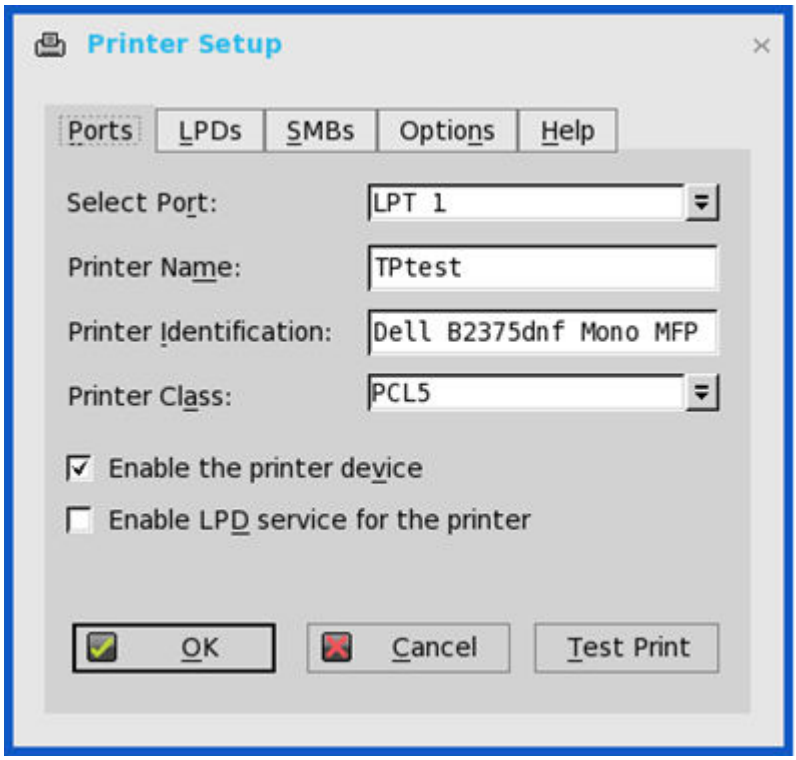


Figure 18. Printer Setup

d Click **Ok** to save the configuration.

6 Click the **Options** tab, and do the following:

a Set **LPT1: <Printername>**as default printer.

NOTE: Do not select the Enable .print Client check box.

b Click **Ok** to save the configuration.

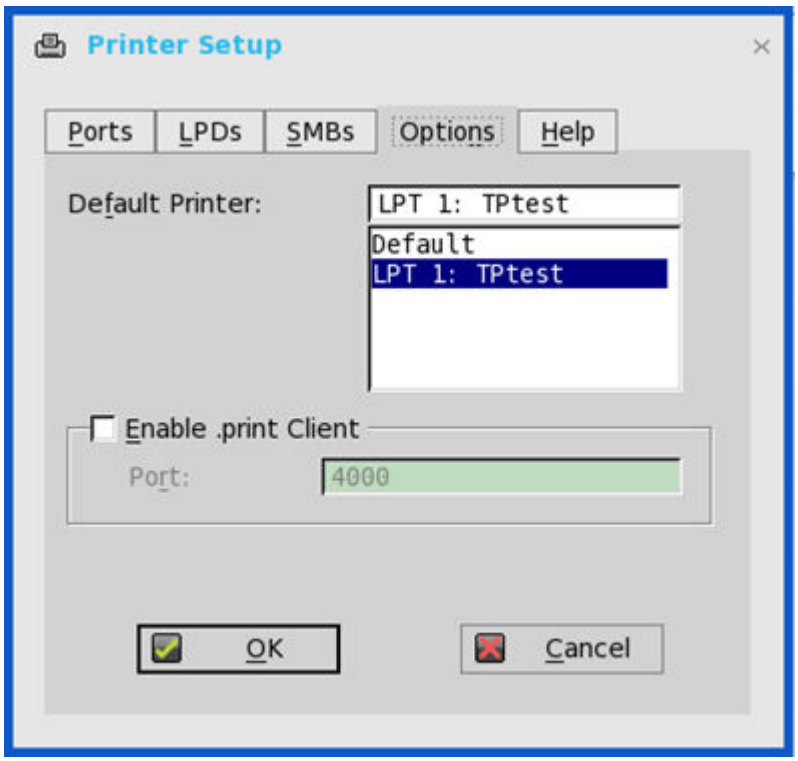


Figure 19. Options

7 Connect to a VMware Blast session. Go to **Control Panel** > **Devices and Printers**. The printer that is configured locally in ThinOS is mapped to the session.

The mapped printer's driver is TP PS Driver and the port is TPVM port.

The virtual printer allows the ThinOS local printer to be mapped to the VMware Blast session without installing the printer driver in the session.

Enable hardware cursor in Blast session

The hardware cursor enables GPU to control the display of your mouse cursor. Hardware cursors have less latency.

ThinOS supports the hardware cursor in VMware Horizon session with Blast display protocol. Only two cursor colors—Black and White—are supported.

By default, the software cursor is used in a Blast session, and the hardware cursor is disabled. If the hardware cursor is not enabled, the cursor uses the true color. If the hardware cursor is enabled, the cursor uses black and white colors.

To enable the hardware cursor in a Blast session, use the following INI parameter:

```
SessionConfig=Blast EnableHardwareCursor=yes
```

Enable relative mouse feature

The relative mouse feature is applicable for both PCoIP and Blast enabled thin clients. When you enable the relative mouse feature, Horizon Client uses relative coordinates to transmit data about the mouse pointer movement and improve the mouse performance. The relative mouse feature is supported on the following platforms:

- Wyse 3030 LT thin client
- Wyse 3040 thin client

- Wyse 5010 thin client
- Wyse 5040 AIO thin client
- Wyse 5060 thin client
- Wyse 5070 thin client

For PCoIP enabled thin clients

To enable the relative mouse feature in the **Classic** mode, do the following:

1 Connect to a remote desktop using the PCoIP display protocol.
2 Right-click the remote desktop icon on the ThinOS taskbar.
3 Click **Enable Relative Mouse**.

NOTE: To disable the relative mouse feature, right-click the remote desktop icon on the ThinOS taskbar, and click Disable Relative Mouse.

To enable the relative mouse feature in the **Zero** mode, do the following:

1 Connect to a remote desktop using the PCoIP display protocol.
2 In the ThinOS connection menu, click the **A** icon that is displayed after the PCoIP session name.

NOTE: To disable the relative mouse feature, click the R icon that is displayed after the PCoIP session name.

For Blast enabled thin clients

1 Add *SessionConfig=Blast EnableRelativeMouse=yes* into the INI file.
2 Reboot the thin client.
You can see the entry **[Horizon] enable relative mouse** in the event log if Relative Mouse is enabled.

USB device splitting in Blast session

ThinOS supports the USB device splitting feature on the Nuance Dictaphone PowerMic II microphone in a Blast session. The USB device splitting feature enables you to split the composite device into its components. To enable this feature, use the following INI parameters:

```
Device=vusb InterfaceRedirect=yes
Device=vusb ForceRedirect=0x00,0x00,0x03,0x00,0x00
SessionConfig=Blast viewusb.IncludeVidPid=Vid-0554_Pid-1001
viewusb.SplitVidPid=Vid-0554_Pid-1001(exintf:00;exintf:01;exintf:02)
```

After you enable the USB device splitting feature, the buttons on the PowerMic II are redirected to the blast session, and the audio mapping is retained in the local device.

For more information about the supported USB devices and USB configurations, see the *Nuance SpeechMagic VMware View Extension - Supported USB Devices and USB Configuration* article at kb.vmware.com.

Supporting Teradici SDK

The PCoIP Client Software Development Kit (SDK) is a set of libraries and binaries that you can use to build or customize a PCoIP client.

ThinOS supports the Teradici SDK version 2.9.

User scenario:

- Behavior with earlier Teradici SDK versions: You were able to switch the USB disk redirection between sessions. For example, plug in the USB disk, and connect the desktop 1 and 2. The disk is redirected to desktop 1. If you disconnect from desktop 1, then the USB disk is redirected to desktop 2.
- Behavior with Teradici SDK version 2.9: When you disconnect from desktop 1, the USB disk is not redirected to desktop 2. You must remove the USB disk and plug in the USB disk again for redirection.

Configuring PCoIP connections using Teradici Remote Workstation card

In ThinOS 8.6, you can directly configure the PCoIP connection using either the TERA2240 Remote Workstation Card or TERA2220 Remote Workstation Card. This feature is supported only on PCoIP-enabled thin clients. This feature only works with the direct PCoIP connection, and does not work when you connect using the Horizon View broker.

Prerequisites

- Ensure that the Teradici Remote Workstation card version matches the Teradici PCoIP SDK version 2.9.
- Ensure that host cards are connected to a remote workstation.
- Ensure that host cards are installed correctly, that is, connected to a remote workstation with GPU.

NOTE: The SDK in ThinOS does not function similar to Teradici zero client firmware. For example, the SDK in ThinOS does not support USB redirection with the host card connection. This feature is mainly for workstation users working on the server remotely.

To configure the PCoIP connection, do the following:

1 On ThinOS desktop, go to **Connect Manager**.

2 Click **New**, and then click **PCoIP**.

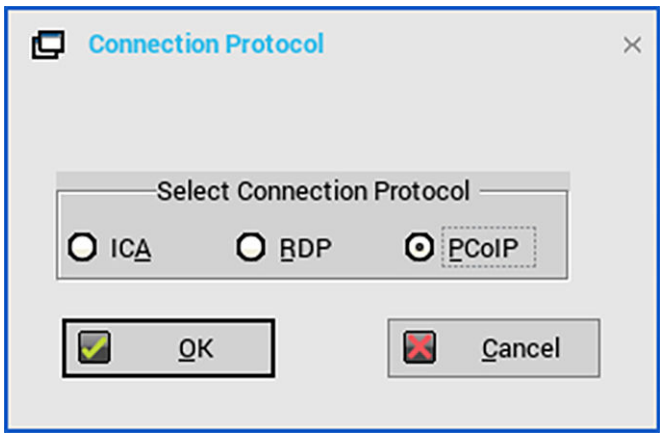


Figure 20. PCoIP Connection Protocol

3 In the **Connection Settings (PCoIP)** dialog box, do the following:

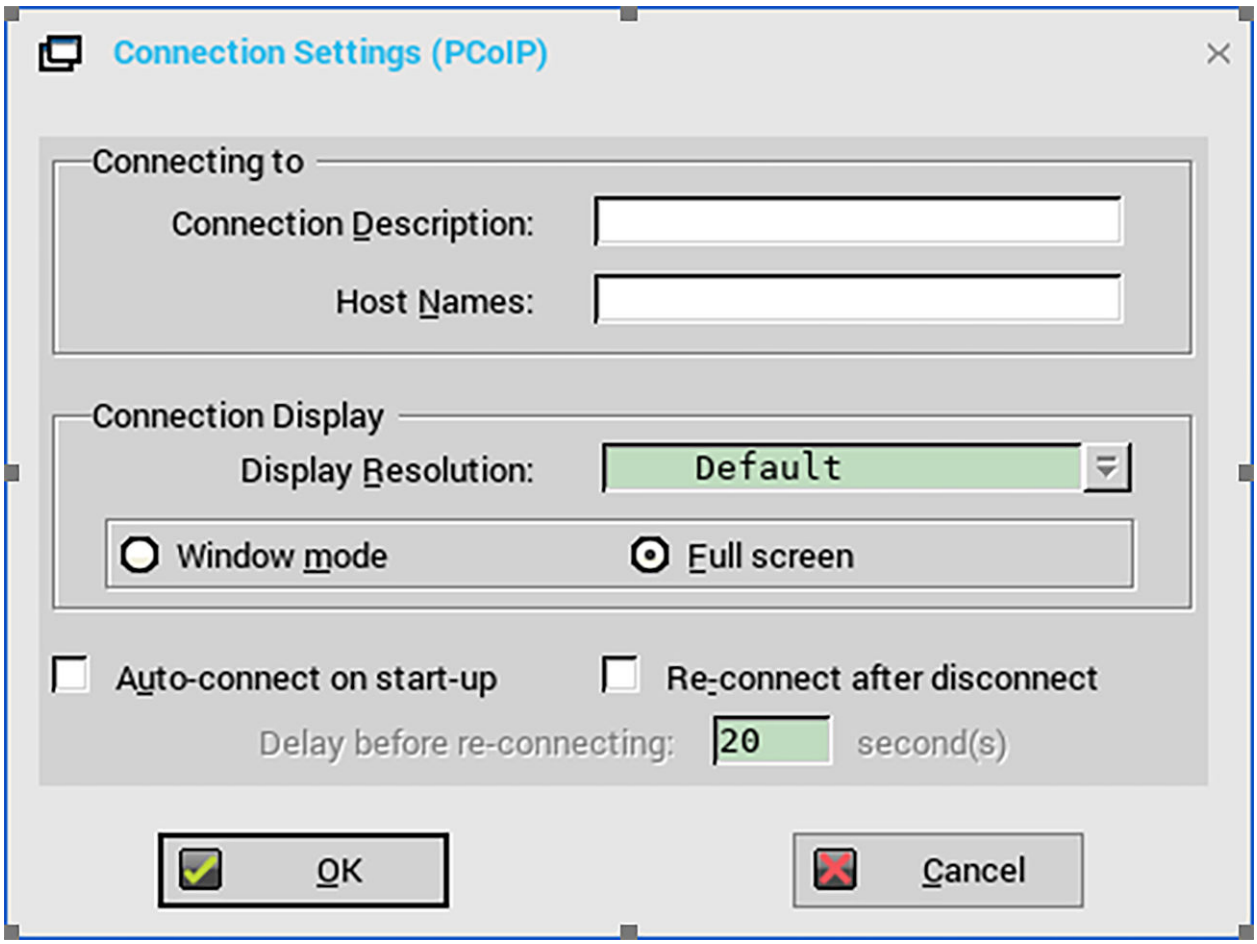


Figure 21. Connection Settings - PCoIP

a Enter the description for the PCoIP connection.
b Enter the IP address of the remote host card.
c From the **Display Resolution** drop-down list, select a display resolution for the PCoIP connection.
TERA2220 supports a single display with 2560 x 1600 resolution or two displays with 1920 x 1200 resolution. TERA2240 supports two displays with 2560 x 1600 resolution or four displays with 1920 x 1200 resolution.
d Select either the **Window mode** or **Full screen** to set the initial view of the session.
e If you want to automatically connect to the session after you restart the thin client, select the **Auto-connect on start-up** check box.
f Select the **Re-connect after disconnect** check box if you want to automatically reconnect to a session after the session is disconnected. If you select this option, enter the wait interval in the **Delay before re-connecting** box. The default is 20 seconds.

4 Click **OK** to save the settings.

For more information about the supported platforms and limitations, see the *Dell Wyse ThinOS 8.6 Version Release Notes* at www.dell.com/support.

For information about the Teradici host cards, see the Host Card documentation at www.teradici.com.

Configuring Microsoft Remote Desktop

Microsoft Remote Desktop application allows you to access and manage the data and resources of a remote device using an internet connection.

This section provides information about how to configure the Remote desktop broker connection on your ThinOS device, and other remote desktop features that you can configure on ThinOS.

Configuring the Microsoft Remote Desktop broker connection

To configure the Microsoft Remote Desktop broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

2 In the **Broker Setup** tab, from the drop-down list, select **Microsoft**, and do the following:
- **Broker Server**—Enter the IP address/Hostname/FQDN of the Broker Server.
- **Auto Connect List**—Enter the name of the desktops that you want to launch automatically after logging in to the respective broker. More than one desktop can be entered. Each desktop name is separated by semi-colon, and is case-sensitive.

3 Click **OK** to save the settings.

Configuring RDP connections

To configure the RDP connection:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

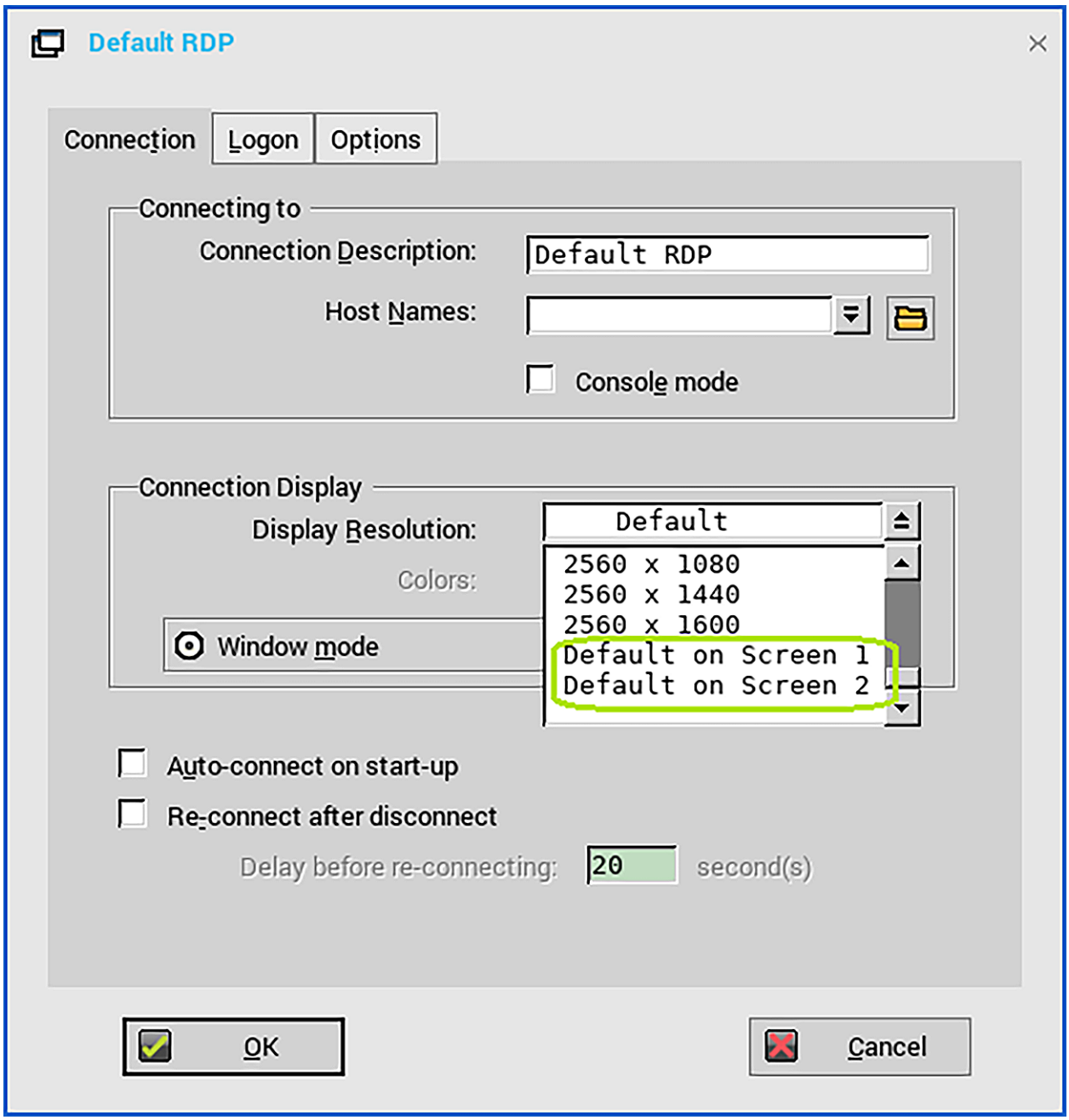
2 In the **Broker Setup** tab, from the drop-down list, select the **Broker type** as **None**.

3 Click **RDP** connection protocol, and click **Configure**.
The **Default RDP** dialog box is displayed.

4 Click the **Connection** tab, and use the following guidelines:
a **Connection Description**—Enter the descriptive name that is to appear in the connection list (38 characters maximum).
b **Host Names**—Use the list to select the valid DNS server name or the IP address of the server to which the thin client connection is to be made. You can also use **Browse** next to the box to make the selection you want. For example, a list of WTS servers on the local network from which you can select.

> **NOTE: The server name may be resolved using one of two mechanisms: DNS, and WINS. DNS uses the default domain name in the network control panel to attempt to construct an FQDN but will also try to resolve the name without using the default.**

c **Console mode**—Select to set the RDP connection with Windows Console mode.
d **Display Resolution**—Select the display resolution for your RDP connection.
In ThinOS version 8.6, you can select your preferred monitor on which you want to start the RDP session in full screen mode based on the following scenarios:



- **Mirror mode is enabled on multi-display or single display**—The **Default on screen x** option is not displayed. The display resolution of the RDP connection is set as **Default** irrespective of the value configured in the `onscreen=x` INI parameter.
- **Span mode is enabled on multi-display**—The **Default on screen x** option is displayed. You can select your preferred display on which you want to start the RDP session. You can also set your preferred display using the `onscreen` INI parameter. After you deploy the INI parameter, the **Default on screen x** option is set automatically according to the configured INI settings.

> **NOTE: If the value defined in the `onscreen` parameter for your RDP connection is higher than the number of displays connected to the thin client, the display resolution is set as Default. If you switch the display mode between span and mirror, you must reboot the thin client to apply the INI settings.**

e **Colors**—Select the color depth of the RDP session. If High Colors (16-bits) or True **Colors** (32-bits) is selected and the RDP server does not support this color depth, the thin client renegotiates the color depth to the lower value for example, 256 Colors (8-bits). The highest is 32-bits, if the hardware supports this color depth.

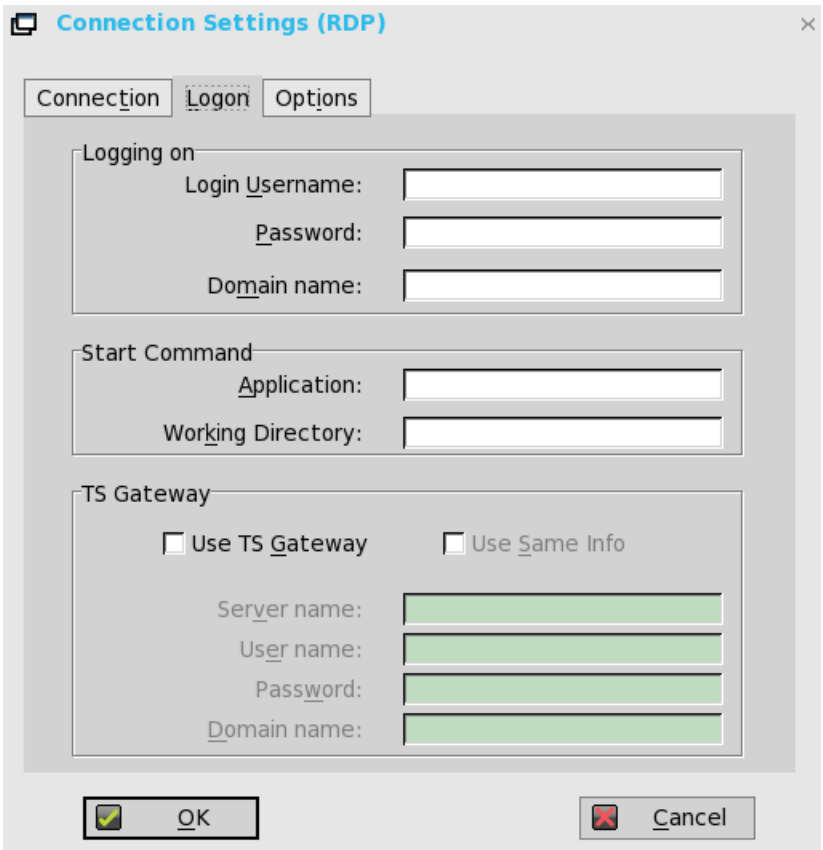
f **Window mode on 1 monitor or Full screen span all monitors**—Select the initial view of the session in window mode or full screen mode.

g **Auto-connect on start-up**—When selected, automatically connects the session on start-up.

h **Re-connect after disconnect**—When selected, causes the thin client to automatically reconnect to a session after a non-operator-initiated disconnect. If selected, the wait interval is that set in the **Delay before re-connecting** box (enter the number of seconds 1 to 3600) or the user profile for yes (20 seconds) or seconds. The default is 20 seconds, if there is no INI file description of this connection, or is a Stand-alone user, or is simply omitted.

You can reset the options in the Connection tab of the Connection Settings (RDP) dialog box. To reset, click the **Reset VM** command button. This command button is located in the upper-right of the dialog box. It appears only with a VDM broker connection.

5 Click the **Logon** tab, and use the following guidelines:



a **Logging on area**—Enter login username, password, and domain name. If these boxes are not populated, you can enter the information manually in the RDP server login screen when the connection is made. Use the following guidelines:

- **Login Username** —Maximum of 31 characters is allowed.
- **Password**—Maximum of 19 characters is allowed.
- **Domain Name**—Maximum of 31 characters is allowed.

b **Application** (127 characters maximum) and **Working Directory** (63 characters maximum)—Enter an initialization string and arguments, including an associated working directory, that you want to start automatically on the server when the connection is made.

c **Use TS Gateway**—Enables the use of Terminal Services Gateway (TS Gateway) server when connecting. If required, then enter the IP address or URL of the TS Gateway server in the Server name box. You can also enable **Use Same Info** (if the server credentials are the same credentials as your Remote Desktop Credentials (Host remote computer credentials) in the Login Username, Password, and Domain name fields) or disable **Use Same Info** and enter the Server name, User name, Password, and Domain name of the TS Gateway server if required.

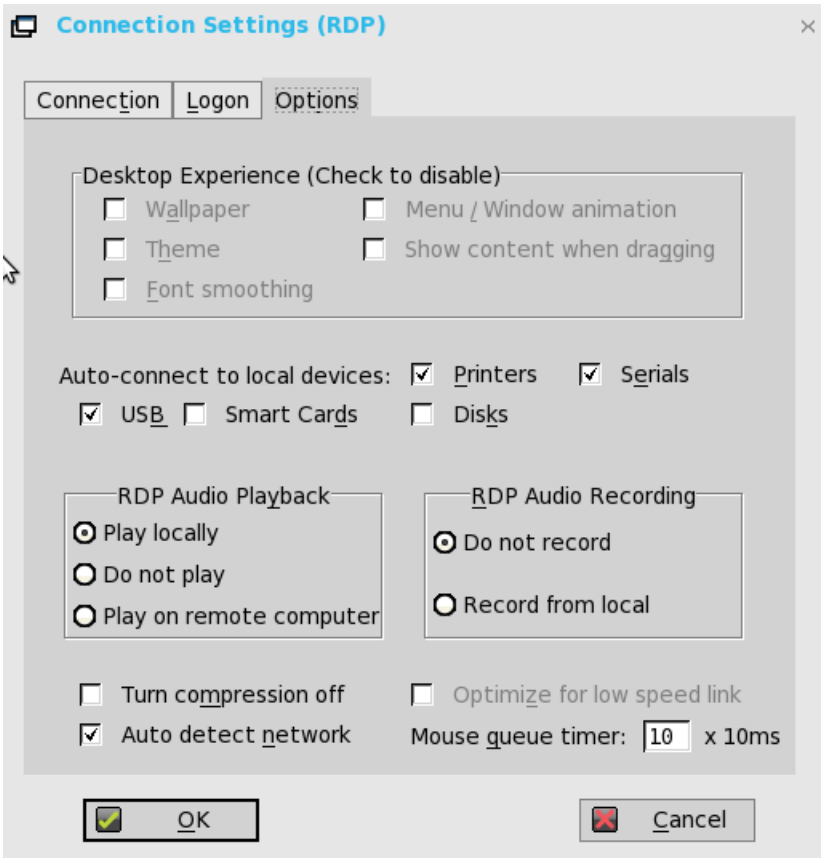
> **NOTE: A TS Gateway server is a type of gateway that enables authorized users to connect to remote computers on a corporate network from any computer with an Internet connection. A TS Gateway server enables Remote Desktop connections to a corporate network from the Internet without having to set up virtual private network (VPN) connections. Ask your network administrator whether you need to specify a TS Gateway server.**

- **User Name**—Enter a user name for the connection.

- **Password**—Enter the password.
- **Domain**—Enter the domain name.

> **NOTE: The user name, password, and domain name fields are optional. If you leave any of these fields blank, interactive login is required and users must enter the information at the login time.**

6 Click **Options** tab, and use the following guidelines:



a **Wallpaper**—When selected, disables the desktop wallpaper.
b **Menu / Window animation**—When selected, disables the menu or window animation.
c **Theme**—When selected, disables the desktop themes.
d **Show content when dragging**—By default, when you grab a Window by the title bar and move it around, the contents of the window will move with it. Select this to disable this content view so that only the outline of the window moves when dragging it, until you drop the window. This option can be beneficial, as it uses less processing power.
e **Font smoothing**—Converts vector text to bitmap for better display.
f **Auto-connect to local devices**—Select any options (Printers, Serials, USB, Smart Cards, and Disks) to have the thin client automatically connect to the devices.

> **NOTE: USB—Redirects locally attached USB devices on the thin client to a Microsoft Windows terminal server. When the user connects to the terminal server, locally attached USB devices on the thin client are accessible.**

g **RDP Audio Playback**—Select the audio playback options such as Play Locally, Do not play, and Play on remote computer.
h **RDP Audio Recording**—Select the audio recording options such as Do not record, and Record from local.
i **Turn compression off**—When selected, turns compression off (intended for high-speed connections).
j **Optimize for low speed link**—When selected, allows optimization for low-speed connections, such as reducing audio quality and/or decreasing protocol-specific cache size. Intended for a connection spanning a WAN link or using dialup.
k **Auto detect network**—When selected, turns on the auto detect network feature. This feature is enabled by default. It also disables the Optimize for low speed link option and the Desktop Experience options by default.
l **Mouse queue timer**—Specifies the default queue timer of a mouse event in an ICA or RDP session (in 1/100 of a second). It can be used to adjust the bandwidth of a network.

7 Click **OK** to save the settings.

Switch between RDP session and ThinOS client desktop

After you start RDP sessions with the **Default on screen x** option, and you want to switch back to the ThinOS client desktop using Ctrl + Alt + Down key combinations, the design is as follows:

- **Scenario 1: When the mouse cursor is located in an RDP session**—In this scenario, if you press Ctrl + Alt + Down and select the user to log in to ThinOS, only the session with the mouse cursor is minimized and ThinOS desktop is displayed on the screen. Other RDP sessions remain unchanged.
- **Scenario 2: When you start an RDP session on the primary display with Default on screen x**—In this scenario, ensure that the RDP session on primary display has the mouse cursor. To switch back to the ThinOS desktop screen, press Ctrl + Alt +Down and select the user to log in to ThinOS.
- **Scenario 3: When you press Ctrl + Alt + Down and select the System Information window**—In the scenario, the window is displayed on the screen irrespective of the cursor position.
- **Scenario 4: When you want to display the Connect Manager window**—In this scenario, you must minimize the RDP session and open the ThinOS client desktop screen where the Connect Manager is located. Press Ctrl + Alt + Down and select **Connect Manager**.

Features of RDP protocol

Remote Desktop Protocol (RDP) is a network communications protocol developed by Microsoft that enables you to remotely access virtual desktops and applications. This section describes the functionality of ThinOS over RDP protocol.

Using multi-monitors in RDP session

This section is applicable to Wyse 5070 thin client. ThinOS supports multiple-monitor display to launch RDP desktops on each monitor.
User scenario:

1 Connect multiple monitors to ThinOS device.
2 In the **Display Setup** dialog box, disable **Mirror Mode**, and configure the display layout.
3 Launch an RDP desktop with full screen.

All data described in the following table is based on virtual machine without RemoteFX/vGPU enabled configuration.

Table 25. RDP display capability matrix

Destination endpoint	Maximum resolution per monitor [Enable Force Span]	Maximum display support [Span Monitors]
Windows 7 SP1	4096 (w) x 2048 (h)	4096 (w) x 2048 (h)
Windows 8.1	8192 x 8192	6 x 4K
Windows Server 2012 R2	8192 x 8192	6 x 4K
Windows 10	8192 x 8192	6 x 4K
Windows Server 2016	8192 x 8192	6 x 4K

RDP H.264

From ThinOS version 8.5.1, logs of H.264 and H.264-AVC444 are hidden and not displayed in the **Event Log** tab. In ThinOS version 8.6, the H.264 resolution limitation is changed for different platforms.

