Control Server
Dell™ Wyse™ SUSE® Linux™ Thin Client
User Guide
Sept 2017
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Document Updates

<table>
<thead>
<tr>
<th>Revision</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Connect to Host Using VMware Horizon Client</td>
<td>Added this section to provide the procedure to connect to a Host using the VMware Horizon Client</td>
</tr>
</tbody>
</table>

Related Documents

<table>
<thead>
<tr>
<th>Doc #</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEH-6840</td>
<td>NetworkST 3.1/4.0 for Mark Vle Controls Application Guide</td>
</tr>
<tr>
<td>GEH-6842</td>
<td>Control Server Dell Wyse SUSE Linux Thin Client HMI System Support and Maintenance Guide</td>
</tr>
<tr>
<td>GEH-6843</td>
<td>Control Server Dell Wyse SUSE Linux Thin Client HMI System Secure Deployment Guide</td>
</tr>
<tr>
<td>GEH-6844</td>
<td>Control Server System Overview</td>
</tr>
<tr>
<td>GEH-6845</td>
<td>Control Server — Domain Services Maintenance Guide</td>
</tr>
<tr>
<td>GEH-6846</td>
<td>Control Server Installation and Setup Guide</td>
</tr>
</tbody>
</table>

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Contents

1 Introduction .................................................................................................................................................................. 5

2 Operation........................................................................................................................................................................... 7
  2.1 Thin Client Startup......................................................................................................................................................... 7
  2.2 Thin Client Login ......................................................................................................................................................... 7
  2.3 Connect to a Host ......................................................................................................................................................... 8
    2.3.1 Launch Host Connection Manually ......................................................................................................................... 8
    2.3.2 Automatic Host Connection .................................................................................................................................. 9
    2.3.3 Client Session ....................................................................................................................................................... 10
  2.4 Close Host Connection ................................................................................................................................................. 11
  2.5 Thin Client Logout ....................................................................................................................................................... 11
  2.6 Thin Client Shut Down and Restart ............................................................................................................................... 12
  2.7 Connect to Host Using VMware Horizon Client ......................................................................................................... 13
    2.7.1 Connect to Host Using VMware Horizon Client .................................................................................................. 13
    2.7.2 VMware Horizon Client - Host Login Sequence .................................................................................................. 14
    2.7.3 User Unable to Establish Host Connection Using VMware Horizon Client ......................................................... 18
    2.7.4 User Unable to Log In to Host Using VMware Horizon Client ........................................................................... 19
  2.8 Disconnect VMware Horizon Client - Host Session .................................................................................................. 20
    2.8.1 Full Screen ............................................................................................................................................................. 20
    2.8.2 Partial Screen ........................................................................................................................................................ 21
  2.9 Connect to Host Using Wyse RDP Client ..................................................................................................................... 22
    2.9.1 Wyse RDP Client - Host Login Sequence .............................................................................................................. 22
    2.9.2 User Unable to Establish Host Connection Using Wyse RDP Client .................................................................... 25
    2.9.3 User Unable to Log In to Host Using Wyse RDP Client ......................................................................................... 25
  2.10 Disconnect Wyse RDP Client - Host Session ........................................................................................................... 26

3 Troubleshooting .............................................................................................................................................................. 27
  3.1 Thin Client Will Not Boot Up ...................................................................................................................................... 27
    3.1.1 Thin Client Power Button Will Not Illuminate .................................................................................................. 27
    3.1.2 Thin Client Monitor Will Not Display ................................................................................................................... 27
    3.1.3 Boot Sequence Will Not Complete ....................................................................................................................... 27
  3.2 User Unable to Log In to Thin Client ............................................................................................................................. 28
  3.3 Loss of Thin Client Network Connection .................................................................................................................... 28
  3.4 Unable to Power Down Thin Client ............................................................................................................................ 28

Glossary of Terms .............................................................................................................................................................. 29
1 Introduction

GE has developed the Control Server platform to implement the use of virtual machines running various applications from a server, in place of personal computers (PCs) each running the applications individually.

The Control Server platform is a set of rack mounted servers configured using hypervisor technology to support a number of virtual machines that provide infrastructure and control. The servers are configured as a high availability system to provide redundant operation.

