

Wyse WSM Reference Architecture and Configuration Guide (Single site up to 50 users)

Release 1.2

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Changes

Version	Date	Changes
1.0	4/3/2012	Initial Public Release
1.1	4/23/2012	Updated for SetCache modification settings
1.2	5/11/2012	Added updated info for Dell T110 ii server

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1 Introduction

Wyse WSM is the first solution to use OS and application streaming to package and deliver the end user desktop environment to remote client devices, giving IT administrators the control they need to ensure the consistency of desktop software across the enterprise.

Wyse WSM requires very little datacenter infrastructure, operates standalone, or complements existing presentation and VDI solutions, while dramatically reducing the storage space, IT time and expense of delivering and maintaining desktop software throughout an enterprise. By streaming the operating system and applications independently to a stateless client device and running them locally in memory, Wyse WSM enables virtually any Windows application to be run on the client just as it would on a traditional PC. Yet all files and applications reside in the private data center or in the branch router, where they are easier to back up, manage, and maintain.

Because applications are streamed independently of the operating system, Wyse WSM enables standardization of operating system images across the organization and delivers applications based on user roles and responsibilities. Administrators can also easily provision new applications or updates to existing applications without having to modify the operating system image.

Out of the box, the remote client devices contain no local operating system software on the device, but instead use OS and Application Streaming (OAS) to deliver a true PC experience with cloud computing benefits of centralized storage, control, and simplified OS and application maintenance. The true PC OS and applications are literally delivered in real-time over the LAN from Wyse WSM provisioning software in the datacenter cloud.

2 Required Materials

The following materials are required before starting the installation:

- Windows Server 2008 R2 running DNS, DHCP, and Key Management Services (KMS)
- WSM Deployment Server with (minimum specs)
 - Intel i3-2100 (Dual Core 3.0 GHz)
 - 8 GB of Memory
 - o Intel Q67 or C206 chipset
 - o Dual SATA II SSD drives (HDD for up to 25 users)
 - o Dual Gigabit Ethernet NICs (single NIC for up to 25 users)
 - o Windows 7 Enterprise or Professional (64 bit version)
 - Wyse WSM server image and license (Version 4.01)
- Windows 7 Enterprise or Professional 32 bit ISO image compatible with KMS
- Appropriate applications (such as Office 2010 ISO image compatible with KMS)
- Additional applications which can be site licensed or use an optional license server
- Endpoint devices such as Wyse Z00D
- Required Networking Gear (Routers and Switches)
- Ethernet Cables as needed

3 Preparing the network for WSM deployment

The Wyse WSM reference architecture consists of several components as shown in Figure 1.

- A Management Server Provides necessary Network services such as Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP) and Key Management Service (KMS)
- The Wyse WSM server Provides the central repository of the streamed OS and Application images. It also stores the system cache files for each streamed client.
- Network Components Such as switches and routers, needed to connect the streaming client devices to the WSM and Management services as well as the internet.
- Streaming Client Devices Cloud PC (such as Wyse Z00D or X00m)

Figure 1: Typical Deployment Configuration



The first step is to determine the network information to be used. See Table 1 as a template to fill in this information.

Table 1: Required Network Deployment Information

Domain Name	
IP Subnet for Streaming Clients	
Default Router for Streaming Clients	
DNS server(s) IP address(es)	
Static IP address for WSM server	
Default Router for WSM server	
Active Directory Server Administrator User	
Name	
Active Directory Server Administrator Password	

If you have not already deployed your management server, see Section 7 on tips for doing so. Make sure that your DNS, DHCP, and Active Directory services are fully functional before proceeding to the next step.

3.1 Configuring Key Management Server (KMS)

The Microsoft Key Management Server must be installed on the network to support the licensing of the individual Windows 7 client desktops. This service allows for each streamed client OS to be automatically activated seamlessly after it is loaded onto the remote device. Since KMS will be used to authenticate the streamed Windows 7 client OS, Microsoft requires that it be installed on a Windows Server 2008 R2 machine. In fact, it is automatically enabled as part of the Windows Server 2008 R2 installation. However, the License Key must be installed before it can authenticate the additional client OS machines.

Log into the <u>Microsoft Volume License Service Center</u>, and retrieve the <u>KMS</u> License Key for "Windows Server 2008 Std/Ent KMS B". To License/Activate Server 2008 R2 **AND** Windows 7 **THIS IS THE ONLY KEY YOU NEED**. You do **NOT** need to add additional keys for Windows 7.

You simply need to change the product key on the server that will be the KMS server, to the new key. Start > Right Click "Computer" > Properties. Select "Change Product Key" > Enter the new KMS Key > Next.



		Towindows Activation
System .		🕢 🕅 Windows Activation
COO 🕴 • Control Fanel •	· System and Security + System 🔹 🛄 🔂	
Control Panel Home Control Panel Paneles extrings Advanced system settings	Yeen basic information about your computer Vindous obtain Vindous Server 2008 R2 Standard Copyright © 2009 RAcoust Corporation, All rights reserved. Service Pack 1	Type your product key The Windows Server 2009 R2 Standard product key can be found on the established disc holder mode the Windows puckage. Advision will register the product key to this compater. The product key looks like this:
	Syntym Processor: bete(D) / New (D) CPU X5650 Invalued sensory (SAR): 4.05 GB System Hpor: 44-34 Operating System Per an of Touch: Popul is weakable fi Computer name, dimana, and montpage settings	PRODUCT KEY: 300000-300000-300000-300000 Where do I find my Windows product key! Product Key: 12345-ABCDE-67890-FGHID-12345
See also Acton Center Windows Update	Computer name Your/Server Nal computer name Computer description Computer description Comain Peterbell/ver.com Wolfens attraction Recomment attracted today. Activate Windows now Product 20: 00077-179-0000027-44104 Charge product bery	What is constant of the second s

You will receive a warning that you are using a KMS Key > OK. You may now need to activate your copy of Windows with Microsoft, this is done as normal. If you can't get it to work over the internet you can choose to do it over the phone.

Figure 3: Windows Activation Warning

Windows	Activation	×
	You have entered a Key Management Service (KMS) key that should only be used to create an activation infrastructure for an organization. Click 'OK' to use the KMS key, or click 'Cancel' to enter a different product key.	
	OK Cancel	

If you are running the Firewall Service on your Windows 2008 R2 server, you will need to enable the rule for the Key Management Service. To allow the service, select Start >Control Panel>System and Security>Windows Firewall>Allow program or feature through Windows Firewall. Scroll down to the Key Management Service and select the check boxes.





4 Installing WSM Server

Use this section for installation steps for Windows 7 and prepare it for the Wyse WSM server. While you have probably installed Windows many times before, there are some special configuration steps to be completed after the standard installation.

4.1 Loading Windows 7 image

Start installation as if on a standard PC starting with the screen shown in Figure 5.

Install Windows Windows Windows Windows United States) Language to install: [enginh Ime and currency format: [enginh []] Ime and []]	6 0 0	h 🕼 🕞 🧇				
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Install Windows				•		
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Unidows Language to install: Inglish Imme and currency formati: Inglish (United States): Keyboard or input method: Inter your language and other preferences and click "Nest" to continue. Copyright & 2020 Mcrosoch Corporation. All rights reserved.	👋 Install V	Vindows			<u>_</u>	
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Enter your language and other preferences and click "Next" to continue. Copyright © 2009 Microsoft Corporation. All rights reserved.		<u>K</u> eyboard or input metho	od: US			0
Cited your language and outer protocited and tick i hold to contrained.		Enter your languar	na and other preferences and slich			1
Copyright © 2009 Microsoft Corporation, Al rights reserved.			ge and other preferences and ener			
	Copyrigh	nt © 2009 Microsoft Corporation. A	All rights reserved.		Next	

Figure 5: Standard Windows 7 Installation Screen

After the OS installation is complete, install any required device drivers for the particular server board you are using including network drivers. After installing the updated system drivers, set the static IP address for the NIC interface.

Once the WSM server has network connectivity, use the Microsoft Update Center to install all appropriate updates and patches. This will insure that the WSM server installation is not overwritten by any Microsoft patch or update that might change the NIC interface driver. Since Windows 7 installs Power Management software by default, it is important enable high performance mode as the default mode. Lastly, make sure that the Windows License is applied and is registered with Microsoft.

4.2 Configuring NIC teaming

On the Dell T110 ii WSM server platform, there are three Broadcom NICs. For the small server configuration, the onboard NIC will not be used as part of the team, and can be disabled. The NIC teaming software is used to form a 2 Gbps bonded interface by combining the remaining two NICs. This provides more bandwidth for the streaming traffic.

Right click on network icon located on the right side of the task bar at the bottom of the screen. This will open the **Network and Sharing Center** control panel. Click on **Change Adapter Settings**. At this point, you should see your three network adapters, which are normally labeled **Local Area Connection, Local Area Connection 2** and **Local Area Connection 3**. The Intel NIC teaming software will create a fourth interface called **Local Area Connection 4** from these two interfaces. This is a virtual interface. **Once it is created, all new network parameter changes should be made to the team interface.**

In order to create a NIC team, you need to download the Broadcom Advance Control Suite software from: http://www.broadcom.com/support/ethernet_nic/management_applications.php.

Once this is downloaded, right click on the icon and select **Run as Administrator.** After it is installed, you should see a green NIC card icon on the right side of your task bar. You can double click on this icon to launch the BACS software. The BACS organizes the drivers in a tree structure as shown in Figure 6. Next, click on the icon which represents your server's host name.

Broadcom Advanced Control Suite 4	
File View Action Filter Context Tools Teams iSCSI Help	
Filter: TEAM VIEW	
Explorer View 🗗	
Hosts Key With Hosts Key Wi	
BROADCOM.	

Figure 6 BACS Admin Panel

Before you can create the NIC team, you need to disable the iSCSI feature set from the Broadcom adapters because the iSCSI protocol is not supported on NIC teams.

Scroll down to the Broadcom adapters (Primary Adapters) and double click on the first BCM5709 adapter you see. A sub-panel will appear as shown in Figure 7. Click on Resource Reservations and scroll down to the iSCSI Offload Engine. Unselect this feature by clicking in the square.

Broadcom Advanced Control Suite 4						
File View Action Filter Context lools learns iSCSI Help						
Explorer View	Information	Configurations	Statistics			
🗄 000 Hosts	Property			Value		
🖻 📕 wsmt110 📄 🥽 Adapter1 (BCM5709 C0)	Advanced	operties to Default	t Values	Set to	o default values	
	Resource Click t	Reservations he button to conf	ïaure		Configure E	
[0011] Broadcom BCM57	Offloa	d Configuration		First Come First Serv	red	
🖶 🥌 Porti E 📴 [0039] Broadcom BCM5709C	Pre-Al	located Resource: DIS	5	🔽 Enable		
[0012] Broadcom BCM57 → ■ Adapter2 (BCM5722 A0)	TCP Offload Engine (TOE)			Enable Disable		
TCP Offload Engine Disable						
	Connections			0		
Advanced Advanced on the Configurations tab allow you to view and change the values of the available properties of the selected adapter. The potentially available properties and their respective settings are described below.						
Apply Reset						
BROADCOM	_	_	_	BIAL		

Figure 7 Disable Broadcom iSCSI feature set

Repeat this procedure for the second Broadcom 5709 adapter. Once you have disabled iSCSI protocol, you can go back and create the NIC Team. Go back to the main panel and select **TEAM VIEW**. You can select the Team menu, and **Create Team**. Select the two Broadcom 5709 adapters and add them to the team. The last item that needs to be changed is the team type. To get proper load balancing, select 802.3ad. This will create an LACP based team. Make sure your upstream is also set to LACP mode.