The following table describes the RDP H.264 functionality matrix:

Table 26. RDP H.264 functionality matrix

RDP H.264	Session connection	Support platforms
H.264 is not enabled.	Windows 7/ Windows Server 2008 R2	All ThinOS-based platforms
H.264 is automatically disabled for display resolutions higher than 1920 x 1080.	Windows 8.x/ Windows Server 2012 R2, Windows 10/Windows Server 2016	Wyse 3010 thin client and Wyse 3020 thin client
H.264 is automatically disabled for display resolutions higher than 1920 x 1200.	Windows 8.x/ Windows Server 2012 R2, Windows 10/Windows Server 2016	Wyse 3040 thin client
H.264 is automatically disabled for display resolutions higher than 2048 x 1200.	Windows 8.x/ Windows Server 2012 R2, Windows 10/Windows Server 2016	Wyse 5060 thin client
H.264 is automatically disabled for display resolutions higher than 2048 x 1280.	Windows 8.x/ Windows Server 2012 R2	Wyse 3030 LT thin client, Wyse 5010 thin client, Wyse 5040 thin client, Wyse 7010 thin client, Wyse 5070 thin client
H.264 is automatically disabled for display resolutions higher than 3840 x 2160.	Windows 10/Windows Server 2016	Wyse 3030 LT thin client, Wyse 5010 thin client, Wyse 5040 thin client, Wyse 7010 thin client, Wyse 5070 thin client

The following table describes the RDP H.264 decoding matrix for Wyse 5070 thin client:

Table 27. RDP H.264 decoding matrix

Unit type	GPU	Session	Windows 10/Windows Server 2016		Windows 8.1/Windows Server 2012 R2	
		Display resolution	H.264-AVC444	Decoding	H.264	Decoding
Wyse 5070 Extended thin client	AMD	3840 x 2160	Enabled	Software	Disabled	
		2560 x 1440	Enabled	Software	Disabled	
		2048 x 1280	Enabled	Software	Enabled	Hardware
		1920 x 1200	Enabled	Software	Enabled	Hardware
	Intel	3840 x 2160	Enabled	Software	Disabled	
		2560 x 1440	Enabled	Software	Disabled	
		2048 x 1280	Enabled	Software	Enabled	Hardware
		1920 x 1200	Enabled	Software	Enabled	Hardware
Wyse 5070 thin client—Celeron processor Wyse 5070 thin client—Pentium processor	Intel	3840 x 2160	Enabled	Software	Disabled	
		2560 x 1440	Enabled	Software	Disabled	
		2048 x 1280	Enabled	Software	Enabled	Hardware
		1920 x 1200	Enabled	Software	Enabled	Hardware

All data described in the table is based on virtual machine without RemoteFX/vGPU enabled configuration.

NOTE:

- Windows 10/Window Server 2016 must be hosted in Microsoft RDS 2016 broker for enabling H.264-AVC444.
- H.264 logs and H.264-AVC444 logs are hidden and not displayed in the **Event Log** tab.

Known issues

- In Mirror mode with active session, when you change the resolution from 2048 x 1280 to greater than 2048 x 1280, the connected RDP session (Windows 8/ Windows 2012 R2) is closed forcibly and an error message—**RDP: The server-side graphics subsystem is in an error state and unable to continue graphics encoding** is displayed. This is because the session is not reconnected in Mirror mode after resolution is changed that resulted in H.264 codec exceeding its supported resolution.

Workaround—You must manually reconnect the session after the resolution is changed.

- In an RDP session with VOR enabled by default (Windows 8.1 x86), you connect to a session with full screen, and span more than four 4K monitors. In this scenario, if you play a video, the session may be disconnected automatically with an error log **RDP: The server-side graphics subsystem is in an error state and unable to continue graphics encoding**. This is because VOR /x-264 requires more resources, such as RAM, than the server resources.

  Workaround—You can reduce the number of monitors or lower the resolutions or switch to other 64-bit operating system with more RAM.

Configuring H.264 AVC444 in RDP 10 session

Prerequisites:

- Thin client must run on ThinOS version 8.5 or later.
- Windows 10 or Windows Server 2016 must be created in Microsoft RDS 2016 broker or in the latest VMware View broker.

NOTE:
H.264-AVC444 is also used in Windows 8.1 with RemoteFX GPU configured.

To configure the H.264 AVC444 in an RDP 10 session:

1. In the Windows session host, run **gpedit.msc**.
2. Open the Local Group Policy Editor.
3. Navigate to **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Services** > **Remote Desktop Session Host** > **Remote Session Environment**, and enable the following policies:
   - Prioritize H.264/AVC 444 Graphics mode for Remote Desktop connections
   - Configure H.264/AVC hardware encoding for Remote Desktop connections
4. Open **cmd.exe** and run **gpupdate /force**, or restart the server.

VOR codec in RDP session

When you are playing video in an RDP session—Windows 8.1, Windows 2012 R2, Windows 10, and Windows 2016—VOR codec is used. The following logs are displayed in the **Event Log** tab.

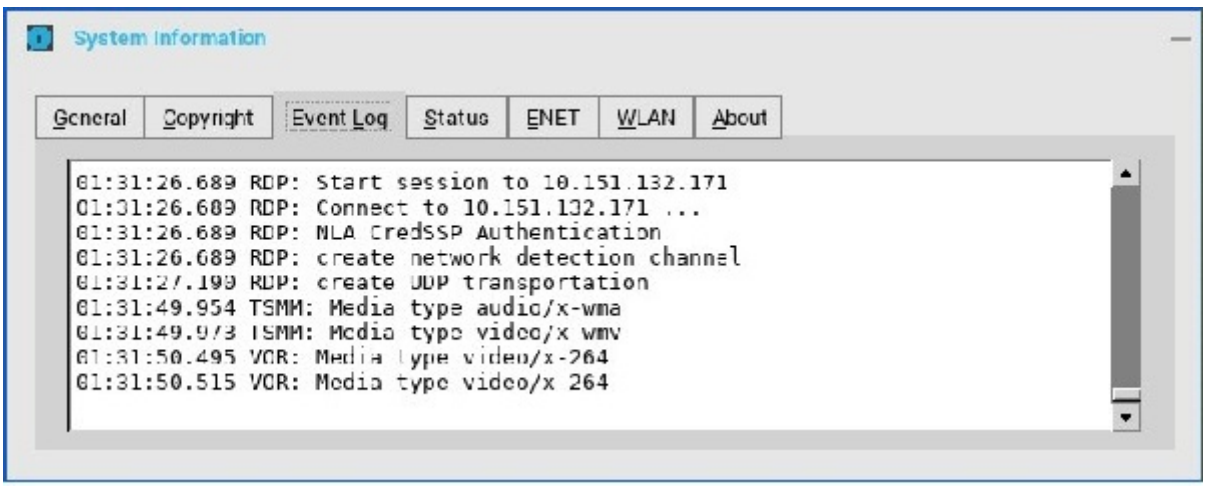


Figure 22. Event log tab

NOTE:

- Dependence 1—RDP GFX status, H.264, and VOR work only when GFX is enabled.
- Dependence 2—VOR is dynamic. So the enablement/disablement of VOR dynamically changes during the change in the video resolution (enlarge/shrink).
- Dependence 3—H.264 enablement is decided at the beginning of connection, depending on the maximum resolution available for the session.

If H.264-AVC444 is enabled, VOR is not used in Microsoft broker 2016, and Windows 10/2016 sessions without the RemoteFX GPU. If you disable H.264-AVC444, VOR is used.

In RDP session (RDP 8.1 and later), VOR, H.264, and H.264-AVC444 are enabled by default. To disable these parameters, use the INI parameter— `SessionConfig-RDP EnalbeGFX=yes EnableVOR=no EnableRDPh264=no`.

When you connect to an RDP session in Windows 8.1 or Windows 10 with RemoteFX GPU adapter, H.264-AVC444 is used irrespective of the H.264-AVC444 group policy configurations. If you disable the H.264 feature by using the INI parameter, the VOR codec is used in RDP sessions. However, graphic-related issues are observed in RDP sessions. From ThinOS version 8.6, the VOR codec is not used when you disable H.264 using the INI parameter.

TS Gateway in Microsoft Broker

User scenario:

1 Log in to Microsoft Broker with TS Gateway configured.

2 Launch a published collection.
TS Gateway connection is established.

The following table lists the TS Gateway versions supported by Windows Server.

Table 28. Supported TS Gateway versions

Server operating system	TS Gateway II	TS Gateway III	WebSocket
Windows 2008 R2	Support	Not support	Not Support
Windows 2012 R2	Support	Support	Not Support
Windows 2016	Support	Support	Support

NOTE:

- TS Gateway - WebSocket is a new feature introduced from ThinOS version 8.5.
- In TS Gateway II or III connection, the setup uses a two half-duplex communication between Terminal Server (TS) Gateway server and thin client.
- In the WebSocket connection, the session connection setup uses a duplex communication between TS Gateway and thin client
- TS Gateway II and TS Gateway III are downward compatible with Windows Server 2016, that means, if the WebSocket connection fails or the TS Gateway server or thin client version does not support WebSocket, then TS Gateway II or TS Gateway III is used.

The following screenshot displays the TS Gateway II connection setup logs:

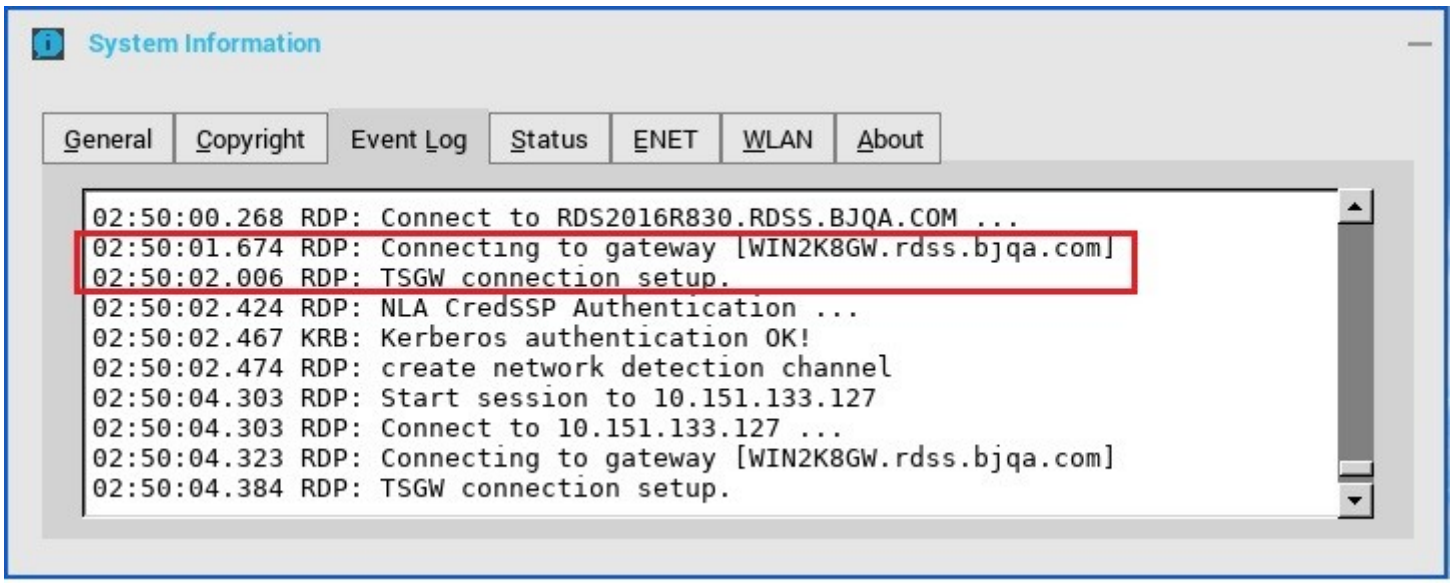


Figure 23. Event log tab

The following screenshot displays the TS Gateway III connection setup logs:

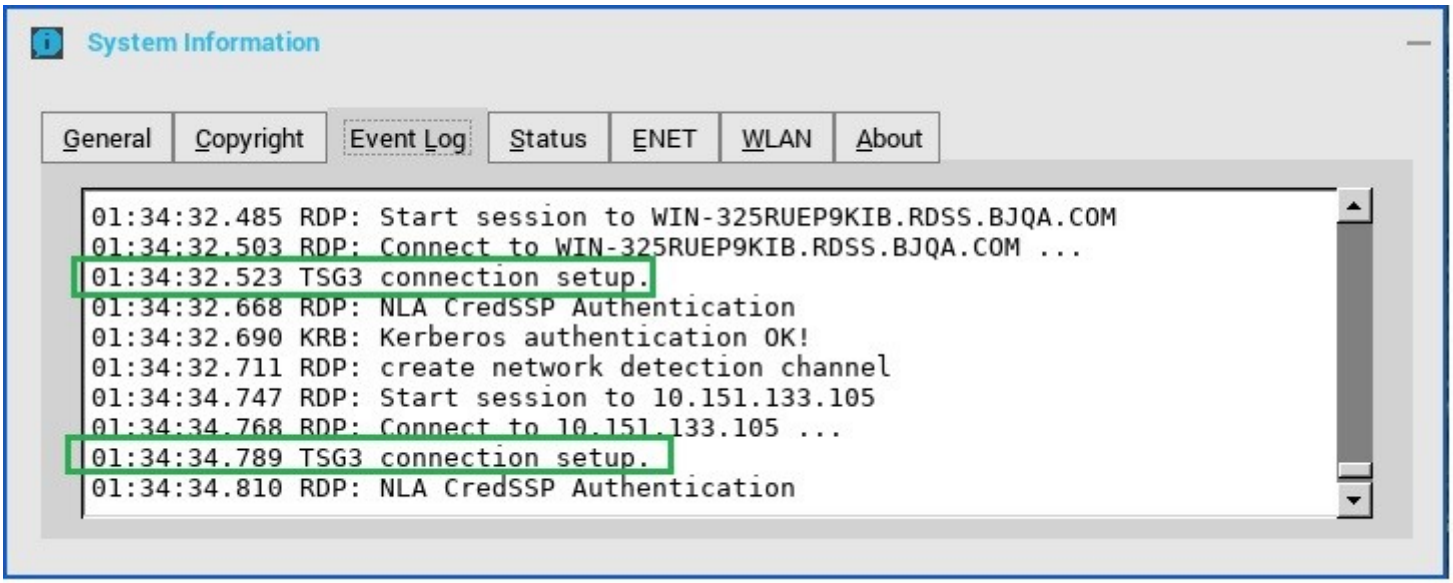


Figure 24. Event log tab

NOTE:

- WebSocket connection log is hidden and not displayed in the **Event Log** tab. If you want to view the WebSocket connection log, go to **Troubleshooting** > **Capture** and enable **Persistent** for the export event log.
- From the ThinOS v8.6 release onwards, the **WebSocket** feature is disabled by default. To enable **WebSocket**, deploy the following INI parameter:

  `Sessionconfig=RDP TSGWWebSock=yes`.

Connect to RDP session using UDP with TS Gateway

To connect to a Remote Desktop Session using User Datagram Protocol (UDP) with TS Gateway, do the following:

1 Deploy the following INI parameter to the thin client:

`SessionConfig=RDP TSGWUDP=yes`.

2 Enable **Terminal Services Gateway** (TSGW) for the applications and desktops from the Microsoft RDS broker server.

3 On the ThinOS client, start a Remote Desktop Session using the RDS connection broker.

4 Connect to the published desktop.

On the ThinOS desktop, the following event log is displayed in the **System Information** window:

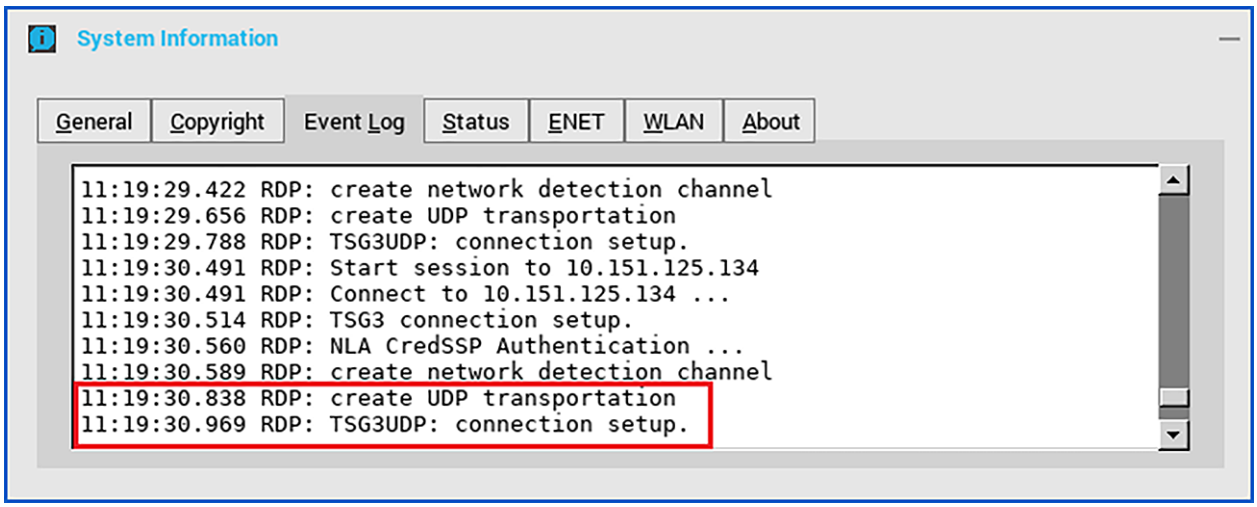


Figure 25. Event log

Configuring Dell vWorkspace

Workspace virtualization delivers a list of applications or desktops together as a single complete virtual workspace. It isolates and centralizes an entire computing workspace. vWorkspace provides flexible, location and platform independent access by delivering virtual workspace from multiple virtualization platforms.

This section provides information about how to configure a Dell vWorkspace broker connection on your ThinOS device.

Configuring the Dell vWorkspace broker connection

To configure the vWorkspace broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

2 In the **Broker Setup** tab, from the drop-down list, select **Dell vWorkspace**, and do the following:
- **Broker Server**—Enter the IP address/ Hostname/ FQDN of the Broker Server.
- **Auto Connect List**—Enter the name of the desktops that you want to launch automatically after logging in to the respective broker. More than one desktop can be listed. Each desktop name is separated by a semi-colon, and is case-sensitive.
- Select the check box to enable vWorkspace Gateway.
- **vWorkspace Gateway**—Enter the IP Address of the vWorkspace Gateway.

3 Click **OK** to save the settings.

Configuring Amazon Web Services or WorkSpaces

Amazon WorkSpace is a cloud-based virtual desktop that allows you to access remote applications with ease.

Amazon WorkSpaces connection is applicable only for PCoIP clients running ThinOS 8.3, and later versions.

This section provides information about how to configure the Amazon WorkSpaces (AWS) connection on your ThinOS device, and other Amazon WorkSpace features that you can configure on ThinOS.

Configuring the Amazon WorkSpaces broker connection

Amazon WorkSpaces connection is applicable only for PCoIP clients. To configure the Amazon WorkSpaces (AWS) broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**
The **Remote Connections** dialog box is displayed.

2 In the **Broker Setup** tab, from the **Select Broker Type** drop-down list, select **Amazon WorksSpaces**.

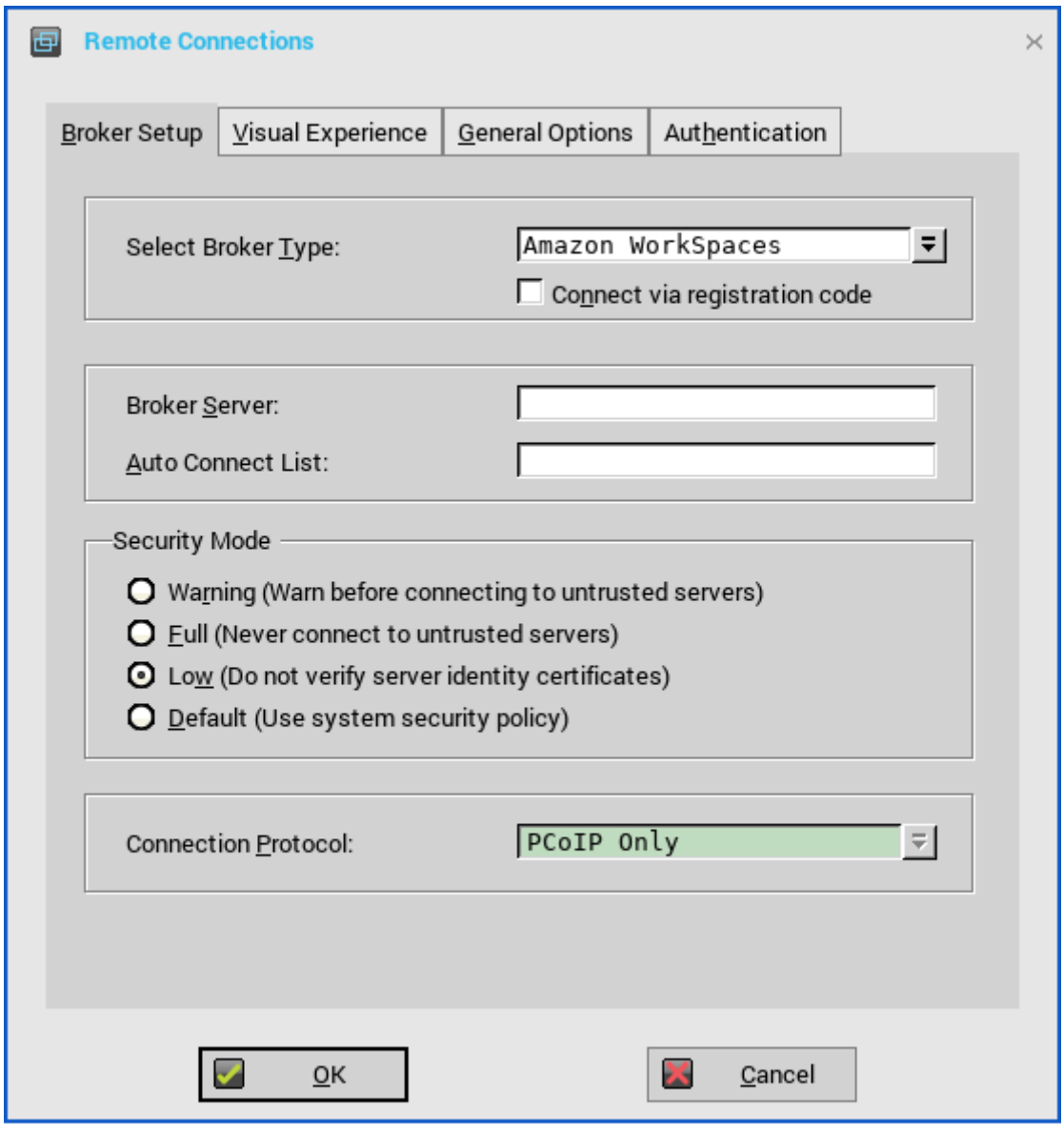


Figure 26. Amazon WorkSpaces

3 Based on your preferred connection mode, do either of the following:

- If you want to connect to AWS using the registration code, select the **Connect via registration code** check box, and enter the WorkSpaces registration code in the **Registration Code** field. The workspace registration code is provided to you in your welcome email after you set up Amazon WorkSpaces.

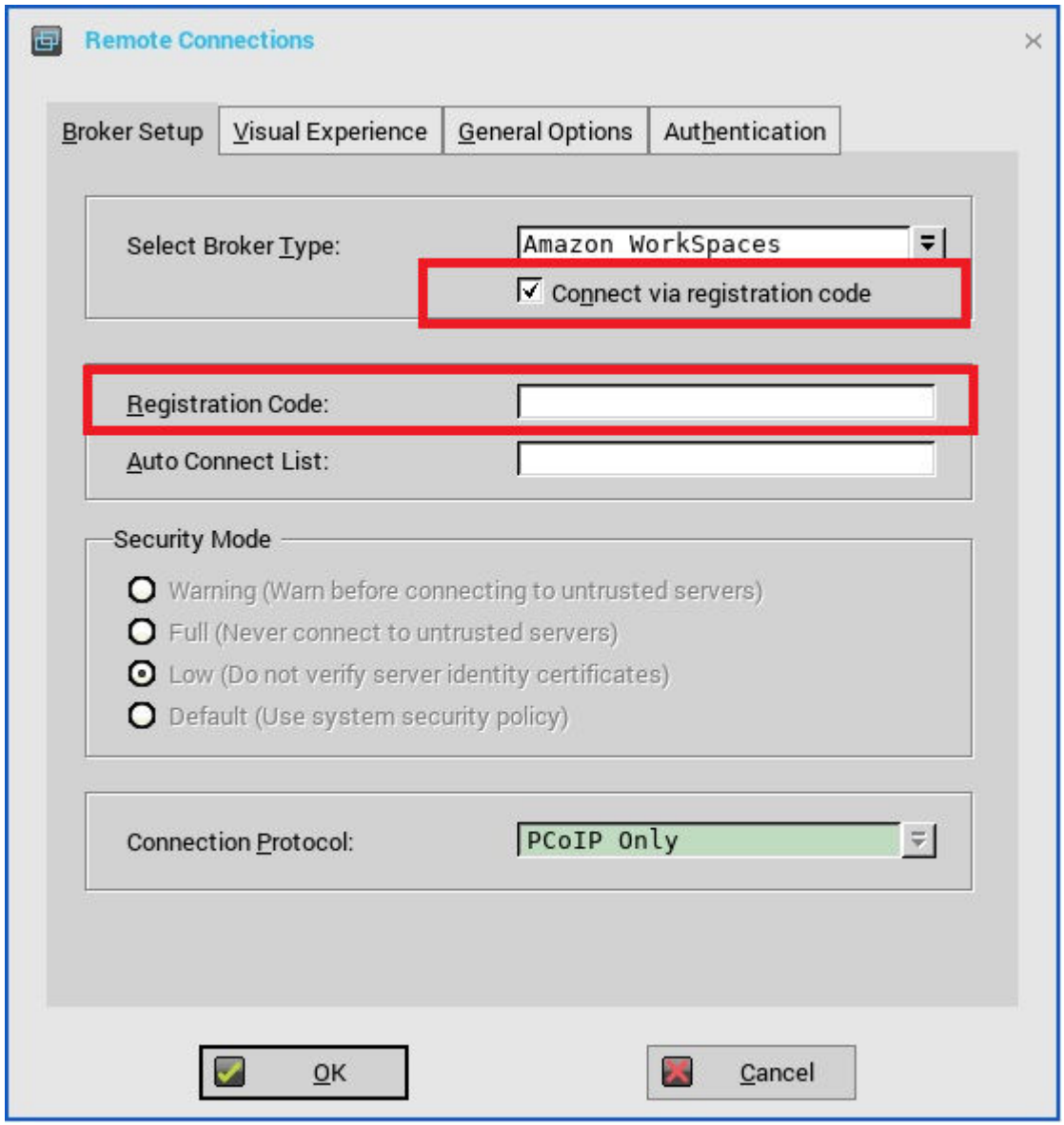


Figure 27. Amazon WorkSpaces with the Registration Code field

NOTE: You cannot configure the direct connection mode using the INI parameter or Wyse Management Suite.

When you connect to Amazon WorkSpaces using the registration code, the **MFA token** option is displayed in the login window. However, you cannot use the MFA Token option as the option is disabled in this release.

Figure 28. Amazon WorkSpaces login window

- If you want to connect to AWS using the default PCoIP Gateway mode, enter the IP address/Hostname/FQDN of the broker server in the **Broker Server** field.

  NOTE: Do not select the Connect via registration code check box if you are using the default PCoIP Gateway mode.

4 In the Auto Connect List field, enter the name of the desktops that you want to launch automatically after logging in to the respective broker. More than one desktop can be listed. Each desktop name is separated by a semicolon, and is case-sensitive.

5 Select the preferred Security mode from the following options:

- **Warning**—This security mode requires FQDN address for domain certificate that is installed in PCM. If certificate is not installed on the client, corresponding warning message is displayed for you to continue.
- **Full**—This security mode requires FQDN address with domain certificate that is installed in PCM, and certificate installed on the client.
- **Low**—This security mode enables FQDN/IP address with/without certificate.
- **Default**—Follows global security mode settings.

  NOTE: The Connection Protocol drop-down list is disabled for the AWS broker. By default, the option is set to PCoIP Only.

6 Click **OK**

For information about deploying AWS WorkSpaces and AWS EC2 PCM for AWS WorkSpaces, go to www.teradici.com/web-help/Connecting_ZC_AWS_HTML5/TER1408002_Connecting_ZC_AWS.htm#03_DeployPCM.htm%3FTocPath%3D3.

For information about configuring the Broker Server address = "URI (https://<FQDN or IP address>) of the PCM", go to www.teradici.com/web-help/Connecting_ZC_AWS_HTML5/TER1408002_Connecting_ZC_AWS.htm#05_Connect.htm%3FTocPath%3D5.

Known issues with Amazon Web Services or WorkSpaces

- Key combination **Ctrl + Alt** disconnects users from AWS session intermittently with old agent in AWS desktop. To fix this issue, update to latest agent by rebooting the desktop.
- Each user is assigned with one WorkSpaces desktop, and therefore logon with any username returns to the single desktop and then the session connects automatically. Disconnecting from the desktop returns user to logon screen.

Configuring Teradici Cloud Access

Teradici technology enables you to securely access the remote applications using Teradici Cloud Access. You can manage and optimize your PCoIP-enabled clients. For more information about Cloud Access, see www.teradici.com/cloud-access.

This section provides information about how to configure a Teradici Cloud Access broker connection on your ThinOS device.

Configuring the Teradici Cloud Access broker connection

To configure the Teradici Cloud Access broker setup:

1 From the desktop menu, click **System Setup**, and then click **Remote Connections**.
The **Remote Connections** dialog box is displayed.

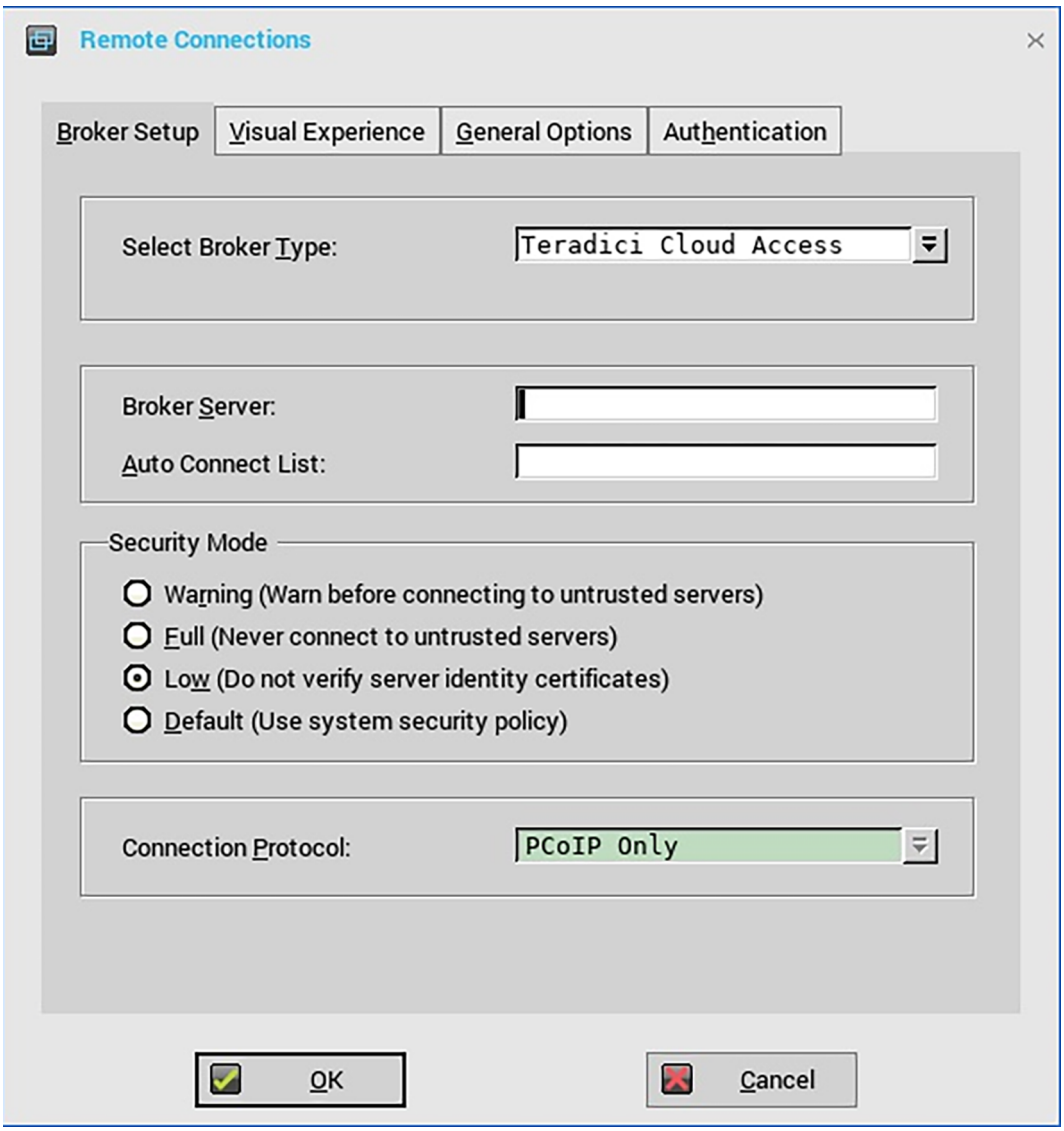


Figure 29. Broker setup - Teradici Cloud Access

2 On the **Broker Setup** tab, from the **Select Broker Type** drop-down list, select **Teradici Cloud Access**, and configure the following options:

- **Broker Server**—Enter the IP address or FQDN of the broker server.
- **Auto Connect List**—Enter the name of desktops that you want to start automatically after logging in to the respective broker. Use a semicolon to separate each desktop name.

