ThinManager
vs.
VMWare Horizon View

Comparison Paper

A Sales Resource for Rockwell Channel Partners
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Summary

- Horizon View is not designed for the plant floor. ThinManager, on the other hand, is purpose-built. It is a content and device management solution designed specifically for the plant floor.

- Horizon View is an IT-centric (Information Technology) solution, requiring IT resources to deploy and maintain. ThinManager is an OT-centric (Operational Technology) solution that allows the critical plant floor content to be owned and managed by Engineering and Maintenance.

- Horizon View requires a complex server architecture with up to seven servers required for administration alone. ThinManager can be deployed on a single server (up to two servers are required for redundancy), and is typically co-located on a Remote Desktop Server.

- Adding High Availability or Fault Tolerance to Horizon View adds even more complexity to the configuration and architecture. ThinManager high availability is accomplished with a checkbox and a second Terminal Server. This is referred to as Automatic Terminal Server Failover.

- Horizon View does not manage the actual thin client itself. Depending on the thin client, a separate thin client management piece of software might be available. With ThinManager, the terminal configuration defines the content and settings for the terminal centrally. No terminal configuration is required at the thin client.

- Because no configuration is done at the thin client, ThinManager thin clients can be replaced in minutes. The replacement can be done literally by anyone with only a few minutes of training.

- While ThinManager supports both Remote Desktop Services (RDS) and Virtual Desktop Infrastructure (VDI) deployments (or a combination of both), RDS is better suited for the plant floor, as full desktops are neither required nor desired. ThinManager makes it very easy to eliminate the Windows desktop altogether on the plant floor and only deliver the applications that are required. This is called Application Link.

- Horizon View recently added support for RDS sessions in addition to VDI sessions because VMWare recognizes that VDI is not a one size fits all approach. However, an RDS infrastructure with ThinManager is more cost effective and simpler to deploy.

- There are no industrial thin client options available for Horizon View because it is not a plant floor solution. ThinManager works with hardware companies that provide true industrial thin clients, most of which have dual Ethernet ports that ThinManager can use for network redundancy or to participate on multiple networks without routing.

- ThinManager supports a much broader range of thin and zero clients. ThinManager Ready thin clients have our BIOS extension image embedded in them, so out of the box they know how to find a

ThinManager server. ThinManager Compatible thin clients utilize Intel's PXE technology to deliver the ThinManager firmware at boot time. ThinManager Ready and ThinManager Compatible terminals are functionally equivalent.

- Natively, Horizon View only supports ELO touchscreens. ThinManager natively supports over 15 unique touchscreen drivers, including a generic USB touchscreen driver that supports a number of additional touchscreen controllers.

- Be wary of cost comparisons that only focus on cost per client. While Horizon View may appear less expensive on a cost per client basis, this is only a small part of the story. A truly accurate comparison would also factor in the server architecture required (including hardware and software licensing), annual support contracts, as well as the number and type of resources required to deploy and support the system.

- Horizon View can only deliver content based on a user's login. ThinManager can assign content to the thin client, to a user, or to a location. User based content delivery is called TermSecure. Location based content delivery is called Relevance and underscores ThinManager's focus on the plant floor. Relevance enables content delivery to a mobile device like a tablet or a smartphone based on where it is physically located. Relevance can utilize Quick Response (QR) Codes, Bluetooth Beacons and/or WiFi Access Points for indoor location resolution and GPS for outdoor location resolution.

- ThinManager can deliver video streaming from IP cameras to thin clients.

- ThinManager ships with an ActiveX control that can be embedded within FactoryTalk View SE to programmatically interact with ThinManager (i.e.: to show an IP camera overlay based on process condition, to launch the touchscreen calibration utility, etc.)

- ThinManager offers Terminal to Terminal shadowing where one terminal can see what is going on at another terminal. This is not limited to just 1:1, a terminal can be shadowed from several other terminals. The shadowed sessions can be interactive or non-interactive.

- ThinManager can deliver multiple RDS and/or VDI sessions to a single thin client. This is called MultiSession. These sessions can be visualized simultaneously using Tiling Mode.

- It is simple to shadow (interactively or non-interactively) any thin client from ThinManager, even multiple thin clients simultaneously. Horizon View requires either Windows Remote Assistant, a separate VNC install on each VDI image or running a command from vCenter Console.