Figure 8: Setting NIC team mode

C Broadcom Advanced Control Suite 4				
File View Action Filter Context Tools Teams iSCSI Help				
Filter: TEAM VIEW				
Explorer View 8	Information	Diagnostics Statistics		
B 000 Hosts	Property		Value	
🖻 🔝 wsmt110	😑 Vital Sign	s		
E Teams	MAC	Address	001018B45E6C	
Er and Team 1	Team	Name	Team 1	
E BASP Virtual Adapters	Team	Туре	802.3 ad	
Team 1 ([0016] BASP Virtual Adapter)	Offlo	ad Capabilities	LSO, CO, RSS	
🖻 🤛 Primary Adapters	IPv4	Address	192.168.3.234	
📆 [0011] Broadcom BCM5709C NetXtreme II GigE (NDIS VBD Client)	- Driver Status		Loaded	
- 57 [0012] Broadcom BCM5709C NetXtreme II GigE (NDIS VBD Client) #2	- Link Status		Up	
🖻 📴 Unassigned Adapters	MTU		1500	
[0007] Broadcom NetXtreme Gigabit Ethernet				
	Team Type			
BROADCOM	-	_		

Once the team is created, you can go back to the network control panel and set the IP Address settings on the Team interface.

4.3 Time and NTP settings

The Time and NTP settings for Windows 7 are part of the Control Panel. To access this, select **Control Panel** from the start menu, select **Clock, Language, and Region**, select **Date and Time**, select **Internet Time** tab and click on the **Change Settings** button. Enter the name of the NTP server. Press "OK" then "OK" to exit the **Date and Time** screen.

Figure 9: Windows 7 Internet Time Settings

Control Panel Clock, Language, and Region	🗕 😽 Search Control Panel	
Comme Parter Forme Zone Add clocks for different ti	me zones	
Date and Time Additional Clocks Internet Time This computer is set to automatically synchronize with 'time-nw.nist.gov'. e, or number format Change ke	yboards or other input methods	
This computer is set to automatically synchronize on a scheduled basis.		
Configure Internet Time Settings Configure Internet time set Synchronize with an Internet Server: time-nw.n This computer is set to aut	tings: smet time server ist.gov • Update now omatically synchronize on a scheduled basis.	
What is Internet time synchronization? OK Cance Apply	OK Cancel	

4.4 Optimizing Windows on the WSM server

In order to optimize the Windows 7 OS for WSM operations, certain features need to be turned off and others need to be enabled. A list of features to be turn off are: Media Features, Print and Document Services, Remote Differential Compression, Tablet PC Components, Windows Gadget Platform, XPS Services and XPS Viewer. Also, some optional services should be turned on for troubleshooting purposes: Simple TCPIP services, Telnet Client, TFTP Client. Change these application settings in the Start->Control Panel->Programs->Windows Features screen.

Figure 10: Windows Features Configuration Panel

🔯 Windows Features	٢
Turn Windows features on or off	
To turn a feature on select its check box. To turn a feature off, clear its	
check box. A filled box means that only part of the feature is turned on.	
⊕ 🗐 🔒 Games	٦.
Indexing Service	
🔽 🍌 Internet Explorer 8	
⊞	
Internet Information Services Hostable Web Core	
🕀 💷 📙 Media Features	
Image:	
🕀 💷 📙 Microsoft Message Queue (MSMQ) Server	
RAS Connection Manager Administration Kit (CMAK)	
Remote Differential Compression	
RIP Listener	
Image: The second se	
🛛 🖟 Simple TCPIP services (i.e. echo, daytime etc)	
Subsystem for UNIX-based Applications	
Tablet PC Components	
🔽 🍌 Telnet Client	
Telnet Server	
TFTP Client	
Windows Gadget Platform	
Windows Process Activation Service	
Windows Search	
Windows TIFF IFilter	
XPS Services	
TPS Viewer	
OK Cancel]

5 Installing and configuring the WSM software

The installation of WSM server software is in two parts. First, as a prerequisite, the Microsoft SQL Express 2008 software must be installed. Windows 7 is NOT compatible with the 2005 version. Do not use the WSM Prerequisite Application stored in the WSM installation directory. This will cause incompatibilities with Windows 7. After SQL express is installed, the WSM application software can be installed from the pre-mentioned directory.

5.1 Installing Microsoft SQL Express 2008

SQL Express 2008 will need to be installed prior to running the WSM Server Install script. Download the software from Microsoft at:

http://www.microsoft.com/download/en/details.aspx?displaylang=en&id=1695

Figure 11: Microsoft SQL Server Download Site

Microsoft Search Download Cer	nter blog 💽 PRODUCT	S STORE DOWNLOADS SUPPORT	United States (Englis
moroson subromadica		s store connectors softwart	Sign
Download Cer	nter		
Windows Office Product d	downloads Download categories Secu	urity Resources	
Microsoft Microsoft	t® SQL Server® 2008	8 Express	2
Quick links	SQL Server 2008 Express is a	free edition of SQL Server that is a	n ideal data platform
↓ Overview	for learning and building desi	ktop and small server applications,	and for redistribution
System requirements	by 15¥3.		
 Instructions 			
Additional information			
Additional information	Quick details		
 Additional information 	Quick details Version: 10.00.1600.2	22 Date published:	2/8/2009
Additional information	Quick details Version: 10.00.1600. Change language: English	22 Date published:	2/8/2009
Additional information	Quick details Version: 10.00.1600. Change language: English Files in this download	22 Date published:	2/8/2009
Additional information Looking for support? Visit the Microsoft	Quick details Version: 10.00.1600. Change language: English Files in this download The links in this section correspond to fi	22 Date published:	2/8/2009 appropriate for you.
Additional information Looking for support? Visit the Microsoft Support site now >	Quick details Version: 10.001600. Change language: English Files in this download The links in this section correspond to fi	22 Date published:	2/8/2009 appropriate for you.
Additional Information Looking for support? Visit the Microsoft Support site now >	Quick details Version: 10.00.1600. Change language English Files in this download The links in this section correspond to fi File name SQLDSPL_64_DNU.ore	22 Date published:	2/8/2009 appropriate for you. DOWNLOAD
Additional information Looking for support? Viat the Microsoft Support site now > Microsoft	Quick details Version: 10.00.1600. Change language English Files in this download The links in this section correspond to fi File num SQLDPR_64_INU one SQLDPR_66_INU one	22 Date published: If its available for this download. Download the files a Size 825 MS 89.1 MS	2/8/2009 http://piste.for.you. DOWWLOAD DOWNLOAD
Additional Information Looking for support? Visit the Microsoft Support site now > Microsoft Cynamics CRM Online	Quick details Version: 10.00.1600. Change language English Files in this download The links in this section correspond to fi File name SQLEDRP.off.DNLose SQLEDRP.off.DNLose SQLEDR2_d6_DNLose	22 Date published:	2:8/2009 Appropriate for you. DOWNLOAD DOWNLOAD DOWNLOAD

Click on the red box to download the program *SQLEXPR_x64_ENU.exe*. Once downloaded, it can be executed, by right clicking on its name and selecting **Run as Administrator**. Accept any security warnings that might pop up. The support files will be extracted and the install options page will appear.

Select New Installation and on the next screen, accept the license agreement. On the **Feature Selection** screen select the defaults by clicking on the *Next*>.

Regist Bre Works Verster Freter	 SQL Server Exclusion Context Planning Installation Mutationance Tools Resources Advanced Options 	New installation or additional interface to a conting SQ devices to an examing SQ devices to an examing SQ devices to an examine some system and SQ devices and SQ. Image: Search Ker product update Search Microsoft Update	A month of the month of th		
	₹ SQL Server 2008/2	(E) Conversion 2018 of lenge Feature Selection Sect the lenges features to in Induction Rules Installation Rules Database Super Configuration Database Super Configuration Database Super Configuration Inter Reporting Stallation Configuration Rules Database Rules D	aut Factures: (1) Ontonie EnjourSonices (2) Control Registrations (2) Control Registrations (2) Control Registrations Redistributed Factures	Description: The final state of the state of	
			Betech All Structech All Source Entertient directory Colleaguese Tables directory Colleaguese Tables Colleaguese Tables Colleaguese Tables Colleaguese Colleaguese Colleaguese	at 505 Serveri Konzenti SQL Serveri Neat > Canzel Help	2 million 22mm

Figure 12: MS SQL Express Feature Selection

On the **Instance Configuration** screen, to simplify the install, click Default instance (which is not the default). Then click **Next>** to continue to the next screen.

Figure 13: Selecting the Default Instance

SQL Server 2008 R2 Setup					
Instance Configuration					
Specify the name and instance	ID for the instance of SQL Se	rver. Instance II) becomes part of th	e installation path.	
Setup Support Rules	<u> D</u> efault instance				
Feature Selection	Named instance:	SQLExpress			
Installation Rules					
Disk Space Requirements	Instance ID:	MSSQLSERVE	R		
Server Configuration	- Instance root directory	C:\Program I	iles\Microsoft SOLS	erver\	
Database Engine Configuration					
Installation Configuration Rules	SOL Server directory	C\Program F	iles\Microsoft SOL Se	ever\MSSOL10_50.M	ISSOL SERVER
Installation Progress	Sige Server directory.	crit rogiumi	103 (INICIOSOTE DQL DC		isolgesen ven
Complete	Installed instances:				
	Instance Name I	nstance ID	Features	Edition	Version
		[< Back	Next > Can	cel Help
			< <u>B</u> ack	Next > Can	cel H

On the **Server Configuration Screen**, the default settings are fine, so click **Next>**. On the **Database Engine Configuration** screen select **Mixed Mode** authentication and enter the Systems Administrator (SA) password. It is important to remember this password as it will be needed during the WSM software installation. Click **Next>** to continue.

lation or add features to an exi New installation or add features to an existing investigation of a wizard to install SQL Server 2008 R2 in a non-clust features to an existing SQL Server 2008 R2 instance. nt or to add 1 SQL Server 2008 R2 Setup Database Engine Configuration Specify Database End Setup Support Rules Feature Selection Installation Rules Instance Configuration Account Provisioning Data Directories User Instances FILESTREAM Specify the authentication mode and administrators for the Database Engine Authentication Mode Disk Space Requirements O Windows auth Server Configuration Mixed Mode (SQL Server authentication and Windows authen Database Engine Configu Error Reporting Installation Configuration Specify the password for the SQL Server system administrator (sa) acc Enter password: Installation Progress Confirm password: Complete Specify SQL Server administra SQL Serve Add Qurrent User Add... Add... <<u>Back</u> Next > Cancel Help 1 🐮 🐮 P

Nothing needs to be changed on the **Error and Reporting** screen, so just click **Next>.** At this point, the software will be installed. When the installation is complete, click **Close**.

5.2 Enabling Named Pipes and TCP/IP connections

The next step is to modify the MS SQL Express Configuration for WSM operation. To do this, from the windows start prompt, select *START->All Programs->Microsoft SQL Server 2008 R2->Configuration Tools->SQL Server Configuration Manager*. Select *SQL Server Network Configuration* and then **Protocols for MSSQLSERVER**.

Make sure that **Named Pipes** and **TCP/IP** are enabled. By default, they are disabled. Right click on each of them and select **Enable**. Make sure they are also enabled in **SQL Native Client 10.0 Configuration**.

Figure 15: Enabling Named Pipes and TCP/IP



After making these changes, the SQL server will need to be restarted. Click on **SQL Server Services** and right click on **SQL Server (MSSQLSERVER)** and select restart.

Figure 14: Setting SQL SA Password

5.3 Installing the WSM Server Software

The WSM server application is provided in self-extracting ZIP format. Right click on the ZIP file, select **Run as Administrator**, and the software will be installed in the **C:\WSM V 4.0.1_RTM_WYSE directory**. In this location, there will be several subdirectories and executable files.