  NOTE: Field values are case-sensitive.
- **Security mode**—Select your preferred security mode from the following options:
  - **Warning**—Warn security requires the FQDN address with a self-signed certificate, or without any certificate. However, the corresponding warning message is displayed.
  - **Full**—Full security requires the FQDN address with a domain certificate.
  - **Low**—Low security allows the FQDN or IP address with or without a certificate.
  - **Default**—Follows the global security mode settings.
- **Connection Protocol**—By default, the option is set to **PCoIP Only**.

3 Click **OK** to save your settings.

7

Configuring local settings

You can configure available thin client settings on the thin client using the following. Depending on user privilege level, some dialog boxes and options may not be available for use.

NOTE: While it is not recommended to use dialog boxes for configuring thin client settings, they are available in case you want to temporarily override central default configurations or you do not have the option to set up central configuration (smaller environments). In general, it is recommended that you use central configuration to enable you to automatically push updates and any desired default configuration to all supported thin clients in your environment.

Local Settings Menu

To access the Local settings menu:

- **Zero desktop**—Click the **System Settings** icon on the Zero toolbar. Administrators can also click the **Admin Mode** button on the **Login** dialog box.
- **Classic desktop**—Click User Name, and select **System Setup**.

NOTE: User Name is the user who is logged-on and is at the lower-left pane of the taskbar.

Configuring the system preferences

Use the **System Preference** dialog box to select personal preferences such as screen saver, time/date and custom information settings.

Setting the general system preference

To configure the general settings for system preference:

1 From the desktop menu, click **System Setup**, and then click **System Preferences**.

The **System Preference** dialog box is displayed.

2 Click the **General** tab, and use the following guidelines:

a **Screen Saver**—Allows you to select the type of screensaver you want. The default is to **Turn Off Screen**.

Other available screensavers are **Flying Bubbles**, **Moving Image**, **Showing Pictures**, and **Playing Video**.

b **Timer**—Select the idle time after which the screensaver is to be activated; either **disable**, **1 minute**, **3 minutes**, **5 minutes**, **10 minutes** (default), **15 minutes**, or **30 minutes**.

When the thin client is left idle for the specified idle time, the screensaver is initiated.

c **After Turn Off Screen**—Specify whether the thin client must enter the sleep mode or power off after the screen is turned off by the screen saver. This option is available only on Wyse 5040 AIO clients.

d **Timer**—Select the idle time after which you need the thin client to enter sleep mode. This option is available only on Wyse 5040 AIO clients.

e Locale—Select a language to be activated for the user login-experience; either **French**, **German**, or default **English**.

NOTE: Locale changes the language for the user login-experience screens only displayed during boot-up and login and not the configuration or administrator screens.

Only the following messages are applicable for French locales:

- Username/Password/Domain

- System Information
- Shut down the system, restart the system, reset the system setting to factory default
- OK, Cancel
- Initiating devices
- Looking up IP address from DHCP, Note: Pressing CTRL-ESC keys cancel out of network check
- Retry DHCP for an IP address
- Waiting for network link. Verify that network cable is plugged into back of unit
- Check Cable, No Ethernet link
- Leave administrator mode
- Connecting
- Sign off from account
- Lock Terminal, Unlock Password
- Terminal is locked, Invalid unlock password

f **Terminal Name**—Allows you to specify the name for the thin client. The default is a 14-character string that is composed of the letters WT followed by the thin client Ethernet MAC address.

Some DHCP servers use this value to identify the IP address lease in the DHCP Manager display.

3 Click **OK** to save the settings.

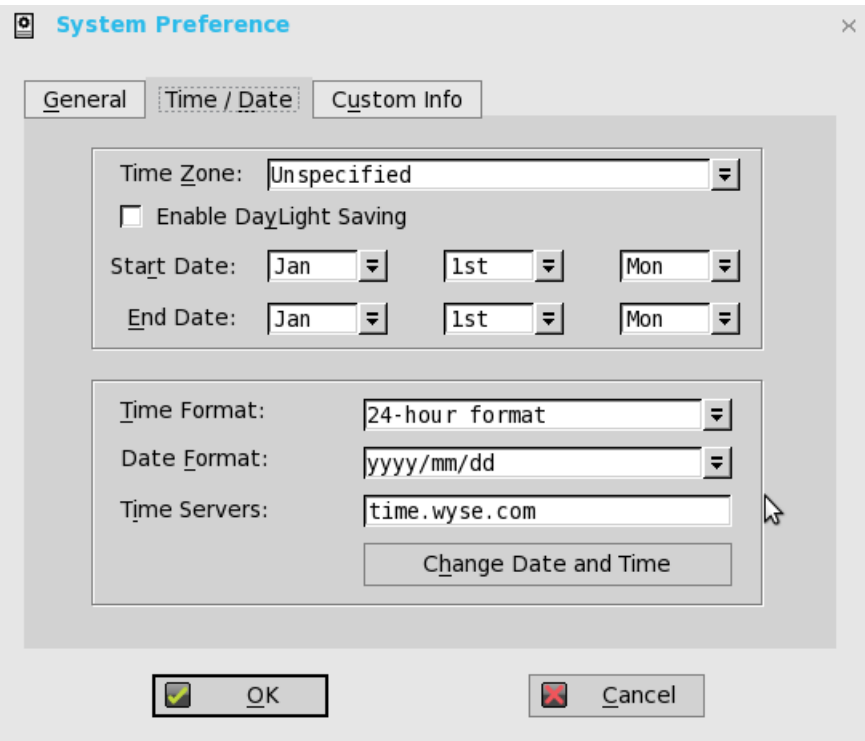
Setting the time and date

To configure the time and date settings:

1 From the desktop menu, click the **System Setup**, and then click **System Preferences**.

The **System Preference** dialog box is displayed.

2 Click the **Time/Date** tab, and use the following guidelines:



a **Time Zone**— Select a time zone where the thin client operates from the drop-down list. Default value is **Unspecified**.

b **Enable Daylight Saving**— Allows you to enable the daylight saving settings. When selected, the **Start Date** and **End Date** boxes must be properly configured to define the daylight saving starting (month/week/day) and ending (month/week/day) periods.

Use the following guidelines to enter the Start date and End date:

- **Month**— Specifies the month in the year from **January** through **December**.
- **Week**— Select **1** through **4** for the week in the month. Week last denotes the last week in the month.
- **Day** — Specifies the day of the week from **Monday** through **Sunday**.

c **Time Format** — Allows you to select the 12 or 24-hour time format. **default is 24-hour format.**

d **Date Format** — Allows you to select the yyyy/mm/dd (year/month/day) or dd/mm/yyyy (day/month/year) date format. Default is **yyyy/mm/dd**.

e **Time Servers** — List of IP addresses or host names with optional TCP port number of Time Servers.

Each entry with optional port number is specified as Name-or-IP: port, where: port is optional. If not specified, port 80 is used. Locations can be supplied through user profiles if user profiles are used. The Time Servers provide the thin client time based on the settings of time zone and daylight saving information. If DHCP is used, locations can be supplied through DHCP.

f **Change Date and Time** — Allows you to change date and time for secure environments requiring a solution to outside server access. When connecting to a file server over HTTPS, the proper time must be defined on the thin client for SSL/ certification validation.

3 Click **OK** to save the settings.

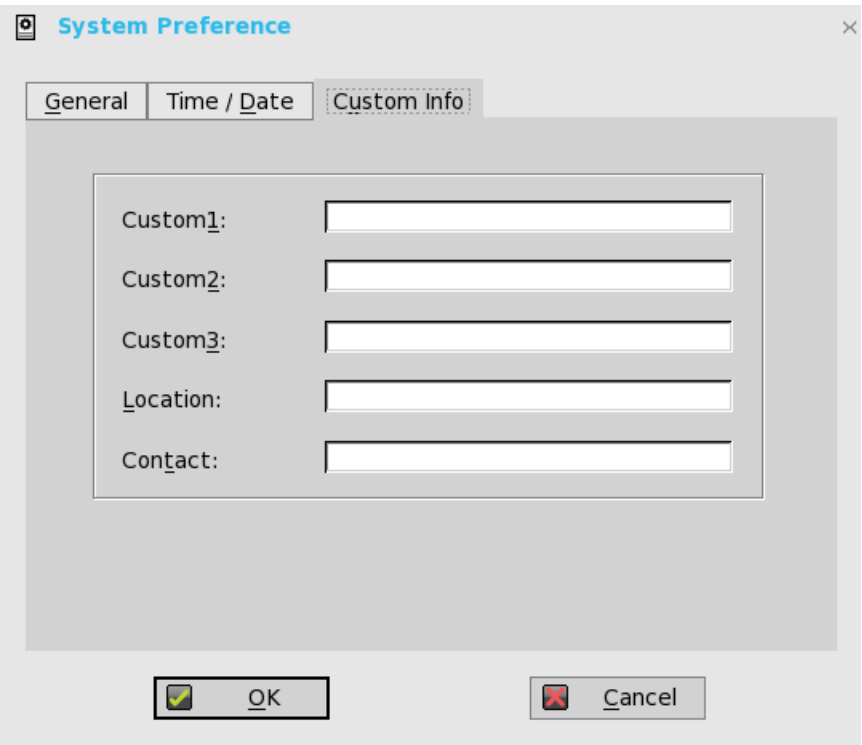
Setting the custom information

Use the **Custom Info** tab to enter configuration strings for use by WDM software. The configuration strings can contain information about the location, user, administrator, and so on.
To set the custom information:

1 From the desktop menu, click **System Setup**, and then click **System preferences**.

The **System preference** dialog box is displayed.

2 Click the **Custom Info** tab to enter configuration strings used by WDM software. The configuration strings can contain information about the location, user, administrator, and so on. Clicking **OK** transfers the custom field information you enter in the dialog box to the Windows registry. The information is then available to the WDM Client Manager. For more information on using Custom Fields and using WDM for remote administration and upgrading thin client software, see WDM documentation.



3 Click **OK** to save the settings.

Configuring the display settings

Use the **Display** dialog box to select the resolution and refresh rate for the monitor used with the thin client.

Configuring the display setup

This section is applicable to Wyse 5070 thin client. Use the **Display Setup** dialog box to configure the display settings for the connected monitors.
To configure the display setup:

1 From the desktop menu, click **System Setup**, and then click **Display**.

The **Display Setup** dialog box is displayed.

2 In the **Display Setup** dialog box, configure the following options:

- **Mirror mode**—Select the **Mirror mode** check box to enable all connected monitors to use the same display settings configured on the primary monitor.

  The following screen represents the Mirror mode configuration.

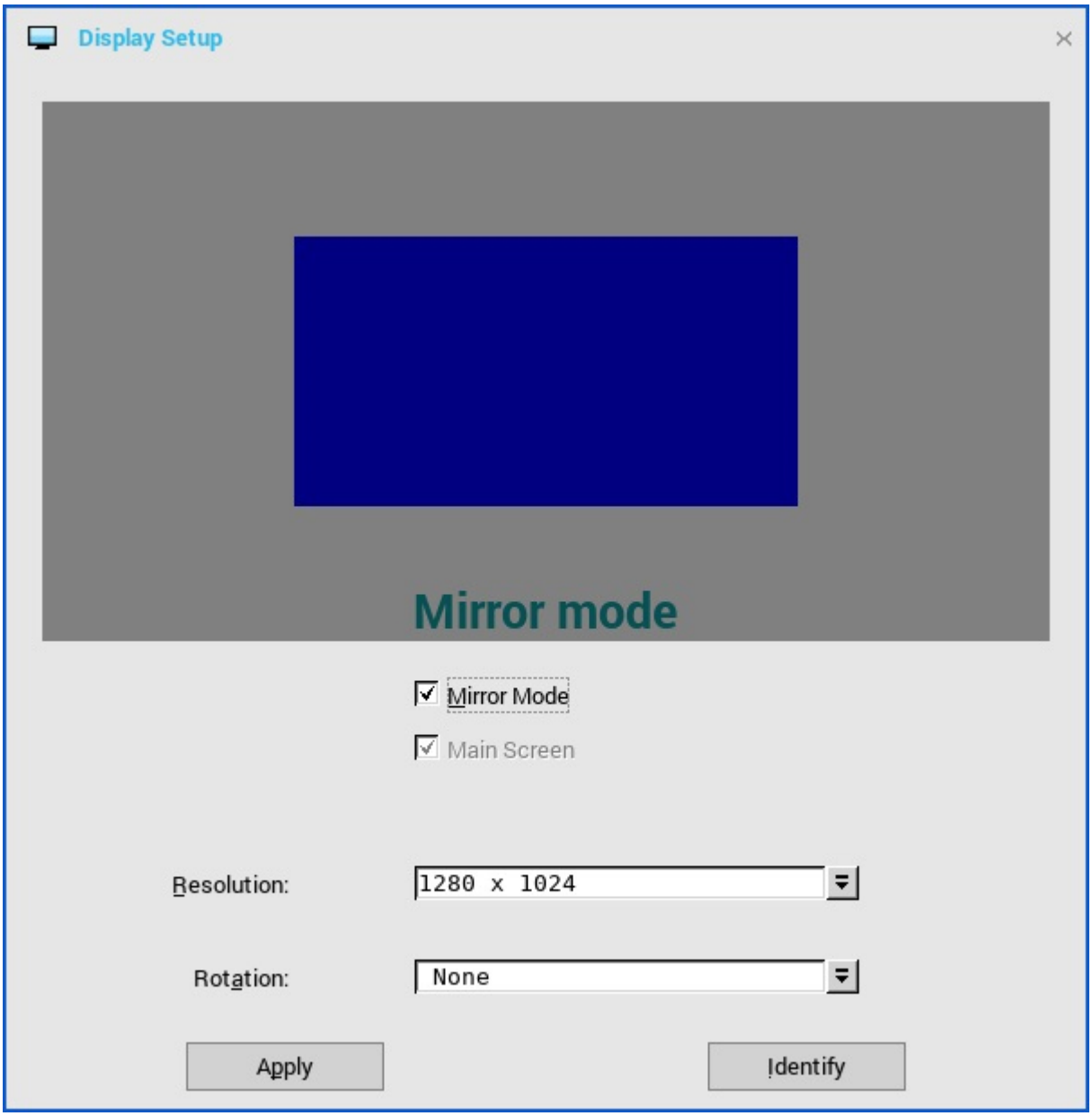


Figure 30. Display settings

If you clear the **Mirror mode** check box, the **Span Mode** is enabled. The following screen represents the span mode configuration.

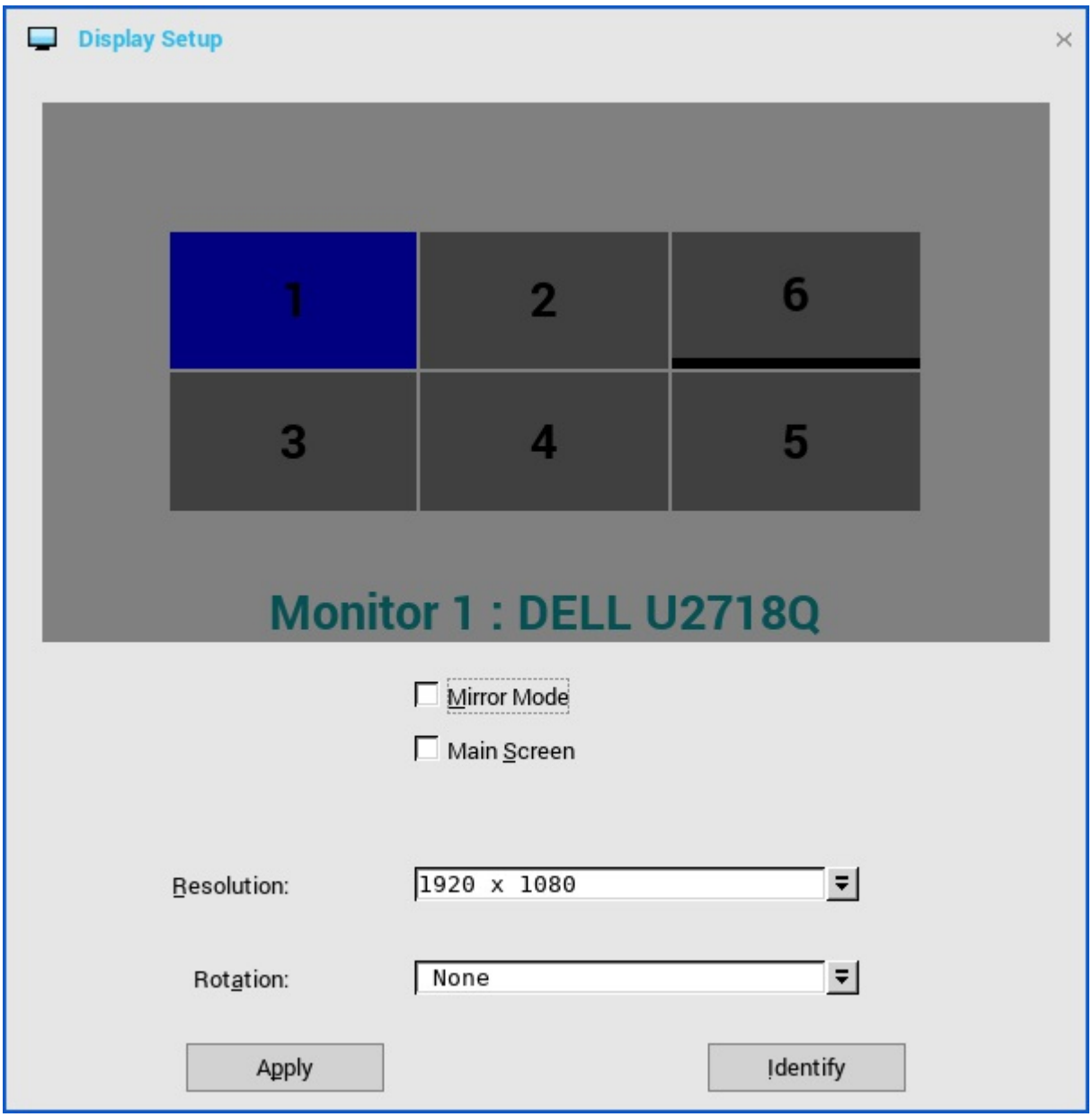


Figure 31. Display settings

Blocks displayed on the screen represent the number of monitor screens connected to the thin client. Each block represents a single monitor screen.

Every monitor contains a unique display order number and display configuration. You can move the blocks horizontally or vertically and construct the multi-display layout in mixed directions. To construct a new display layout, move the blocks to your preferred position, and click **Apply**. A new display layout is created. However, the system sets the block to its default position if the block is moved to an incorrect position.

NOTE: Wyse 5070 Extended thin client supports up to six monitors.

- **Main screen**—Select the **Main screen** check box to set the monitor as primary monitor or main screen. To set a monitor as main screen, click the monitor block, and select the **Main screen** check box. After you set the monitor as main screen, the monitor block is highlighted with an underline, and the **Main screen** option is disabled for that monitor block. The **Main screen** option is available for other monitor blocks.

NOTE: Main screen option is effective only in Span Mode and always disabled in Mirror Mode.

- **Resolution**—From the **Resolution** drop-down list, select a display resolution supported by your monitor.

  In **Mirror Mode**, the resolution list is derived from the intersection of resolutions in all connected monitors.

  In **Span Mode**, select a monitor block and change its resolution from the **Resolution** drop-down list.
- **Rotation**—From the **Rotation** drop-down list, select an option to rotate the monitor screen in different directions—**Left turn 90 degrees** or **Right turn 90 degrees**. By default, the option is set to **None**.

3 Click **Apply**.

The new display settings are applied, and you can view the modified display.

4 Click **OK** to confirm the new settings.

NOTE: Use the Identify option, to know the display order number of the connected monitors.

Hardware capability

This section describes the hardware capability for display.

Table 29. Port preferences

Model	Summary
Wyse 5070 thin client with Celeron processor	• On Wyse 5070 thin client without wireless module, the optional port can be used as second RJ-45, SFP, VGA, or second serial port. • On Wyse 5070 thin client with wireless module, the optional port cannot be used as second RJ-45 or SFP. • When monitor is connected on USB Type-C port, DisplayPort 2 becomes inactive.
Wyse 5070 thin client with Pentium processor	• On Wyse 5070 thin client without wireless module, the optional port can be used as second RJ-45, SFP, VGA, or second serial port. • On Wyse 5070 thin client with wireless module, the optional port cannot be used as second RJ-45 or SFP. • Back headset is disabled if front headphone is used. • When monitor is connected on USB Type-C port, DisplayPort 2 becomes inactive. • When VGA monitor is connected on VGA optional port, DisplayPort 3 becomes inactive.
Wyse 5070 Extended thin client	• On Wyse 5070 Extended thin client without wireless module, the optional port can be used as second RJ-45, SFP, or VGA. • On Wyse 5070 Extended thin client with wireless module, the optional port cannot be used as second RJ-45 or SFP. • Back headset is disabled if front headphone is used. • When monitor is connected on USB Type-C port, DisplayPort 2 becomes inactive. • When VGA monitor is connected on VGA optional port, DisplayPort 3 becomes inactive. • Power option is available on the first serial port. • PCIe slot is available.

Wyse 5070 thin client with Celeron processor

Table 30. Display matrix

Number of displays	Supported display resolution	
	4K resolution 3840 x 2160 @ 60 Hz	Non-4K resolution Up to 2560 x 1600 @ 60 Hz
One display	Yes	Yes
Two displays	Yes	Yes

Number of displays	Supported display resolution	
Three displays	No[1]	Yes[2]

[1]VGA port does not support 4K display. However, it supports a display with 1080p screen resolution.

[2]For non-4K displays, screen resolution up to 2560 x 1600 @ 60 Hz is supported on all ports except VGA. VGA port supports only 1080p resolution.

Table 31. Ports

Ports	DP1	DP2	VGA	USB Type-C
Monitor priority	1	2B[1]	3	2A[1]
4K display	Yes	Yes	No[2]	Yes
Non-4K display	Yes	Yes	Yes[2]	Yes

[1]DP2 and USB Type-C port are mutually exclusive with USB Type-C port taking higher priority.

[2]VGA port supports only 1080p resolution.

NOTE: 4K resolution @ 60 Hz on USB-C type port is tested using the Type-C to HDMI and DP adapters. Dell monitor S2718D with USB type-C port supports up to 2560 x 1440 resolution.

Wyse 5070 thin client with Pentium processor

Table 32. Display matrix

Number of displays	Supported display resolution	
	4K resolution 3840 x 2160 @ 60 Hz	Non-4K resolution Up to 2560 x 1600 @ 60 Hz
One display	Yes	Yes
Two displays	Yes	Yes
Three displays[1]	Yes	Yes

[1]Dell recommends that you configure a maximum of two displays with 4K resolution and the third display with non-4K resolution on DisplayPort 3 for optimized stability and performance. However, based on the maximum technical capability of Wyse 5070 thin client with Pentium processor, ThinOS supports a maximum of three 4K displays.

Table 33. Ports

Ports	DP1	DP2	DP3	VGA	USB Type-C
Monitor priority	1	2B[1]	3B[2]	3A[2]	2A[1]
4K display	Yes	Yes	Yes	No[3]	Yes
Non-4K display	Yes	Yes	Yes	Yes[3]	Yes

[1]DP2 and USB Type-C port are mutually exclusive with USB Type-C port taking higher priority.

[2]DP3 and VGA port are mutually exclusive with VGA port taking higher priority.

[3]VGA port supports only 1080p resolution.

NOTE: 4K resolution @ 60 Hz on USB-C type port is tested using the Type-C to HDMI and DP adapters. Dell monitor S2718D with USB type-C port supports up to 2560 x 1440 resolution.

Wyse 5070 Extended thin client with AMD GPU

Table 34. Wyse 5070 Extended thin client with AMD GPU

Number of displays	Supported display resolution	
	4K resolution 3840 x 2160 @ 60 Hz	Non-4K resolution Up to 2560 x 1600 @ 60 Hz
One display	Yes	Yes
Two displays	Yes	Yes
Three displays[1]	Yes	Yes
Four displays[2]	Yes	Yes
Five displays[2]	Yes	Yes
Six displays[2]	Yes[2]	Yes

[1]For three displays, Dell recommends that you configure the first two 4K displays on the main board (DP1~DP3), and the third 4K display on AMD GPU card.

[2]Dell recommends that you configure a maximum of four displays with 4K resolution and the remaining displays with non-4K resolution on DisplayPort 3 and DisplayPort 6 for optimized stability and performance. However, based on the maximum technical capability of Wyse 5070 Extended thin client, ThinOS supports a maximum of six 4K displays.

NOTE: Best practice—To achieve maximum 4K display output, Dell recommends setting up 1080p on the DisplayPort 3, with rest of the monitors in 4K resolution to optimize performance.

Table 35. Ports

Ports	DP1	DP2	DP3	VGA	USB Type-C	mDP4	mDP5	DP6
Monitor priority	1	2B[1]	3B[2]	3A[2]	2A[1]	4	5	6
4K display	Yes	Yes	Yes	No[3]	Yes	Yes	Yes	Yes
Non-4K display	Yes	Yes	Yes	Yes[3]	Yes	Yes	Yes	Yes

[1]DP2 and USB Type-C port are mutually exclusive with USB Type-C port taking higher priority.

[2]DP3 and VGA port are mutually exclusive with VGA port taking higher priority.

[3]VGA port supports only 1080p resolution.

NOTE: 4K resolution @ 60 Hz on USB-C type port is tested using the Type-C to HDMI and DP adapters. Dell monitor S2718D with USB Type-C port supports up to 2560 x 1440 resolution.

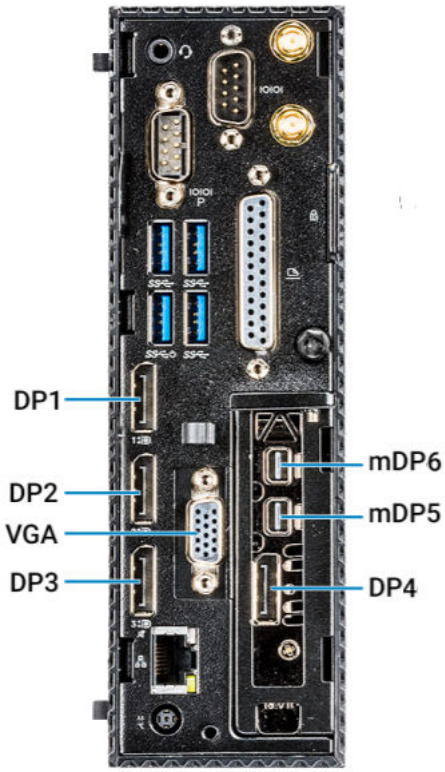


Figure 32. Ports on Wyse 5070 Extended thin client

Monitor priority—The following order defines the monitor priority set on ThinOS for Wyse 5070 Extended thin client:

- DP1 > DP2 > DP3 > DP4 > mDP5 > mDP6
- DP1 > USB Type-C > DP3 > DP4 > mDP5 > mDP6
- DP1 > DP2 > VGA > DP4 > mDP5 > mDP6
- DP1 > USB Type-C > VGA > DP4 > mDP5 > mDP6

NOTE: Monitor cable hot plug—Screen layout settings are changed based on supported monitor resolution and the port to which the monitor is plugged in.

NOTE: Earlier in ThinOS zero theme, the Display Setup window was aligned with left-hand setting panel. In current scenario, the Display Setup window is positioned to center of the screen regardless of Classic/Zero mode. This enhancement is made to easily configure the display setup along with the confirmation window.

Known issues

- Hot plugging a monitor may result in a black screen in the VDI connected session. To recover the session screen, you must power off the monitor, and then power on the monitor. This issue will be resolved in the next release.
- Hot plugging a monitor during VDI connection or display setup configuration may result in unexpected issues, such as terminal freeze or display layout change. This issue will be resolved in the next release.

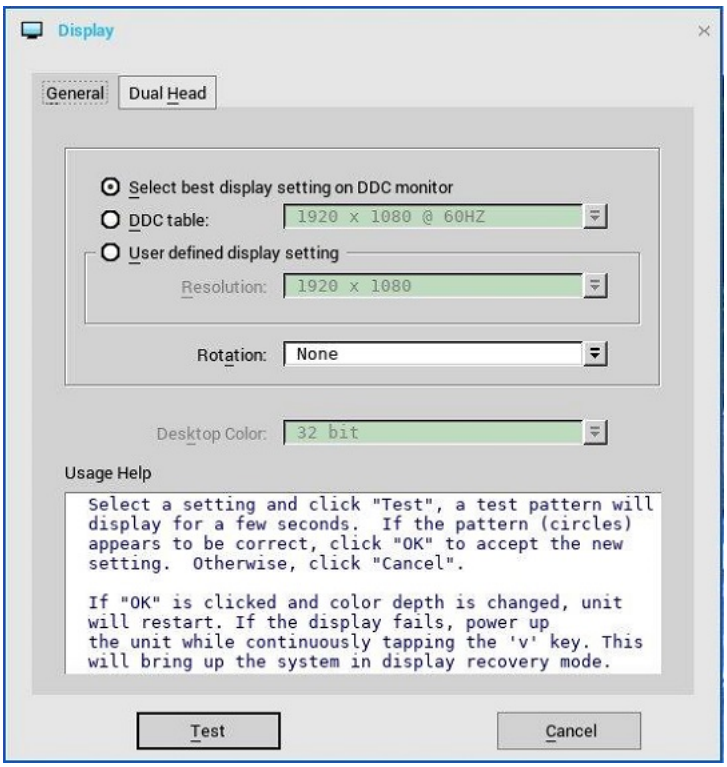
Configuring the general display settings

This section is not applicable to Wyse 5070 thin client.

To configure the general display settings:

1 From the desktop menu, click **System Setup**, and then click **Display**.
The **Display** dialog box is displayed.

2 Click the **General** tab, and use the following guidelines:



a **Select best display setting on DDC monitor**—If the monitor is VESA DDC2B (Display Data Channel) compatible, selecting this option allows the thin client to automatically select the best resolution and refresh rate.

If your monitor is not DDC compatible, then **Monitor does not support Plug and Play** message is displayed. Click **OK** to acknowledge the message and remove it from the screen.

b **DDC table**—If the monitor is VESA DDC2B (Display Data Channel) compatible, selection of this option allows you to select the resolution and refresh rate you want from the list.

c **User defined display setting**—Select this option and select the resolution and refresh rate supported by your monitor. All combinations are allowed.

