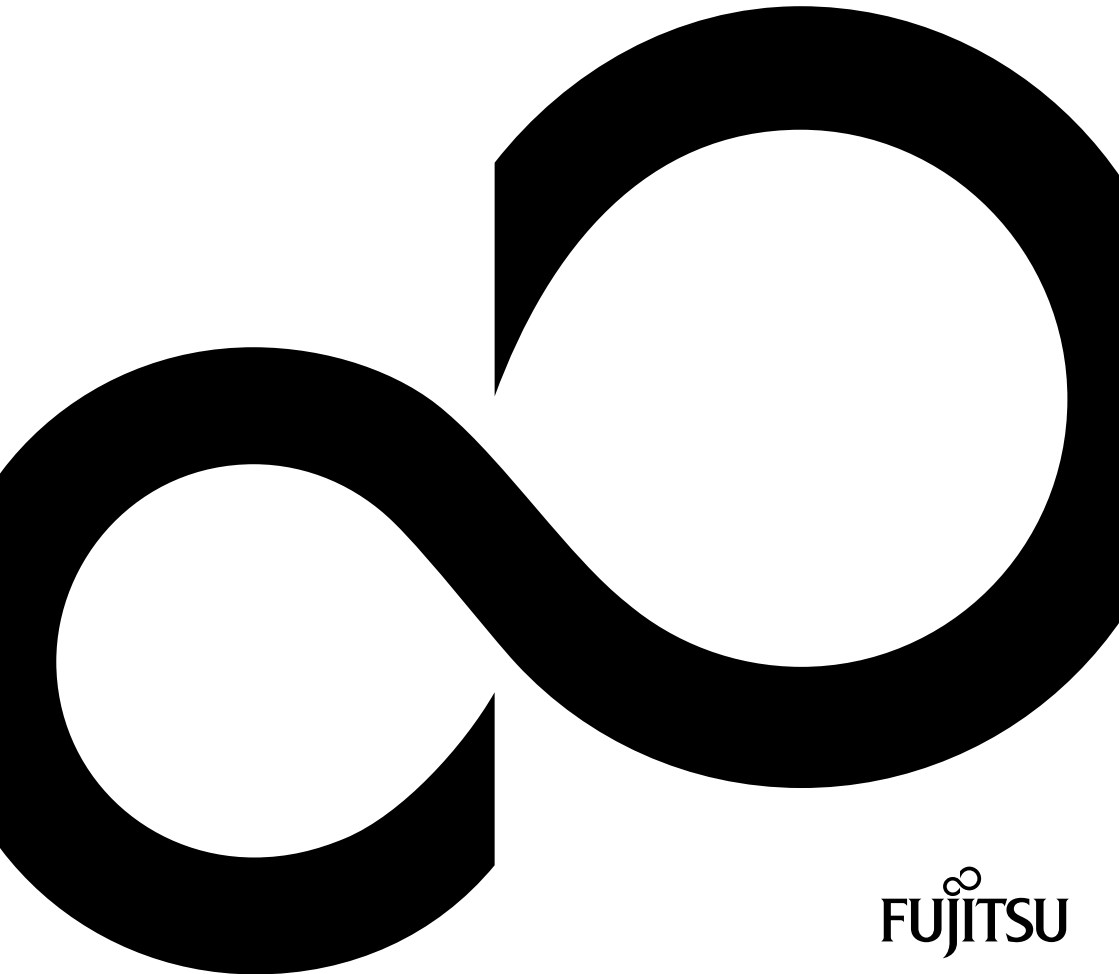


Zero Client Integration into Citrix XenDesktop



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Zero Client Integration into Citrix XenDesktop

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Description...

This document describes the implementation of the FUJITSU ZERO CLIENT Solution into a Citrix XenDesktop Infrastructure.

Any credentials that users input through the ZERO CLIENT login screens are passed to the Citrix Web Interface (a component of the XenDesktop Controller).

XenDesktop Controller specifies the appropriate desktop virtual machine (DVM) for the session and Zero Client Controller connects the ZERO CLIENT device to the appropriate desktop virtual machine.