Figure 16: WSM Install Directo

Computer > Local Disk (C) > WSM V 4.0.1 RTM WYSE > + 4 Search WSM V 4.0.1 RTM WYSE >						
Organize Include in library Share with	New folder			• <u> </u>		
☆ Favorites	Name	Date modified	Туре	Size		
E Desktop	InstallTools	10/14/2011 9:37 AM	Compressed (zipp	4 KB		
Downloads	SQLEXPR_x64_ENU	9/20/2011 4:58 PM	Application	75,857 KB		
🔛 Recent Places	😼 WSM_Prerequisites	4/5/2009 2:45 PM	Windows Installer	83,665 KB		
	🛃 WSMClient	10/14/2011 9:36 AM	Application	10,307 KB		
🥽 Libraries	WSMClientUtilities	10/14/2011 9:36 AM	Application	2,671 KB		
Documents	WSMPublisher	10/14/2011 9:36 AM	Application	8,323 KB		
🎝 Music	WSMServer	10/14/2011 9:36 AM	Application	156,211 KB		
Pictures	WSMTools	10/14/2011 8:31 AM	Compressed (zipp	44 KB		
H Videos						
Computer						
Eocal Disk (C:)						
St Natwork						
8 items						

Right click on WSMServer and select Run as Administrator. This will start the installation process.

Accept any Windows security Popups. After a few moments, the WSM Server Installation splash screen should appear. Click on **Next>** to continue and accept the License terms as shown in Figure 17.



Figure 18: Wyse WSM License Agreement



Click on This is a new WSM installation as shown in

Figure 19 and **Typical** on Figure 20.

Figure 19: WSM Server Information

谩 WSM Server		_ 🗆 🗙
WSM Server Information		WYSE
Is this a new WSM installation? Or will this se WSM installation?	rver be part of an existir	ng
C This server belongs to the following	g WSM installation:	
InstallShield		
	< <u>B</u> ack <u>N</u> e:	t > Cancel

Figure 20: WSM Server Type

😸 WSM Server		×
Setup Type Choose the se	tup type that best suits your needs.	WYSE
Please select a	setup type.	
• Typical	Requires minimum user interaction.	
C Custom	Requires maximum user interaction. Recommended for adva users.	nced
InstallShield ———	< Back Next >	Cancel

On the **Database Server** screen, the database name should be the same as your WSM server name. Make sure that the **SA** password is the same as you entered in Figure 14 above.

😸 WSM Server				×
Database Server Select database se	erver and authentic	ation method		WYSE
Select the database database servers. credentials or a SQI	e server to install to You can also specify L Login ID and Passy	from the list belo the way to auth vord.	w or click Browse to enticate your login (see a list of all Ising your current
Database	WSM			•
				Browse
Connect using the l	Login ID and passwo	ord below		
Login ID:	sa			
<u>P</u> assword:	•••••			
InstallShield				
		< <u>B</u> ack	<u>N</u> ext >	Cancel

After checking the information hit Next>. The installation should start when you click on Install.

Figure 22: WSM Ready to Install Screen

邊 WSM Server	×
Ready to Install the Program	WINGE
The wizard is ready to begin installation.	WIJE
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back exit the wizard.	. Click Cancel to
InstallShield	
< <u>B</u> ack Install	Cancel

During the install, various status messages will appear. You will be asked to select the network adapter as shown on

Figure 23.

Figure 23: WSM Network Adapter Selection

🥑 WSM Server Configuration	_ <u> </u>
Select Network Adapter	Host Name
Intel(R) PRU/1000 MT Network Connection	WSM
	OS Streaming Max Packet Size
	DHCP Enabled
	192.168.2.251
	<u>IP Address</u>
	255 . 255 . 255 . 0
	OK Cancel

The WSM Installation will be completed after that.

5.4 WSM configuration

To access the WSM Admin Console select Start->All Programs->WSM Server->WSM Admin Console.



Figure 24: Accessing the WSM Admin Console

If the SQL Express Server Parameters for TCP/IP and Named Pipes were not set properly as shown on.

Figure 15, the browser will be redirected to the **Database Configuration** Screen as shown on Figure 25. If this happens, close the browser window, and return to section 5.2.

~	
B Wyse WSM - Windows Internet Explorer	
C v line with the stranger of the stranger of the straight of	🔻 🔀 😽 🗙 🔽 🖸 Bing 🖉 🖉
🖕 Favorites 🛛 🖕 🔊 Suggested Sites 👻 🔊 Web Slice Gallery 👻	
🏉 Wyse WSM	🟠 🕶 🖾 👻 🔜 🖶 Rage 🕶 Safety 🕶 Tools 🕶 🚱 🖛
WYSE W S M	
Database Configuration DATABASE CONECTION PARAMETERS Wyse WSM is not connected to the database. Please modify th Database Configuration a	ne database connection parameters below.
DATABASE CONNECTION PARAMETERS:	
Primary Database Server:	192.168.2.251
SQL Server Purt (optional):	Note: SQL Server port is optional if you are using the default port or SQL Browser service is running and no firewall is blocking the Browser service (UDP port 1434) access from VKM.
Database Server IP:	192.168.2.251
Database Name:	StreamingDB
User Name:	wsmdb
Password:	
	Dut Count Down 20
	Reset Connect to Primary DB
Done	💊 Local intranet Protected Mode: Off 🛛 🖓 🔻 🍕 100% 👻

Figure 25: WSM Admin Login Screen with Error

If the Named Pipes and TCP/IP connections are enabled properly, the browser will be redirected to the normal login screen as shown on Figure 26.

ſ	29 WSM2 on localhostwyse.com	3	×
	<u>File View</u> <u>VM</u>		
	🖉 Wyse WSM - Windows Internet Explorer	×	Â
	🚱 🖉 🔻 🚺 http://localhost8080/admin/login.do 🔻 🗟 47 🗙 🗔 Bing 👂	•	
	🚖 Favorites 🛛 🎄 🚺 Suggested Sites 🔻 🔊 Web Slice Gallery 👻		
	🔁 Wyse WSM 🔄 👻 🖾 🐨 Page 🔻 Safety 👻 Tools 👻 🔞	•	
		Â	
	WYSE		
	Welcome to Were WCM	1	E
	welcome to wyse wom:		
		=	
	Please log in to proceed:		
	Admin Username: admin		
	Dansword:		
	Pdoswolu.		Ц
	Login		
		-	
	Done 🔩 Local intranet Protected Mode: Off 🦓 👻 🔍 100% 👻	.d	-
	< III		Þ
II			

Figure 26: Normal WSM Admin Login Screen

The default username is **admin** and the default password is **admin**.

After logging in, you will be directed to the Site Configuration screens starting on Figure 27.

Figure 27: WSM Site Type Selection

Ayse WSM - Windows Internet Explorer			- 8
💭 🗢 🚺 http://localhost:8080/admin/siteConfig.do?isConfigV	Viz=0	🕶 🗟 😽 🗙 🖸 Bing	
Favorites 🛛 🚖 🔊 Suggested Sites 🔻 🔊 Web Slice Gallery 👻			
Wyse WSM		👌 • 🗟 • 🖻 🖶 •	r <u>P</u> age ▼ <u>S</u> afety ▼ T <u>o</u> ols ▼
WYSE			WSM
			1011
Configuration Wizard - Step 1 of 3			
1 Chapter Site Extension 2 Impart Server Licence	2 Active Directory Configuration		
T choose site category 2 import server crowse	s Active Directory conligatation		
Welcome to Wyse WSM!. This page allows you to select a site	e category for the current WSM installation.		
 Stand_Alone Site has its own database and operates in 	ndenendentfir		
 Linked Site is connected to the Headquarters and sync 	roependensy. cs up with a site template at Headquarters		
SITE CONFIGURATION:			
	Stand-Alone Site		
Choose a site category:	C Linked Site		
	Headquarters Site		
			Reset Setup Site

Click on **Setup Site** and you will be directed to the **Step 1 of 2** screen. Click on **Browse**, locate your License file on your desktop and press **Open**.

Figure 28:	WSM	License	Installation	Screen
------------	-----	---------	--------------	--------

→ ▼	ost:8080/admin/serverLicense.do	?isConfigWiz=0	▼ 🗟 🍫 🗙	b Bing		
vorites 🛛 👍 🔁 Sugge	sted Sites 👻 💋 Web Slice Galle	ry 🕶				
yse WSM			🟠 👻	🔊 - 🖃 🖶		y ▼ T <u>o</u> ols ·
-					About 1M/SM)	Meb II ogo
						Teo Teogo
WIJE						WSN
Configuration Mizza	rd - Stop 1 of 2					
Configuration wiza	ra - step i or z					
1 Import Server Licens	2 Active Directory Config	auration				
In order to add devices f	to the system, you will need to in	nport a server license file. You may cho	ose to skip this step and ir	nport the server l	license later in the !	System
In order to add devices t Settings page. You can	to the system, you will need to in use WSM for a period of 30 days	nport a server license file. You may cho s using the evaluation license that com	ose to skip this step and ir es with the product	nport the server I	license later in the	System
In order to add devices f Settings page. You can	to the system, you will need to in use WSM for a period of 30 day:	nport a server license file. You may cho s using the evaluation license that com	ose to skip this step and ir es with the product.	nport the server I	license later in the S	System
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In order to add devices t Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day: O:	nport a server license file. You may cho s using the evaluation license that com	ose to skip this step and ir es with the product.	nport the server I	license later in the s	System
In order to add devices t Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day: D: License Ty	nport a server license file. You may cho s using the evaluation license that com npe: Evaluation	ose to skip this step and ir es with the product.	nport the server I	license later in the t	System
In order to add devices I Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use VVSM for a period of 30 day: D: License Ty Valid Fri	nport a server license file. You may cho s using the evaluation license that com ppe: Evaluation om: Tue Oct 04 00:00:00 PDT 2011	ose to skip this step and in es with the product.	nport the server I	license later in the t	System
In order to add devices I Settings page. You can	to the system, you will need to in use WSM for a period of 30 day D: License Ty Valid Fr Valid Fr	nport a server license file. You may cho s using the evaluation license that com pper Evaluation om: Tue Oct 04 00:00:00 PDT 2011 milit. Two locu 02 00:00 PDT 2011	ose to skip this step and in es with the product.	nport the server l	license later in the f	System
In order to add devices I Settings page. You can	to the system, you will need to in use WSM for a period of 30 day o: License Ty Valid Fr Valid I	nport a server license file. You may cho s using the evaluation license that com pe: Evaluation om: Tue Oct 04 00:00:00 PDT 2011 ntil: Thu Nev 03 00:00:00 PDT 2011	ose to skip this step and in es with the product.	nport the server l	license later in the f	System
In order to add devices I Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day 5- License Ty Valid In Valid In Number of Se.	nport a server license file. You may cho s using the evaluation license that com ype: Evaluation om: Tue Oct 04 00:00:00 PDT 2011 mtll: Thu Nov 03 00:00:00 PDT 2011 ats: 20	ose to skip this step and in es with the product.	nport the server l	license later in the f	System
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In order to add devices I Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day D: License Ty Valid Fr Valid U Number of Se Server License File:	nport a server license file. You may cho s using the evaluation license that com per Evaluation om: Tue Oct 04 00:00:00 PDT 2011 mtil: Thu Nev 03 00:00:00 PDT 2011 ats: 20	ose to skip this step and in es with the product.	nport the server I	license later in the S	System
In order to add devices I Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day D License Ty Valid Fr Valid I Number of Se Server License File:	nport a server license file. You may cho s using the evaluation license that com ype: Evaluation om: Two Oct 04 00:00:00 PDT 2011 ntil: Thu Nov 03 00:00:00 PDT 2011 ats: 20	ose to skip this step and in es with the product.	mport the server i	license later in the S	System
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In order to add devices I Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day D: License Ty Valid Fr Valid I Number of Se Server License File:	nport a server license file. You may cho s using the evaluation license that com npe: Evaluation om: Tue Oct 04 00:00:00 PDT 2011 ntil: Thu Nov 03 00:00:00 PDT 2011 ats: 20	ose to skip this step and in es with the product.	Out Inp	license later in the S	Next »
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In order to add devices I Settings page. You can SERVER LICENSE INFO	to the system, you will need to in use WSM for a period of 30 day D License Ty Valid Fr Valid I Number of Se Server License File:	nport a server license file. You may cho s using the evaluation license that com nper: Evaluation orn: Tue Oct 04 00:00:00 PDT 2011 ntil: Thu Nov 03 00:00:00 PDT 2011 ats: 20	ose to skip this step and in es with the product. Browse	out the server l	license later in the S	System Next >

Once the license file is installed, you will be asked if you want to Enable Active Directory integration.