Resolutions include:

640 x 480 (Display resolution not supported on Wyse 3020 thin client with ThinOS—T10D)

800 x 600 (Display resolution not supported on Wyse 3020 thin client with ThinOS—T10D)

1024 x 768

1152 x 864

1280 x 720

1280 x 768 (Display resolution not supported on Wyse 3010 thin client with ThinOS—T10)

1280 x 1024

1360 x 768 (Display resolution not supported on Wyse 3010 thin client with ThinOS and Wyse 3020 thin client with ThinOS —T class)

1366 x 768

1368 x 768 (Display resolution not supported on Wyse 3010 thin client with ThinOS and Wyse 3020 thin client with ThinOS —T class)

1400 x 1050

1440 x 900

1600 x 900

1600 x 1200

1680 x 1050

1920 x 1080

1920 x 1200

1920 x 1440

2560 x 1080

2560 x 1440

2560 x 1600

3440 x 1440 (Display resolution supported on Wyse 3030 LT, 5010 and 5060 thin clients)

3840 x 2160

d **Rotation**—Select a rotation option. The available options are **None**, **Left turn 90 degrees**, or **Right turn 90 degrees**.

e **Desktop Color**—Only 32-bit is permitted. This value is selected by default. From ThinOS version 8.6 release, only 32-bit desktop color is supported on Wyse 3010 (T10) and 3020 (T10D) thin clients.

f **Usage Help**—This section contains brief instructions for using the **Display** dialog box and running the test. No operator entry can be made in this box.

Make note of the instructions in the area, regarding v-key reset usage if there is display failure.

3 Click **OK** to save the settings.

For information about the tested monitors, see the latest Dell Wyse ThinOS Release Notes.

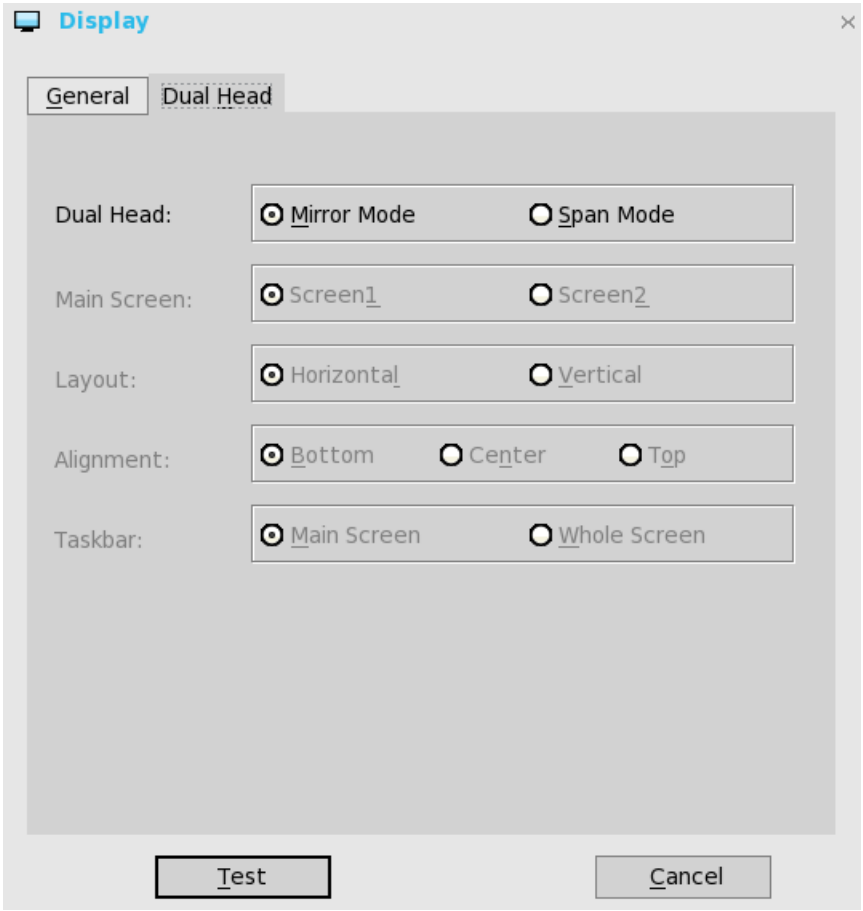
Configuring the Dual Head display settings

This section is not applicable to Wyse 5070 thin client. To configure the Dual Head display settings:

1 From the desktop menu, click **System Setup**, and then click **Display**.

The **Display** dialog box is displayed.

2 Click **Dual Head** tab, and use the following guidelines:



This feature is applicable for supported Dual Monitor capable thin clients Only.

a **Dual Head**—Select **Mirror Mode** to have the two monitors work in a matching state, or **Span Mode** to have the two monitors work separately second is extended from first.

b **Main Screen**—Select which of the two monitors you want to be the main screen (**Screen1** or **Screen2**). The other screen is extended from the main screen.

The other screen is extended from the main screen. When using a DVI to DVI/VGA splitter with VGA and DVI monitors at the same time, the VGA monitor will be the primary monitor.

c **Layout**—Select how you want the two monitors to be oriented to each other.

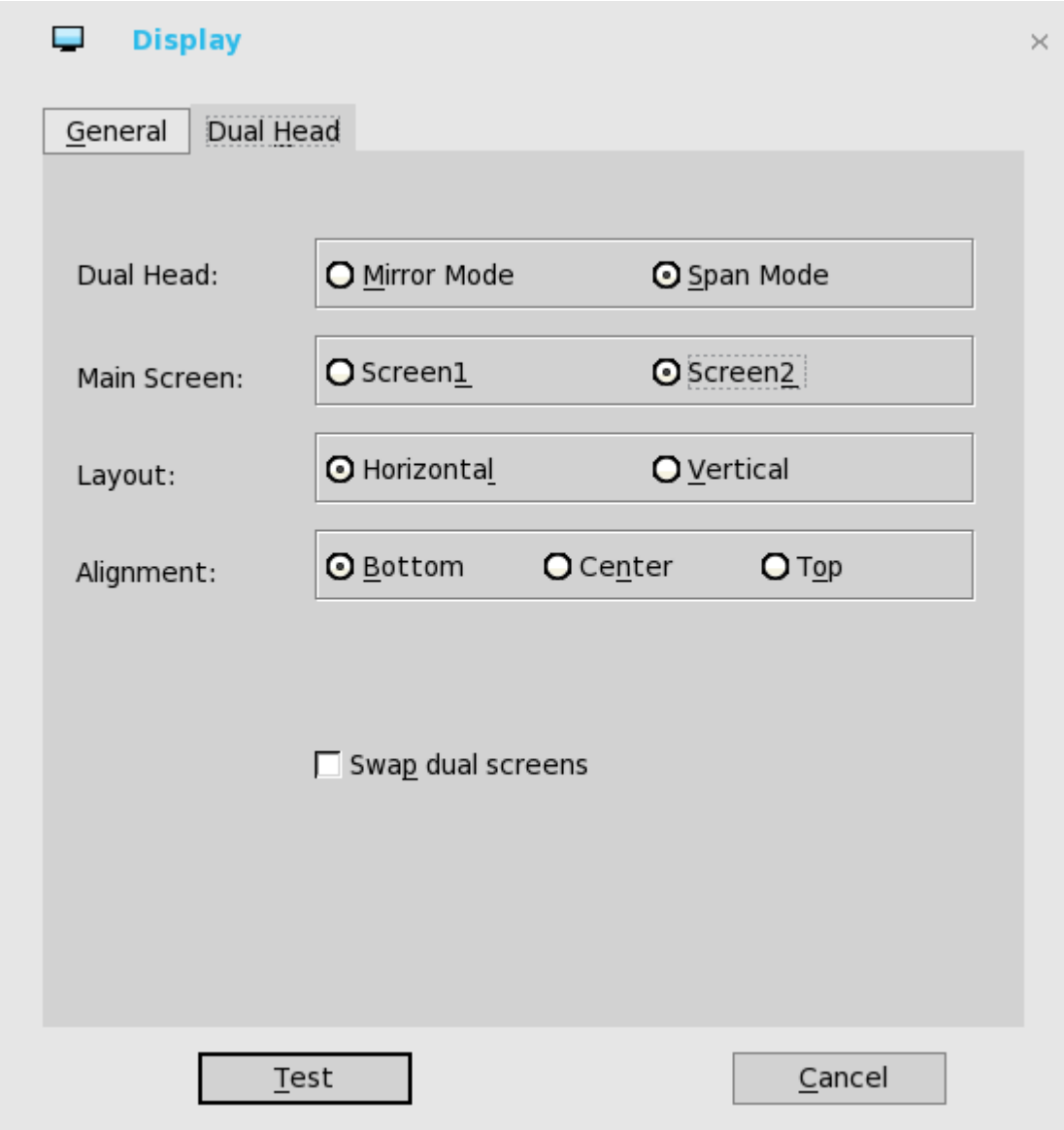
Horizontal — where you move between the monitors from the left and right of the screens.

Vertical— where you move between the monitors from the top and bottom of the screens.

d **Alignment**— Select how you want the monitors to be aligned **Bottom**, **Center**, or **Top**.

Bottom means screens are bottom-aligned in a horizontal orientation; Center means screens are center-aligned; Top means screens are top-aligned in a horizontal orientation.

e **Taskbar (Classic Desktop Only)**—Select under which screen you want the Taskbar to appear **Whole Screen** or **Main Screen**



For Swap dual screens, when you set Main Screen to Screen2, an additional check box is displayed at the bottom of the tab that allows you to swap dual screens. If you clear the check box, the Screen1 is usually the left one or the top one in dual display. When you set Main Screen to Screen2, the main screen is changed to the right screen or bottom screen. If you select the **swap dual screens** check box, you are able to set Main Screen to Screen2, but still have it at the left side or the top side, which is considered more user friendly.

Changing Display Settings Dynamically

From ThinOS 8.4 release, after you change the display settings, the changes will take effect immediately without a system restart.

Single mode user scenario

Go to **System Setup** > **Display** > **General**, and do the following:

1 Change resolution from DDC table or User defined display settings.

2 Change rotation setting from User defined display settings.

When the display settings are changed, the modified settings are applied to the active sessions dynamically. But some of the active sessions disconnect and then reconnect. For example, RDP for Win7 session.

Dual Head user scenario

Go to **System Setup** > **Display** > **Dual Head** and change the settings.

Go to **System Setup** > **Display** > **General**, and do the following:

1 Change resolution from DDC table or User defined display settings.
2 Change rotation setting from User defined display settings.

When the display settings are changed during active sessions, the active sessions do not resize dynamically in the following situations:

- Seamless sessions
- For dual head mode, including:
  - Change from single mode to dual head.
  - Change from dual head to single mode.
  - Change display setting in dual head mode.

To apply the settings, disconnect the session and reconnect it.

Vertical Synchronization

Vertical Synchronization or V-Sync enables the ThinOS client to synchronize the frame rate of a video with the monitor refresh rate to avoid screen tearing. Screen tearing occurs when the graphic processor delivers display frames more than your monitor can process. As a result, the image appears to be cut in half. Enabling VSync synchronizes the output video of the graphics card to the refresh rate of the monitor.

In ThinOS version 8.6, V-Sync is enabled by default. Vertical Synchronization feature is not supported on Wyse 3010, 3020, and 3030 LT thin clients.

Limitation

The ThinOS client desktop background flashes for a second when the RDP session desktop is connected with H.264- AVC444 enabled.

Configuring the peripherals settings

The **Peripherals** dialog box enables you to configure the settings for the Keyboard, Mouse, Audio, Serial, Camera, Touch Screen, and Bluetooth.

Configuring the keyboard settings

To configure the keyboard settings:

1 From the desktop menu, click **System Setup**, and then click **Peripherals**.
The **Peripherals** dialog box is displayed.
2 Click the **Keyboard** tab and set the Character Set, Keyboard Layout, Delay Before Repeat and Repeat Rate parameters. The following table explains the keyboard parameters.

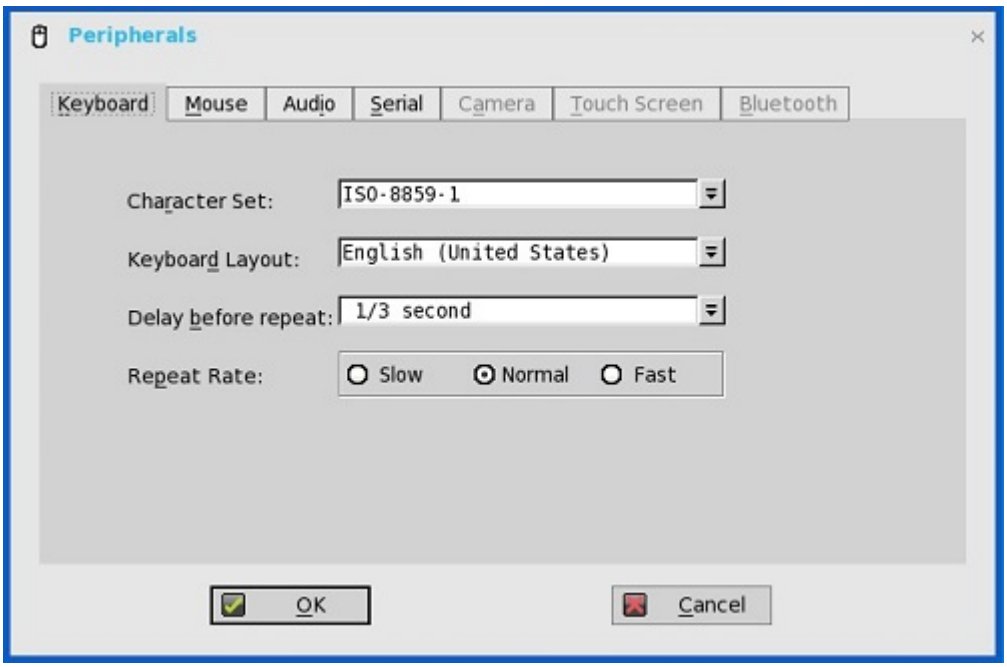


Table 36. Keyboard settings

Parameter	Description
Character Set	Specifies the character set. Each character is represented by a number. The ASCII character set, for example, uses the numbers 0 through 127 to represent all English characters and special control characters. European ISO character sets are similar to ASCII, but they contain additional characters for European languages.
Keyboard Layout	Presently the keyboard languages listed in the **Keyboard layout** drop-down list are supported. The default value is **English (United States)**.
Delay Before Repeat	Specifies the repeat parameters for held-down key. Select the Delay before repeat value as either **1/5 second**, **1/4 second**, **1/3 second**, **1/2 second**, **3/4 second**, **1 second**, **2 seconds**, or **No Repeat**. The default is **1/3 second**.
Repeat Rate	Select **Slow**, **Normal**, or **Fast**. The default value is Medium.

3 Click **OK** to save the settings.

Configuring the mouse settings

To configure the mouse settings:

1 From the desktop menu, click **System Setup**, and then click **Peripherals**.
The **Peripherals** dialog box is displayed.
2 Click the **Mouse** tab to select the mouse speed and mouse orientation.
3 Select the **Swap left and right mouse buttons** check box to swap mouse buttons for left-handed operations.
4 Select the **Reverse mouse wheel scroll direction** check box to invert the direction of the mouse scroll wheel.
5 Select the **Enable big mouse pointer** check box to increase the size of the local mouse pointer by two times.

NOTE: This option affects ThinOS local mouse pointer

6 Click **OK** to save the settings.

Configuring the audio settings

To configure the audio settings:

1 From the desktop menu, click **System Setup**, and then click **Peripherals**.
The **Peripherals** dialog box is displayed.

2 Click the **Audio** tab to select the volume settings for connected devices.

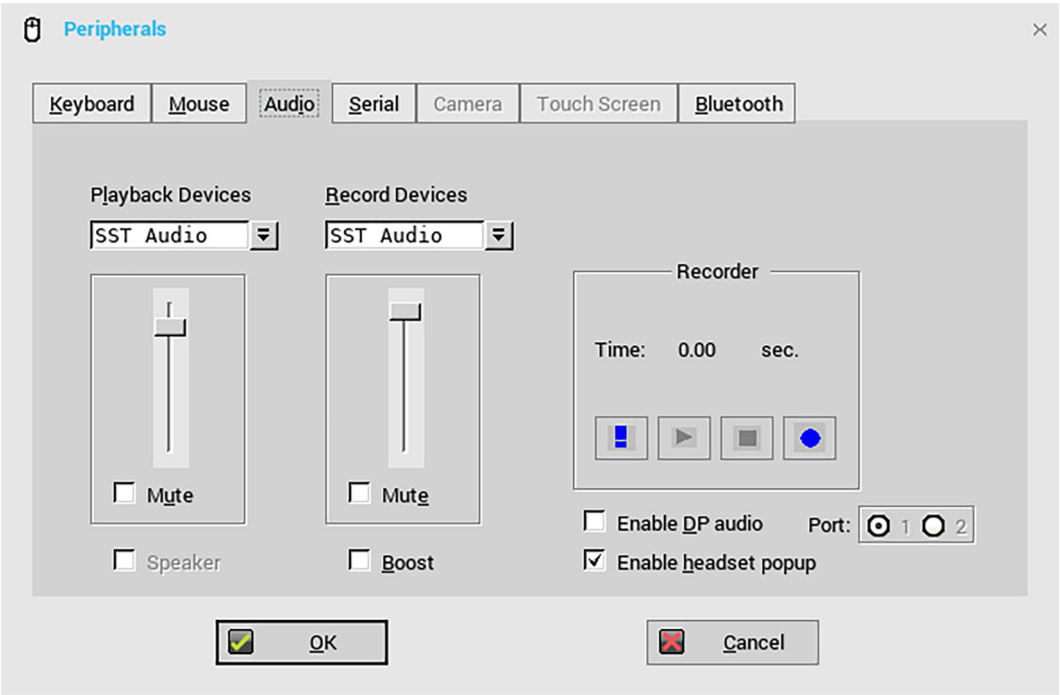


Figure 33. Audio tab

a Click the **Playback Devices** tab to select the type of the audio from the drop-down menu.
   - If the HD audio and DP audio options are available in playback devices, the thin client determines the priority between HD audio and DP audio when the DP cable is connected. In this scenario, select the playback device type that is based on your preference, and click **OK**. The playback device which you select takes the priority.
   - Use **slider** to control the volume settings for the playback devices.
   - Select the check box to mute.

b Click the **Recorded Devices** tab to select the type of the record from the drop-down list.
   - Use **slider** to control the volume settings for the record devices.
   - Select the check box to mute.

c Click **Play** to play the audio.

d Use the **Recorder** tab and do the following:
   - Collect information about the speaker and microphone being used.
   - Examine the performance of the speaker and microphone being used.

   For example, the connected USB headsets are displayed in the drop-down. Select the **HD audio** option for analog earphone use, the **Speaker** check box to enable the internal speaker, and the **Boost** check box for audio enhancement.

e Select the **Speaker** check box to connect the speaker.

f Select the **Boost** check box to boost the connected devices.

g Select the **Enable DP audio** check box to enable the DisplayPort audio function on your thin client. You must click either **Port 1** or **Port 2** to select your desired DisplayPort.

h Select the **Enable headset popup** check box if you want the headset popup dialog box to be displayed when you connect an analog headset to the front headset jack.

In the headset popup dialog box, select any one of the following audio devices:

- Headset
- Headphone
- Speaker

NOTE: To disable the headset popup dialog box, select the Not show again check box, and click OK. You can also use an INI parameter to enable or disable the headset popup dialog box. For more information about INI parameters, see the latest *Dell Wyse ThinOS INI Reference Guide*.

3 Click **OK** to save your changes.

Using DisplayPort audio

Use the DisplayPort (DP) interface to connect your thin clients to the display devices. The interface can include audio signals in the same cable as the video signals. To enable the DisplayPort audio, ensure that you set up the following components:

- A thin client that supports DisplayPort audio and/or dual mode with audio.
- A display device, such as monitor, that supports audio playback in ICA, RDP, Blast, or the PCoIP sessions.
- An analog audio device or a monitor integrated speaker.

To enable the DisplayPort audio on ThinOS:

1 Set up a monitor with DP audio support.
2 Connect the ThinOS client to monitor using DP cable.
3 Plug the analog headset into the monitor DP audio interface.
4 On the ThinOS desktop, click **System Setup** > **Peripherals** > **Audio** > **Playback devices**, and select the **Enable DP audio** check box.
5 In the **Audio** tab, select either **Port 1** or **Port 2**.
6 Start either an RDP, ICA, PCoIP, or Blast session.
7 Play a video, and check the audio output using the analog headset.

NOTE:

- ThinOS supports only the DisplayPort audio playback. Audio recording using DisplayPort is not supported.
- DisplayPort audio is supported only on Wyse 3030 LT thin client, Wyse 5060 thin client, and Wyse 5070 thin client.
- By default, the DP audio is disabled on Wyse 3040 thin client. If you update ThinOS to a newer version, the default setting for DP audio is not set automatically. You must reset the thin client to factory default settings to load the default settings for DP audio. However, thin clients shipped with the latest version of ThinOS are already configured with default settings.

  If you enable the DP audio, and select the DP audio as the playback device, the following issues are observed:

  – A black screen is displayed for a few seconds during the system reboot.
  – DP audio stops responding, and a black screen is displayed when you play an audio file.

Using PulseAudio

PulseAudio is a sound server that runs on ThinOS to deliver audio and manage audio devices. PulseAudio supports multiple audio devices when using real-time audio applications in ICA, RTME, and other VDI sessions.

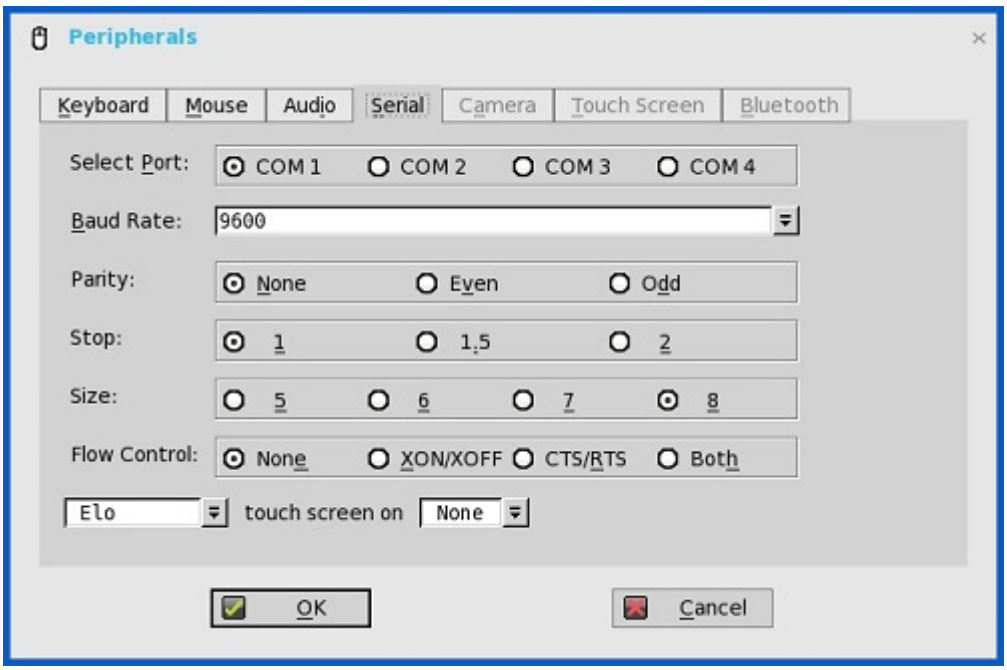
NOTE: You cannot disable the PulseAudio feature on your ThinOS client.

Configuring the serial settings

To configure the Serial settings:

1 From the desktop menu, click **System Setup**, and then click **Peripherals**.
The **Peripherals** dialog box is displayed.

2 Click the **Serial** tab and do the following:



a **Select Port**—Click the button to select the Port. Default is **COM 1**.
b **Baud Rate**—Select the Baud Rate from the drop-down list. Default is **9600**.
c **Parity**—Click the button to select the Parity.
d **Stop**—Click the button to select the stop bits **1, 1.5, 2**. Default value is **1**.
e **Size**—Click the button to select the Character size **5**, **6**, **7**, or **8** bits. **Default is 8.**
f **Flow Control**—Click the button to select Flow Control: Either **None**, **XON/XOFF**, **CTS/RTS**, or **Both** can be selected. Default is None.
g **Serial Touch Screen selections**—Select the required touch screen from the drop-down list. Available options are ELO, MicroTouch and FastPoint.
h **Touch Screen on**—Select the required serial port (COM port) or **None** from the drop-down list.

3 Click **OK** to save the settings.

ThinOS enables you to disable the onboard serial port on the following platforms:

- Wyse 5070 Thin Client with Celeron processor
- Wyse 5070 Thin Client with Pentium processor
- Wyse 5070 Extended Thin Client with Pentium processor

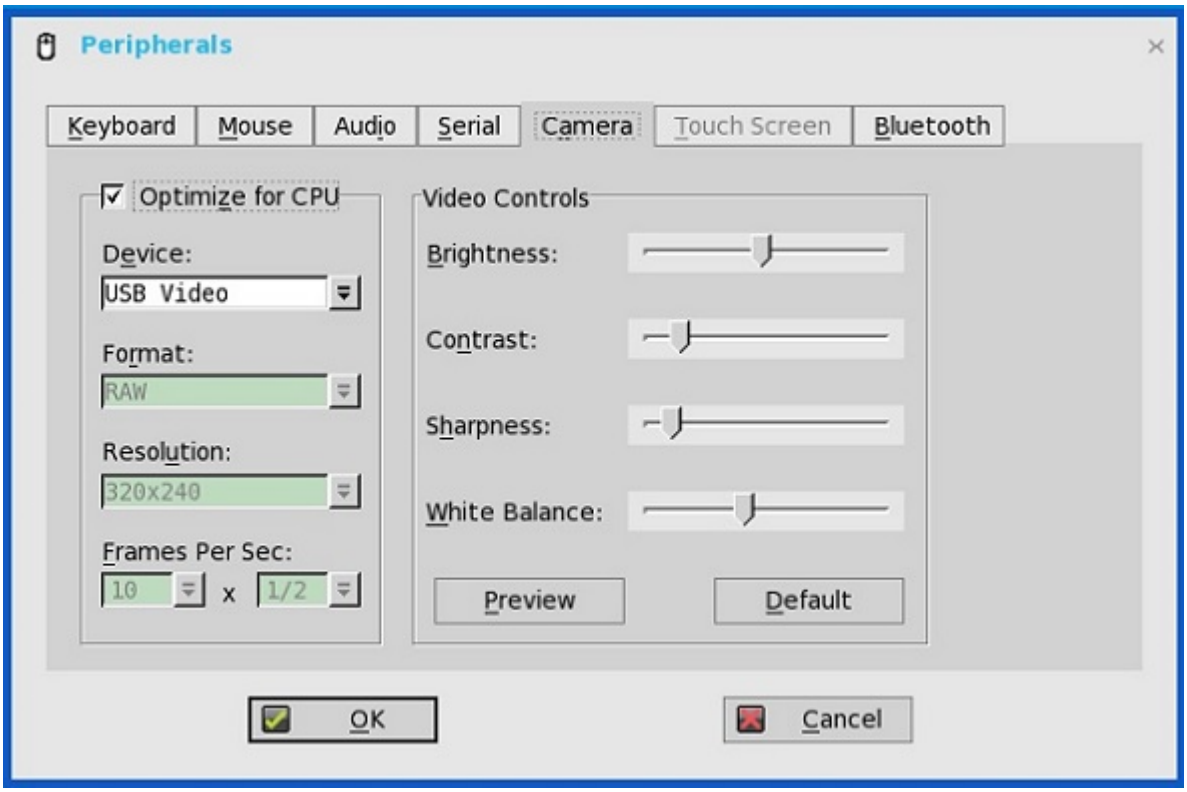
To disable or enable the onboard serial port, use the INI parameter *Device=SerialDisable={yes, no}*. The default value is no. This option does not affect the USB serial devices. The value that you specify is saved into NVRAM and a system reboot is required for changes to take effect.

After the onboard port is disabled, all the port values—COM1, COM2, COM3, and COM4—are available for USB serial device mapping. You can view the ThinOS event log to know the local serial port name that is used when a USB serial device is attached to the thin client.

Configuring the camera settings

Use the **Camera** tab to interface with cameras that are locally connected to the thin client (USB) and supported by a UVC driver. When using the HDX RealTime webcam feature of Citrix Virtual Apps and Desktops, you can control options such as maximum resolution and frames per second (10 FPS is recommended).

By default, the format of USB camera is set to RAW.



NOTE:
You can optimize performance and modify the frame rate per second, if the **Optimize for CPU** check box is not selected—supported values include 1/1, 1/2, 1/3, 1/4, 1/5, and 1/6– directly from the thin client (if the webcam supports Universal Video Driver).

Also, this feature is CPU intensive and is recommended for high performance products.

Configuring the touch screen settings

Use the **Touch Screen** tab to configure touch screens that are connected to the thin client. The tab is available (not grayed out) when the thin client detects that a touch screen is attached through a USB port or a serial port, and the setup or calibration has not been performed. The Touch Setup window prompts you to touch two circles on the screen to make the necessary calibration adjustment. The adjusted calibrated values are saved in the local terminal NVRAM until the system is reset to factory default, or another type of touch monitor is connected.

NOTE: From ThinOS version 8.5, the ELO touch screen does not work in certain scenarios. For more information, see the latest Dell Wyse ThinOS Release Notes.

Configuring the Bluetooth settings

The Bluetooth feature helps you to connect your thin client with Bluetooth enabled devices such as headsets and mouses.

ThinOS supports both Intel wireless chipset 7260 and 7265.

ThinOS supports Intel Dual Band Wireless AC 9560 chipset on Wyse 5070 thin client.

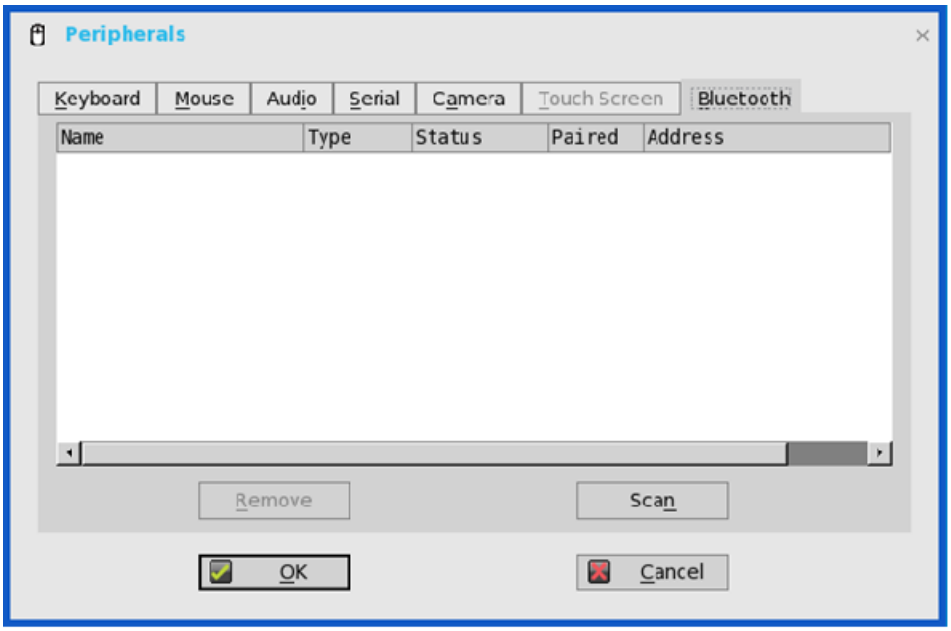
For mouse, keyboard, and headset, ThinOS supports both Bluetooth 3.0 and 4.0.

Bluetooth 4.0 supports Classic and Bluetooth Low Energy (BLE). However, Bluetooth Alternate MAC/PHY (AMP) is not supported.

NOTE: From ThinOS v8.4.1, the Bluetooth feature is supported on Wyse 3040 thin client with ThinOS and Wyse 3040 thin client with PCoIP.

To configure the Bluetooth settings:

1 From the desktop menu, click **System Setup**, and then click **Peripherals**.
The **Peripherals** dialog box is displayed.