DVM provisioning is managed through XenDesktop.

ZERO CLIENT Controller does not communicate with XenServer to start the DVM; rather, XenDesktop Controller handles these tasks.

Implementation

Requirements

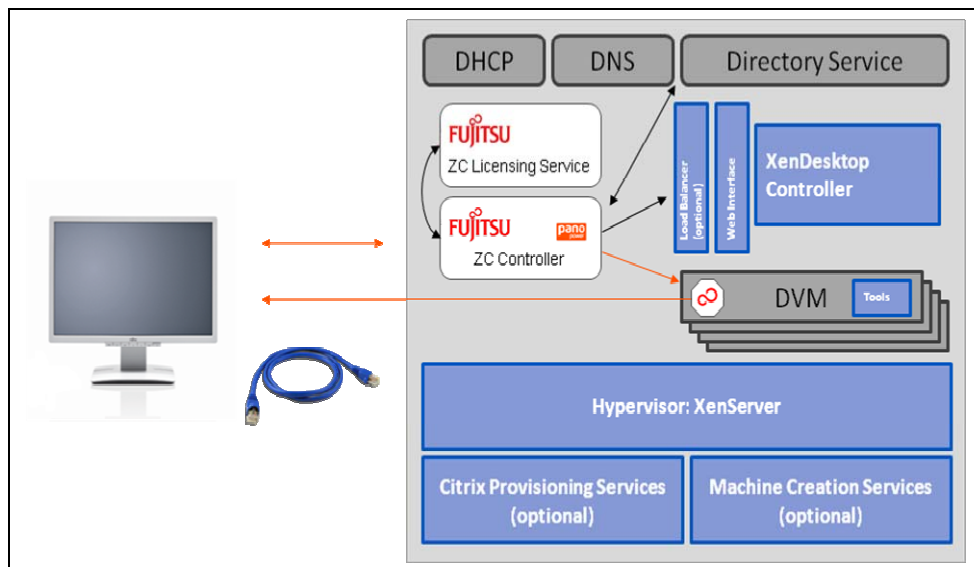
- DHCP-Service.
- Active Directory for user authentication.
- Citrix XenDesktop virtualization infrastructure.
- An existing Citrix XenDesktop Desktop Group with virtual machines (DVMs) for access from Zero Client devices.



More information can be found here: <http://ts.fujitsu.com/support/manuals.html>

Select "Zero Clients D-Series".

Architecture overview



Limitations

- ZERO CLIENT does not use the HDX/ICA protocol.
- ZERO CLIENT devices and HDX/ICA clients cannot access the same DVMs.
- Isolation between desktop groups must be maintained (separate desktop groups for Zero Client devices and HDX devices).
- Roaming between ZERO CLIENT devices and HDX clients is not supported.
- On Windows 7, the login process via HDX will be disabled automatically by the ZERO CLIENT Direct Service Installer.
- All connection brokering is performed by XenDesktop, which does not support the device-based concept; you cannot configure anything other than a "Citrix XenDesktop" collection.
- End users cannot restart, reset or trash a DVM from the Options dialog.
- Smart card, biometric or other USB authentication devices are not supported.