Figure 29: Active Directory Integration Screen

🥔 Wyse WSM - Windows Internet Explorer		
😋 🔵 🔻 💋 http://localhost:8080/admin/adConfig.do?isConfigWiz=0	🗕 🗟 😽 🗙 🔁 Bing	+ م
🖕 Favorites 🛛 👍 💽 Suggested Sites 🔻 🔊 Web Slice Gallery 👻		
🖸 Wyse WSM	🟠 🔻 🖾 👻 📑 🕶 Safety	▼ T <u>o</u> ols ▼ @▼
	About WSM V	Veb Logout 🔷 🏠
WYSE		WSM
Configuration Wizard - Step 2 of 2		
1 Import Server License 2 Active Directory Configuration		
Users and groups can either be created manually or imported from Active E before any users, groups, or devices are added to the system.	Directory. You can always change Active Directory settings in the System Settings ;	bage
Enable Active Directory Integration:		- 1
	Qut	Finish
Done	🔹 🔍 Local intranet Protected Mode: Off	• 🔍 100% •

Click on the box to enable the LDAP integration and then click **Next>** when it appears. On the next screen enter the information for your Active Directory Server, and then click **Add Domain**.

	+			
lhost:8080/admin/d	omainWiz.do?isConfigWiz=0		☆ マ C 🖁 😽 - Google	
WYSE				WSN
Configuration	Wizard - Step 3 of 4			
1 Import Server	r License 2 Active Directory Configuration	ion 3 Add Domain 4 Import Groups		
This page allows	you to add a domain from Active Directory t	to be made accessible for Wyse WSM.		
	Domain Name:			
	DC Hostname or IP Address (optional):			
	Active Directory User:	admin		
	Password:			
	Enable Kerberos Authentication:			
			Quit Add I	Domain »

Figure 30: Entering Active Directory Information

On Step 4, you will need to select the specific Organization Area (OA) within your AD database to place the computers that will be added as part of the WSM streaming service. You should select the group that you have created for this purpose. In this example, as shown in

Figure 31, the WSM group was created previously, and is now selected. This will be used for Application Streaming, which will be documented in a future version of this guide. After making the selection, click **Finish**.

Iocalhost:8080/admin/c	domainGroupImport.do	☆ マ Œ 🚺 - Google 🔎
WYSE		WSM
Overview Site Groups	Sites Operating Systems Applicati	ons Server Groups Servers Device Groups Devices User Groups Users System Settings Reports
Configuration V	Nizard - Step 4 of 4	
1 Import Server	License 2 Active Directory Configurat	tion 3 Add Domain 4 Import Groups
This page allows y	you to import groups from this domain by	specifying a search criteria.
To import a group, e	nter the search criteria and click on Filter.	Then choose the group you want to import and click on Finish
Note: Group Names	suffixed by (*) are already imported to W	SM database.
1. FILTER GROUPS	BY:	
	Group Name Contains:	
	LDAP Context Root:	
	Max Results Limit:	100
		Clear Fiter
2. SELECT GROUPS	S TO IMPORT FROM WSM-TEST.WYSE.	COM: [expand]
Group Hall	e Imine	A
Server One	rators	
Terminal Se	erver License Servers	
Users		
Windows A	uthorization Access Group	
WSM WSM		
✓ WSM		
V WSM		Out Finish
V WSM		Quit Finish

Figure 31: Selecting the LDAP group for WSM

After finishing the initial configuration of WSM, select the **Systems Setting Tab** and then select **Active Directory Configuration**. On this page, you can set the options for the Active Directory interaction. You can enable SSL communications between WSM and AD server.

retox Y	
Iocalhost:8080/admin/adConfig.do	☆ マ פ' 🚼 ד Google 🔎 🍙
WYSE	WSM
	<u></u>
verview Site Groups Sites Operating Systems Applications Server Groups Serve	ers Device Groups Devices User Groups Users System Settings Reports
	MESSAGES
This page allows you to enable or disable Active Directory use within Wyse WSM.	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and
A trive blace for a component on This page allows you to enable or disable Adive Directory use within Wyse WSM. <u> « Back to System Settings </u>	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.
Active Directory Commonwerton Sector State Commonwerton Sector System Settings Active Directory Domains Sector Directory Domains	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.
Active Directory Commonwerton Sector System Settings Active Directory Domains * Active Directory ConFigurAtion:	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.
Active Directory outo enable or disable Active Directory use within Wyse WSM.	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.
Active Directory out to enable or disable Active Directory use within Wyse WSM.	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.
Active Directory outo enable or disable Active Directory use within Wyse WSM.	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.
Active Directory outo enable or disable Active Directory use within Wyse WSM.	Attention: Active Directory mode can only be modified when there are no existing groups, users, devices and device templates in the system.

Figure 32: Changing LDAP Options

If you choose not to enable SSL, then you will need to manually make a change to the **WSM OS Authentication Service** to provide it with the proper permissions to have access to the AD database. From the Windows Start menu, type **Services**. The services application should appear at the top of the start menu. Right click on it and select **Run as administrator**. Scroll through the list of services and towards the bottom you should see **WSM OS Authentication Service**. Right click on it, and select **Properties**. The properties screen should appear as shown on Figure 33. Select the Log On tab and enter the credentials for a user account that has read/write permissions to the AD database.

			ſ	wsm o	S Authenticat	ion Service	Properties (Local Com	puter)
Q Services				Gene	ral Log On F	Recovery	Dependencies	
File Action View	Help			Log	on as:			
					ocal System ac	count		
Consistent (Lanal)			_		Allow service	to interact	with desktop	
Services (Local)	Services (Local)							
	WSM OS Authentication Service	Name	Des	0	This account:	WSN	1-TEST\Administrator	Browse
		🔍 Windows Image A	Prov	F	Password:	••••	•••••	
	Stop the service	Windows Installer	Add		Confirm passwor	d:		
	Restart the service	🔍 Windows Manage	Prov					
		🔍 Windows Media C	Win	Help	o me configure u	iser accoun	t log on options.	
		🌼 Windows Media C	Star					
		🎑 Windows Media P	Sha					
		🔍 Windows Module	Ena					
		Windows Presenta	Opt					
		Windows Remote	Win					
		Windows Search	Prov					
		Windows Time	Mai					
		Windows Update	Ena					
		WinHTTP Web Pr	Win					
		Wired AutoConfig	The				OK Cance	Apply
		WLAN AutoConfig	The					
		WIMI Performance	Provi	ues pen		IVIGITUDI	Cocor System	
		Workstation	Ureal MCM	es and	Charled	Automati	ic inetwork 5	
		WSM Monitor	Mon	tors an	Started	Automati	ic Local Syste	
		WSM Multicart Ro	WOII	tors an.	Started	Automati	ic Local System	
		WSM Malacast bo			Started	Automati	ic WSM-TEST	=
		WSM OS Streamin			Started	Automati	ic Local Syste	-
		WWAN AutoConfig	This	service		Manual	Local Service	-
	Extended Standard	- Autocooling			•			
1								

Figure	33.	Changing	Permission	of WSM	Authentication	Service
riguic	55.	onanging	1 01111331011		Autonitication	

You will need to click **OK**. You will need to restart the WSM OS Authentication service for this change to take effect. If the user account or password changes, you will need to manually repeat these steps.

At this point, go back to your WSM Admin console and you should see the System Overview screen as shown in Figure 34. If you have installed your license key, you should not see the red warning as shown.

	dmin/overview.do	👻 💀 🆛 🗙 🔽 Bing	
	B		
orites 🚖 🙋 Suggested Sites •	• @ Web Slice Gallery •		
e WSM			Page ▼ Safety ▼ Too
WYSE			WSM
verview Site Groups Sites O	perating Systems Applications Server Groups Servers [Device Groups Devices User Groups Users S	System Settings Report
System Overview		MESSAGES	
This page allows you to quickly	view important summary information for each functional area of	Wyse WSM. System Settings	
		Reports	
		Change Admin Password	
			_
Note: You are using an evaluatio	n license that will expire in 30 day(s) unless you import a valid	Configuration Wizard	
Note: You are using an evaluatio	n license that will expire in 30 day(s) unless you import a valid STATUS	Conflauration Wizard	
Note: You are using an evaluation CATEGORY Operating Systems	n license that will expire in 30 day(s) unless you import a valid STATUS There are no OS images in the system.	Confouration Wizard	
Note: You are using an evaluation CATEGORY Operating Systems Applications	n license that will expire in 30 day(s) unless you import a valid STATUS There are no OS images in the system. There are no application images in the system.		_
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Figure 34: WSM System Overview

5.5 Modifying the WSM system cache settings

On Windows Operating System, if WSM Streaming server was up for a few days with active or idle streaming sessions, system's available memory will steadily decrease. Server will eventually run out of memory. This was caused by the Windows' file system cache. Since Windows gives priority to the System Cache over application processes, and there is no upper limit on file system cache size on certain Windows systems, running the streaming service for extensive period will end up with a huge file system cache due to the large numbers of file I/O requests made by WSM Streaming service. This problem is not unique to WSM. It applies on any windows services or applications which use heavy file I/O calls. Problem is also more apparent on 64-bit Windows Operating Systems.

Starting on release 4.0.1, Wyse incorporated a subset of MS's Dynamic Cache Service into WSM server to limit the maximum system cache size on 64-bit OS. At this time, there is no workaround for 32-bit versions of Windows.

When WSM Authentication service starts, it launches SetCache64.exe provided that the registry entry **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Wyse\WSM\LS\SkipSetCache** does not exist or is set to 0 (DWORD). If the registry entry exists and is set to any non-zero value, Setcache64 will not run and the cache settings will not be modified.

SetCache64.exe sets the maximum system cache size according to below registry setting: HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Wyse\WSM\MaxSystemCacheMBytes which represents desired System Cache Size upper limit.

The accepted values are:

0 (default) – Setting the value to 0 will let the system to automatically assign the memory limit based on the amount of available memory. The more memory available, the higher percentage of that memory will be allocated to the System Cache.

Available Memory	Maximum System File Cache Size
<= 2GB	Available Memory * 50%
> 2GB & < 8GB	Available Memory * 75%
>= 8GB	Available Memory * 85%

However, if the Authentication Server is restarted, the amount of available memory at that time may be less than when the server was first started, and therefore, the amount of System Cache memory will also be less.

1-99 - Limit the maximum size of the System File Cache to the specified percentage of currently available memory. The same restriction for setting the value to zero is true here as well. If the Authentication server is restarted and the amount of available memory is less, then the size of the System Cache will also become less.

100-199 – These values have no meaning and will be rounded up to 200.

> 200 - Limit the maximum size of the System File Cache to x Mbytes

The maximum system cache file size must be >= 200MB AND <= available ram size minus 300MB. The available ram is the amount of ram after WSM services have been loaded. Setting the value too low will cause performance issues with File I/O. Setting the value too high will take away available memory for programs to load and may cause application errors. The specific value cannot be determined ahead of time. Since every WSM environment and server work load is different, the default setting that Wyse provides is not suitable for all environments. Wyse strongly recommends that you monitor the memory usage of your WSM server and adjust the "MaxSystemCacheMBytes" setting accordingly.