2 Click the **Bluetooth** tab, and use the following guidelines:
Bluetooth enabled devices, such as headsets and mouses that are available in the thin client environment are listed in the **Bluetooth** page. The following attributes are displayed in the list:

- **Name**—Specifies the name of the Bluetooth enabled device.
- **Type**—Specifies the type of the Bluetooth enabled devices, such as headsets, mouses, and keyboards.
  Both **Human Interface Devices (HID)** and **Headset** Bluetooth devices are supported.
  - **HID** type
    - HID includes mouse and keyboard.
    - The maximum number of HIDs that can be connected is seven.
  - **Headset** type
    - The Bluetooth headset is supported in this release.
    - The maximum number of Bluetooth headsets that can be connected is one.

IMPORTANT: Other types of Bluetooth devices are not scanned and supported. Call level audio quality on headsets is supported. However, multimedia are still not supported.

- **Status**—The **Bluetooth** page has two columns, namely, **Status** and **Paired**.

  Table 37. Bluetooth status

Attribute	Value	Summary
Status	Connected	The Bluetooth device is connected to the ThinOS device. It is ready to be used.
	Connecting	The Bluetooth device is connecting to the ThinOS device.
	Disconnected	The Bluetooth device is not connected to the ThinOS device.
Paired	Yes	The Bluetooth device is paired with the ThinOS device.
	No	The Bluetooth device is not paired with the ThinOS device.

- **Address**—Displays the address of the Bluetooth device connected to your thin client.

The following are the user scenarios and corresponding Bluetooth statuses displayed on the Bluetooth page:

Table 38. User scenario

User scenario	Status
Device turned off	Disconnected | Paired
Device turned on	Connected | Paired
Device disconnected from ThinOS	Disconnected | Not Paired

- **Scan**—All Bluetooth devices enter into **Page Scan** mode. Different Bluetooth devices enter into the Page Scan mode at different instances such as when a specific button is pressed three times or a specific button is pressed and held until the LED turns blue.
- **Connect**—Select a particular Bluetooth enabled device, and click **Connect** to connect the selected device to the thin client. If the Bluetooth device is connected successfully, the status is displayed as **Connected** in the **Bluetooth** window.
- **Remove**—Select a particular Bluetooth device, and click **Remove** to disconnect and remove the device from the list.
- **Auto Connect function**—The Auto Connect function is designed for HIDs.
  - ThinOS has no HIDs connected such as USB or Bluetooth HIDs.
  - The Bluetooth HIDs are configured as Page Scan mode.

  When you start the ThinOS client, the Bluetooth HIDs can connect to ThinOS automatically without scanning or pairing operations. The Bluetooth HIDs automatically reconnect after you restart the ThinOS client.
- **Reconnect function**—The Reconnect function is designed for HIDs and headsets.

  When you restart the system with the Bluetooth device (HID/headset) that is already paired and connected, the Bluetooth device automatically reconnects within a few seconds.

  For example, you can hover the Bluetooth mouse, and then click a few times for the Bluetooth mouse to reconnect successfully. The Bluetooth headset reconnects automatically, but might require you to manually close or reopen the device on certain occasions.

To know about the certified devices and known issues, see the latest *Dell Wyse ThinOS release notes* at www.dell.com/support.

USB support

USB port—Wyse 7010 with ThinOS (Z10D) supports two USB 3.0 ports. USB 3.0 is compatible with USB 2.0. When USB 2.0 device is connected to 3.0 ports, the behavior of the device remains unaltered. For USB 3.0 device to connect to 3.0 ports, the device type should be of 5 Gbps. All types of USB devices work when connected to USB 3.0 port.

USB hard disk—Do not plug in the USB hard disk with 10 or more drives, or do not plug in more than 10 USB keys into ThinOS client. ThinOS does not detect the USB disk with 10 or more drives.

Known issue—Camera preview has some known issue.

Support for USB Type-C

Wyse 5070 thin client supports the USB Type-C port.

- The USB 3.1 Type-C connector can be used to perform the following activities:
  - Transfer data by using USB mass storage
  - Connect monitors

    NOTE: If you use USB Type-C, one monitor capability is reduced from rear panel, and DP2 is disabled.
  - Charge smartphones
  - Connect USB 2.0, 3.0, and 3.1 compatible devices.
- The USB 3.1 Type-C cannot be used for the following:
  - Thunderbolt, HDMI, and MHL alt modes
  - Docking stations
  - Powering a thin client
- Limitation—In Wyse 5070 thin client, XHCI is used for all types of USB devices. The transmission speed gap between USB 3.0 and USB Type-C is not significant.

Configuring the printer settings

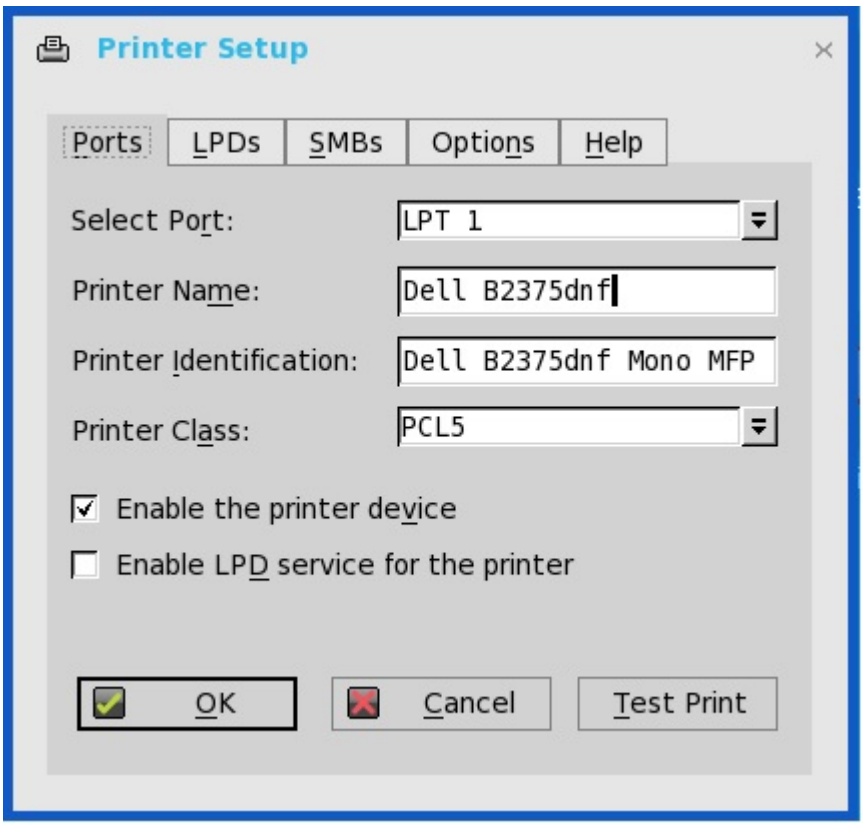
Use the **Printer Setup** dialog box to configure network printers and local printers that are connected to the thin client. Through its USB ports, a thin client can support multiple printers. If more than one printer is to be used and another port is not available on your thin client and the port that is to be used must be shared with a USB modem converter, connect a USB hub to the port.

Configuring the ports settings

To configure the ports settings:

1 From the desktop menu, click **System Setup**, and then click **Printer**.
The **Printer Setup** dialog box is displayed.

2 Click the **Ports** tab, and use the following guidelines:



a **Select Port**— Select the port you want from the list. **LPT1** or **LPT2** selects the connection to a direct-connected USB printer.

b **Printer Name** — (Required) Enter name you want displayed in your list of printers.

most USB direct-connected printers report/fill in their printer name automatically.

> **NOTE: If Enable LPD service for the printer is selected, the printer name becomes the queue name for other clients using LPR to print to this printer.**

c **Printer Identification** — Enter the type or model of the printer in the exact text of the Windows printer driver name—including capitalizations and spaces, most USB direct-connected printers report/fill in their printer identifications automatically.

This entry must be either the device driver name for the printer under the Microsoft Windows system, or a key to map to the device driver. If not specified, the name will be defaulted to the printer-supplied identification for standard direct-connected USB printers or **Generic / Text Only** for non-USB connected printers upon connection to Windows hosts. The driver name mapping takes place either through a printer-mapping file read by the system as part of the global profile (wnos.ini) or by MetaFrame servers through the MetaFrame printer configuration file (\winnt\system32\wtsprnt.inf).

> **NOTE: The maximum characters allowed in the Printer Identification field is 31. If your printer driver string is more than 31 characters (including space), you can create a txt file (printer.txt) and upload to your file server. Edit the txt file and type the content, such as `"HP Color" = "HP Color LaserJet CM1312 MFP PCL6 Class Driver"`. Add the command line `printermap=printer.txt` to your wnos.ini file. Now, you can type `"HP Color"` in the Printer Identification field instead of the full driver string.**

d **Printer Class**— This is optional. Select the printer class from the list **PCL5**, **PS**, or **TXT** or **PCL4.**

e **Enable the printer device** — Select this option to enable the directly-connected printer. It enables the device to display on the remote host.

f **Enable LPD service for the printer** — Select this to make the thin client an LPD (Line Printer Daemon) network print server for LPR printing requests from the network.

> **NOTE:**
>
> If the thin client is to be used as an LPD printer server, DHCP must not be used and a static IP address must be assigned to the client, see Configuring the Network Settings.

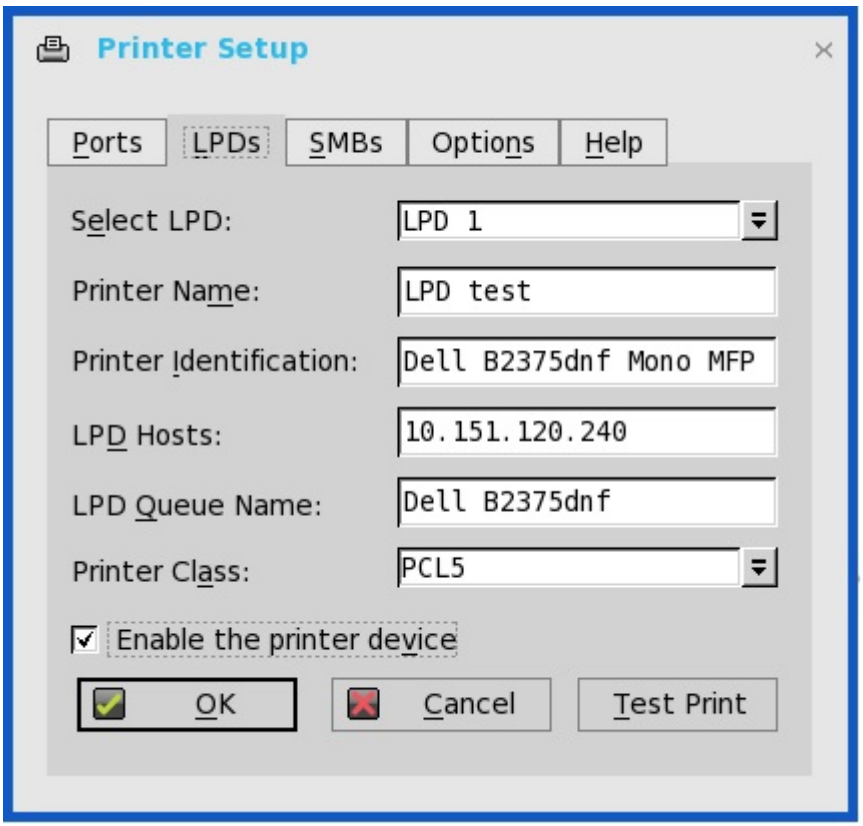
3 Click **OK** to save the settings.

Configuring the LPDs settings

To configure the LPDs settings:

1 From the desktop menu, click **System Setup**, and then click **Printer**.
The **Printer Setup** dialog box is displayed.

2 Click the **LPDs** tab, and use the following guidelines when printing to a non-Windows network printer:



NOTE: Be sure to check with your vendor that the printer can accept Line Printer Request print requests.

a **Select LPD** —Select the port you want from the list.

b **Printer Name** —(Required) Enter name you want displayed in your list of printers.

c **Printer Identification**—Enter the type or model of the printer in the exact text of the Windows printer driver name—including capitalizations and spaces.

This name must be either the device driver name for the printer under the Microsoft Windows system, or a key to map to the device driver. If not specified, the name will be defaulted to the printer-supplied identification for standard direct-connected USB printers or **Generic / Text** for non-USB connected printers upon connection to Windows hosts. The driver name mapping takes place either through a printer-mapping file read by the system as part of the global profile (wnos.ini) or by MetaFrame servers through the MetaFrame printer configuration file (\winnt\system32\wtsprnt.inf).

d **LPD Hosts**—The DNS or WINS name of the server for the network printer. An IP address of the printer on the network can also be entered.

If the printer is attached to another thin client on your network, the entry in the LPD Hosts box is the name or address of that thin client.

e **LPD Queue Name**—An LPD host maintains a named queue for each supported printer. Enter the name of the queue associated with the printer to be used.

This name can be different for each vendor. This field is required and must be correct so that the network printer accepts incoming print jobs properly. For example, auto can be used for HP LaserJet 4200n PCL6 as per documentation found on the HP Web site.

NOTE: If the printer is attached to another thin client on your network, the LPD Queue Name must match the content of the Printer Name box on the thin client with the printer attached.

f **Printer Class**— (Optional) Select the printer class from the list.

g **Enable the printer device**—Must be selected to enable the printer. It enables the device so it displays on the remote host.

3 Click **OK** to save the settings.

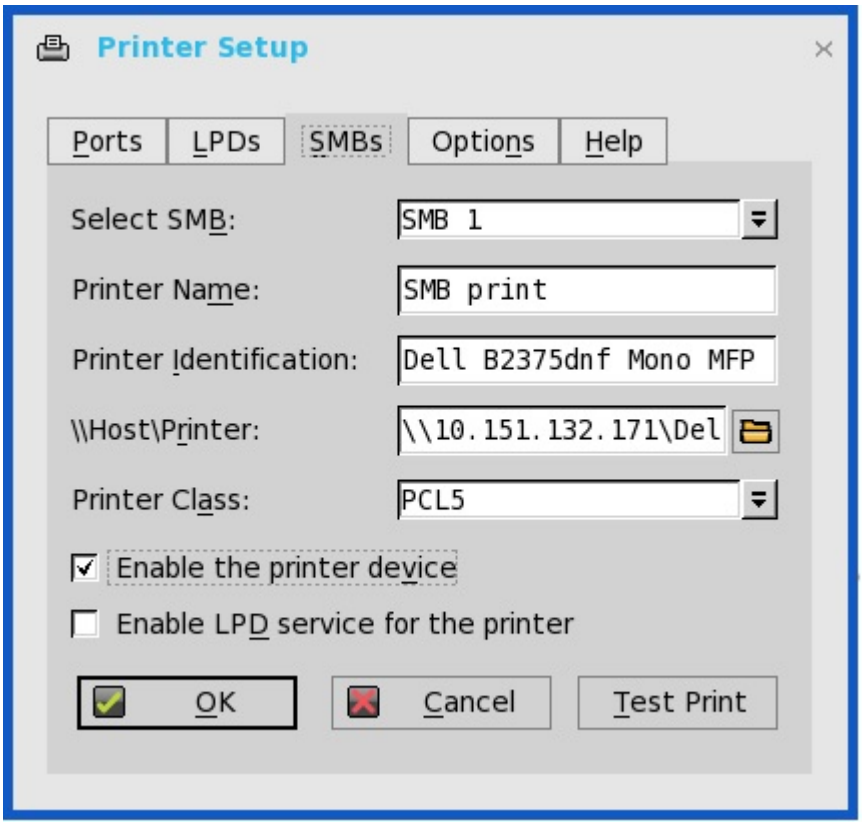
NOTE: When the LPD printer is mapped to one session and you cannot access the LPD service host, then the TCP connection tries to connect to the LPD service host. The timeout period is 60 seconds. During this timeout period, if you try to close the session, the session waits until the LPD printer connection is established. The initialization failure logs are displayed.

Configuring the SMBs settings

To configure the SMBs settings:

1 From the desktop menu, click **System Setup**, and then click **Printer**.
The **Printer Setup** dialog box is displayed.

2 Click **SMBs** tab, and use the following guidelines when printing to a Windows network printer.



a **Select SMB**—Select the SMB you want from the list.

b **Printer Name**—(Required) Enter the name to be displayed in your list of printers.

c **Printer Identification**—Enter the type or model of the printer in the exact text of the Windows printer driver name—including capitalizations and spaces.

This name must be either the device driver name for the printer under the Microsoft Windows system, or a key to map to the device driver. If not specified, the name will be defaulted to the printer-supplied identification for standard direct-connected USB printers or **Generic / Text** for non-USB connected printers upon connection to Windows hosts. The driver name mapping takes place either through a printer-mapping file read by the system as part of the global profile (wnos.ini) or by MetaFrame servers through the MetaFrame printer configuration file (\winnt\system32\wtsprnt.inf).

d **\\Host\Printer**—Enter the Host\Printer or use the browse folder icon next to the box to browse your Microsoft Networks and make the printer selection you want from the network printers available (the DNS name or IP address of the Windows print server on the network).

e **Printer Class** —(Optional) Select the printer class from the list.

f **Enable the printer device**—Must be selected to enable the printer. It enables the device so it displays on the remote host.

g **Enable LPD service for the printer**—Select this to make the thin client an LPD (Line Printer Daemon) network print server for LPR printing requests from the network, see Using Your Thin Client as a Print Server (LPD).

If the thin client is to be used as an LPD printer server, DHCP must not be used and a static IP address must be assigned to the thin client as described in Configuring the Network Settings.

3 Click **OK** to save the settings.

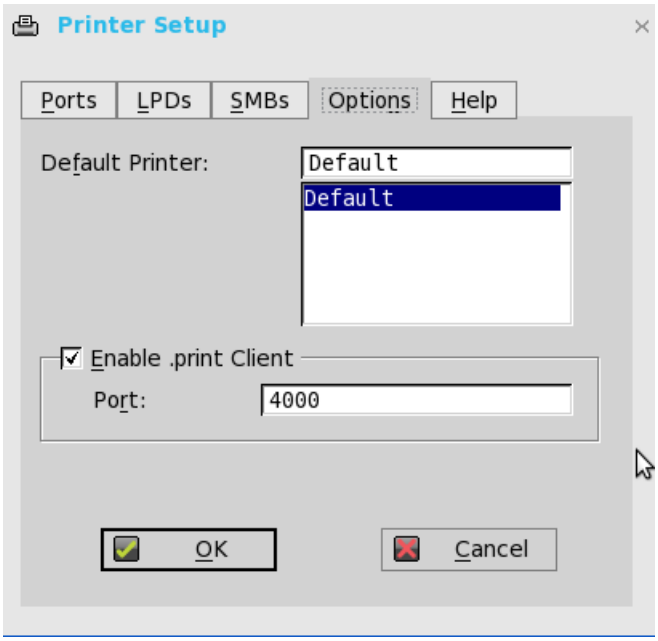
Using the printer setup options

To configure the printer setup options:

1 From the desktop menu, click **System Setup**, and then click **Printer**.

The **Printer Setup** dialog box is displayed.

2 Click the **Options** tab, and use the following guidelines:



a **Default Printer** —Select the printer you want to be the default printer from your list of available printers.

b **Enable .print Client** and **Port** —If you want to enable .print Client, select **Enable .print Client** , and then enter the **port**.

3 Click **OK** to save the settings.

Using the Help

When you click the **Help** tab, the following message is displayed in the text box.

Printer Identification is supplied by printer device. Change it to a Window's printer driver name or setup a driver mapping file.

Reset features

Reset features include:

- Resetting to factory defaults using G-Key reset
- Resetting to factory defaults using shutdown reset
- Resetting display settings using V-Key reset

Resetting to factory defaults using G-Key reset

High-privileged or stand-alone users can reset the thin client to factory default settings using the G-key reset feature.

To reset the thin client to factory default settings, restart the thin client and continuously tap the **G** key during the restart process. G-key reset impacts all configuration items, including, but not limited to, both network configuration and connections defined in local NV-RAM.

NOTE: G-key reset is disabled for Low-privileged and Non-privileged users in Lock down mode.

Resetting to factory defaults using shutdown reset

A high-privileged or stand-alone user can reset the thin client to factory default settings from the **Shutdown** dialog box.
To reset the thin client to factory defaults:

1. From the desktop menu, click **Shutdown**.
   The **Shutdown** dialog box is displayed.
2. After starting your thin client you will see a **Dell logo** for a short period of time.
3. Click **Restart the system** to restart your thin client.
4. Select the **Reset the system setting to factory default** check box to restore your system settings to default factory settings.
5. Click **OK** to save the settings.
   Shutdown reset impacts all configuration items, including, but not limited to network configuration and connections defined in local NV-RAM. However, the terminal name will not be changed.

NOTE:
Shutdown reset is disabled for Low-privileged and Non-privileged users, regardless of lock down state.

Resetting display settings using V-Key reset

If the display settings are inappropriate for the particular monitor that is connected, it is possible that the display will not function properly when the thin client restarts. To correct this, power-on the thin client while continuously tapping the **V** key. This will restart the thin client with a default/automatic display resolution.

8

TCX Suite

Dell Wyse TCX Suite is a single software solution that provides the benefits of cloud client computing. The supported environments for Dell Wyse TCX Suite are Microsoft Remote Desktop Services, Citrix Virtual Apps and Desktops, Citrix Virtual Apps, Teradici, and VMware Horizon View. The Collaborative Processing Architecture (CPA) used in Dell Wyse TCX divides the workload between the server and Plug-n-Play USB devices. TCX Suite uses the established software protocols to provide breakthrough multimedia and audio technology for cloud client computing environments. For more information about the TCX features, see the latest *Dell Wyse TCX Administrator's Guide*.

TCX Suite enables rich flash playback, multiple monitors awareness, rich multimedia playback, high-quality bidirectional audio capabilities, and seamless USB device access for cloud clients.

TCX Suite provides the following features:

- **TCX Flash Acceleration and TCX Flash Redirection**—Enhances the performance of the Flash video content in a remote computing environment.
- **TCX Multidisplay**—Provides productivity, enhancing advantages for cloud clients with multiple monitors by using virtual desktops.
- **TCX Multimedia**—Supports enhanced playback of MPEG, WAV, WMV, H.264, and other multimedia file formats. The software includes both the server and the client components that redirect multimedia processing tasks between the client and server for a rich user experience.
- **TCX Rich Sound**—Provides bidirectional audio capabilities for virtual desktops and applications and supports sound recording and playback applications. It supports zero-compromise deployment.
- **TCX USB Virtualizer**—Makes the USB devices attached to thin clients or endpoints visible to the virtual desktops and applications. It removes any dependencies on limited local device drivers for a broad range of USB-based printers, scanners, storage devices, Palmtop, BlackBerry, Pocket PC handhelds, HID devices, Webcams, headsets, iPhone, credit card machines, and smart cards.
- **TCX Monitor**—Helps you to efficiently identify the system state for proper functioning of USB and Flash Redirection modules.

TCX Flash Redirection

TCX Flash Redirection uses the client CPU to decode and render flash. TCX Flash Redirection uses the Adobe flash player plug-in that supports the NPAPI interface on the client. TCX Flash Redirection is supported over RDP and PCoIP protocols. TCX Flash Redirection uses less Server CPU cycles.

Prerequisites

- **TCX.i386.pkg** must be installed on client for the feature to work.
- **TFRSServerBHO Class** must be enabled in browser add-on.
- **Enable Protected Mode** is turned off in the Security options of Internet Explorer.
- **Enable third-party browser extensions** is enabled in the Advanced options of Internet Explorer.

Verifying the working status of TCX Flash Redirection

Verifying the status of TCX Flash Redirection is similar to HDX FR.

Use the following INI parameter to display the HW label:

```
MMRConfig=VIDEO flashingHW=1
```

NOTE: TCX FR on ThinOS is not working for certain flash video pages. However, the result is the same between FR over RDP, and FR over PCoIP. Dell recommends you to validate, and block the URL that does not work, before deploying TCX FR on all the systems.

9

Trusted Platform Module version 2.0

Wyse 5070 thin client supports disk encryption and decryption through Trusted Platform Module (TPM) version 2.0.

- Measured boot—SHA1 (Secure Hash Algorithm 1) is used to produce a hash value for ThinOS image, and extend the integrity measurement into Platform Configuration Registers (PCR) inside TPM—**TPM_PCR16**. This is used to generate disk encryption or decryption key.
- Disk encryption/decryption key
  - Disk C with user data and Disk B with system libraries are encrypted.
  - Prestored **KeyStub** and **TPM_PCR16** are used to generate disk encryption and decryption keys through TPM. The actual implementation is based on TPM-unseal operation.
  - If the key is modified, the key fails to verify the specific disk partition. The disk partition is formatted to make the partition valid. The following screenshot displays the event log:

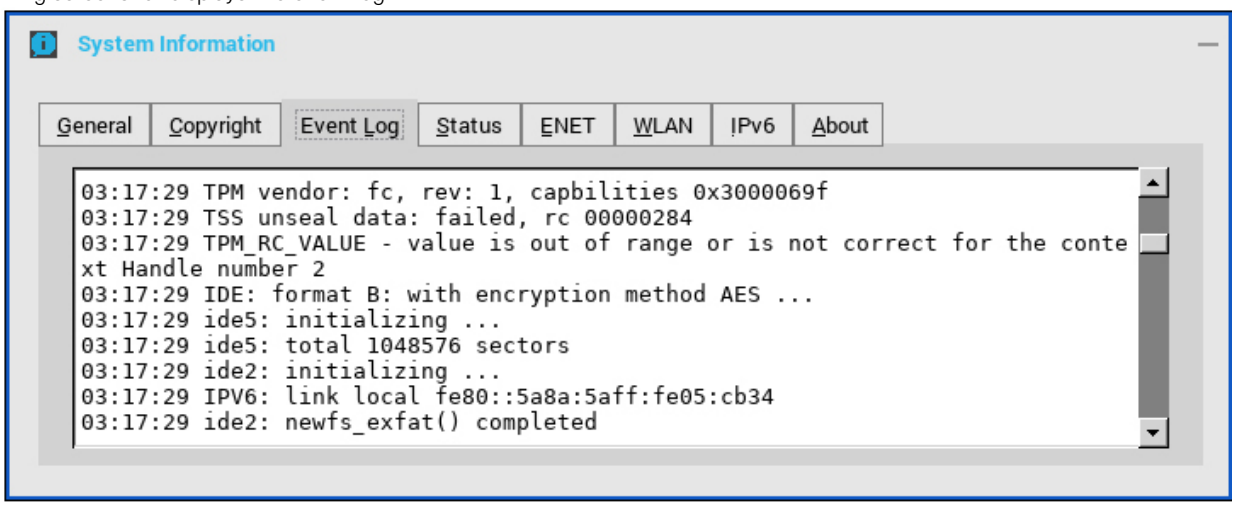


Figure 34. Event log tab

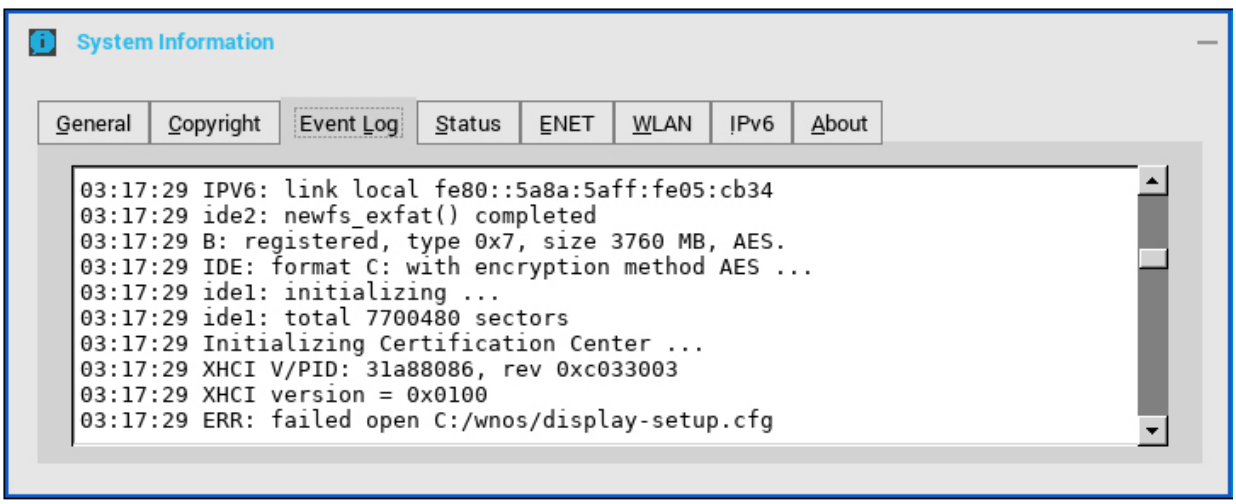


Figure 35. Event log tab

– After the disk partition is formatted, some user configurations, such as display settings, user certificates, wireless settings—except the first SSID, as it is saved in NVRAM—cookie, and mirror file server data, are lost.

10

Performing diagnostics

This chapter helps you identify and troubleshoot your thin client using the troubleshooting options.

System tools

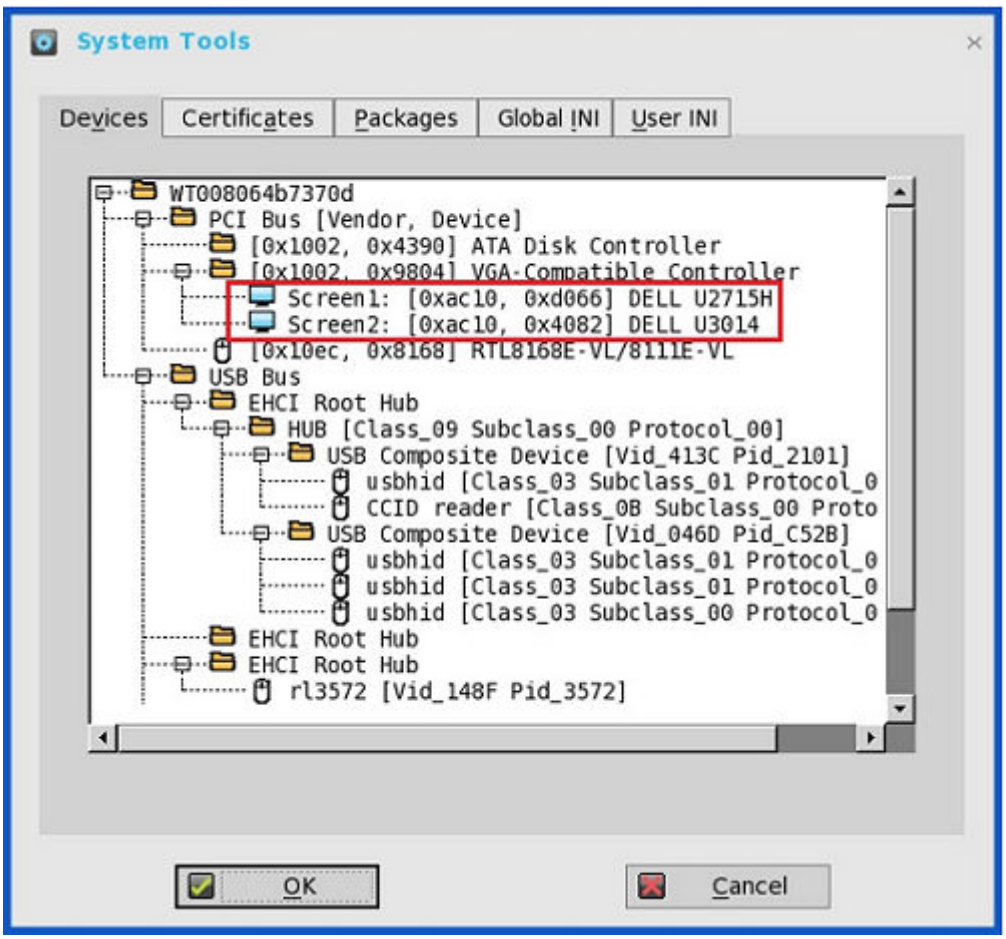
Use the **System Tools** dialog box to view device details, package details and Global INI/User INI information. You can also import certificates using the **Certificates** tab.

1 From the desktop menu, click **System Tools**.

The **System Tools** dialog box is displayed.