Integration Workflow

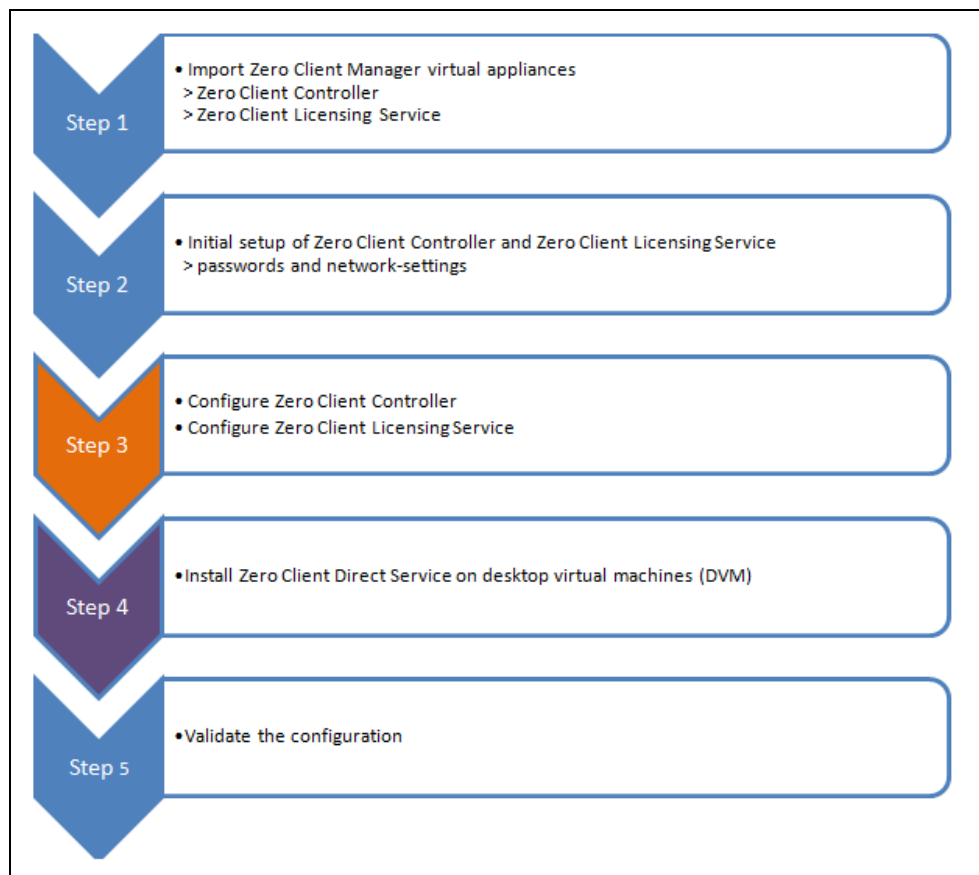
This Chapter describes how to integrate FUJITSU ZERO CLIENT Controller with Citrix XenDesktop.

In addition, the following software is needed. See <http://ts.fujitsu.com/support/downloads.html>



Product: Zero Clients D-Series.

Product	File
Zero Client Controller virtual appliance	FTS_ZeroClientController_for_Citrix_x.x.x.zip
Zero Client Licensing Service virtual appliance	FTS_ZeroClientLicensingService_for_Citrix_x.x.x.zip
Zero Client Direct Service for virtual machines	ZC_DirectService_Win7_x.x.x.msi ZC_DirectService_WinXP_x.x.x.msi

Workflow: How to integrate FUJITSU Zero Client Controller with XenDesktop.




Import Zero Client virtual appliances

Task	
1	▶ Start Citrix XenCenter Client and connect to your XenServer host.
2	▶ Select „Tools“, „Virtual Appliance Tools“ and „Import Appliance...“. <div data-bbox="199 295 268 367">  </div> When using XenCenter 5.6 select "File" and "Appliance Import...".
3	▶ Select path to FUJITSU Zero Client appliance. For downloading Zero Client appliances, see http://ts.fujitsu.com/support/downloads.html and select "Zero Clients D-Series".
4	▶ Go through the rest of the dialogue and follow prompts for XenServer/Pools; SRs; Network; Security Settings. <div data-bbox="199 534 268 606">  </div> ON ADVANCED OPTIONS PAGE, UNCHECK "RUN OPERATING SYSTEM FIXUPS" OPTIONS.
5	▶ Verify settings and finish the wizard. ▶ Import may take 15-25 minutes.
6	▶ Select newly created VM and click on Network tab.
7	▶ Launch Properties dialog and select the option to auto-generate a MAC address.
8	▶ Repeat Task 1-7 and import Zero Client Licensing Service appliance.

Initial setup of Zero Client appliances

All tasks have to be executed inside XenCenter Client.