You can use Registry Editor (Regedit) to set these values. To run regedit with administrative permissions, select the **Start** button on the taskbar and type **regedit** in the search window. The Regedit application should appear at the top of the program list. Right click on the name and select **Run as Administrator**. Highlight the menu trees as shown above until you reach the WSM registry folder. On the right side, you will see the list of registry values. Right click **MaxSystemCacheMBytes** and select **Modify**. Click on **Decimal** and enter the value based on the above options.





SetCache64 will output messages to the SetCache.log file under "<WSM Server install folder>\log" folder. This log file records the exact value system cache file size was set to.

5.6 Verifying WSM server Installation and Operation

To verify that the WSM software was installed correctly and that it is fully operational, you can click on the Servers tab. You should see a list of the systems running WSM. In this case, it should show only the current machine you are connected to.

Figure 36: Servers Overview Screen

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rview Site Groups Sites	Operating Systems Appli	ations Server Gro	ups Servers Devic	e Groups Devic	es User Group	os Users S	ystem Settings	Repo
Servers					MESSAGES			
'his page allows you to view	and manage the Wyse WSM	servers that are avai	lable. Servers are ad	ded during the	Attention: 1 se	erver is not conf	ligured.	
nstallation process.								
1. FILTER SERVERS BY:								
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ID Addresses		_	Application	Image: Crist				
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Site: 🥸	<u>ilect</u>		Site	e Group: <u>Select</u>				
							Clear	Fiter
CLICK ON SERVERS TO Y	/IEW DETAILS:							
Name	Site	Server Group	IP Address	# of OS Image	s # of App Imag	<u>tes Status</u>	Version	
M wsm2 (Core)	wsm2_site	Default	192.168.2.251	0	0	Up	4.0.0	^
Select All I Deselect all	elete Selected							

Click on your server name and verify that all the services are running as show in Figure 37.

🏉 Wyse WSM - Windows Internet Explorer - • • 🚱 🕞 🗢 http://localhost:8080/admin/serverDetails.do?id=MACH(1) 🝷 🔯 🍫 🗙 🔁 Bing ρ. 🖕 Favorites 🛛 🚖 🔁 Suggested Sites 👻 🔊 Web Slice Gallery 👻 🕖 Wyse WSM 🟠 🔹 🔝 👻 🖶 👻 Page 🔹 Safety 🖛 Tools 🕶 🕢 « Back to Servers Manage server SERVER DETAILS FOR WSM2 Name: wsm2 Type: Core Server Description: wsm2 IP Address: 192 . 168 . 2 . 251 reaming Directory: C: Program Files Wyse WSMStreamingDir Status: Up WSM Version: 4.0.0 Reset Save Change Port Status (Start All / Stop OS Authentication Service 6910 Up Stop OS Streaming Service 6911 View Log Up <u>Stop</u> Application Authentication Service 8002 View Log Up Stor Application Streaming Service 8001 Up Stop View Log Monitor Service 5000 Up Stop View Log Content Distribution Service 20248 Up Stop Multicast Boot Service 10703 Up Stop View Log DHCP Proxy Service 67 Up <u>Stop</u> 69 TFTP Service Up <u>Stop</u> OS IMAGES STREAMED BY WSM2: Device Class Ve 4 + 4 100% 💊 Local intranet | Protected Mode: Off

Figure 37: WSM Services Screen

Click on DHCP Proxy Service and verify that Enable Device Discovery option is checked. If not enable it and click Save Changes.

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	W	/șę								
	Overview	Site Groups	Sites	Operating Systems	Applications	Server Groups	Servers	Device Groups	Devices	UserC

Figure 3	88:	DHCP	Proxy	Service	Options
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verview Site Groups Sites Operating Sy	stems Applications Server Groups Servers Device Groups Devices User Groups Users System Settings Report
SERVICE DETAILS	
« Back to Server Details	
SERVICE DETAILS FOR DHCP PROXY S	ERVICE:
Service Type:	DHCP Proxy Service
Server:	wsmsmall
Port:	67 (Default)
	 4011 (Select this port if DHCP server is running on the currently selected WSM server)
Enable Device Discovery:	V
Status:	Up <u>Stop</u>
	Reset Save Changes

Creating New Hardware profile for Streaming Client 5.7

You can add a hardware profile for your new streaming client device if it is not already in the WSM database. To do this, click on Systems Settings tab on the main screen, and then select Manage Device Classes. Look through the list of devices to see if yours is in the list. If not, type the name of the new device class in the Add a new Device Class box and click Add.

Figure 39: Adding New Device Cla

Current Dev	vice Classes:		
🔲 Wys	e VOOL/LE	Rename	*
🔲 Wys	e X00	Rename	
🔲 Wys	:e X00C	Rename	
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🔲 Wys	e X00e	Rename	-
<u>Select All</u>	Deselect all Delete Select	ected	
Add a new l	Device Class:	d	

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5.8 Adding virtual desktop (Operating system and Applications) to WSM

The instructions for building an Operating System image and uploading it to WSM are included in Chapter 6 of the WSM Installation Guide. A summary of the steps is also listed in this guide in Section 6. Once the image has been created and uploaded to the WSM server, it will be available to register into the WSM system. From the main WSM screen, click on **Operating Systems** tab and select **Add OS Image**. On the screen show in Figure 40, type the label you want to assign to this image and select the appropriate file from the pull down **File Name** entry. At this point, you cannot make any other changes on this screen so click on **Next>** to continue.

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	About WSM Web Logout
WYSE	WSM
1010	
Adding OS Image Step 4 e60	
Adding OS image - step 1 or 3	
Add OS Image 2 Select Site Groups 3 Assi	sign to Sites
Select new OS image.	
Name:	Win7x32
File Name:	200.4
Description:	
Version:	1 - 0 - 1
OS Class:	V
Device Class:	·
Enable Safe Boot:	
First Partition Mode:	Persistent Cache (Shared Mode)
	Cancel Next >
Done	🕵 Local intranet Protected Mode: Off 🦷 👻 🔍 100% 🔻

Figure 40: Adding OS Image - Step 1

Select the Default Site for this image and click on Add and Next>.

Figure 41: Adding OS Image Step 2

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WYSE		WSM
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Colort Site Oversing Step 9 of 3		
Select Site Groups - Step 2 of 3		
1 Add OS Image 2 Select Site Groups 3 Select Sites		
This page allows you to select site groups to filter the sites for next step.		
All Site Groups	Selected Site Groups	
All Site Groups	Selected Site Groups Default	
All Site Groups	Selected Site Groups Default	
All Site Groups	Selected Site Groups Defeat	
All Site Groups	Selected Site Groups Defeuit	
All Site Groups	Selected Site Groups Default	
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All Site Groups	Selected Site Groups Default	
All Site Groups	Selected Site Groups Detext	ncel Next »
All Site Groups	Selected Site Groups Detext	ncel Next »
All Site Groups	Selected Site Groups	ncel Next »

Next, select the Site Group for this image and click **Add** and then **Finish**. Again, there should only be one Site Group to select from.

Figure 42: Adding OS Image Step 3

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Select Sites - Step 3 of 3			
1 Add OS Image 2 Select Site Groups 3 Se	lect Sites		
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Sites in Selected Site Groups		Selected Sites	
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Verify the information you selected, click on the Operating Systems tab on the main screen and select your OS image name. Scroll down as show on Figure 43 and you will notice that no Server Group has been selected. Click **Change Server Group Assignments**.

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Wyse WSM			🏠 🔻 🖾 👻 🖶	★ Page ★ Safety ★ Tools ★
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				Change Site Assignment
SITES ASSIGNED OS IMAGE	WIN7X32: Description	Site Group Na	ime # Of OS Imag	26
wsm2_site	wsm2_site	Default	1	*
			Change	Server Group Assignments
			Sync	Server Group Assignments
SERVER GROUPS HOSTING V	MIN7X32:			
Name	Description	Site	# of Servers # of	Device Groups
				Ŧ
SERVERS STREAMING WIN7	x32:			
				0.11

Figure 43: Click OS Image Status

Select the Default Server Group on Figure 44, click **Add>** and **Done**. This will complete the OS installation into the WSM Database.

🏉 WSM - Assign Server Groups - Windows Internet Explo	rer		
WYSE			Wyse WSM
ASSIGN SERVER GROUPS FOR OS IMAGE: WIN7X	32		
Server Groups from Sites where image is ready.	Add >	Assigned Server Groups Default (wsm2_site)	
	« Remove		
			Cancel Done

Figure 44: Adding OS image to the Default Server Group

5.9 Creating a Device Template

A Device Template can be created for testing the OS image. This allows you to add device automatically as they turn on. From the main screen, select **Systems Settings** and the **Manage Device Templates**. Then click on **Add Device Template.** Enter the name of the Template as shown in

Figure 45. Select the Device Class from the pull down menu item. You can optionally specify the subnet you want by clicking **Specify a Subnet Range** and filling in the subnet information. Lastly, click **Next>** to continue.

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	About WSM Web Logout
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Adding Device Template - Step 1 of 6	
Adding Device Template - Step T 010	
Add Device Template 2 Select Site Group	3 Select Site 2 Assign a Device Group 3 Assign an OS Image 4 Select Streaming Server
This page allows you to add a Device Template to the syste	em.
Name	25001
Description:	
Device Class:	Wyse 200 💌
Connection Type:	Network
Specify a Subnet Range:	
Subnet Address:	
Subnet Mask:	: 255 . 255 . 255 . 0
	Cancel Next »
Done	🔩 Local intranet Protected Mode: Off 🛛 🖓 👻 🔍 100% 💌

Figure 45: Adding Device Template - Step 1

Select the Default Site group by clicking **Next>** on Step 2, the Default Site on Step 3, the default Device group on step 4, the newly created OS Image on Step 5, and finally the default Streaming Server on step 6. This should take you to the screen shown in Figure 46.

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Adding Device Template - Step 6 1 Adding Device Template - Step 6 1 Add Device Template - Step 6 2 4 2 2 3 5 2 4 4 2 5 4 <t< th=""><th>🕞 🗢 🚺 http://localhost:8080/admin/deviceTemplateWiz.do</th><th>- 22 4</th><th>🕈 🗙 🖸 Bing</th><th>Q</th></t<>	🕞 🗢 🚺 http://localhost:8080/admin/deviceTemplateWiz.do	- 22 4	🕈 🗙 🖸 Bing	Q
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1 Add Device Tampide 2 Select Site 2 Add prive Device Group 5 Add prive n 0.5 mage 6 Extended Sites This page allows you to choose from which sener to stream the 0.6 image. Select 3 Select Sites 6 Extended Sites 6 Field 7 7 100 7 7 100 7 7 100 7 7 100 7 7 100 7 7 100 7 7 100 7 7 100 7 7 100 7 7 100 7 100 7 100 7 100 7 100 7 100 7 100 7 100 7 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100	Adding Device Template - Step 6			
This page allows you to choose from which server to stream the OS image. Select a Streaming Server: Westin2 Reback Curcet Pren	1 Add Device Template 2 Select Site Group 3	Select Site 2 Assign a Device Group 5 As	ssign an OS Image	aming Server
This page allows you to choose from which server to stream the OS image. Select a Streaming Server: Verm2 e Back Concel Pren Concel Pren				
von2 cancel Pren Concel Pren	Select a Streaming Server:			
	wsm2			
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Figure 46: Adding Device Template - Step 6

Press **Finish** to complete the template creation. At this point, you should go back to the Operating Systems tab, click on your OS image, and change the **First Partition Boot Mode** to **Private** and click **Save Changes**. This will allow you to boot one device and make any last minute changes to the OS before deploying it to production. After doing this, power on one unit and verify that it gets added to the database by clicking on Devices tab and scrolling down to see if your device gets added to the database as shown in Figure 47. Once it is up and running, you can shut it down remotely by clicking box to the left of the device name and selecting **Send Command** and clicking **Shutdown**.