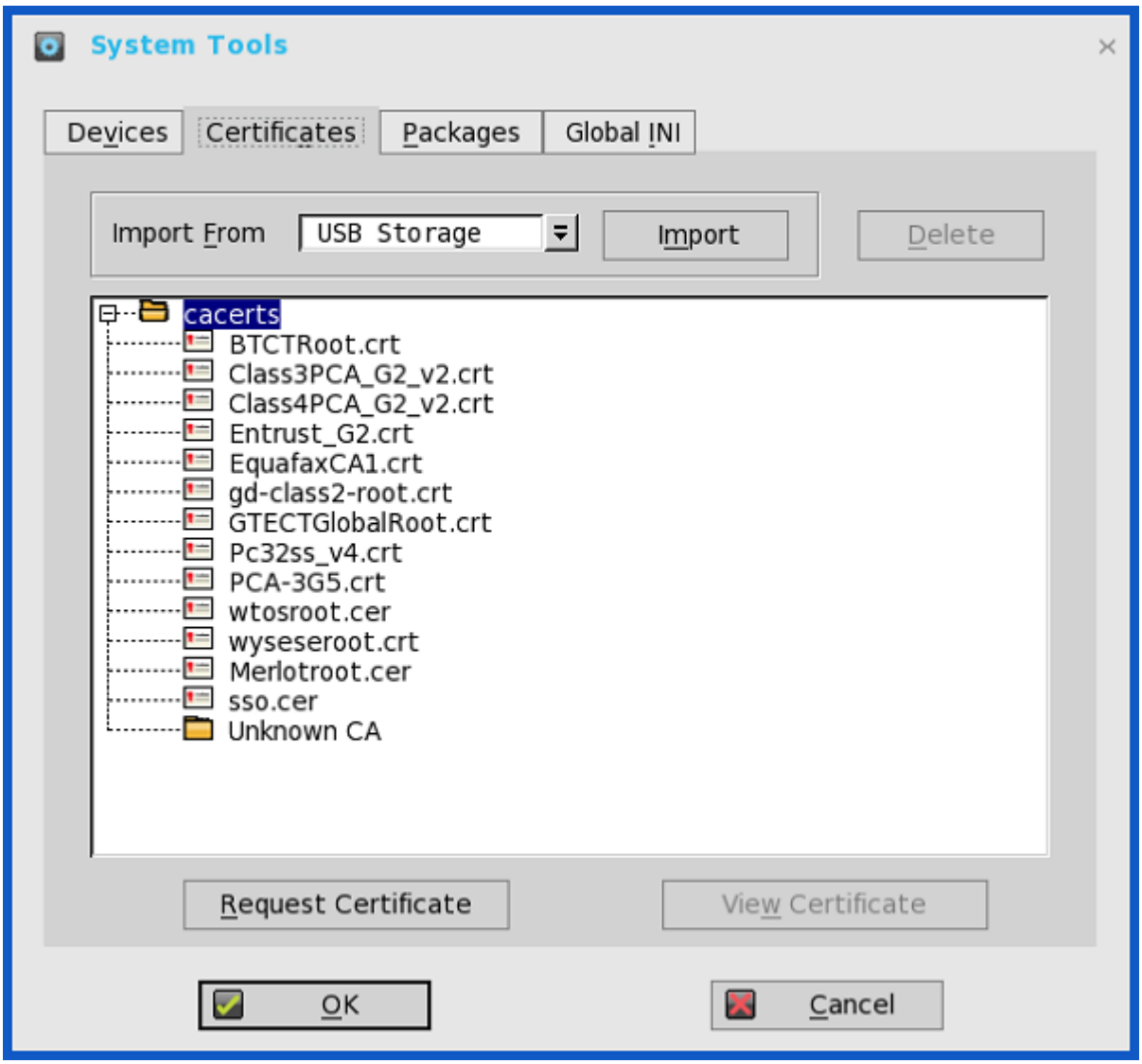
2 Click the **Devices** tab to display all the locally attached devices, including USB, Serial, and Parallel on applicable platforms. The details about the monitors connected to the thin client are also displayed.

The Device Viewer button was previously available in the **Devices** tab of the **System Information** dialog box.



NOTE: The Mirror File Server tab has been removed from the System Tools dialog box, as it can now be viewed in the Devices tab.

3 Click the **Certificates** tab, and use the following guidelines:



a Import the certificates by selecting either USB Storage or File Server from the drop-down list, and then click **Import** to import the required certificate.

b Click **Delete** to delete the imported certificate.

c Click **View Certificate** to view the imported certificate information such as Version, Validity, and Serial number. You can also view the certificate path and certificate status. For more information about the default certificates, see About default certificates.

d Click **Request Certificate** to manually request certificate for your client. For more information about Simplified Certificate Enrollment Protocol, see Simplified Certificate Enrollment Protocol.

4 Click the **Packages** tab, and use the following guidelines:

ThinOS packages that are installed on thin client are listed in the **Packages** tab.

a Click the **Delete** button to delete the selected package.

b Click the **Delete all** button to delete all the packages.

The following packages are displayed in the **Package** tab:

- `base.i386.pkg`
- `FR.i386.pkg`—This package is introduced to support Flash Redirection.
- `RTME.i386.pkg`—This package is introduced to support Citrix RTME.
- `Horizon.i386.pkg`—This package is introduced to support VMware Blast protocol. The package version number is updated to match the latest Horizon client.

  To install this package, PKG installation INI file needs to be changed to `AddPkg="horizon"`.

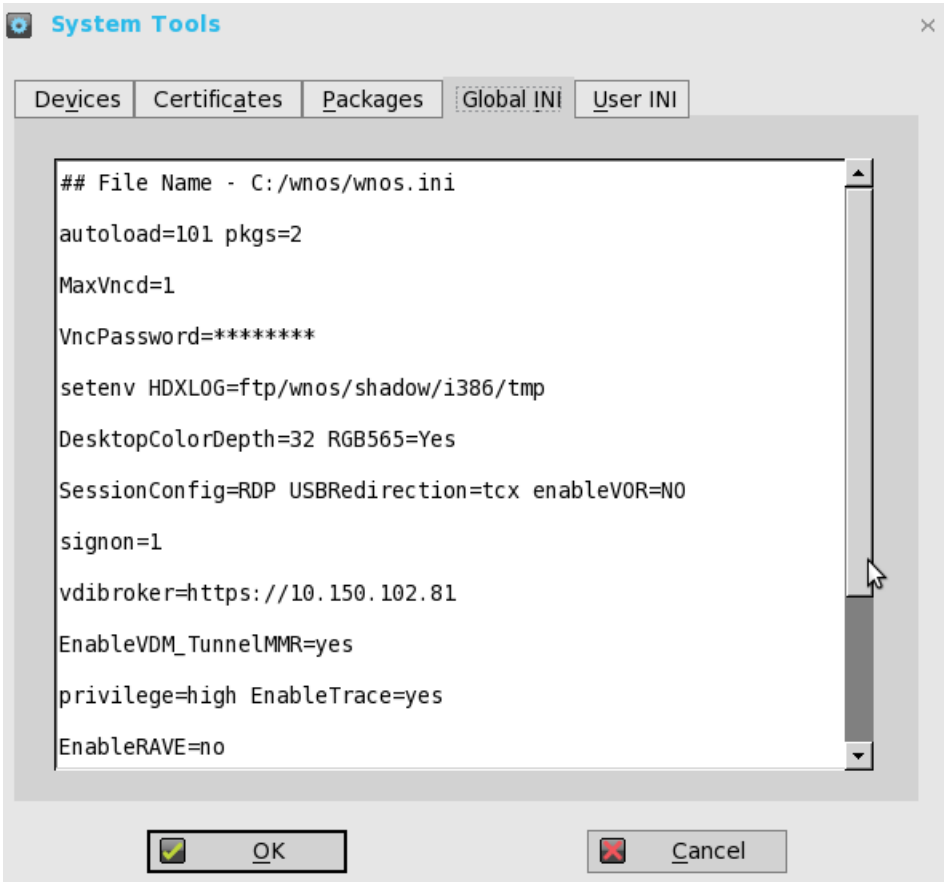
- `JVDI.i386.pkg`—This package is introduced to support Cisco Jabber.
- `pcoip.i386.pkg`—This package is available only on Wyse 3030 LT with PCoIP, Wyse 3040 with PCoIP, Wyse 5010 with PCoIP (D10DP), Wyse 5040 AIO with PCoIP (5213), and Wyse 5060 with PCoIP.
- `TCX.i386.pkg`—This package is introduced to support TCX.

You cannot delete the base package separately. If you click **Delete All**, all packages are deleted including the base package. When you click **Delete All**, a message is displayed prompting you to restart the device.

The `base.i386.pkg` is mandatory for all ThinOS clients. At present, PCoIP package is mandatory for the PCoIP enabled thin clients. Other packages are optional. Base package and PCoIP package are integrated into the ThinOS firmware image. Installing the latest ThinOS firmware image will automatically install the latest version of these packages on ThinOS client. You cannot manually install or upgrade these embedded packages. However, the package version details of respective packages are displayed in the **Packages** tab for engineering information purpose only.

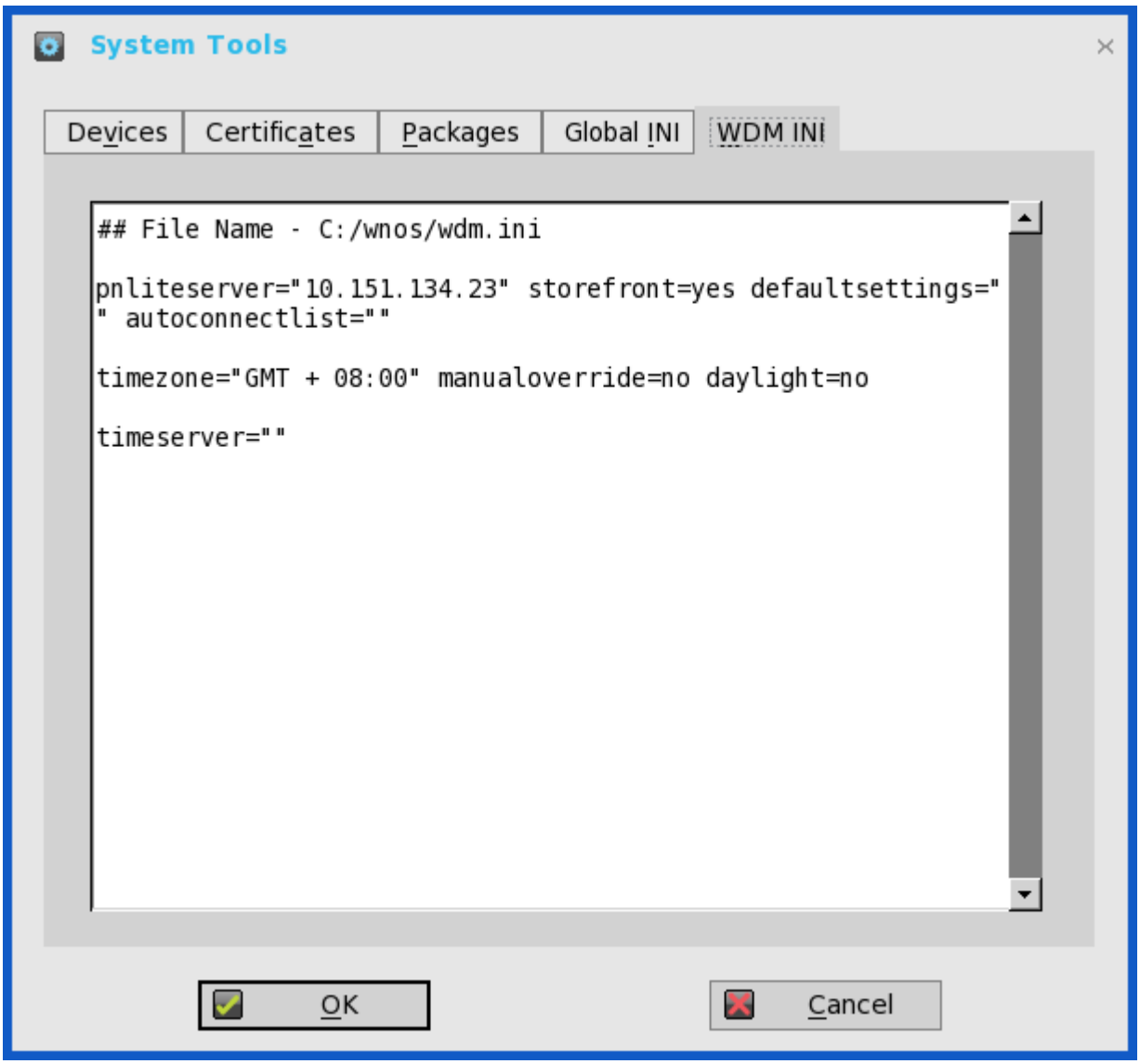
NOTE: When you install packages or restart the ThinOS device, the ThinOS client verifies the version of the installed package. If you have not installed the latest package version, the details about the current package version and the recommended package version are displayed in the Event Log tab. In every ThinOS release, the packages may be updated to the latest version. For information about the latest package version, see the latest *Dell Wyse ThinOS release notes*.

5 Click the **Global INI** tab to view the wnos.ini information.



6 Click the **User INI** tab to view wnos.ini information.

7 Click the **WDM INI** to view the received WCM configurations.



WCM function is supported from WDM for comprehensive client configuration. Without configuration from server, the client loads the cached settings (wdm.ini), if available.

Limitation

To upgrade or downgrade firmware/image through WCM, you are required to enable WDM file server function by selecting the **WTOS INI path upon checkin (FTP/HTTPS/HTTP/CIFS**) check box in the WTOS preferences in the WDM configuration manager.

8 Click **OK** to save the settings.

Simplified Certificate Enrollment Protocol

Simplified Certificate Enrollment Protocol (SCEP) was used in a closed network where all end-points are trusted. The goal of SCEP is to support the secure issuance of certificates to network devices in a scalable manner. Within an enterprise domain, it enables network devices that do not run with domain credentials to enroll for certificates from a Certification Authority (CA).

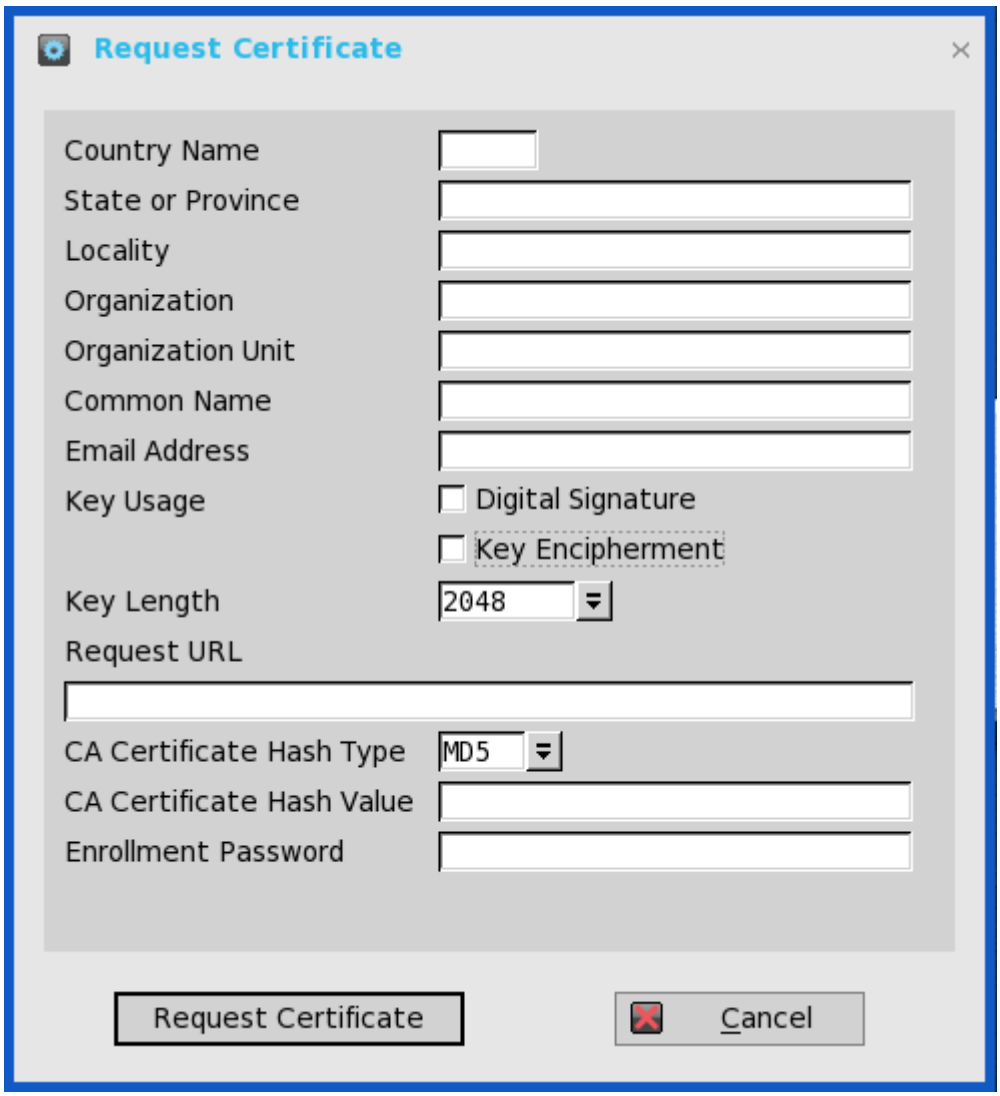
At the end of the transactions that are defined in this protocol, the network device has a private key and associated certificate that is issued by a CA. Applications on the device may use the key and its associated certificate to interact with other entities on the network. The most common usage of this certificate on a network device is to authenticate the device in an IPSec session.

ThinOS is treated as a network device. The functionality of ThinOS SCEP includes manual certificate request, automatic certificate request, and automatic renewal of certificate.

Requesting certificate manually

To request the certificate manually, do the following:

1 Go to **System Tools** > **Certificates** > **Request Certificate**.
The **Request Certificate** dialog box is displayed.



2 Enter the appropriate values in the **Request Certificate** dialog box, and then click the **Request Certificate** button.
The certificate request is sent to the server, and the client receives the response from server and installs both CA certificate and client certificate.

3 Click **Ok** to save the changes.

NOTE:

- The CA Certificate Hash type currently supports MD5, SHA1, and SHA256.
- The request server URL can be an HTTP or HTTPs link. You can add the protocol prefix before the URL.

Requesting certificate automatically

Use INI parameters to automate the request, and renew the certificate process. Related INI parameters are of global scope and should be used with INI parameter `ScepAutoEnroll`.

For more information about using the INI parameters, refer to the latest *Dell Wyse ThinOS INI Reference guide*.

About Default Certificates

Default certificates embedded in the ThinOS are displayed in the **Certificate** dialog box. To view the default certificate, set ThinOS to factory default, and on the desktop click **System Settings** > **System Tools** > **Certificates**. The following default certificates are displayed in the **cacerts** folder, in an expandable tree structure format:

- BTCTRoot.crt
- Class3PA_G2_v2.crt
- Class4PA_G2_v2.crt
- Entrust_G2.crt
- EquafaxCA1.crt
- gd-class2–root.crt
- GTECTGlobalRoot.crt
- Pc32ss_v4.crt
- PCA-3G5.crt

To view each certificate, select the certificate you want to view, and then click **View Certificate**. In the **Certificate** dialog box, click any of the following tabs to view the corresponding certificate attributes:

1 **General**—The following values are displayed:
   - Purpose of the certificate
   - Certificate issued to
   - Certificate issued by
   - Certificate valid period
2 **Details**—The certificate details are listed along with the corresponding default values. For information about individual certificates, see the **Certificate Details** section.
3 **Certification Path**—The folder path where the certificate is stored is displayed. Certificate status can be viewed in the lower pane of the window.

Certificate details

This section lists the certificates with the valid attributes and corresponding default values.

Certificate name—BTCTRoot.crt

Table 39. BTCTRoot.crt Certificate details

Certificate field	Default value/format
Version	V3
Serial number	02 00 00 b9

Certificate field	Default value/format
Signature algorithm	sha1RSA
Issuer	Baltimore CyberTrust Root CN=Baltimore CyberTrust Root OU=CyberTrust O=Baltimore C=IE
Valid from	2000–05–12 18:46:00
Valid to	2025–05–12 23:59:00
Subject	Baltimore CyberTrust Root CN=Baltimore CyberTrust Root OU=CyberTrust O=Baltimore C=IE
Public key	RSA (2048 bits). Key bits are displayed in the lower pane of the window.
Key usage	Certificate Sign, CRL Sign
Subject key ID	e5 9d 59 30 82 47 58 cc ac fa 08 54 36 86 7b 3a b5 04 4d f0
Basic constraints	Subject Type=CA, Path Length Constraints=None
Thumbprint algorithm	sha1
Thumbprint	d4 de 20 d0 5e 66 fc 53 fe la 50 88 2c 78 db 28 52 ca e4 74

Certificate name—Class3PCA_G2_v2.crt

Table 40. Class3PCA_G2_v2.crt Certificate details

Certificate field	Default value/format
Version	V1
Serial number	7d d9 fe 07 cf a8 le b7 10 79 67 fb a7 89 34 c6
Signature algorithm	sha1RSA
Issuer	VeriSign Trust Network OU=VeriSign Trust Network OU=(c) 1998 VeriSign, Inc. – For authorized use only OU=Class 3 Public Primary Certification Authority – G2 O=VeriSign, Inc C=US
Valid from	1998–05–18 00:00:00
Valid to	2028–08–12 23:59:59

Certificate field	Default value/format
Subject	VeriSign Trust Network OU=VeriSign Trust Network OU=(c) 1998 VeriSign, Inc. – For authorized use only OU=Class 3 Public Primary Certification Authority – G2 O=VeriSign, Inc C=US
Public key	RSA (1024 bits). Key bits are displayed in the lower pane of the window.
Thumbprint algorithm	sha1
Thumbprint	85 37 1c a6 e5 50 14 3d ce 28 03 47 1b de 3a 09 e8 f8 77 0f

Certificate name—Class4PCA_G2_v2.crt

Table 41. Class4PCA_G2_v2.crt Certificate details

Certificate field	Default value/format
Version	V1
Serial number	32 88 8e 9a d2 f5 eb 13 47 f8 7f c4 20 37 25 f8
Signature algorithm	sha1RSA
Issuer	VeriSign Trust Network OU=VeriSign Trust Network OU=(c) 1998 VeriSign, Inc. – For authorized use only OU=Class 4 Public Primary Certification Authority – G2 O=VeriSign, Inc C=US
Valid from	1998–05–18 00:00:00
Valid to	2028–05–01 23:59:59
Subject	VeriSign Trust Network OU=VeriSign Trust Network OU=(c) 1998 VeriSign, Inc. – For authorized use only OU=Class 4 Public Primary Certification Authority – G2 O=VeriSign, Inc C=US
Public key	RSA (1024 bits). Key bits are displayed in the lower pane of the window.
Thumbprint algorithm	sha1
Thumbprint	0b 77 be bb cb 7a a2 47 05 de cc 0f bd 6a 02 fc 7a bd 9b 52

Certificate name—Entrust_G2.crt

Table 42. Entrust_G2.crt Certificate details

Certificate field	Default value/format
Version	V3
Serial number	4a 53 8c 28
Signature algorithm	sha256RSA
Issuer	Entrust Root Certification Authority CN=Entrust Root Certification Authority—G2 OU=(c) 2009 Entrust, Inc. – For authorized use only OU=See www.entrust.net/legal-terms. O=Entrust, Inc. C=US
Valid from	2009–07–07 17:25:54
Valid to	2030–12–07 17:55:54
Subject	Entrust Root Certification Authority CN=Entrust Root Certification Authority—G2 OU=(c) 2009 Entrust, Inc. – For authorized use only OU=See www.entrust.net/legal-terms. O=Entrust, Inc. C=US
Public key	RSA (2048 bits). Key bits are displayed in the lower pane of the window.
Key usage	Certificate Sign, CRL Sign
Subject key ID	6a 72 26 7a d0 1e ef 7d e7 3b 69 51 d4 6c 8d 9f 90 12 66 ab
Basic constraints	Subject Type=CA, Path Length Constraints=None
Thumbprint algorithm	sha1
Thumbprint	8c f4 27 fd 79 0c 3a d1 66 06 8d e8 1e 57 ef bb 93 22 72 d4

Certificate name—EquafaxCA1.crt

Table 43. EquafaxCA1.crt Certificate details

Certificate field	Default value/format
Version	V3
Serial number	04
Signature algorithm	md5RSA
Issuer	Equifax Secure eBusiness

Certificate field	Default value/format
	CN=Equifax Secure eBusiness CA-1 0=Equifax Secure Inc. C=US
Valid from	1999–06–21 04:00:00
Valid to	2020–06–21 04:00:00
Subject	Equifax Secure eBusiness CN=Equifax Secure eBusiness CA-1 0=Equifax Secure Inc. C=US
Public key	RSA (1024 bits). Key bits are displayed in the lower pane of the window.
Key usage	Digital Signature, Key Encipherment, Data Encipherment, Key Agreement, Certificate Sign, CRL Sign, Encipher Only, Decipher Only
Subject key ID	4a 78 32 52 11 db 59 16 36 5e df c1 14 36 40 6a 47 7c 4c a1
Authority key ID	80 14 4a 78 32 52 11 db 59 16 36 5e df c1 14 36 40 6a 47 7c 4c a1
Basic constraints	Subject Type=CA, Path Length Constraints=None
Thumbprint algorithm	sha1
Thumbprint	da 40 18 8b 91 89 a3 ed ee ae da 97 fe 2f 9d f5 b7 d1 8a 41

Certificate name—gd-class2–root.crt

Table 44. gd-class2–root.crt Certificate details

Certificate field	Default value/format
Version	V3
Serial number	00
Signature algorithm	sha1RSA
Issuer	Go Daddy Class 2 Certification Authority OU=Go Daddy Class 2 Certification Authority O=The Go Daddy Group, Inc. C=US
Valid from	2004–06–29 17:06:20
Valid to	2034–06–29 17:06:20
Subject	Go Daddy Class 2 Certification Authority OU=Go Daddy Class 2 Certification Authority O=The Go Daddy Group, Inc. C=US

Certificate field	Default value/format
Public key	RSA (2048 bits). Key bits are displayed in the lower pane of the window.
Key usage	Digital Signature, Key Encipherment, Data Encipherment, Key Agreement, Certificate Sign, CRL Sign, Encipher Only, Decipher Only
Subject key ID	d2 c4 b0 d2 91 d4 4c 11 71 b3 61 cb 3d a1 fe dd a8 6a d4 e3
Authority Key ID	Key bits are displayed in the lower pane of the window.
Basic constraints	Subject Type=CA, Path Length Constraints=None
Thumbprint algorithm	sha1
Thumbprint	27 96 ba e6 3f 18 01 e2 77 26 1b a0 d7 77 70 02 8f 20 ee e4

Certificate name—GTECTGlobalRoot.crt

Table 45. GTECTGlobalRoot.crt Certificate details

Certificate field	Default value/format
Version	V1
Serial number	01 a5
Signature algorithm	md5RSA
Issuer	GTE CyberTrust Global Root CN=GTE CyberTrust Global Root OU=GTE CyberTrust Solutions, Inc. O=GTE Corporation C=US
Valid from	1998–08–13 00:29:00
Valid to	2018–08–13 23:59:00
Subject	GTE CyberTrust Global Root CN=GTE CyberTrust Global Root OU=GTE CyberTrust Solutions, Inc. O=GTE Corporation C=US
Thumbprint algorithm	sha1
Thumbprint	97 81 79 50 d8 1c 96 70 cc 34 d8 09 cf 79 44 31 36 7e f4 74

Certificate name—Pc32ss_v4.crt

Table 46. Pc32ss_v4.crt Certificate details

Certificate field	Default value/format
Version	V1
Serial number	70 ba e4 1d 10 d9 29 34 b6 38 ca 7b 03 cc ba bf
Signature algorithm	md2RSA
Issuer	Class 3 Public Primary Certification Authority OU=Class 3 Public Primary Certification Authority O=VeriSign, Inc. C=US
Valid from	1996–01–29 00:00:00
Valid to	2028–08–01 23:59:59
Subject	Class 3 Public Primary Certification Authority OU=Class 3 Public Primary Certification Authority O=VeriSign, Inc. C=US
Public key	RSA (1024 bits). Key bits are displayed in the lower pane of the window.
Thumbprint algorithm	sha1
Thumbprint	74 2c 31 92 e6 07 e4 24 eb 45 49 54 2b e1 bb c5 3e 61 74 e2

Certificate name—PCA-3G5.crt

Table 47. PCA-3G5.crt Certificate details

Certificate field	Default value/format
Version	V3
Serial number	18 da d1 9e 26 7d e8 bb 4a 21 58 cd cc 6b 3b 4a
Signature algorithm	sha1RSA
Issuer	VeriSign Class 3 Public Primary Certification Authority — G5 CN=VeriSign Class 3 Public Primary Certification Authority — G5 OU=(c) 2006 VeriSign, Inc. – For authorized use only OU=VeriSign Trust Network O=VeriSign, Inc C=US
Valid from	2006–11–08 00:00:00
Valid to	2036–07–16 23:59:00
Subject	VeriSign Class 3 Public Primary Certification Authority — G5 CN=VeriSign Class 3 Public Primary Certification Authority — G5

Certificate field	Default value/format
	OU=(c) 2006 VeriSign, Inc. – For authorized use only OU=VeriSign Trust Network O=VeriSign, Inc C=US
Public key	RSA (2048 bits). Key bits are displayed in the lower pane of the window.
Key usage	Certificate Sign, CRL Sign
Subject key ID	7f d3 65 a7 c2 dd ec bb f0 30 09 f3 43 39 fa 02 af 33 31 33
Basic constraints	Subject Type=CA, Path Length Constraints=None
Thumbprint algorithm	sha1
Thumbprint	4e b6 d5 78 49 9b 1c cf 5f 58 le ad 56 be 3d 9b 67 44 a5 e5

Using the troubleshooting options

Use the **Troubleshooting** dialog box to configure trace and event log settings, performance monitor graphs that display client CPU, memory, and networking information, and CMOS management extract and restore CMOS settings. It also enables you to view the wnos.ini cached information for troubleshooting purposes.

To use the troubleshooting options:

1 From the desktop menu, click **Troubleshooting**.
The **Troubleshooting** dialog box is displayed.
2 Click the **General** tab, and do the following:

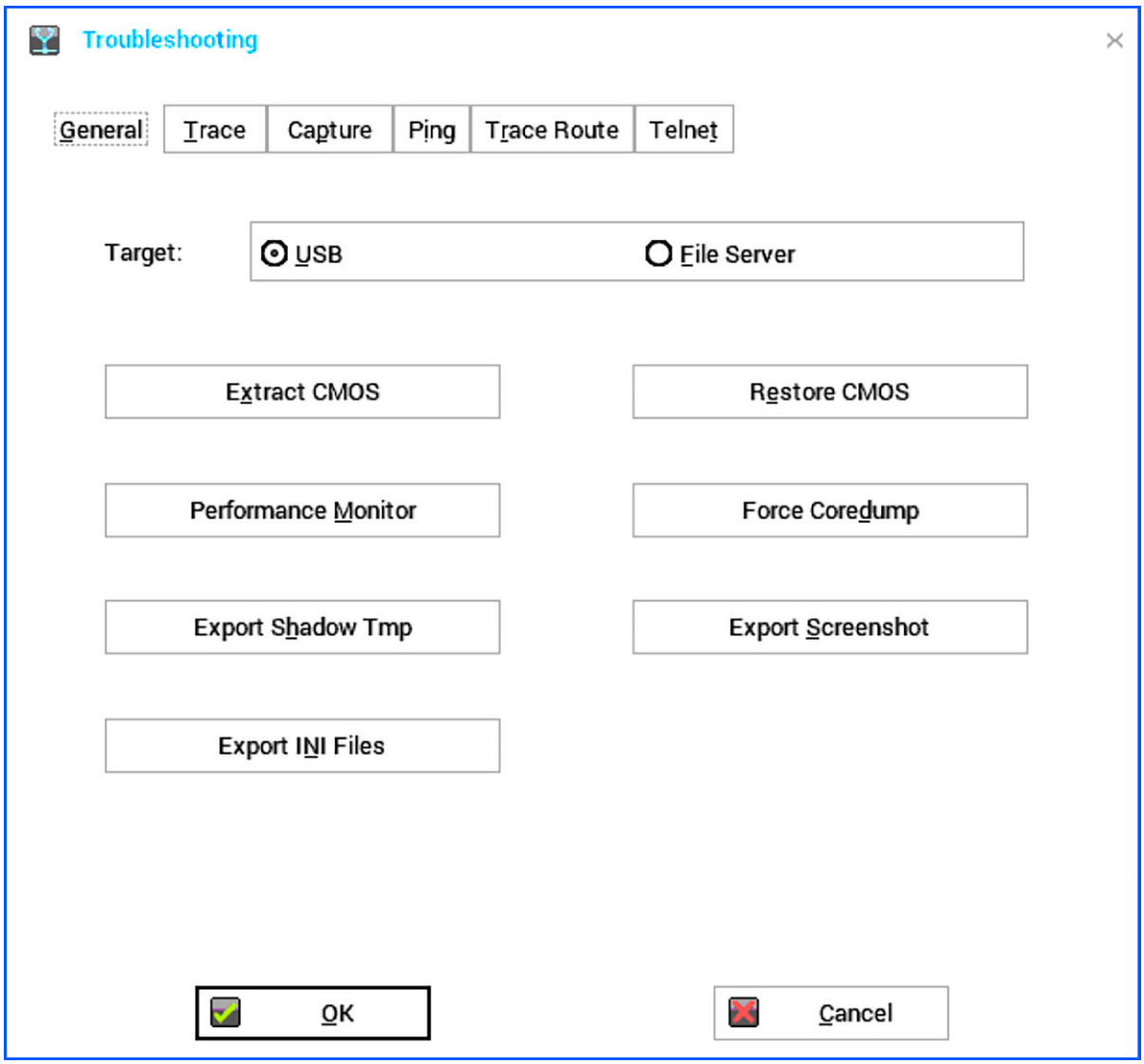


Figure 36. General

- Click either **USB** or **File Server** to select your target device you want to use for CMOS management.
- **Extract CMOS**—Click this option to extract the CMOS settings and certain BIOS settings to the USB drive or file server based on your target device selection. ThinOS reads the CMOS settings from the SMBIOS Interface for Dell BIOS, and the CMOS interface for legacy Wyse BIOS. For information about the support matrix, see the *Dell Wyse ThinOS Version 8.6 Release Notes* at www.dell.com/support.