Task	
1	▶ Power on imported Zero Client Controller.
2	▶ Open Console.
3	▶ Set password for console and web-interface.
4	▶ Set network configuration.
5	▶ Select (1) Pano Controller. <div data-bbox="199 1157 1008 1225">  </div>
5	▶ Repeat Task 1-4 with Zero Client Licensing Service.

Configure Zero Client Controller

The following tasks require access to a web browser with Adobe flash plug in.

Task	
1	<ul style="list-style-type: none"> ▶ Open a web browser and enter following URL: <i>http://IP_Address_of_Zero_Client_Controller/admin.jsp</i>
2	<ul style="list-style-type: none"> ▶ Log in with user "admin" and appropriate password.
3	<ul style="list-style-type: none"> ▶ Select Setup-Tab.
4	<p>Set up access to LDAP-Server:</p> <ul style="list-style-type: none"> ▶ Select Directory Configuration and define URL: <i>ldap://computername_ad_controller.dnsdomain:3268</i> User name: <i>username@domain</i> Password: appropriate password
5	<p>Set up Broker Configuration:</p> <ul style="list-style-type: none"> ▶ Select Broker Configuration. ▶ Select "Add..." ▶ Select "Citrix XenDesktop Broker Type". ▶ Broker name: e.g. myXenDesktop ▶ URL: enter the URL for the XenDesktop Controller (more precisely: URL of Citrix Web Interface) e.g. <i>http://ip-XenDesktop-Controller</i> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> i </div> <p>As an option, enter URL of a load balancer (e.g. Citrix NetScaler).</p>
6	<p>Set up Zero Client device detection:</p> <p>Zero Client devices need to be discovered before they can be controlled by the Zero Client Controller. There are two ways that the Zero Client Controller can discover Zero Client devices:</p> <ul style="list-style-type: none"> • Broadcast/Probe Method --> for fast setup and testing. • DHCP Method --> recommended; please see 1.7 (DHCP Method) Set Up Zero Client Device Detection. <p>For fast setup this task describes the Broadcast Method.</p> <ul style="list-style-type: none"> ▶ Select "Discovery Configuration" and click Edit button; specify any of the following discovery options, then click OK. ▶ Local Broadcast – Select this option if your Zero Client Controller and Zero Client devices are located on the same subnet. ▶ Probe Address – Select this option to specify a range of IP addresses or specify Remote Broadcast Networks.

7	Set up License Service Configuration: <ul style="list-style-type: none"> ▶ Select License Service Configuration and specify the Zero Client Licensing Server by entering a URL of the form: <i>https://ZCLS.dnsdomain</i> or <i>https://IP-ZCLS</i>
8	Set up default input language for login: <ul style="list-style-type: none"> ▶ Select Clients tab, click Settings button and choose Login Preferences...

Configure Zero Client Licensing Service

The following tasks require access to a web browser with Adobe flash plug in.

Task	
1	<ul style="list-style-type: none"> ▶ Open a web browser and enter following URL: <i>http://IP_Address_of_Zero_Client_Licensing_Service</i>
2	Licensing Service Configuration Wizard is starting: <ul style="list-style-type: none"> ▶ Select "Next".
3	Activation of the Zero Client Licensing Service <ul style="list-style-type: none"> ▶ Select "No, this is a new installation".
4	Apply for Activation Key Select the URL and request an activation key <ul style="list-style-type: none"> ▶ Select "Next".
5	Licensing Service Administrator Account <ul style="list-style-type: none"> ▶ Enter User Name and appropriate Password. ▶ Select „Next“.
6	Zero Client Controller IP Address Configuration <ul style="list-style-type: none"> ▶ Enter IP address of your Zero Client Controller. ▶ Press "Test connection". <div data-bbox="199 981 268 1053" style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">i</div> Connection status should show "Available". <ul style="list-style-type: none"> ▶ Select "Set Preferences".
7	Check values <ul style="list-style-type: none"> ▶ Select "Confirm".
8	Success! <ul style="list-style-type: none"> ▶ Select "Finish".