Figure 47:	Shutting	Down the	Reference	Device
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Acti	ive Server: 🧕	lect		Site G	Group: <u>Select</u>			
						a	lear Filter	
2. CLICK ON E	DEVICES TO VI	IEVV DETAILS:	Chattan			MAG Address ID Addres		
70	intest	wsm2_site	Lin	wsm2	Win7x32	00-80-64-3A-5E-E3 192 168	2.160	*
Select All ID	esselect all	videt Started				SERE DEVICE COMMAND Select the command to be issued the selected device: Reboot Select down Value on LAN Time Delay: 000 seconds Send command now (or schedul designated time). Cancel Send Comm	ree WASM for	-

Before deploying the image, go back and set the **First Partition Boot Mode** back to Persistent or Volatile mode depending on your environment. At this point, the system is up, and you have successfully completed the WSM installation.

An example boot screen on the client device is shown on Figure 48.

Figure 48: Streaming Client Power On screen

Nyse WSM Bootstrap - version 4.0.1	
Copyright (c) 2005 - 2011 Hyse Technology. All rights reserved.	
CPUID = AuthenticAND PXE Version 8281 UNDI IRQ: 888A VENDOR ID: 18EC DEVICE ID: 8168	
Local HAC : 000064901029 Local IP : 192.168.3.1 Submet nask : 255.255.255.0 Default gateway : 192.168.3.254 Boot server : 192.168.3.230 Bootstrap loaded at 0062:0000 Size 4D34	
Connecting to the WSM services. Please wait Authentication server : 192.160.3.230:6910 .VLD1:server@192.160.3.230:6911;virtual disk fo Version : 0004 Flag : 0000 Safe Mode Off	und
Discovering MTU Max UDP len is 1420	
A CONTRACTOR OF CONTRACTOR	Manager and Party of the Party

You can then go back to the Devices Screen and monitor the power on of the group of test units as shown in Figure 49 through Figure 51.

Vyse W	SM				🟠 🔻 6	🛚 🕶 🖶 🕶 <u>P</u> age	▼ Safety ▼	T <u>o</u> ols •
	Active Server: Sel	ect		Site 0	Froup: <u>Select</u>			
							Clear	Fiter
2. CLIC	K ON DEVICES TO VIE	W DETAILS:						[expand]
	Name	Site Name	Status	Active Server	Active Image	MAC Address IP	Address	
	Win7DT_1	wsm2_site	Up	wsm2	Win7x32	00-80-64-3A-5F-F3 1	32.168.2.160	^
	Win7DT_10	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-18-3E 1	32.168.2.171	
	Win7DT_11	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A5-8F 19	32.168.2.174	
	Win7DT_12	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-18-B1 19	32.168.2.175	
	Win7DT_13	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A6-E6 19	32.168.2.170	
	Win7DT_14	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-9E-4E 1	32.168.2.173	
	Win7DT_15	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-9E-67 1	32.168.2.166	
	Win7DT 16	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A7-D3 19	32.168.2.177	E
	Win7DT 17	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-18-29 19	32.168.2.178	
	Win7DT_18	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A7-B1 19	32.168.2.176	
	Win7DT_19	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A7-3F 19	32.168.2.179	
	Win7DT_2	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-18-9E 19	32.168.2.162	
	Win7DT_20	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A6-F5 1	32.168.2.180	
	Win7DT_21	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-9E-4B 1	32.168.2.181	
	Win7DT_22	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-17-F7 1	32.168.2.182	
	Win7DT_23	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-18-BF 1	32.168.2.185	
	Win7DT_24	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9B-18-A1 1	32.168.2.183	
	Win7DT_25	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A7-11 19	32.168.2.184	
	Win7DT 3	wsm2_site	Authenticated	wsm2	Win7x32	00-80-64-9A-A6-B0 1	32.168.2.163	-
0.1	A BULD				0	Obert Commond C		

Figure 49: Monitoring Test Units Power On - Stage 1

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	Active Server: Sele	<u>ect</u>		Site 0	Group: <u>Select</u>			
							Clear	Filter
. CLIC	K ON DEVICES TO VIE	W DETAILS:					[expand]
	Name	Site Name	<u>Status</u>	Active Server	Active Image	MAC Address	IP Address	
	Win7DT_1	wsm2_site	Up	wsm2	Win7x32	00-80-64-3A-5F-F3	192.168.2.160	*
	Win7DT_10	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9B-18-3E	192.168.2.171	
	Win7DT_11	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A5-8F	192.168.2.174	
	Win7DT 12	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9B-18-B1	192.168.2.175	
	Win7DT 13	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A6-E6	192.168.2.170	
	Win7DT_14	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-9E-4E	192.168.2.173	
	Win7DT 15	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-9E-67	192.168.2.166	
	Win7DT_16	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A7-D3	192.168.2.177	Ξ
	Win7DT 17	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9B-18-29	192.168.2.178	
	Win7DT 18	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A7-B1	192.168.2.176	
	Win7DT 19	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A7-3F	192.168.2.179	
	Win7DT_2	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-18-9E	192.168.2.162	
	Win7DT_20	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A6-F5	192.168.2.180	
	Win7DT_21	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-9E-4B	192.168.2.181	
	Win7DT_22	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9B-17-F7	192.168.2.182	
	Win7DT_23	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9B-18-BF	192.168.2.185	
	Win7DT_24	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9B-18-A1	192.168.2.183	
	Win7DT_25	wsm2_site	Starting OS	wsm2	Win7x32	00-80-64-9A-A7-11	192.168.2.184	
	Win7DT_3	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A6-B0	192.168.2.163	+
Selec	t All Deselect all De	lete Selected			Send Command	Abort Command	Configure Device	IS

Figure 50: Monitoring Test Units Power On - Stage 2

Figure 51: Monitoring Test Units Power On - Stage 3

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yse W.	SM				👌 • 6	e	age ▼ _Safety ▼	T <u>o</u> ols
	Active Server: Sele	<u>ect</u>		Site 0	iroup: <u>Select</u>			
							Clear	Filter
CLIC	K ON DEVICES TO VIE	W DETAILS:					[expand]
	<u>Name</u>	Site Name	<u>Status</u>	Active Server	Active Image	MAC Address	IP Address	
	Win7DT_1	wsm2_site	Up	wsm2	Win7x32	00-80-64-3A-5F-F3	192.168.2.160	^
2	Win7DT_10	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-18-3E	192.168.2.171	
	Win7DT_11	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A5-8F	192.168.2.174	
	Win7DT 12	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-18-B1	192.168.2.175	
	Win7DT 13	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A6-E6	192.168.2.170	
	Win7DT 14	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-9E-4E	192.168.2.173	
	Win7DT 15	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-9E-67	192.168.2.166	
	Win7DT 16	wsm2_site	∪p	wsm2	Win7x32	00-80-64-9A-A7-D3	192.168.2.177	Ε
	Win7DT 17	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-18-29	192.168.2.178	
	Win7DT 18	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A7-B1	192.168.2.176	
	Win7DT 19	wsm2_site	∪p	wsm2	Win7x32	00-80-64-9A-A7-3F	192.168.2.179	
	Win7DT_2	wsm2_site	∪p	wsm2	Win7x32	00-80-64-9B-18-9E	192.168.2.162	
	Win7DT_20	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A6-F5	192.168.2.180	
	Win7DT_21	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-9E-4E	192.168.2.181	
	Win7DT_22	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-17-F7	192.168.2.182	
	Win7DT_23	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-18-BF	192.168.2.185	
	Win7DT_24	wsm2_site	Up	wsm2	Win7x32	00-80-64-9B-18-A1	192.168.2.183	
	Win7DT_25	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A7-11	192.168.2.184	
	Win7DT_3	wsm2_site	Up	wsm2	Win7x32	00-80-64-9A-A6-B0	192.168.2.163	
Selec	tAll Deselect all De	elete Selected			Send Command	Abort Command	Configure Device	es

6 Creating the Streaming Client OS image

WSM Client installation takes place on a Reference Device (PC, Wyse client device, or virtual machine). It will be built using Windows 7 Enterprise or Professional VL Edition operating system and the appropriate device drivers for your streamed clients. The Reference Device must contain all the device drivers for your client environment (the client devices to which you will stream the OS Image—traditional PC, Wyse Cloud PC, or other device). The Reference Device differs from the Streaming Client in one important way. It contains some local storage (HDD or SDD) where the Operating system and applications reside. When the image is captured and uploaded to the WSM server, the OS image will be converted into a Virtual Hard Drive image.

6.1 Installing Windows 7 Volume License Edition

In order to maintain the legality of your Microsoft OS licenses across the various streamed desktop, it is important to use the Volume License (VL) version of Windows 7. This will allow each new streamed desktop OS to authenticate with the Key Management Server which was installed in Section 3.1 above. The client OS must be a 32 bit edition. Windows 64 bit can NOT be streamed from WSM at this time.

Use a USB CD-ROM drive to install the Windows 7 Enterprise or Professional VL Edition operating system (be sure to configure the operating system to meet the needs of all client devices that will boot from it later). When installing the operating system, be sure to boot the Reference Device from the USB CD-ROM drive. If the Reference Device tries to boot from a blank flash drive, you will see a disk error. To ensure the Reference Device boots from the external USB CD-ROM drive, you must set the USB DVD drive to be the first boot device.

For most Wyse thin clients and appliances, you can use the one-time boot menu: Attach the USB CD-ROM drive to the thin client. During boot, press and hold the P key. Select the USB Drive option and press Enter.

For Wyse mobile clients, you can enter and change the BIOS Setup Utility: During boot, press and hold the F2 key. Enter the password **Fireport** (this is case sensitive) and press Enter. Select the Boot Device option and press Enter. Select the USB Drive option and move it to the 1 position by using the + key. Save the BIOS settings and reboot (you can return the original BIOS setup options at a later date if needed).

If you are using a Wyse client device, download and install the client device drivers you need for your specific device class (for example, go to http://www.wyse.com/serviceandsupport/support/downloads.asp, select Z00D under Wyse Cloud PCs in the **Please choose your product** box, click **Search**, click the File Name link for the driver zip, and then use the File Download dialog box to install the drivers).

6.2 Preparing your Reference Device for the WSM Client Software

After you have installed the operating system (and if necessary, the device drivers) on the Reference Device, you will need to make some modifications to image to enhance user experience and improve stability. Perform the same prerequisite steps on the reference device as you did for the WSM server. Make sure to disable the sleep settings in the Power Options Control panel. If your streaming client devices do not have real-time clock chips, you may want to turn on the NTP client as shown in Section 4.3 above. Also, you should also turn off any un-needed windows features using the steps outlined in Section 4.4. Make sure your Reference Device is added into the AD controller, and test the user logon procedure to insure that the roaming profiles are functioning properly.

Lastly, a special hotfix from Microsoft is necessary to correct an issue related to a bug that prevents client devices from accepting the streamed OS image from the WSM server. This patch requires that Service Pack 1 be installed prior to the hotfix, and this hotfix is required to be applied before loading the WSM client driver software. You can get this hotfix from the Microsoft website (make sure you download the 32 bit version of the hotfix): http://support.microsoft.com/kb/2550978

6.3 Installing the WSM Client Software

This section provides the detailed procedures you must complete to install the WSM Client. Although you can select custom installation configurations during the installation, it is recommended that you use the default configurations. WSM Client software adds the required drivers and functions for streaming the Client operating system. It also enables application streaming and subscriptions for individual client users. An easy-to-use operating system image creation tool is included in the WSM Client software, which is used to create a base OS Image that can be provisioned to client devices in your WSM environment.