  NOTE: You can only extract the BIOS settings that are supported by the INI parameter `Device=CMOS` and `Device=DellCMOS`.
- **Restore CMOS**—Click this option to write the CMOS settings and BIOS settings from the USB drive to the target thin client. For information about the support matrix, see the *Dell Wyse ThinOS Version 8.6 Release Notes* at www.dell.com/support.

  NOTE: You can restore the BIOS settings that are supported by the INI parameter `Device=CMOS` and `Device=DellCMOS`.
- **Performance Monitor**—Click this option to display the CPU usage history with frames per second (FPS), Memory, and Networking information. The graphs display on top of all windows.
- **Force Coredump**—Use this option to forcibly generate the debug information for technical investigation when your system is not responding. Both the coredump file and the trap information image are saved to the local drive. After you restart the thin client, both the coredump file and trap issue screenshot file are uploaded to the **/wnos/troubleshoot/** directory of the file server or a USB drive.

- **Export Shadow Tmp**—Use this option to export temporary logs for debugging purpose. All log files can be exported to a USB drive or file server depending on the target configuration.
- **Export Screenshot**—Use this option to export screenshots to the file server or a USB drive. The exported file name is added with build information for a better troubleshooting. If a screenshot is present in the clipboard, it is exported to the target location. If the screenshot is not available, the full screen is copied automatically and exported to the target location.
- **Export INI files**—Use this option to export the global INI file (wnos.ini or xen.ini), wdm.ini, ccm.ini, mac.ini, or other machine based INI file to the file server or a USB drive. Only username.ini file cannot be exported.

3 Click the **Trace** tab to configure the trace actions and delay on trace. The available options for trace action are None, Capture, and Playback.

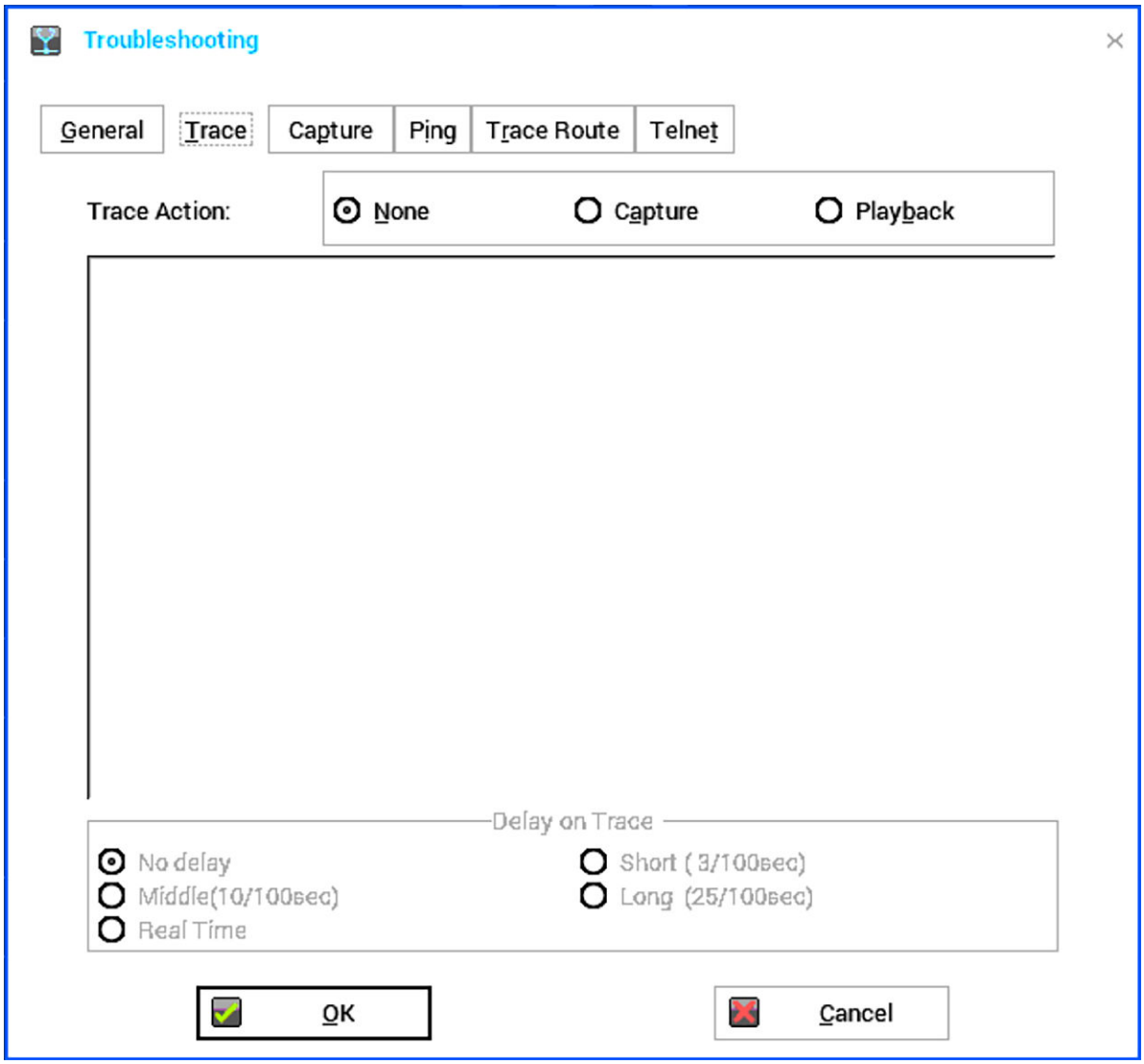


Figure 37. Trace

4 Click the **Capture** tab, and configure the export event log, network capture, wireless capture, and capture USB packets as per your requirements.

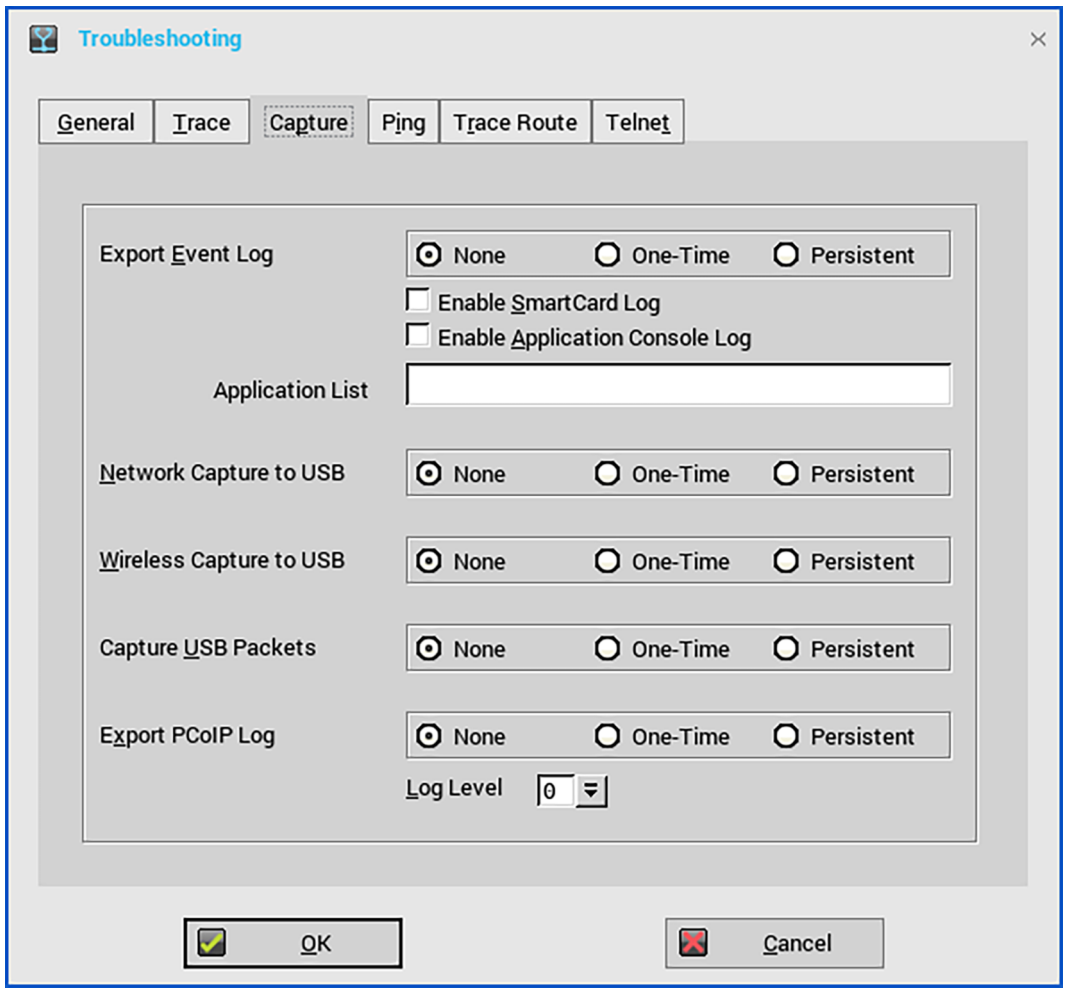


Figure 38. Capture

a **Export Event log**—Click either the **One-time** or **Persistent** option to enable logging any unexpected error messages. You can turn off logging and check the log file under the folder `ftp:/wnos/trouble_shoot`. Ensure to enable the **Enable Trace** option of the Privilege parameter in a wnos.ini file. For more information, see the *Dell Wyse ThinOS INI Guide*.

b **Enable SmartCard log**—To enable the client to log error messages of the smart card, select the **Enable SmartCard log** check box.

c **Enable Application Console Log**—To enable the client to log error messages of an application console, select the **Enable Application Console Log** check box. All logs are saved to the **trouble_shoot** folder with the name TerminalName_proc_name_date_time.log.

In the **Application List** field, enter the name of the application for which you want to generate logs. The name in the list can be part of the application name. For example, the PCoIP application name is **/pcoip/pcoip** and blast application name is **/usr/lib/vmware/view/usb/horizon**. If you want to generate logs for both PCoIP and Blast applications, enter `pcoip;vmware` in the **Application List** field. By default, the **Application List** filters are not applied and all logs are saved to the target folder.

d **Network capture to USB**—Click either the **One-time** or **Persistent** option to enable the capture of network information. Enabling this option captures the network trace of all traffic coming in and out of the thin client to a USB drive that is inserted into the thin client.

After you log in and use the Citrix Apps and Desktops server or network, you can view the **/wnos/troubleshoot/[Terminal Name]_[ENET or WS].[Date_Time].pcap** file in the USB drive. You can analyze using software such as a packet analyzer used for network troubleshooting, and analysis.

For example, for Ethernet, the file name is **yx008064b2bfd7_ENET.20150415_064455.pcap**. For wireless, the file name is **yx008064b2bfd7_WS.20150415_064455.pcap**.

> **NOTE: Ensure that you have inserted the USB drive into the thin client before selecting the network capture option. If the USB drive is not inserted and you exit the dialog box, the network capture is automatically cleared.**

e **Wireless capture to USB**—Click either the **One-time** or **Persistent** option to enable the capture of wireless network information. Enabling this option captures the wireless network trace of all traffic coming in and out of the thin client to a USB drive that is inserted into the thin client.

f **Capture USB Packets**—Click either the **One-time** or **Persistent** option to enable the capture of USB packets.

g **Export PCoIP log**—Click either the **One-time** or **Persistent** option to export PCoIP logs on the PCoIP-enabled clients.

5 Click the **Ping** tab, and use the following guidelines to start the ping-diagnostic utility and display response messages:

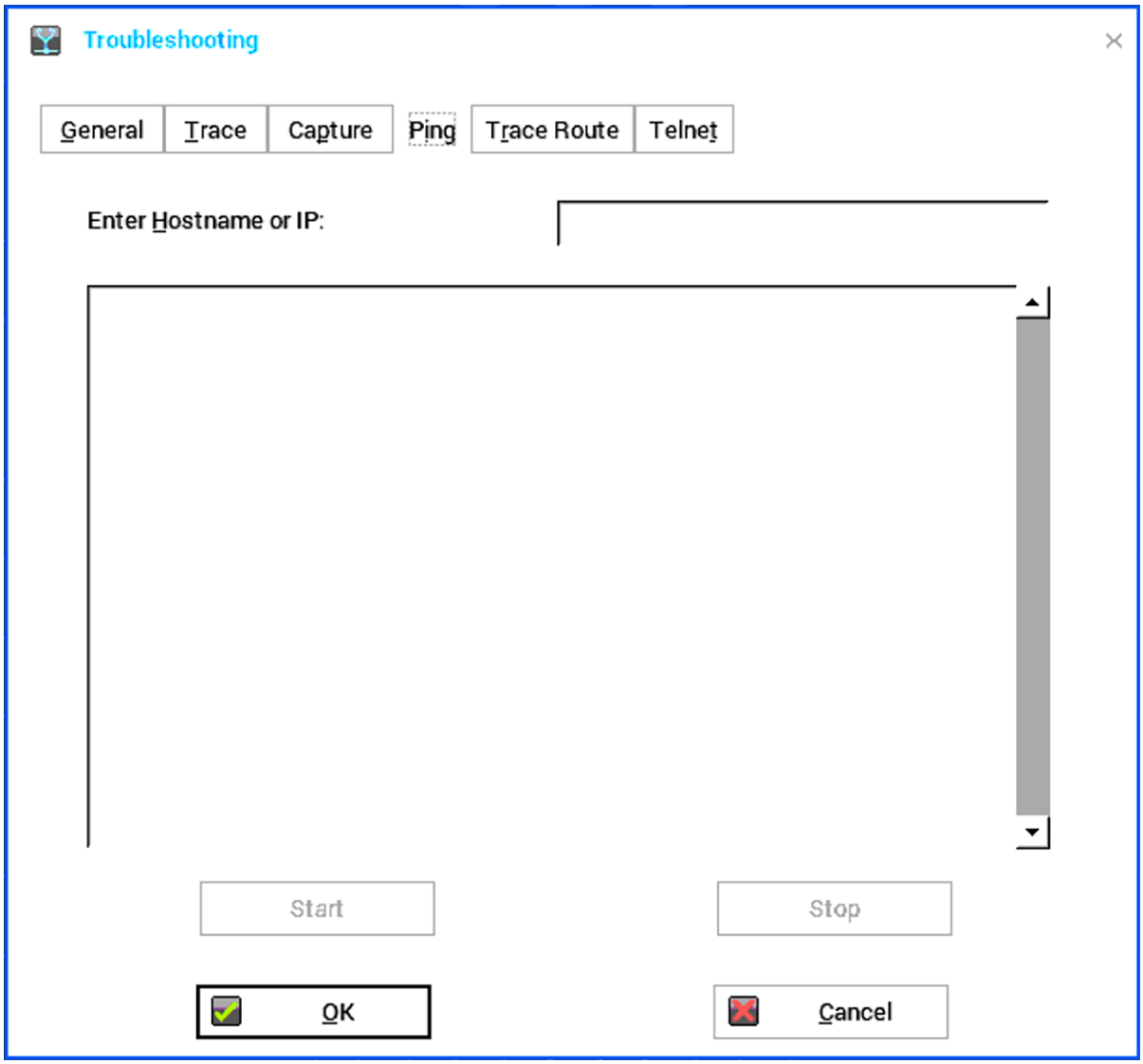


Figure 39. Ping

- **Enter Hostname or IP**—Enter the IP address, DNS-registered hostname, or WINS-registered hostname of the target to be pinged.
- **Data area**—Displays ping response messages. The ping command sends one echo request per second, calculates round trip times and packet loss statistics, and displays a brief summary upon completing the calculation.
- **Start**—Executes the ping command. If the host is operational and on the network, it responds to the echo request. By default, echo requests are sent until interrupted by clicking **Stop**.

- **Stop**—Terminates the ping request and leaves the **Ping** dialog box open, so you can read the summary posted in the data area.

  NOTE:
  Ping sends an echo request to a network host. The host parameter is either a valid hostname or an IP address. If the host is operational and on the network, it responds to the echo request. Ping sends one echo request per second and calculates round trip times and packet loss statistics. It displays a brief summary upon completion of the calculation.

  The ping utility can be used to:

  - Determine the status of the network and various foreign hosts.
  - Track and isolate hardware and software problems.
  - Test, measure, and manage networks.
  - Determine the IP address of a host if only the hostname is known.

  IMPORTANT: Not all network equipment responds to ping packets, as this is a common mechanism that is used in denial-of-service attacks. Lack of response does not necessarily indicate that the target of the ping is unusable for other purposes.

6 Click the **Trace Route** tab, and use the following guidelines to start the tracert diagnostic utility and display response messages.

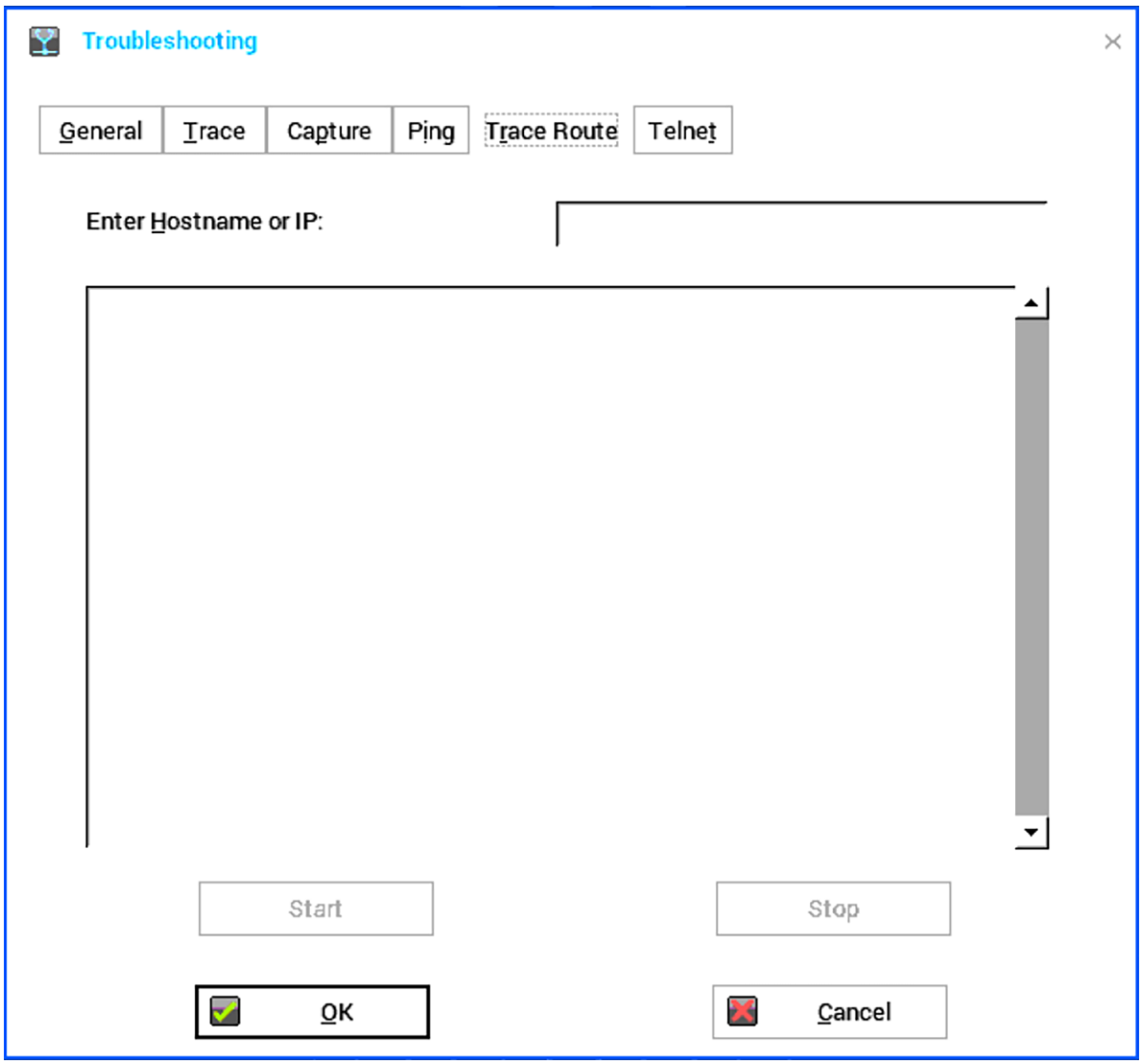


Figure 40. Trace route

- **Enter Hostname or IP**—Enter the IP address, DNS-registered hostname, or WINS-registered hostname of the target to be traced.
- **Data area**—Displays round-trip response time and identifying information for each device in the path.
- **Start**—Executes the tracert command.
- **Stop**—Terminates the tracert command and leaves the **Trace Route** dialog box open, so that you can read the information posted in the data area.

The tracert utility traces the path from your thin client to a network host. The host parameter is either a valid hostname or an IP address. The tracert utility sends out a packet of information three times to each device (routers and computers) in the path and displays the round trip response times and identifying information in the message box.

7 Click the **Telnet** tab, and do the following:

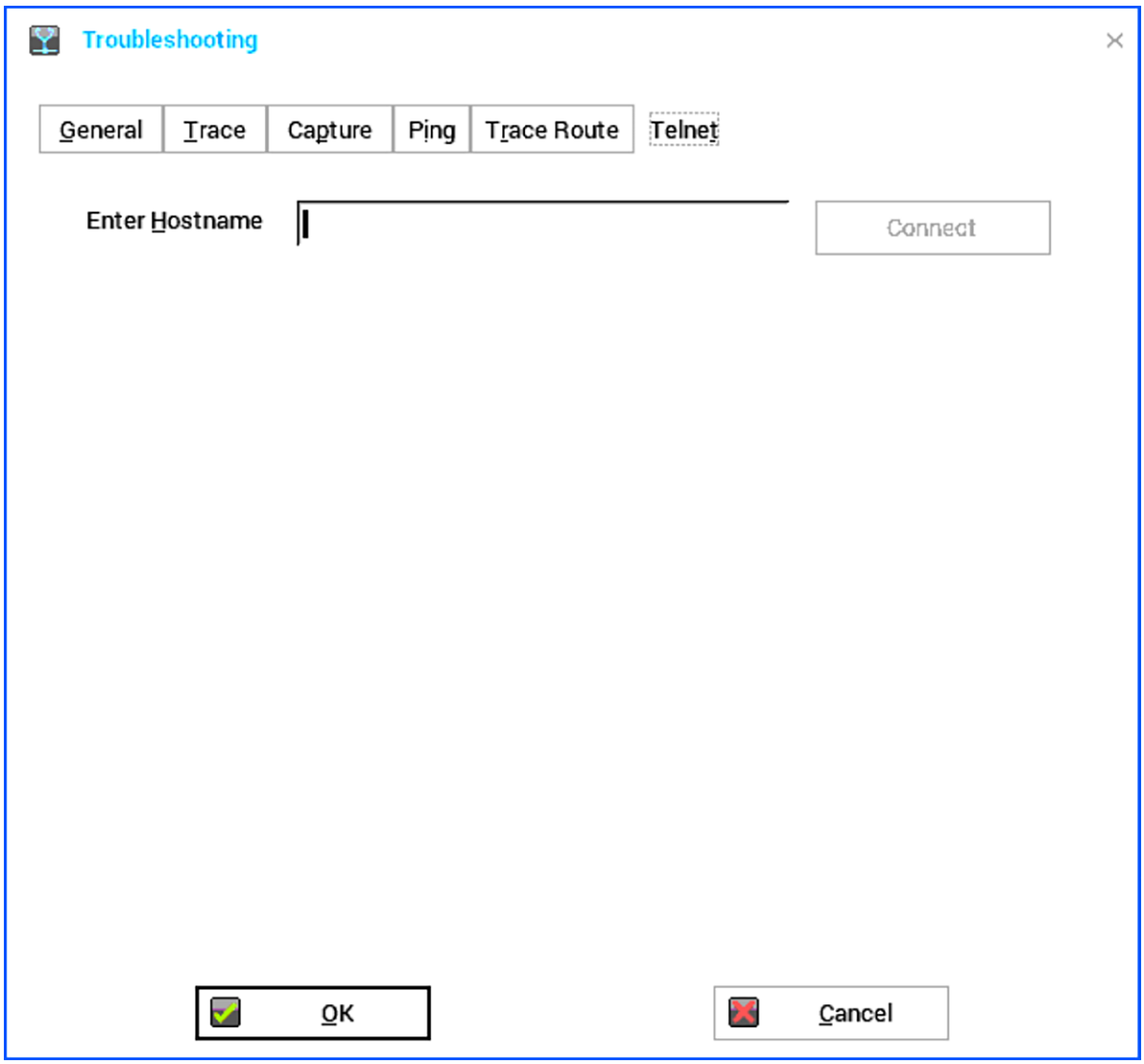


Figure 41. Telnet

a Enter the hostname.
b Click **Connect** to connect to a remote host or device.
The **Telnet** window is displayed, and the troubleshooting window is closed automatically.

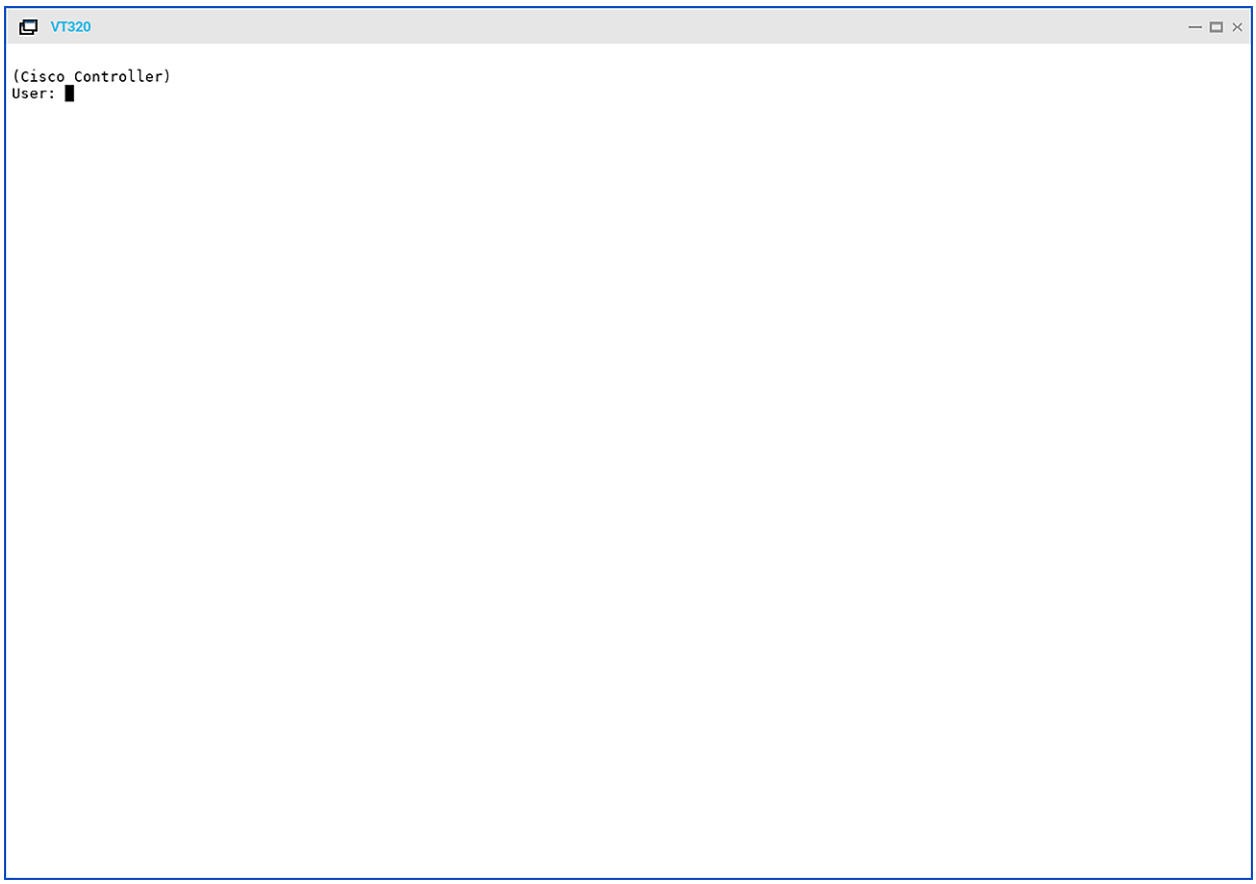


Figure 42. Telnet window

8 Click **OK** to save your settings.

11

BIOS management on ThinOS

This appendix describes the BIOS management on the ThinOS devices with Wyse BIOS (CMOS), or Dell Standard BIOS.

To make the BIOS management consistent between Wyse BIOS and Dell BIOS, an INI parameter **Device=Cmos** is introduced for Wyse BIOS, and **Device=DellCmos** for Dell Standard BIOS.

If the password is configured for the BIOS configuration, then you must enter an appropriate password to update any settings. For example, the INI parameter to update settings must be followed with "CurrentPassword={}". This is mandatory for Dell BIOS.

After you update BIOS on Wyse 5010 thin client, Wyse 5040 thin client, Wyse 7010 thin client, Wyse 5060 thin client, and Wyse 3030 LT thin client by using file server, the BIOS management may not be possible until you manually enter and exit the BIOS configuration menu. This is due to a CMOS mismatch. To resolve this issue:

- Boot unit and press Delete during boot to enter the BIOS menu.
- Enter the BIOS password.
- Press F10 to save BIOS configurations and resolve the CMOS mismatch.