Install Zero Client Direct Service

Virtual desktops which shall be used by XenDesktop-integrated Zero Client devices have to be configured with the following software components:

- Operating System (e.g. Windows XP or Windows 7)
- XenServer Tools
- XenDesktop Virtual Desktop Agent
- Zero Client Direct Service

All these virtual desktops have to be collected into a VMware View Desktop Pool which is restricted to special users.



WDDM display drivers are not supported . This driver is installed by the XenDesktop Agent installers. You have to uninstall this WDDM display driver and replace it with the VGA driver.





In order to install Zero Client Direct Service on 64-bit editions of Windows 7, you must first install the Pano Logic Authenticode certificate (refer to Install Certificate for Zero Client Direct Drivers).

This task only describes the installation of the Zero Client Direct Service. All other components have to be already installed and preconfigured (see prerequisites).


In addition, the following software is needed. See <http://ts.fujitsu.com/support/downloads.html> and select "Zero Clients D-Series".

Product	File
Zero Client Direct Service for virtual machines	ZC_DirectService_Win7_x.x.x.msi
	ZC_DirectService_WinXP_x.x.x.msi

Windows XP and Windows 7

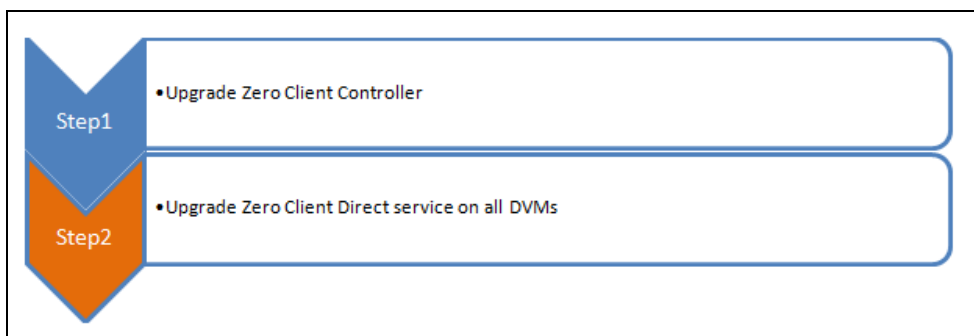
Task	
1	<p>Zero Client Direct Service has to be installed after XenDesktop Virtual Desktop Agent: Installation Order:</p> <ol style="list-style-type: none"> 1. XenServer Tools. 2. XenDesktop Virtual Desktop Agent. (do not install the WDDM display driver) 3. Zero Client Direct Service. <p> To upgrade a Xen component, first uninstall Zero Client Direct Service, then upgrade Xen component and reinstall Zero Client Direct Service.</p> <p> In order to install Zero Client Direct Service on 64-bit editions of Windows 7, you must first install the Pano Logic Authenticode certificate (refer to Install Certificate for Zero Client Direct Drivers).</p> <p>For downloading Zero Client Direct Service installer, see http://ts.fujitsu.com/support/downloads.html and select "Zero Clients D-Series".</p> <p>Installation of Zero Client Direct Service is completed.</p>

Validate the configuration

Task	
1	<ul style="list-style-type: none"> ▶ Enable Desktop Connections from Zero Client Devices: ▶ Assuming an existing XenDesktop Desktop Group with preconfigured ZC- DVMS, you can validate the configuration. ▶ Connect a Zero Client device to the network and log on. ▶ After successful authentication, the Fujitsu Zero Client Controller queries XenDesktop to determine the appropriate desktop for the user. Afterwards, the Zero Client Controller connects the Zero Client device to a desktop specified by XenDesktop. <p> During the input of login credentials the user is able to press the "Options..." button to select a different Desktop Group.</p>

Upgrade ZERO CLIENT Infrastructure

Workflow: Update Zero Client Software



In addition, the following software is needed. See <http://ts.fujitsu.com/support/downloads.html> and select "Zero Clients D-Series".