The system has been designed to work with the Dell™ Wyse™ Thin Client Z50Qq. The Thin Client provides single, dual, or quad monitor support for display flexibility. The user must connect to a VM, login, and then run the desired application. For information on how to configure and download the Thin Client, refer to the Control Server Dell Wyse SUSE Linux Thin Client HMI System Secure Deployment Guide (GEH-6843).
2 Operation

The following sections provide information on starting up, logging in to, connecting, and shutting down a Dell Wyse Enhanced SUSE® Linux™ Enterprise Thin Client.

2.1 Thin Client Startup

Momentarily pressing the power button on the Thin Client applies power to the Thin Client and begins the startup sequence. The power button light remains illuminated and the monitor displays the progress during the boot sequence. When the boot sequence is completed, the Thin Client desktop is visible and the user login dialog is displayed.

Go to Thin Client Will Not Boot Up in the section Troubleshooting if the boot process fails to complete successfully.

2.2 Thin Client Login

The Thin Client displays the login dialog when it first boots up, or when no user is currently logged in. The user must log in to the Thin Client with user credentials provided by the System Administrator in order to use the Thin Client to interact with the system.

➢➢ To log in to the Thin Client

![Login Dialog](image-url)
2.3 Connect to a Host

Once the user is logged in to the Thin Client, they typically establish a connection to a host in order to access the features supported on the host. Host connections made available to the user are based on the logged in user account, and may also be determined on a Thin Client basis. This section provides an overview of the typical use cases with Thin Clients. Refer to the following sections for detailed instructions on managing connections of supported host connection clients:

- Connect to Host Using VMware Horizon Client
- Connect to Host Using Wyse RDP Client

2.3.1 Launch Host Connection Manually

The Thin Client provides host connection links on the desktop based on the logged in user. Connections to the hosts can be launched by double-clicking on the desktop connection links as shown in the following figure.

![Thin Client Displaying Two Host Links](image)

Connections can also be launched manually using the following procedure:

> To launch a host connection manually

From the Computer menu, double-click Connection Manager.

The Connection Manager dialog box displays.
From the **Connection Manager** dialog box, select the host **Connection** and click **Connect** to launch the connection to the host.

### 2.3.2 Automatic Host Connection

When configured for automatic connection, the Thin Client automatically launches a connection to a designated host without the user having to select the connection. Automatic connection to a host is configured by your System Administrator.
2.3.3 Client Session

Typically, the host requests the user credentials from the client when the connection is established.

In some cases, the login credentials of the host are automatically provided in the configured connection, and in other cases the user is required to provide the login credentials in order to establish the connection to the host. Once the user authentication is complete, the client provides a view of the host’s desktop or an application running on the host, and the user interacts with the host from the client window. The following figure shows the VMware™ Horizon Client’s display of a host’s desktop. The host desktop is displayed within the VMware Horizon Client window, and the user interacts with the desktop exactly like he would if he were directly logged into the host.
2.4 **Close Host Connection**

To prevent unauthorized access to the Host, the user should close the Host connection when it is not in use. Refer to the following sections for detailed instructions on managing connections of supported host connection clients:

- *Connect to Host Using VMware Horizon Client*
- *Connect to Host Using Wyse RDP Client*

2.5 **Thin Client Logout**

To prevent unauthorized access to the system from the Thin Client, the user should always log out of the Thin Client when it is not being used.

➢➢ **To log out of the Thin Client**

From the **Computer** menu, double-click **Logout**. The **Log Out of the Session** dialog box displays.

From the **Log Out of the Session** dialog box, click **Log Out**.

You are currently logged in as “admin”. You will be automatically logged out in 27 seconds.
2.6 Thin Client Shut Down and Restart

The following procedure is used to shut down or restart a Thin Client for maintenance or other activities.

➢ To shut down or restart the Thin Client

From the Computer menu, click **Shutdown**.

The **Shut Down the Computer** dialog box displays.

From the **Shut Down the Computer** dialog box, click either **Shut Down** to power down the Thin Client, or **Restart** to restart the Thin Client.

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2.7 Connect to Host Using VMware Horizon Client

The VMware Horizon Client is used to connect to hosts that support the VMware Horizon server. This section provides details on managing and troubleshooting the VMware Horizon Client connections.

2.7.1 Connect to Host Using VMware Horizon Client

➢➢ To connect to a Host using the VMware Horizon Client: double-click the desktop icon for the appropriate host or launch the connection from the Connection Manager to begin the connection sequence. Refer to the section Connect to a Host for the detailed procedure.

When the connection is launched the Horizon Client will attempt to authenticate the identity of the server. If authentication is successful, the connection will immediately proceed to the host login sequence.