BIOS functionality matrix

Table 48. BIOS functionality matrix

Major requirement	INI parameter for BIOS management	Wyse 5010 thin client, Wyse 5040 thin client, Wyse 7010 thin client	Wyse 5060 thin client	Wyse 3030 LT thin client	Wyse 3040 thin client
Power on without beeps	N/A	Yes	Yes	Yes	Yes
Update BIOS from file server	N/A	Yes	Yes	Yes	Yes
Change BIOS password with INI	Device=DellCmos CurrentPassword={} NewPassword={} Device=Cmos CurrentPassword={} NewPassword={}	Yes	Yes	Yes	Yes
Change boot order with INI	Device=cmos BootOrder={PXE, HardDisk, USB}	Yes	Yes	Yes	Not applicable
Enable/Disable PXE imaging with INI	Device=DellCmos PXEBootSupport={yes, no}	Not applicable	Not applicable	Not applicable	Yes
Enable/Disable USB imaging with INI	Device=cmos BootFromUSB={yes, no} Device=DellCmos USBBootSupport={yes, no}	Yes	Yes	Yes	Yes
Manage AC recovery with INI	Device=cmos AutoPower={yes, no} Device=DellCmos ACRecovery={PowerOff, PowerOn, LastState}	Yes	Yes	Yes	Yes

Major requirement	INI parameter for BIOS management	Wyse 5010 thin client, Wyse 5040 thin client, Wyse 7010 thin client	Wyse 5060 thin client	Wyse 3030 LT thin client	Wyse 3040 thin client
Manage auto on time with INI	Device=DellCmos AutoPower={Disable, Daily, Workday} AutoPowerTime=hh:mm Device=Cmos AutoPowerDate=yes AutoPowerTime=2:30:30 AutoPowerDays=Sunday;Friday	Yes	Yes	Yes	Yes
CMOS Extract and Restore	Device=cmos Action={extract, restore} CurrentPassword={} Device=DellCmos Action={extract, restore} CurrentPassword={}	Yes	Yes	Yes	Yes
Audio management with INI	Device=cmos OnboardAudio={yes, no} Device=DellCmos Audio={yes, no}	Yes	Yes	Yes	Yes
USB Port management with INI	Device=cmos USBController={yes, no} Device=DellCmos USBRearPort={yes, no} USBFrontPort={yes, no} (Rear/Front for Dell BIOS only)	Yes	Yes	Yes	Yes
Admin lockup management with INI	Device=DellCmos AdminLock= {yes, no}	Not applicable	Not applicable	Not applicable	Yes
Wake on USB support	Device=DellCmos WakeOnUSB={yes, no}	Not applicable	Not applicable	Not applicable	Yes
Wake On LAN	Device=cmos WakeOnLan= {yes, no} Device=DellCmos WakeOnLan= {Disable, LAN, PXE}	Yes	Yes	Yes	Yes

Accessing BIOS settings

After starting your thin client, you will see a Dell logo for a short time. During this period, press and hold the Delete key or F2 key based on the thin client model.

- Delete key—Press and hold the Delete key to enter the BIOS settings on the ThinOS clients with Wyse BIOS.
- F2 key—Press and hold the F2 key to enter the BIOS settings on the ThinOS clients with Dell Standard BIOS.

When prompted, type the password **Fireport** to view the BIOS settings screen. For example, you can use the F7 key to use Optimized Defaults—load optimal default values for all the items in the BIOS setup utility.

NOTE: These BIOS settings are not applicable to Wyse 3010 thin client and Wyse 3020 thin client, as there is no BIOS on ARM platform. To accessWLOADER on an ARM platform, press the power button for four seconds until the power light turns green, and then press the Delete key.

CMOS central management and extracting CMOS settings to the file server for distribution

CMOS central management allows ThinOS administrators to easily manage CMOS settings for large deployments of thin client devices using central configuration methodologies. Wyse 5010 thin client with ThinOS (D10D) is considered here as an example. The following instructions are for Wyse 5010 thin client with ThinOS (D10D) BIOS version 3.0D. However, the instructions are also applicable for other supported hardware platforms and BIOS versions.

1 To prepare a reference drive containing BIOS version 3.0D or later:
   a The reference device is a golden image you use to distribute to other thin client devices. To use reference drive, enter the BIOS setup utility. Press the **Delete** key, enter the password — **Fireport** (case sensitive) and press **Enter**. Configure the CMOS settings, includes Auto Power, Boot Order, P-key setting, and BIOS Password.
   b Save your CMOS settings.
   c Restart your thin client device.
2 To create a CMOS INI file in a file server:
   a In the file server, create a cmos.ini file and place it in the wnos directory/folder under the file server ini directory. Make sure that wnos directory on the file server has upload privilege.
   b Type the following name in the cmos.ini file: **Device=cmos Action=extract**.
3 To reboot the reference device to the file server containing the CMOS INI file:
   a On the thin client you want to use as a reference device, start the thin client.
   b In the **Login** dialog box, enter the credentials you need to access the cmos.ini file.
   c After login, to view the **Event Log** tab, do the following:

      Click **System Information icon** > **System Information dialog box** > **Event Log tab**.

      You can open the event log to view a CMOS: extract to D10D_cmos.3.0D event. This means that the CMOS central management file (containing the CMOS settings from your Reference Device) is now copied to the wnos directory/folder on the file server. As this is a D10D BIOS version 3.0D, the CMOS central management file name would be D10D_cmos.3.0D. These CMOS settings are now ready for distribution to other thin clients.
4 To prepare the file server containing the CMOS INI file for distribution:
   a Write the following line in the cmos.ini file for distribution on your file server: **Device=cmos Action=restore**.
   b Save the file.
5 Log in to all target device to the file server containing the CMOS INI file:
   a Start the thin client devices for which you want to distribute the reference device CMOS settings.
   b To access the cmos.ini. file, enter your credentials in the **Login** dialog box.
   c To open **Event Log**, click **System Information** icon. In the **System Information** dialog box, select **Event Log** tab.

      You can view the CMOS: restore from D10D_cmos.3.0D event. This means that your central management file containing the CMOS settings from your reference device is copied to the targeted thin client devices.

> **NOTE: After you target your thin client devices contain the CMOS settings you want, do not log in to the file server containing the cmos.ini file with the restore action (unless you want to redo the restore process). Administrators can remove the cmos.ini file to prevent from unwanted CMOS overwrites.**

> **NOTE: It is recommended to initially complete these procedures on a file server designated to test the success of your CMOS central management settings/process. While the central configuration method can be used to enforce your CMOS settings in a production environment, be aware that any thin client device that logs in to the file server that contains the cmos.ini and its extract and restore commands are subject to those commands (CMOS overwrites).**

For more information about the INI parameter Device=cmos, see Dell Wyse ThinOS INI Reference Guide.

CMOS local management and extracting CMOS settings to a USB key for distribution

CMOS local management allows ThinOS administrators to easily manage CMOS settings for small deployments of thin clients using USB key distribution methods. Wyse 5010 thin client with ThinOS (D10D) is considered here as an example. The following instructions are for Wyse 5010 thin client with ThinOS (D10D) BIOS version 3.0D.

1 To prepare a reference drive containing BIOS version 3.0D or later:
   a The reference device is a golden image you use to distribute to other thin client devices. To use reference drive, enter the BIOS setup utility. Press the **Delete** key, enter the password — **Fireport** (case sensitive) and press **Enter**. Configure the CMOS settings, includes Auto Power, Boot Order, P-key setting, and BIOS Password.
   b Save your CMOS settings.
   c Restart your thin client device.
2 To extract the CMOS settings to a USB key.
   a Attach a formatted USB key on the thin client device which you want to use as a reference device. For example, to format on Windows 7, attach the USB Key, right-click the USB key, select format, click **Restore device defaults**, select **Quick Format**, and then click **Start**.
   b Use the extract CMOS to USB GUI feature of ThinOS to extract the CMOS settings to the USB key. On Classic Desktop, right-click the desktop and select Extract CMOS to USB. On Wyse Zero desktop, in the General tab of the **System Tools** dialog box (**System Settings icon** > **System Tools** > **General tab**), click Extract CMOS to USB.
   c Once extraction successful you see a pop-up message: CMOS: extract to D10D_cmos.3.0D, properly eject and detach the USB key. The CMOS settings on the USB key are now ready for distribution to other thin clients
3 To restore the CMOS settings to your target devices:
   a On all of the target thin clients that you want to distribute the reference device CMOS settings, start the thin client.
   b Use the Restore CMOS from USB GUI feature of ThinOS to write the CMOS settings from the USB Key to the target thin client: For Classic Desktop, Right-click the desktop and select Restore CMOS from USB. For Wyse Zero Desktop, in the General tab of the System Tools dialog box (**System Settings icon** > **System Tools** > **General tab**), click Restore CMOS from USB.
   c Once restoration successful the following message is displayed: CMOS: restore from D10D_cmos.3.0D properly eject and detach the USB Key. The CMOS settings on the USB Key are now written to your target thin client.

Dell Standard BIOS management

This section describes how to configure and manage the ThinOS clients with Dell Standard BIOS.

Supported devices

- Wyse 3040 thin client with ThinOS
- Wyse 3040 thin client with PCoIP
- Wyse 5070 thin client with ThinOS
- Wyse 5070 Extended thin client

The following Dell BIOS configurations are supported by using file server (INI parameters):

Table 49. BIOS configuration options

Parameters	Settings
System Configuration	Audio
Security	• Admin Setup Lockout • Admin Password – Enable/Disable Admin Password – Update Admin Password
USB Configuration	• Enable Front USB Ports

Parameters	Settings
	• Enable Rear-Left Dual USB 2.0 Ports
Power Management	• Wake-On-LAN – Disabled – LAN Only – LAN with PXE Boot • AC Recovery – Power Off – Power On – Last Power State • Auto-On Time – Disabled – Every Day – Weekdays – Select Days • Wake-On-USB
Device boot	• USB boot • PXE boot

For information about INI parameters and their usage, see the latest *Dell Wyse ThinOS INI Reference Guide*.

The following are examples of INI parameters:

- **Device=DellCmos newpassword=1234567** or **newpasswordenc=encrypted strings**—Use this INI parameter to create the admin password when password is not set.
- **Device=DellCmos currentpassword=1234567 newpassword=""** or **currentpasswordenc=encrypted strings**—Use this INI parameter to clear the existing password.

12

Security

A new global security policy has been defined for ThinOS and this policy is applied to all secure connections (https/SSL connections) with a few exceptions.

Purpose—To improve the security level by default and add the global configuration. This security policy integrates security setting for each application.

Table 50. INI parameter

INI parameter	Description

`SecurityPolicy={full | warning (default) | low}`
`SecuredNetworkProtocol={yes | no (default)}`
`TLSMinVersion={1 (default), 2, 3}`
`TLSMaxVesion={1, 2, 3 (default)}`
	Full—SSL connection must verify the server certificate. If it is untrusted, cancel the connection.
	Warning (default)—SSL connection must verify the server certificate. If it is untrusted, you can continue or cancel the connection.
	
	Low—Server certificate is not verified. This value is set for a few applications.
	
	After firmware is updated, the default value is set to warning for all applicable applications immediately.
	
	There is an exception for file server and WDM.
	
	The old ini SecurityLevel | SecureProtocol from Privilege segment is deleted.

All applications running on the default SSL security mode follow the global mode. In the global mode, the default value is Warning. The affected applications include VMware View, Amazon WorkSpaces (AWS), file server, WDM Service, Caradigm Server, and OneSign Server.

For more information about the security mode INI parameters, see Dell Wyse ThinOS INI Guide.

The following are the exceptions:

- File server and WDM in factory reset state—Before you load any INI parameter, the SSL security mode is set to Low, and after loading the INI parameter, the value is changed to follow the global mode value. For example, the default value is set to warning, if the value is not changed by the INI parameter.

  System with previous settings (default value is set to Low) follows the global mode after the unit is upgraded. For example, the default value is set to Warning, if the value is not changed by the INI parameter.
- VMware View and AWS brokers include own security settings (GUI and INI). From ThinOS 8.3 release, an additional option is added to follow the global mode as its new default value. The security mode GUI context is updated for better understanding.
- Wyse Management Suite, Microsoft RDS broker, Citrix broker, and SecureMatrix are always `Full`.

File server default protocol is retained as FTP without any setting from WDM/DHCP/INI and always displays the full address with protocol prefix. For example, `ftp://`.

New firmware/client deploy information

- Dell recommends that you define the Security Policy before upgrading to version 8.3 and later. If not, you may get warning messages that require intervention to proceed.
- Before you upgrade to version 8.3 and later, Dell recommends that you define the desired SSL security level and add the required Security Policy parameters/options to the global INI file.

- For `SecurityPolicy=Full`or `warning`, add certificates from the respective File, View, AWS, WDM, Wyse Management Suite, OneSign, and/or Caradigm servers to the ThinOS client before updating the firmware.
- The default protocol of file server is still FTP and ftp prefix is added automatically if the protocol is not provided.
- Earlier when the connection to https file server fails in full security mode, a dialog box is displayed which prompts you to click **OK**. From ThinOS 8.5 HF2 release, the feature is updated to display a tooltip at the bottom-right of the screen.
- Improved user-friendly messages are displayed for errors and warnings.

NOTE:
If the WDM server is set as https, the server address does not convert to http.

Firmware signature

Firmware signature feature was introduced in ThinOS 8.3.1 for better firmware security. From ThinOS 8.4 release, firmware signature verification is added to enhance firmware security.

Salient features

- By default, signature verification is required on firmware downgrade/upgrade process.
- Provision to downgrade from 8.4 firmware to 8.3 firmware without signature. For example, earlier to ThinOS 8.3.1 release, the firmware downgrade is prohibited by default.
- New INI parameter `verifysignature=no` is introduced to enable user downgrade firmware. For example: `autoload=101 verifysignature=no`. For more information about using INI parameters, refer to the latest Dell Wyse ThinOS INI Reference guide.

  The following scenarios are allowed without need of using INI parameters:

  - Upgrade from 8.3.x firmware to 8.4 firmware.
  - Upgrade or Downgrade between 8.3.x and/or earlier firmware.
  - Upgrade or Downgrade between 8.4 and later firmware.

Transport Layer Security

Transport Layer Security (TLS) is a protocol that provides communication security between the client and server applications.

Upgrade to Transport Layer Security (TLS)— In the ThinOS 8.2 release, the TLS is upgraded from version 1.0 to version 1.2. By default, the ThinOS client uses TLS 1.2 to secure any communication protocols, connections, or applications upon SSL/ TLS in general and falls back to the previous SSL/ TLS version when negotiating with the server.

Smart cards and smart card readers

A smart card is a security token that has embedded integrated circuits. Smart cards allow you to store and transact data.

A smart card reader is an input device that reads data from a smart card.

- **Gemalto smart card IDPrime MD840**—Gemalto smart card IDPrime MD830 and MD840 are supported. IDGo 800 version 1.2.1 - 01 for the Windows middleware is required for supporting Gemalto smart card IDPrime MD840.

  The Secure Messaging feature is supported to enable the usage of latest MD830 Rev B cards.

  Known issue for Prime MD 840 smart card: If first container is used, then Xen broker logon fails.
- **OMNIKEY smart card readers**—The following OMNIKEY smart card readers are supported:
  - Omnikey 5427 CK (0x5427, 0x076b) reader supports iclass15693, 14443a, 125k card
  - Omnikey 5422
  - Omnikey 5326 DFR (0x5326, 0x076b) reader supports iclass15693 card
  - Omnikey 5025 CL (0x502a, 0x076b) reader supports 125k card
  - Ominkey 5325 CL, 5125 (0x5125, 0x076b) reader supports 125k card
  - Omnikey 5321 V2 CLi (0x532a, 0x076b) reader supports 13.56 MHz card
  - Omnikey 5321 V2 (076b, 5321) reader supports 13.56 MHZ card

  - Omnikey 5021 CL (0x5340, 0x076b) reader supports 13.56 MHZ card
  - Omnikey 5321 V2 CI Sam (0x5341, 0x076b) reader supports 13.56 MHz card
  - Omnikey 5421 (0x5421, 0x076b), reader supports 13.56 MHz card
  - Omnikey 5321 CR (0x5320, 0x076b)
  - Omnikey 5022 CL
- **On-board smart card reader**—On-board smart card reader works with regular smart cards. The functionality is similar to other external USB smart card readers and on-board smart card readers such as Dell KB-813.

For information about the complete list of the tested smart cards and smart card readers, see the latest Release Notes.

Rutoken smart card reader

Rutoken is a USB smart card that is used for two-factor authentication. You can generate and store encryption keys for electronic signatures, use it to encrypt keys, and perform electronic signature. You can also use this device to encrypt store digital certificates and other data.

ThinOS 8.6 MR3 supports Rutoken 2151 and Rutoken ECP 2.0 (2100).

13

Troubleshooting

This section describes some basic troubleshooting that you can implement when you experience any problem.

- ThinOS devices allow secure SSL connections—**`SecurityMode=Full`**—only after verifying the certificates. In the present scenario, the devices enforce the warning policy after you define a server using a valid IP address.

  The following are the workarounds to avoid the SSL connection issue:

  - Ensure that the device has a valid certificate and the correct time is selected on the device.
  - Define the server by name instead of IP address.
  - Set the value of the global security policy to high.
  - Use the following INI parameter to enforce the high security mode:

    `SecurityPolicy=high TLSCheckCN=Yes`
- Blast connection—If there is a launch issue, check the remote desktop status and network status; reboot unit few times and the desktop connects successfully.

A

Examples of common printing configurations

This appendix provides examples on using the **Printer Setup** dialog box and ThinOS INI parameters for common printing situations. Use these general guidelines in addition to the information provided in Configuring the Printer Setup.

IMPORTANT: Host-based printers are not supported.

It includes:

- Printing to local USB or parallel printers
  - Using the Printer Setup dialog box for local USB or parallel printers
  - Using INI parameters for local USB or parallel printers
- Printing to non-Windows network printers (LPD)
  - Using the Printer Setup dialog box for non-Windows network printers (LPD)
  - Using INI parameters for non-Windows network printers
- Printing to Windows network printers (SMB)
  - Using the Printer Setup dialog box for Windows network printers
  - Using INI parameters for Windows network printers
- Using your thin client as a print server (LPD)
  - Using the Printer Setup dialog box for configuring LPD services
  - Using INI parameters for configuring LPD services
- Configuring ThinPrint

Printing to local USB or parallel printers

You can print to locally attached printers through USB or parallel ports.

IMPORTANT: Microsoft Remote Desktop Session Host (RDSH), Microsoft Terminal Services, and Citrix XenApp each have their own printing policies that must be configured properly to allow client side printing. For details on configuring printing in these environments, see your vendor instructions.

Using the Printer Setup dialog box for local USB or parallel printers

In this example you have an HP LaserJet 4000 attached to a thin client USB port. When connecting USB printers, some printers fill out the Printer Name and Printer Identification fields for you.
To Configure the Printer to print locally attached printers through USB or Parallel ports.

1 From the desktop menu, click **System Setup** > **Printer**.
The **Printer Setup** dialog box is displayed.

2 Click **Printer Setup**, and use the following guidelines for the Ports tab when printing to a local USB printer:
   a **Select Port** — Select LPT1 or LPT2 port.
   b **Printer Name** — Enter name you want displayed in your list of printers, most USB direct-connected printers report/fill in their printer name automatically.

c **Printer Identification** — Enter the type or model of the printer in the exact text of the Windows printer driver name — including capitalizations and spaces most USB direct-connected printers report/fill in their printer identifications automatically. In our example case, enter HP LaserJet 4000 Series PCL.

d **Printer Class** — You can leave this as default.

e **Enable the printer device** — Must be selected to enable the directly connected printer enables the device so it displays on the remote host.

3 Click **OK** to save the settings.

Using INI parameters for local USB or parallel printers

Configuring local printing using ThinOS INI parameters is simple and an easy way to configure a printer for all clients in your environment assuming every printer is the same.

Your INI parameters will look something like the following:

```
Printer=LPT1 \
Name="HP LaserJet 4000" \
PrinterID="HP LaserJet 4000 Series PCL" \
Enabled=yes
```

NOTE: The PrinterID is the exact text of the Windows printer driver name, so if a printer driver is named HP LaserJet 4000 Series PCL in Windows, then it must be exactly the same in the PrinterID field in the INI parameters including capitalizations and spaces.

Printing to non-Windows network printers

ThinOS can print to non-Windows network printers as long as the printers can accept LPR print requests. Most workgroup printers and large network printers have this capability be sure to check with your vendor that the printer can accept Line Printer Request print requests.

Once your thin client is configured to print to an LPR capable printer, the client will then redirect this printer through an RDP or ICA connection to your back end infrastructure. In this way the client will connect to your back end infrastructure and this network printer will appear as a client local printer.

Using the Printer Setup dialog box for non-Windows network printers

To configure the **Printer Setup** dialog box for Non-Windows Network Printers (LPD).

1 From the desktop menu, click **System Setup**, and then click **Printer**.
The **Printer Setup** dialog box is displayed.

In this example we have an HP LaserJet 4200n attached to a thin client through LPR.

2 Click the **LPDs** tab and use the following guidelines when printing to a non-Windows network printer:

a **Select LPD** — Select LPD1 or LPD2 port.

b **Printer Name** — Enter name you want displayed in your list of printers.

c **Printer Identification** — Enter the type or model of the printer in the exact text of the Windows printer driver name — including capitalizations and spaces.
In this example, enter HP LaserJet 4200n PCL6.

d **LPD Hosts** — The DNS or WINS name of the server for the network printer. An IP address of the printer on the network can also be entered as we have used in our case example.

NOTE: If the printer is attached to another thin client on your network, the entry in the LPD Hosts box is the name or address of that thin client.

e **LPD Queue Name** — An LPD host maintains a named queue for each supported printer. Enter the name of the queue associated with the printer used. This name can be different for each vendor. This field is required and must be correct so that

the network printer accepts incoming print jobs properly. In our case example, **auto** can be used for HP LaserJet 4200n PCL6 as per documentation found on the HP website.

> **NOTE: If the printer is attached to another thin client on your network, the LPD Queue Name must match the content of the Printer Name box on the thin client with the printer attached.**

f **Printer Class** —You can leave this as default.

g **Enable the printer device** — Must be selected to enable the printer enables the device so it displays on the remote host.

Using INI parameters for non-Windows network printers

Configuring network printing using ThinOS INI parameters is simple and an easy way to configure a printer for all clients in your environment assuming every printer is the same.

Your INI parameters will look something like the following:

```
Printer=LPD1 \
LocalName="HP LaserJet 4200n" \
Host=10.10.10.1 \
Queue=auto \
PrinterID="HP LaserJet 4200 PCL6" \
Enabled=yes
```

> **NOTE: The PrinterID is the exact text of the Windows printer driver name, so if a printer driver is named HP LaserJet 4200n PCL6 in Windows, then it must be exactly the same in the PrinterID field in the INI parameters including capitalizations and spaces.**

Printing to Windows network printers

ThinOS can print to printers that are shared by Microsoft print servers. There are some configuration requirements that need to be considered when configuring SMB printing from ThinOS which may require changes to your thin client setup.

Since connecting to a Microsoft Windows Print Server requires domain credentials, you must provide the credentials to ThinOS either on demand as the printer is used or by administrator setup providing credentials cached from the Dell Wyse login screen, see Example **3: Defining an SMB Printer to Use User Credentials Cached by ThinOS (Advanced)** in Using INI parameters for Windows network printers (SMB). This section will discuss both methods.

Using the Printer Setup dialog box for Windows network printers

Configuring an SMB printer is this manner forces users to enter their credentials before each printing; this means they will be temporarily pulled out of their remote session to enter their credentials (this can be avoided by using an INI file as discussed in Using INI parameters for Windows network printers.

1 From the desktop menu, click **System Setup** > **Printer**.
The **Printer setup** dialog box is displayed.

2 Click the **SMBS** tab, and use the following guidelines when printing to a Windows network printer:

> **NOTE: The printer name shared by Windows must not contain any spaces or ThinOS will not be able to use it.**

a **Select SMB** — Select the SMB you want from the list.

b **\\Host\Printer** — Click the browse folder icon next to the box to browse your Microsoft Networks and make the printer selection you want from the network printers available the DNS name or IP address of the Windows print server on the network. After entering required domain credentials, the **Printer Setup** dialog box will display

c **Printer Name** — Enter name you want displayed in your list of printers.

d **Printer Identification** — Enter the type or model of the printer in the exact text of the Windows printer driver name—including capitalizations and spaces.

In example case, enter HP LaserJet 4100 Series PCL.

e **Printer Class** —You can leave this as default.

f **Enable the printer device** — Must be selected to enable the printer.

It enables the device so it displays on the remote host.

Click **Test Print** and you will be prompted to enter your Windows credentials, these credentials will be used to access the printer share. This is also the same dialog box that will display for a user when they attempt to print to this printer.

Using INI parameters for Windows network printers

Configuring SMB printing using ThinOS INI parameters is simple and an easy way to configure printers shared by a Windows server for all clients in your environment. The primary advantage of configuring SMB printing using ThinOS INI parameters is that you can pre-define the domain account to use to authenticate the printer. The following examples discuss how the credentials can be supplied.

1. Defining an SMB printer with generic user credentials in plain text

```
Printer=SMB1 \
LocalName="Demo SMB Printer" \
Host=\\dp-dc-ftp \
Name="TechSupportPrinter" \
PrinterID="HP LaserJet 4100 Series PCL" \
Enabled=yes \
Username=Username1 \
Password=Password \
Domain=contoso
```

2. Defining an SMB printer with generic user credentials that are encrypted

```
Printer=SMB1 \
LocalName="Demo SMB Printer" \
Host=\\dp-dc-ftp \
Name="TechSupportPrinter" \
PrinterID="HP LaserJet 4100 Series PCL" \
Enabled=yes \
Username-enc=PACGOGDBPKDOPGDGKC \
Password-enc=PFDBOHDBODCJPODP \
Domain=contoso
```

NOTE: You can use the Configuration Generator (ConfGen) tool to create INI parameters for ThinOS. ConfGen can be downloaded from technicalhelp.de.

IMPORTANT: This is a non-supported tool that is linked solely for the purpose of this example.

3. Defining an SMB printer to use user credentials cached by ThinOS (advanced)

NOTE: This method requires that the user log in to ThinOS so that the credentials can be cached for later use. The example INI section provided below provides the minimum requirements you need.

Signon=NTLM

```
Connect=RDP \
Host=1.2.3.4 \
Username=$UN \
Password=$PW \
Domain=$DN \
AutoConnect=1
```

```
Printer=SMB1 \
LocalName="Demo SMB Printer" \
Host=\\dp-dc-ftp \
Name="TechSupportPrinter" \
PrinterID="HP LaserJet 4100 Series PCL" \
Enabled=yes \
Username=$UN \
Password=$PW \
Domain=$DN
```

Using your thin client as a print server

ThinOS thin client can be configured as a basic network print server, to share local printers with other thin clients.

Using the Printer Setup dialog box for configuring LPD services

From the Classic desktop mode only, a thin client can be configured to provide LPD (Line Printer Daemon) services making the thin client a printer server on the network. Set up the thin client that is to provide LPD print services as follows:
To configure LPD services using the Printer Setup dialog box.

1 From the desktop menu, click **System Setup** > **Network Setup** to open the **Network Setup** dialog box.
2 Enter a static IP address for the thin client.
3 From the desktop menu, click **System Setup** > **Printer** to open the **Printer Setup** dialog box and select any of the listed ports.
4 Select a LPT.
5 Name the printer in the **Printer Name** box.
6 Enter the **Printer Identification** type or model of the printer in the exact text of the Windows printer driver name — including capitalizations and spaces. In our example case, enter HP LaserJet 4000 Series PCL.
7 You can leave **Printer Class** as default.
8 Select **Enable the Printer Device**.
9 Select **Enable LPD service for the printer**.
10 For setting up Windows 2003/2008 servers, see Setting up Windows 2003/2008 servers.

Setting up Windows servers

To configure setting the Windows 2003/2008 servers

1 Navigate to **Control Panel** > **Administrative Tools** > **Services** and ensure the Microsoft TCP/IP Printing service is installed. If it is not, install it using the Microsoft installation instructions.
2 Add the thin client as the LPD printer by completing the following:
   a Navigate to **Control Panel > Printers > Add Printers > Local Printer > Create a new port** and select **LPR PORT**.

      NOTE: If you do not see LPR Port, ensure that the Microsoft TCP/IP Printing service is installed correctly.

   b Type the thin client IP address or DNS name in the **Name or address of host providing LPD** box.
   c Type the printer name assigned in Using the Printer Setup dialog box for configuring LPD services in the **Name of printer on that machine** box.
   d Click **OK**, and then click **NEXT**.
3 After you have selected the printer, you can perform your normal printer setup for the application server. For example, select the manufacturer printer type and printer name.

Using INI parameters for configuring LPD services

Configuring LPD printing using ThinOS INI parameters is simple and an easy way to configure a ThinOS thin client to be a basic network print server, to share local printers with other thin clients.

Your INI parameters will look something like the following:

```
Printer=LPT1 \
Name="HP LaserJet 4000" \
PrinterID="HP LaserJet 4000 Series PCL" \
```

```
Enabled=yes \
EnableLPD=yes
```

NOTE: The PrinterID is the exact text of the Windows printer driver name, so if a printer driver is named HP LaserJet 4000 Series PCL in Windows, then it must be exactly the same in the PrinterID field in the INI parameters including capitalizations and spaces.

Configuring ThinPrint

No ThinPrint specific configuration is available on the thin clients. Thus to be able to use ThinPrint, users must first set up their printers according to the user documentation, and then configure ThinPrint on the thin client using the Printer Setup dialog box.

To configure the ThinPrint, use the following guidelines:

- Use the **Printer Identification** field to enter a printer class (you can change the printer name as needed).
- Printer IDs are assigned (depending on the physical port) as follows:
  - COM1 = 1
  - COM2 = 2
  - LPT1 = 3 — USB printers are detected automatically on LPT1
  - LPT2 = 4
  - LPD0 = 5– The LPD Queue name is transmitted as the printer name; the Printer Identification as class
  - LPD1 = 6 — The LPD Queue name is transmitted as the printer name; the Printer Identification as class
  - LPD2 = 7 — The LPD Queue name is transmitted as the printer name; the Printer Identification as class
  - LPD3 = 8 — The LPD Queue name is transmitted as the printer name; the Printer Identification as class
  - SMB1 = 9 — In the form \\host\printershare
  - SMB2 = 10
  - SMB3 = 11
  - SMB4 = 12

To install the relevant ThinPrint product on the server use the following guidelines:

- **Printer Objects Created Manually by the Administrator** — After you install.print Engine, create a printer object on the server to use the native driver and ThinPort as a printer port. You can use any protocol (TCP, RDP or ICA) because ThinOS has.print clients for all of the protocols. The printer object needs to observe ThinPrint naming conventions, for example, *HPLJ5#_:2*, in which case print jobs are sent to the local printer that has ID number *.2* by referring to.print client port ID. If no ID number is present, the.print client sends the print job to the printer set as current.
- **Printer Objects Created Automatically by ThinPrint AutoConnect** — When using ThinPrint AutoConnect, the thin client identifies with the thin client ID number 84 and thus is recognized as a thin client without a local spooler. You can also set up a template on the server that uses a native driver example, *HPLJ5*) and ThinPort, and then name this template as you want in the form _#AnyName.

  You can then make sure that the rules on ThinPrint Autoconnect [1] have been set to assign the desired local printers to use this server template. The assigned printer will then be shown in the user session using the HPLJ5 driver and ThinPort; it is named automatically according to ThinPrint naming convention with the printer name from the client side included. Alternatively, you can also define a template name according to the client printer name (replace.AnyName. with printer name 4. and 5. above for example, *_#HP Laserjet 5* so that the local printer object.HP Laserjet 5. is mapped to this template without any rules defined on the ThinPrint Autoconnect.

B

Important notes

- **VNC RFB version upgrade**—Since ThinOS 8.0_214, the VNC RFB version has been upgraded to 3.8. This version upgrade provides support for applications like DameWare. Thus, an administrator can now remote into a ThinOS device using either DameWare or VNC Viewer. Prior to 8.0_214, you could only use VNC Viewer.
- **Headless boot**—ThinOS supports the headless mode that enables you to boot the operating system without a monitor.
- **Report locally attached devices to Wyse Device Manager**— From ThinOS version 8.6, the locally attached devices such as monitor and USB device are reported to the Wyse Device Manager (WDM) server. This information is displayed in the device detail section on the WDM console.

  NOTE: ThinOS supports more than 20 USB devices through the USB hub. However, WDM server shows only 10 devices.

C

Frequently asked questions

This section contains information about the frequently asked questions (FAQs).

How to enable USB Redirection in RDP windows 10 session

To enable USB Redirection in RDP windows 10 session, you must change the policy. Go to **Computer Configuration** > **Administrative Templates** > **Windows Components** > **Remote Desktop Service** > **Remote Desktop Session Host** > **Device and Resource Redirection** > **Do not allow supported Plug and Play device redirection** and disable this policy.