Product	File
Zero Client Controller upgrade	FTS_ZeroClientControllerUpgrade.x.x.x.tar.gz
Zero Client Direct service for virtual machines	ZC_DirectService_Win7_x.x.x.msi ZC_DirectService_WinXP_x.x.x.msi

Upgrade Zero Client Controller

Task	
1	<ul style="list-style-type: none"> ▶ Open a Web-Browser and enter following URL: <i>http://IP_Address_of_Zero_Client_Controller/admin.jsp</i>
2	<ul style="list-style-type: none"> ▶ Log in with user "admin" and appropriate password.
3	<ul style="list-style-type: none"> ▶ Select Setup-Tab.
4	<ul style="list-style-type: none"> ▶ Set up Platform Settings: ▶ Select Platform Settings. ▶ Click "Upgrade".
5	<p>Software Upgrade:</p> <ul style="list-style-type: none"> ▶ In Software Upgrade pick " " and select Zero Client_Controller upgrade-file: FTS_ZeroClientControllerUpgrade.x.x.x.tar.gz ▶ Select "Upgrade & Restart". <p>Zero Client Controller upgrade is uploaded to the Zero Client Controller.</p>
6	<p>Restart Confirmation:</p> <ul style="list-style-type: none"> ▶ In "Restart Confirmation" select "Restart". <p>Zero Client Controller service will be restarted. Upgrade is completed.</p>

Upgrade Zero Client Direct Service

Do not forget to upgrade the Zero Client Direct Service after upgrading Zero Client Controller.

- ▶ Run the installer of Zero Client Direct Service upgrade on all DVMs (Desktop virtual machines). See "Install Zero Client Direct Service".

The upgrade of Zero Client Infrastructure is now completed.

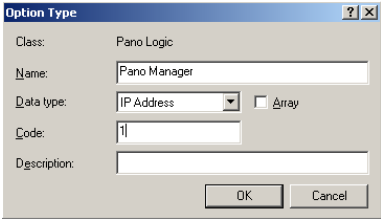
(DHCP Method) Set Up Zero Client Device Detection

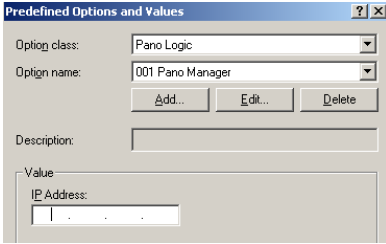
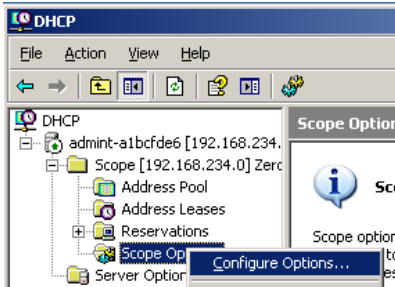
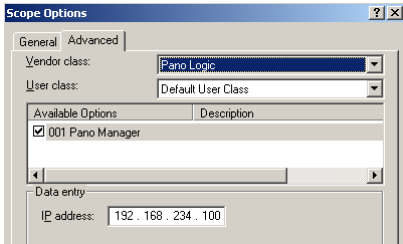
Zero Client devices need to be discovered so they can be controlled by Zero Client-Controller.

This chapter describes how to configure a DHCP server to provide the address of the Zero Client Controller to the Zero Client device.

Zero Client discovery via the DHCP method is the recommended setup for use in a typical production environment. This method relies on a DHCP feature called vendor-specific options.

The example outlined in this procedure is based on a Windows DHCP Server.

Task	
1	Start DHCP Console: <ul style="list-style-type: none">▶ From Control Panel / Administrative Tools start DHCP.
2	Define Vendor Classes: <ul style="list-style-type: none">▶ Right-click on the DHCP Server and click "Define Vendor Classes...".▶ In the DHCP Vendor Classes window, click "Add...".▶ In the New Class dialog, type the following information:▶ In the Display name field, type Pano Logic.▶ In the Description field, type Pano Manager.▶ In the text box, and underneath ASCII, type Pano Logic, click OK.▶ Close DHCP Vendor Classes dialog.
3	Set predefined DHCP options: <ul style="list-style-type: none">▶ From the DHCP window, right-click on the DHCP-Server and select "Set Predefined Options".▶ In the Option Class drop-down list, select "Pano Logic", then click "Add...".▶ In the Option Type dialog, do the following:▶ In the Name field, type Pano Manager.▶ In the Data type drop-down list, select IP Address.▶ In the Code field, type 1 (if Option Type Code 1 is not available, use 101).▶ Press OK. <div></div>