Copy the WSMClient.exe program from your WSM server and place in on the desktop of the reference device. Double-click **WSMClient.exe** and accept the security **User Access Control** pop-up window. This will initiate the Install Shield program. Click **Next>** to open the End User License Agreement window.

Figure 52: Installing WSM Client Software

🔂 WSM Client	× • • • • • • • • • • • • • • • • • • •
WYSE WSM Client	Welcome to the InstallShield Wizard for WSM Client Version
	The InstallShield(R) Wizard will install WSM Client on your computer. To continue, click Next.
E	WARNING: This program is protected by copyright law and international treaties.
	< Back Next > Cancel

After reading the agreement, select the **I accept the terms in the license agreement** option and click **Next>** to open the Customer Information window. Enter the User Name and Organization, and then click **Next>** to open the Destination Folder window. Click **Next>** to accept the default destination. You are ready to install, so click **Install** to begin.

During the installation, the User Account Control pop-up window may appear several times. Accept this pop-up and allow it to automatically install the software and drivers. When the software has finished installing WSM Client Configuration Wizard will appear.

IP Address	Port
10.100.216.4	6910
Imaging Server Info	
IP Address	Port
10.100.216.4	6911
Web Server Info	
Port	IOS Max Packet Length
8080	1420
Client Info	
IP Address	Port
10.100.216.54	6901
Subnet Mask	Gateway IP Address
255.255.255.0	10.100.216. 1

Figure 53: WSN Client Config Wizard

Use the following guidelines to complete the WSM Client Config Wizard:

- Enter the **Authentication Server Info IP Address** to be used by the WSM OS Authentication Service (this address is the same as the Core Server). The **Port** information is automatically filled in with the default value. If the system administrator has changed the port number during the WSM server install, then make sure the **Port** has the same value.
- The **Imaging Server Info IP Address** is a read-only field and is the same as the **Authentication Server IP Address**. It is used by the WSM OS Streaming Service. The **Port** information is automatically filled in with the default value. If the system administrator has changed the port number during the WSM server install, then make user the **Port** has the same value.
- Enter the **Web Server Info Port** address, if necessary. This is the port on which the Web server runs. The **Port** information is automatically filled in with the default value. If the system administrator has changed the port number during the WSM server install, make sure the **Port** has the same value.
- Do not change the **IOS Max Packet Length**. This field was used when either the WSM Client or Server is a version earlier than WSM 3.6.1 (with WSM 3.6.1 or later, the client auto-discovers MTU on boot up).
- The Client Info IP Address, Port, Subnet Mask, and Gateway IP Address are automatically set and should not be changed.

Click **Ok** and then **Finish** completing the installation.

After completing the procedures in this section, restart the system (escape out of the network boot by pressing ESC). You now have the Windows OS Image you need (including the WSM Client software, and if necessary, the device drivers) for your WSM environment on the Reference Device.

6.4 Capturing and uploading the Client OS image

To upload your OS image to the WSM server, locate OSMVDiskImage.exe (the default location is C:\Program Files\Wyse\WSM\os). Right click the OSMVDiskImage.exe and select **Run as Administrator** to open the WSM VDisk Image Creation Utility window.

🥑 WSM VDisk	Image Crea	tion Utility		×
WSM Server I Name: SJC Path: E:\\$	nformation -RYAN-WSM22 StreamingDir\os	2 Capacity: images\	ity: 50.00 GB total, 7.61 GB free	
Virtual Disk Ini VDisk Size (in VDisk Name: Description: Enable Act VDisk Partiti Move Us Combine Use reco Service Partition 1: Partition 3: Partition 4:	formation MB): 5851 tive Directory In on Information er Profiles to se ge File to separ Boot and Syste mmended partit Size (in MB): 5851 0 0 0 0 0	Min. 5083 MB - Max. 32768 MB tegration Advanced Optimizations parate partition ate partition m partition ion sizes Partition Usage: Boot + System + User Profiles n/a n/a n/a n/a	B Status WSM VDisk Image Creation Utility Started	
			Create VDisk E	Exit

Figure 54: VDISK Image Creation Utility

Use the following guidelines:

- Enter the VDisk Size in MB (the maximum virtual disk size is 32 GB). You may want to increase the size from the default to extend the size of the virtual disk that is assigned to the streaming client. This will provide space for any applications that may be added at a later date or to leave room for application that may be streamed from WSM. The WSM VDisk Image Creation Utility will not allow you to create a VDisk that is smaller than this required size.
- Enter a VDisk Name and a Description for the disk.
- Select the **Enable Active Directory Integration** check box; to integrate WSM Client authentication with Active Directory. This field is used for Application streaming to allow the Windows Login credentials to be used to authenticate the applications that are authorized for the particular user of each streamed client device.
- Clear the **Move User Profiles to a separate partition** check box since you will be using roaming profiles which map the user directory and profiles to an external file server.
- Optionally set the **Move Page File to a separate partition** check box if you want to separate out the page file from the OS image. This will allow you to set the image partition to persistent and the page file partition to volatile independently. Leaving the page file partition set to volatile will make patching the base OS image easier and will also help prevent the page file from becoming fragment during daily use.

Click **Create VDisk** to begin building the virtual disk. After building is complete, the **Done** message appears in the WSM VDisk Image Creation Utility window. Click **Finish** to complete the OS Image capturing process. The system will reboot and finish its process after the restart.

6.5 Testing the newly captured OS image

After the OS image has been captured and uploaded, add it to the WSM database using the instructions in Section 5.8. Make sure to set the image type to **Private Mode** for testing.

Boot a single streaming client and use one of the Active Directory accounts to make sure you can log into the unit. Verify that the user account is using the roaming profile, by opening a windows explorer panel and checking to see if the logical drive from the file server has been mounted for the user account.

You can activate your Windows OS license with KMS by using a Command Prompt with Administrator privileges and typing the following command: **c:\windows\system32\sImgr /ato**. If your KMS server is not functioning or if your firewall rules are not set properly, you may see the error message shown in Figure 55. Double check both and retry the activation.

Figure 55: Windows Activation Failed



If your Key Management Server is functioning properly, you may still see the error message shown in Figure 56. This message indicates that KMS has not received enough requests to perform the activation. You will receive this message until you have attempted to activate at least 25 clients.

Figure 56: Windows Activation Waiting

Vindows Script Host	<u> </u>
Activating Windows(R) 7, Professional edition (b92e9980-b9d5-4821-9c94-140f632f6312) Error: 0xC004F038 The software Licensing Service rep could not be activated. The count reported by your H (KMS) is insufficient. Please contact your system adr	orted that the computer Key Management Service ninistrator
	ОК

If you are operating with less than 25 clients, you can continue to issue the **c:\windows\system32\sImgr** *lato* command to bump up your activation count. Once the KMS system as received enough requests, it will start activating the streaming clients and you should see the message shown in Figure 57.

Figure 57: Window Activation Passed



Once you have validated the system, you will need to prepare the boot image for streaming mode by the Rearming process. Because multiple copies of the same image will be deployed (streamed), it is important that each one appear unique on the network. The Rearm process will provide this function. Open a command prompt with administrative privileges and issue the command:

cscript c:\windows\system32\sImgr.vbs -rearm

NOTE: This needs to be the last command issued prior to leaving **Private** mode. Any time you return the image back to private mode for system modification, you will need to rearm the system prior to shutdown.

Shutdown the streaming client, and modify the OS Image type to either **Persistent** or **Volatile** mode in WSM before booting additional clients.

6.5.1 Verifying the KMS activation count

You can also verify the activation count on your KMS server. Using a command prompt on the server providing the KMS service, enter the command:

cscript c:\windows\system32\sImgr.vbs /dli.

This command will show the detailed information for KMS service. Look at the **Current count** as shown in Figure 58. This value shows the number of activate licenses.

Figure 58: Displaying KMS license status



7 Installing Management Server

While WSM is usually deployed in an existing network infrastructure, this document will guide the reader through the installation steps for adding the management infrastructure components to support the streaming operations. This document is not intended to be a complete reference guide for installing Windows Server Operating system or the application servers running on it. It is recommended that the reader be familiar with the Microsoft documentation and installation procedures. In this guide, it is assumed that the necessary management components (Active Directory (AD), DNS server, DHCP server, and Key Management Server (KMS)) are installed on the same machine. Since Microsoft AD requires a server OS such as Windows Server 2008 and KMS requires Windows Server 2008 R2 for deploying Windows 7 and Office 2010, the physical server must be 64 bit capable. The server profile (outlined above for the WSM server) can also be used for the Management Server. However, the Management Server and the WSM server must run on two separate machines. If you have an existing AD directory machine, you can skip to section 7.2.1 below.

7.1 Installing Windows 2008 R2

As mentioned above, the management server must be 64 bit enabled. This is a requirement to install Microsoft Windows Server 2008 R2 since it runs only on 64 bit enabled hardware. This hardware was outlined in Section 2. Complete the normal installation and apply all required drivers and patches for the particular hardware selected. Since this machine will operate as the KMS host, do NOT activate the license at this time. To simplify the installation, make sure that this machine has a static IP address and will be in the same IP subnet as the client devices.

7.2 Configuring Active Directory

Once you have completed the normal Windows 2008 R2 server installation, open the Server Manager icon which looks like a toolbox sitting next to a tower pc. It should automatically be installed on left part of your toolbar. Once the management panel appears, you can click on the Roles and add the role of *Active Directory Domain Service*. When the Domain service is installed, it will also install the Microsoft .Net Framework. Allow it to continue. Once completed, the system will ask you to run the Active Directory Domain Service Installation Wizard (dcpromo.exe) to configure your Active Directory.

e <u>A</u> ction <u>V</u> iew <u>H</u> elp						
🔿 🖄 📅 🛛						
Server Manager (AD) Roles Roles Factures Features Diagnostics Comparison Roles	Active Directory Domain Services					
	Stores directory data and manages communication between users and domains, including user logo processes, authentication, and directory searches.	n				
Storage	Summary	1				
	① This server is not yet running as a domain controller. Run the Active Directory Domain Services Installation Wizard (dcpromo.exe).					
	Events: None in the last 24 hours Go to Event Viewer					
	Vumber of events: 0					
	Level Event ID Date and Time					

Figure 59: Active Directory Domain Services Configuration Panel

Follow the instructions and create a new Active Directory Forest for this environment. If you are not familiar with Microsoft Active Directory, there are many self-paced courses listed on the internet. There are also several instruction books such as the **Windows Server 2008 Active Directory Resource Kit** available online from retailers such as Amazon.

The DNS service role will also be added to the configuration when the Active Directory Service role is created. This will allow computers to automatically be entered into the AD structure when they are added to the DNS database. WSM will automatically populate the DNS database with the streaming client devices using the names specified within the WSM database. This is why Active Directory integration was enabled as part of the WSM installation.

If you plan to integrate Active Directory with WSM without SSL, you must ensure that the WSM OS Authentication Service is running with the credentials of an Active Directory user with privileges to create and manage computer accounts (for example, a member of the Account Operator group). In addition, this user must be a member of the local administrators group of the WSM server; otherwise, the OS Authentication service cannot start when being configured to run with the credentials of the Active Directory user. For more information about integrating Active Directory with WSM without SSL, refer to the Administrators Guide: Wyse WSM_{TM}.

7.2.1 Adding users to the Active Directory

In order to ensure that the client devices function specifically to a particular user, the information for all the system users must be placed into the Active Directory prior to the operating of WSM. Once a user logs onto any of the streamed client devices, the user name will be looked up in the AD and the user will be assigned the appropriate profile. This should include mounting the user's files from the appropriate file server space. It is recommended to store the users files separate from the WSM server. This allows for the network administrator to back up the users files independently from the WSM application files. In addition, if WSM is being used in Volatile Mode, the user's desktop will be wiped clean at each boot up, so storing the user's files on the WSM server would cause them to disappear as well. If WSM is used in Persistent Mode, where the desktop is NOT wiped during each boot up, the hard drive could fill up with those user files.