Attention

Any trust related errors or warnings encountered may be the result of a cyber attack. Do not supply an untrusted server with your login credentials (username and password). Abort the connection and notify the site maintenance personnel for assistance.

If the authentication process fails, the following dialog box is typically displayed. Select the Do Not Connect button to close the connection and notify the site maintenance personnel for assistance.

Never establish an insecure connection to the host. An untrusted connection may be the result of a cyber attack. Do not supply your login credentials (username and password). Immediately close the connection and notify the site maintenance personnel for assistance.
2.7.2 VMware Horizon Client - Host Login Sequence

To establish a connection, the host must receive valid login credentials from the client before it accepts the connection. In some cases, the login credentials of the host are provided in the configured connection, and in other cases the user is required to provide the login credentials in order to establish the connection to the host.

2.7.2.1 No Login Credentials Provided

In cases where the login credentials of the host are not provided, the user is required to enter the Username, Password, and Domain before the connection can be established.

Example of Thin Client Display with Host Desktop and Server Login

Note If errors are displayed indicating a connection failure, go to the section User Unable to Establish Host Connection. If the correct login information is used, but the login indicates a failure due to an incorrect Username or Password, refer to the section User Unable to Log in to Host for further information.

After the connection is established, the host's desktop displays on the connected Thin Client monitor. The host's monitor continues to be displayed as long as the session between the Thin Client and host is active. Typically, the virtual desktop displays in full screen mode, so the Thin Client display is dedicated to the virtual desktop and is the same experience as logging directly into the host.
Example of Thin Client Display with Host Desktop

**Note**  The previous figure shows a virtual desktop within the Thin Client desktop for demonstration purposes. Typically, the virtual desktop is maximized to use all available desktop area of the Thin Client. The Thin Client desktop settings, and the relative size of the virtual desktop are all controlled by the Thin Client configuration that is created and maintained by the System Administrator.
2.7.2.2 Login Credentials Automatically Provided

In cases where the login credentials of the host are provided by the System Administrator in the configured connection, the Username, Password, and Domain information are automatically filled out. Click OK to launch the connection.

![Example of Automatic Login Credentials Between Thin Client and Host](image)

**Note** If errors are displayed indicating a connection failure, refer to the section [User Unable to Establish Host Connection Using VMware Horizon Client](#). If the login indicates a failure due to an incorrect Username or Password, refer to the section [User is Unable to Log in to the Host](#) for further information.
After the connection is established, the host's desktop displays on the connected Thin Client monitor. The host's monitor continues to be displayed as long as the session between the Thin Client and host is active. Typically, the virtual desktop displays in full screen mode, so the Thin Client display is dedicated to the virtual desktop and is the same experience as logging directly into the host.

**Note** The previous figure shows a virtual desktop within the Thin Client desktop for demonstration purposes. Typically, the virtual desktop will be maximized to use all available desktop area of the Thin Client. The Thin Client desktop settings, and the relative size of the virtual desktop are all controlled by the Thin Client configuration that is created and maintained by the System Administrator.
2.7.3  User Unable to Establish Host Connection Using VMware Horizon Client

Errors like the following may be displayed if the Thin Client is unable to contact the Host over the network.

![Example of Thin Client to Host Connection Error](image)

If the Thin Client fails to connect to the host, the problem could be caused by:

- The Thin Client is not connected to the network due to a Thin Client or network issue.
- The host is offline or unreachable due to network or host issues.
- The host is online but not responding to the Thin Client connection requests.

Follow the procedures in Loss of Thin Client Network Connection in the section Troubleshooting to look for and fix any Thin Client network connection issues. Contact the System Administrator if the connection error persists when the Thin Client is connected to the network.
If the login to the host fails, contact the System Administrator to verify that the Username, Domain, and Password are correct. If the login is unsuccessful with the correct information, contact the System Administrator for assistance in resolving the issue.
2.8 Disconnect VMware Horizon Client - Host Session

2.8.1 Full Screen

➢➢ To disconnect a VMware Horizon Client - Host session

From the Host desktop, use the **Connection** drop-down menu to end the session between the Thin Client and the host.

Or, click the **Close** button.
2.8.2 Partial Screen

➢ To disconnect a VMware Horizon Client - Host session

From the Host desktop, use the **Connection** drop-down menu to end the session between the Thin Client and the host.

Or, click the **Close** button.
2.9 Connect to Host Using Wyse RDP Client

The Wyse RDP Client can be used to connect to Hosts that support the RDP protocol. This section provides details on managing and troubleshooting the Wyse RDP Client connections.