	<p>► From Predefined Options and Values window type the IP address, click OK. (IP address is the static IP address of the Zero Client Controller.)</p> 
4	<p>Set scope options:</p> <p>► Under the Scope folder, right-click "Scope Options", then select "Configure Options".</p>  <p>► In the Scope Options window, select the Advanced tab.</p> <p>► From the Vendor class drop-down list, select "Pano Logic", then select the check box that corresponds to "001 Pano Manager", then click OK.</p> 
5	The DHCP configuration is completed.

Install Certificate for Zero Client Direct Drivers

In order to install Zero Client Direct Service on 64-bit editions of Windows 7, you must first install the Pano Logic Authenticode certificate.

Task	
1	<ul style="list-style-type: none">▶ Retrieve the PanoLogicAuthCode.cer from the installation package of 64-bit Zero Client Direct Service.
2	<p>From mmc install the certificate in the TrustedPublishers folder on the virtual machine.</p> <ul style="list-style-type: none">▶ Open MMC as administrator.▶ Click "File" and select "Add/Remove Snap-In".▶ Chose "Certificates" and select "Add".▶ Select "Computer Account".▶ Click "Next".▶ Click "Finish" and "Ok".▶ Import the certificate in the folder Console Root/Certificates/Trusted Publishers/Certificates by a right click.

Configuration Example

This chapter covers additional configuration tasks.

Restrict or allow use of specific USB devices

In general, the decision to disable USB support should be set in the DVM template itself. All DVMs that are created from the template inherit its properties so their USB support will reflect the USB support in the template.

Restricting and allowing the use of USB devices is controlled by USB Filters which are enabled from the DVM's registry. Simply set the USB filter string in the DVM's registry settings. The default value for this setting is 255, which means that all USB devices are allowed. However, you can change the default USB filtering behavior

Registry-entries can also be set centrally with GPOs.

Registrypath: HKEY_LOCAL_MACHINE\Software\Pano Logic\PanoDirect

Variable: USB Filter

Type: Reg_SZ

Value "USB Filter"

Value	Meaning
0	No USB peripherals
1	USB mass storage only
2	USB printers only
3	USB pass storage & printers only
252	All supported USB peripherals except USB mass storage & printers
253	All supported USB peripherals except printers
254	All supported USB peripherals except USB mass storage
255	All supported USB peripherals


Tune settings

To increase desktop performance with Zero Client devices, desktop virtual machines need some performance tuning. Citrix provides a range of documents which cover this topic.

Description	Source
How to optimize XenDesktop Machines	http://support.citrix.com/article/CTX125874
Windows 7 Optimization Guide	http://support.citrix.com/article/CTX127050
Desktop virtualization Top 10 mistakes made	http://support.citrix.com/article/CTX126190
Optimizing Windows XP for XenDesktop	http://support.citrix.com/article/CTX124239

Appendix

Buttons and LED indicator FUJITSU ZERO CLIENT DZ series

			
1	Button for the OSD menu (On Screen Display)	4-6	Buttons for the OSD menu
2	Button for the OSD menu / ECO Mode on/off	7	LED indicator
3	Button for the OSD menu	8	ON/OFF switch (Short press < 2 s: disconnect session)

Overview LED Indicators

LED indicator	Status
green	Zero Client Controller found. (ECO mode - this is the default setting.)
blue	Zero Client Controller found. (Normal mode.)
orange	Power-saving mode. (Display blank; connected to Zero Client Controller; power consumption ≤ 5W.)
slow flashing orange	Zero Client received IP-address.
fast flashing orange	Zero Client requests IP-address.
flashing red	No network found. (Cable unplugged.)
red	HW error
not lit	Zero Client is switched off. (Power consumption in off mode < 0.2W.)