In order to support this, the user accounts must be set up using a roaming profile. This allows the user to access a remote file share after logon. You can manually put the entries in, or use a scripting tool to batch them together and enter at one time. To accomplish this, the free Solarwinds *User Input Tool*, available from http://www.solarwinds.com/ was used for this document. A Comma Separated Variable (CSV) file was created in Microsoft Excel then used with this tool to populate the AD. Contact your organization's IT department to see if they already had a tool for batch entry.

Make sure to set **Password never expires** and clear **User must change password at next login** if you are planning on doing any automated testing of the system, otherwise, the desktops will be stuck waiting for the user to change his password. These fields can easily be changed in bulk by using a third party tool such as AD Infinitum available from http://www.newfawm.com/adi2.htm.

You may need a script to create the user directories on your fileserver. Consult with your IT department on the procedures for doing so.

7.2.2 Configuring DNS Server

While the DNS Server role was added during the Active Directory configuration, you should verify the configuration and make sure both your Forward and Reverse Lookup Zones are constructed properly.

📕 Server Manager						
Eile Action View Help						
♦ ♦ 2 📰 🖾 Q 💀 2 🖬 3 🗉 G						
Server Manager (AD1)	wsm-test.wyse.com 19 record	i(s)			Actions	
E P Roles	Name	Type	Data	Timestamp	wsm-test.wyse.com	-
Active Directory Domain Services	S msdcs	1.1/64				
	isites				More Actions	•
A DNS Server	inter inter					
AUI Repaired	DomainDosZones					
E Ennward Lookun Zones	EorestDosZones					
E S msdcs.wsm-test.wyse.com	(same as parent folder)	Start of Authority (SOA)	[204]. ad1.wsm-test.wvse	static		
T wsm-test.wyse.com	(same as parent folder)	Name Server (NS)	ad1 wsm-test wyse com	static		
🕀 🧰 Reverse Lookup Zones	(same as parent folder)	Name Server (NS)	ad2.wsm-test.wyse.com	static		
Conditional Forwarders	(same as parent folder)	Host (A)	192, 168, 3, 253	3/19/2012 11:00:00 AM		
	(same as parent folder)	Host (A)	192.168.3.252	3/15/2012 1:00:00 PM		
Image Diagnostics	AD	Host (A)	192.168.3.242	3/20/2012 10:00:00 AM		
🗉 🎆 Configuration	ad1	Host (A)	192.168.3.253	static		
🗄 🔚 Storage	AD2	Host (A)	192.168.3.252	static		
	FS1	Host (A)	192.168.3.241	3/19/2012 3:00:00 PM		
	router	Host (A)	192.168.3.254	static		
	wsmbig	Host (A)	192.168.3.231	3/12/2012 5:00:00 PM		
	WSMREFDEV	Host (A)	192.168.3.240	3/19/2012 1:00:00 PM		
	WSMSMALL	Host (A)	192.168.3.230	3/21/2012 10:00:00 AM		
	-					
				1.1		
1	1.1				1	

Figure 60: Domain Name Service Overview

7.3 Configuring DHCP Server

The DHCP Server role is not created by default when you enable Active Directory. You will need to enable it and create scope for the streaming client networks. As part of this scope you will need to create an address pool. It is important to specify a range that does not conflict for static IP addresses assigned for servers on that particular subnet. You can also use the **Reservations** to block out certain IP addresses. Make sure the Scope Options contain the Default Router and DNS server definitions for your network configuration.

Figure 61: DHCP Scope Definition

🛼 Server Manager				
<u>Eile Action View H</u> elp				
🗢 🔿 🔽 🖬 🍳 📑				
Server Manager (AD 1)	Address Pool			Actions
P P Roles Active Directory Domain Services	Start IP Address	End IP Address	Description	Address P 🔺
DHCP Server	192.168.3.1	192.168.3.100	Address range for distribution	More 🕨
ad1.wsm-test.wyse.com				
□ 🔂 IPv4				
Address Pool				
Address Leases				
E Reservations				
Scope Options				
∃ Iters				
1 IPv6				
1 A DNS Server				
🕀 🁬 Configuration				
🛨 🚰 Storage				
				<u> </u>

7.3.1 Adding DHCP scope options for remote DHCP and WSM servers

If your WSM server is NOT on the same subnet as your DHCP server and streaming clients, it is necessary to point the streaming clients to the location of the WSM server. This is because the DHCP request made by the streaming clients during the PXE boot phase uses standard IP broadcast packets which do not cross network boundaries.

Add two scope options 66 and 67 as shown in

Figure 62. Option 66 specifies the IP address of the WSM server and Option 67 specifies the boot image. The boot image is actually the pre-boot image that loads prior to the WSM streaming image.

📕 Server Manager					
<u>File Action View H</u> elp					
🗢 🔿 📶 🖸 🕞 🛛 🖬					
Server Manager (AD 1)	Scope Options				Actions
🖂 🔐 Roles	Option Name	Vendor	Value	Class	Scope Opt 🔺
Active Directory Domain Services	1003 Router	Standard	192.168.3.254	None	More >
ad1.wsm-test.wyse.com	🔝 066 Boot Server Host Name	Standard	192.168.3.230	None	
🖃 🖡 IPv4	067 Bootfile Name	Standard	VLDRMI 13.BIN	None	
Scope [192.168.3.0] WSMtestlow	006 DNS Servers	Standard	192.168.3.252, 192.168.3.253	None	
Address Pool	all 015 DNS Domain Name	Standard	wsm-test.wyse.com	None	
Address Leases					
Reservations					
Scope Options					
Eltere					
T IPv6					
E Solution Server					
🗄 📷 Features					
🕀 📷 Diagnostics					
🕀 🁬 Configuration					
🕀 📇 Storage					
<u> </u>					

Figure 62: DHCP Scope options for WSM

Appendix A: Test Configuration and Results

This section documents the lab configuration tested as part of this reference architecture and configuration guide. This was a closed environment where all the resources described below were dedicated to the WSM testing. **Wyse recommends up to 50 streaming clients using this configuration for optimal performance**. Using WSM in a production network may yield different results depending on the size of the streamed image, applications running on the desktop, and user operation.

Network equipment

Cisco 3560G-24PS for Corporate Switch Dell 5548 for Wiring Closet Switch

Management Server (Core services DNS, DHCP, KMS & AD) - Dell Optiplex 755

Intel Core2 Duo E8400 3.0 GHz 4 GB of Memory 80 GB HDD Windows 2008 Server R2 Standard Active Directory, DNS, DHCP, and KMS services

WSM Server

The following server was used for the reference architecture,

Parameter	Details
Server Model	Dell PowerEdge T110 II
Chassis type	Cabled 6x2.5 hard drives
CPU	Intel Core I3 2100 3.1 GHz, 3M cache, dual
	core/4T
Memory	8GB memory (2x4GB), 1333MHz
OS	Ordered with no OS. Windows 7 64 bit will be
	installed as stated above (Section #4.1)
SAS Controller	PERC 200 internal RAID adapter
Hard drives	2 x 300GB 10K SAS 6Gbps 2.5in drives
Network	Broadcom 5709 dual port 1GbE NIC. This adapter
	is in addition to the onboard 1 GbE NIC port

In our lab test, we also loaded Microsoft Security Essentials available from the website at: http://windows.microsoft.com/en-US/windows/products/security-essentials

After installing the software, you will need to enable the Windows Firewall filter rules for WSM:

Allow programs to communicate through Windows Firewall

To add, change, or remove allowed programs and ports, click Change settings.

Vame	Domain	Home/Work (Private)	Public	
WSM Application Authentication Service				
WSM Application Authentication Service				
WSM Application Streaming Service				
WSM Application Streaming Service				
☑ WSM Appmap Service				
WSM Appmap Service				
WSM Content Distribution Sevice				
WSM Content Distribution Sevice	\checkmark	\checkmark	✓	ſ
WSM DHCP Proxy Sevice				3
WSM DHCP Proxy Sevice				1
WSM Monitor Service				
WSM Monitor Service				1

And scroll down to get the remaining services:

WSM Multicast Boot Service			
WSM Multicast Boot Service			
WSM OS Authentication Sevice			
WSM OS Authentication Sevice			
WSM OS Streaming Service			
WSM OS Streaming Service	\checkmark		
WSM TFTP Sevice	¥	\checkmark	
WSM TFTP Sevice		V	
		Details	Remove
		Allow and	other program

You can verify the installation by double clicking on the toolbar icon and select Help and About.



Streaming Client – Wyse Z00D and Wyse X00M

AMD G-T56N Dual Core 1.6 GHz 2 GB of Memory Windows 7 Professional x32 (streamed from WSM)

VDISK image details – 25 GB

Windows 7 Professional x32 with SP1 Adobe Flash Player 11 ActiveX Adobe Reader X (10.1.2) AMD Catalyst Install Manager (Video Driver) Google Chrome 17.0963.79 m Google Earth 6.2.1.6014 (beta) Microsoft .NET Framework Client Profile Microsoft Visual C++ Studio x86 Redistributable – 10.0.30319 Mozilla Firefox 11.0 (x86 en-US) Realtek High Definition Audio Driver Renesas Electronics USB 3.0 Host Controller Driver Wyse WSM Client

Testing was done with the above equipment using the instructions provided in this document. Streaming client boot storm test results were collected for groups of 10, 20, 30, 40, 50, and 60 simultaneous booting client devices. The times shown in Figure 63 reflect the data collected from the LSLog.txt file located on the WSM server in the **c:/Program Files (x86)/Wyse/WSM/**Log directory. This time does not include the initial DHCP and PXE start times which were approximately 25 seconds collectively and the time for the auto login and remote drive mapping after the boot which accounts for another 15-20 seconds depending on your fileserver and network configuration.



Figure 63: WSM Boot Storm Results - Dell T110 Small Configuration

During the boot storms, data was collected using Perfmon and Task Manager on the WSM server. The resources used during the boot storms were recorded in Figure 64. These were the burst values. Average usage of each of these resources was much less.

# of clients	CPU usage (%)	Memory (MB)	Disk Usage (MBps)	Network Usage (Mbps)
10	45	2770	3	970
20	67	3694	4	980
30	57	4278	9	1300
40	58	4355	10	1400
50	73	5682	8	1300
60	90	5960	8	1400

One important data point is that the boot storms present the maximum load on the server from a resource perspective. The times and system resources needed are dependent on the size of the VDISK image. For example, if the vdisk image is in and around 25GB, the performance and usage can be expected as seen above. If the vdisk size increases significantly like 35GB, 40GB etc.., the performance metrics as in the number of clients supported will be smaller. The general rule is as follows,

Number of theoretical maximum clients = 70-75 %(2000/vdisk size in GB)

Example 1:

Vdisk size = 25GB

70 %(2000/25) ~ 50 users

Example 2:

Vdisk size = 35GB

70%(2000/25) ~ 40 users

Please note that the above formula is a general guideline. Other parameters like network limitations will play a factor in optimal performance tuning.

The next phase of testing will include resource utilization during user activity. Application loading and usage will be recorded and presented in a future version.

The network utilization was also recorded from the task manager and recorded for 30 users in Figure 65. Each tick mark in the time domain represents 6 seconds. In this figure, you can see the peaks for the various phases of the booting process. The first set of peaks represents the traffic sent from WSM to tell the streaming clients to shut down and the traffic sent from the clients to close out the open files and disconnect the remotely mounted drives. There is about a 30 second pause while the clients are executing their BIOS commands and waiting for an answer from the DHCP server. The second phase is when the client devices load the pre-booter via PXE boot. The Third Phase is the OS image loading from the WSM server. The last set of peaks show network traffic for the auto login using a user roaming profiles and remote file server mounts for the home directories.

Figure 65: Network Usage during 30 user Boot Storm