2.9.1 Wyse RDP Client - Host Login Sequence

In order to establish a connection, the host must receive valid login credentials from the client before it accepts the connection. In some cases, the login credentials of the host are automatically provided in the configured connection, and in other cases the user is required to provide the login credentials in order to establish the connection to the host.

2.9.1.1 No Login Credentials Provided

In cases where the login credentials of the host are not provided, the user is required to enter the Username, Password, and Domain before the connection can be established.

![Wyse RDP Client - Host Login Screen](image)

**Note** If errors are displayed indicating a connection failure, refer to the section *User Unable to Establish Host Connection*. If the correct login information is used, but the login indicates a failure due to an incorrect Username or Password, refer to the section *User Unable to Log In to Host* for further information.

After the connection is established, the host's desktop displays on the connected Thin Client monitor. The host's monitor continues to be displayed as long as the session between the Thin Client and host is active. Typically, the virtual desktop is displayed in full screen mode, so the Thin Client display is dedicated to the virtual desktop and is the same experience as logging directly into the host.
**Note** The previous figure shows a virtual desktop within the Thin Client desktop for demonstration purposes. Typically, the virtual desktop is maximized to use all available desktop area of the Thin Client. The Thin Client desktop settings, and the relative size of the virtual desktop are all controlled by the Thin Client configuration that is created and maintained by the System Administrator.

### 2.9.1.2 Login Credentials Automatically Provided

In cases where the login credentials of the host are provided by the System Administrator in the configured connection, the connection with the Host is established without interaction from the user.

**Note** If errors are displayed indicating a connection failure, refer to the section [User Unable to Establish Host Connection](#). If the login indicates a failure due to an incorrect Username or Password, refer to the section [User Unable to Log In to Host](#) for further information.

After the connection is established, the host's desktop displays on the connected Thin Client monitor. The host's monitor continues to be displayed as long as the session between the Thin Client and host is active. Typically, the virtual desktop is displayed in full screen mode, so the Thin Client display is dedicated to the virtual desktop and is the same experience as logging directly into the host.
The previous figure shows a virtual desktop within the Thin Client desktop for demonstration purposes. Typically, the virtual desktop is maximized to use all available desktop area of the Thin Client. The Thin Client desktop settings, and the relative size of the virtual desktop are all controlled by the Thin Client configuration that is created and maintained by the System Administrator.
2.9.2 User Unable to Establish Host Connection Using Wyse RDP Client

Errors like the following may be displayed if the Thin Client is unable to contact the Host over the network.

![Example of Connection Error](image)

If the Thin Client fails to connect to the host, the problem could be caused by:

- The Thin Client is not connected to the network due to a Thin Client or network issue.
- The host is offline or unreachable due to network or host issues.
- The host is online but not responding to the Thin Client connection requests.

Follow the procedures in *Loss of Thin Client Network Connection*, the section *Troubleshooting*, to look for and fix any Thin Client network connection issues. Contact the System Administrator if the connection error persists when the Thin Client is connected to the network.

2.9.3 User Unable to Log In to Host Using Wyse RDP Client

![Example of Login Failure](image)

If the login to the host fails, contact the System Administrator to verify that the Username, Domain, and Password are correct. If the login is unsuccessful with the correct information, contact the System Administrator for assistance in resolving the issue.
2.10 Disconnect Wyse RDP Client - Host Session

➢ To disconnect a Wyse RDP Client - Host session

From the Host desktop, click the **Close** button to end the session between the Thin Client and the host.
3 Troubleshooting

3.1 Thin Client Will Not Boot Up

Momentarily pressing the power button on the Thin Client applies power to the Thin Client and starts the boot sequence. The power button light remains illuminated and the monitor displays the progress during the boot sequence.

3.1.1 Thin Client Power Button Will Not Illuminate

If the power button light does not illuminate when pressed, verify that the power supply is plugged in to the Thin Client, and that the power supply source plug is plugged into an outlet or power strip that has power. If power is applied to the power supply and it is plugged in to the Thin Client, unplug the power supply from the Thin Client and verify the correct power supply voltage. If the power supply voltage is incorrect, the power supply is most likely bad. If the power supply voltage is correct, the problem is most likely a hardware failure in the Thin Client, and the Thin Client may need to be replaced.

3.1.2 Thin Client Monitor Will Not Display

If the power button remains illuminated but there is no display on the monitor, verify that the monitor is plugged in to the Thin Client and the correct source is selected on the monitor. Try a different monitor to verify that the monitor is not the source of the problem. If the Thin Client is unable to drive a working monitor, there may be a failure in the Thin Client hardware. Contact a maintenance engineer to perform further troubleshooting and / or replace the Thin Client.

3.1.3 Boot Sequence Will Not Complete

If the boot sequence is displayed on the monitor but never completes, there is a problem with the Thin Client that requires reloading the Thin Client firmware or replacing the Thin Client. Contact the System Administrator.
3.2 **User Unable to Log In to Thin Client**

If the login to the Thin Client fails, contact the System Administrator to verify that the Username, Domain, and Password are correct.

![Example of Log In Failure](image)

If the login is unsuccessful with the correct credentials, go to the section *Loss of Thin Client Network Connection* to find and fix a potential network connection problem. Contact the System Administrator if the login fails with valid credentials and the Thin Client network connection is active.

3.3 **Loss of Thin Client Network Connection**

Most Thin Client functionality depends on its connection to the PDH. The Thin Client displays the following icon (with the white-on-red 'X') in the status tray in the lower right pane of the Computer bar when it has lost its network connection.

![The Thin Client displays connection icon with the white-on-red 'X' to indicate connection failure.](image)

If the white-on-red 'X' icon is displayed, the Thin Client has lost its connection to the PDH. Verify that the network cable is plugged in to the Thin Client. If the network cable is connected and the problem persists, the problem could be in the Thin Client or a network issue. Contact the System Administrator.

3.4 **Unable to Power Down Thin Client**

The Thin Client should always be powered down using the shutdown procedure described in the previous section. However, in situations where the Thin Client may be hung up and will not shut down from the system command, or other issues prevent logging in to the Thin Client, press and hold the power button until the power button light goes out. This forces a power down of the Thin Client.
Glossary of Terms

Domain Controller (DC) A domain controller is a server that responds to security authentication requests (logging in, checking permissions, and so forth) within a Windows® domain.

Dynamic Host Configuration Protocol (DHCP) Dynamic Host Configuration Protocol is a protocol used to automatically assign and manage dynamic IP addresses to devices on a network.

Hypertext Transfer Protocol Secure (HTTPS) HTTPS is a protocol for secure communication over a computer network.

Hypervisor Platform A hypervisor platform is a physical server that can support the work of several virtual machines. Each of these virtual machines can potentially have a different operating system and/or purpose. The Control Server provides this functionality using the VMware vSphere® Hypervisor (ESXi) application. All three servers (HS1, HS2 and MC2) are configured to use ESXi. Refer to the table VMware Documentation for links to obtain additional information.

Initialization (INI) Initialization is the assignment of an initial value for a data object or variable.

PC-over-IP Protocol (PCoIP) PCoIP is a remote display protocol for delivering remote desktops and applications.

Remote Desktop Protocol (RDP) Remote Desktop Protocol is a proprietary protocol, which provides a user with a graphical interface to connect to another computer over a network connection.

Remote Desktop Services (RDS) Remote Desktop Services allows a user to operate a virtual machine over a network connection.

Host Server HS1 This is one of the servers in the cluster used to run VMs. With the High Availability option VMs are able to migrate across servers in the cluster.

Host Server HS2 This is one of the servers in the cluster used to run VMs. With the High Availability option VMs are able to migrate across servers in the cluster.

Terminal Services (TS) was renamed Remote Desktop Services in Windows Server 2008 R2. (Refer to Remote Desktop Services.)

Thin Client A Thin Client is a purpose-built PC with a keyboard, mouse, monitor, and an Ethernet connection to the plant network (PDH), whose primary function is to provide an access point to hosts running within the system. A host can be a VM running on a server, a standalone PC, or any device that acts as a host for a protocol that the Thin Client can support. For example, the Thin Client can connect to standalone Windows PCs or Windows-based Virtual Machines running on a server using RDP or PCoIP™ client software. Another example would be using a web browser on the Thin Client to connect to a web server, Virtual Machine, or any device that may be publishing web pages. The Thin Clients are configured by the System Administrator to provide a predefined set of host connections, based on the user account that is used to log into the Thin Client. Some user accounts may be allowed access to a limited set of hosts within the system, while other user accounts may have access to a greater number of hosts.

Virtual Machine (VM) A virtual machine is an emulation of a particular computer system. Virtual machines operate based on the computer architecture and functions of a real or hypothetical computer, and their implementations may involve specialized hardware, software, or a combination of both.