- Horizon View supports up to 4 monitors for multiple monitor deployments, while ThinManager supports up to 5. Horizon View can only span the 4 monitors creating one large, logical display. ThinManager can not only span the monitors, but it can also "screen" them, or a combination of both. ThinManager can also deliver different sessions to each display, as well as support tiling mode for each display. Lastly, ThinManager can be configured to allow a single keyboard and mouse control several thin clients, which is ideal for Control Room deployments.

Background

VMWare essentially created VDI (Virtual Desktop Infrastructure). VDI virtualizes Windows desktop operating systems (like Windows XP/7/8/X) and delivers a session of the entire OS down to a zero client device. A zero client differs from a more traditional thin client in that it does not have an operating system. Horizon View offers many tools for creating and managing the virtualized Windows desktops. The protocol typically utilized to deliver these VDI sessions to the zero client is called PC over IP, or more commonly PCoIP.

In addition to delivering VDI sessions, Horizon View can also deliver Remote Desktop Sessions from a Remote Desktop Server. A Remote Desktop Server is simply a Windows server class operating system (like Windows Server 2008R2/2012R2) with the Remote Desktop Session Host (RDSH) role installed on it. This role allows multiple Remote Desktop sessions to be hosted on a single server. Therefore, a number of thin or zero clients could be receiving their content from a single server. This is fundamentally different from VDI, which has a 1:1 relationship between desktop operating system and zero client. Remote Desktop Sessions are delivered via the Remote Desktop Protocol (RDP).

So, what are the drawbacks to Horizon View, as it relates to plant floor deployments?

COMPLEXITY

Horizon View is without question an IT-centric solution that will require IT resources to architect, deploy and maintain. The management components alone can amount to as many as 7[1] virtual servers, not including the virtual servers required to host the actual virtual desktops you intend on delivering to the zero clients. If you want to make sure the virtual desktops are available even if the physical server on which they are being hosted becomes unavailable, VMWare offers its High Availability (HA) and Fault Tolerance (FT) solutions, which add an additional layer of complexity and cost. These solutions amount to hosting the failed image on at least one separate physical server. The HA solution performs this "failover" on demand, whereas the FT solution has a secondary image running at all times kept in lock-step, in sort of a stand-by mode. The storage requirements for these deployments can be substantial, either requiring a physical storage area network (SAN) or now a virtual SAN (vSAN). A vSAN can utilize the storage that exists in the physical servers as opposed to requiring a separate SAN, but VMWare recommends both solid state drives (SSD) and a 10Gb network for the vSAN.

COMPUTING RESOURCES

By its very nature, the VDI architecture is processing intensive by virtue of creating a 1:1 relationship between an entire operating system and the thin or zero client. Each of these virtualized operating systems requires

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[1] *The 7 virtual servers include the (1) Connection Server, (2) Replica Server, (3) Security Server, (4) Composer Server, (5) vCenter Server, (6) SQL Server, (7) Domain Controller*

CPU cycles and RAM commensurate with the OS and applications being hosted. For a heavy user of a VDI session, like a FactoryTalk View SE application, a reasonable estimate would be 4 VDI sessions per CPU core and between 2GB and 4GB of RAM depending on the desktop OS and the requirements of the View SE application. For the pricing/sizing estimates that follow, 4 VDI sessions per CPU core was used with 2GB of RAM for the floating sessions and 4GB of RAM for the dedicated sessions.

MANAGEMENT

While Horizon View certainly has an array of tools to manage the VDI instances, you are still managing an OS for every thin or zero client that you have deployed. A floating desktop will reduce this management by utilizing a shared base image for the OS, so applying patches, updating application software, etc. would only have to be done once in the base image. However, this process can take some time and a floating desktop may not be desirable for an HMI-based thin or zero client. More than likely, a dedicated desktop would be deployed for an HMI endpoint, which essentially is a unique clone of the base image, requiring independent management. A Remote Desktop Services (RDS) deployment, on the other hand, reduces the number of operating systems requiring management because multiple sessions of an application can be hosted on a single server OS.

PRICING

What follows is a pricing comparison for a 50 client deployment between ThinManager and Horizon View. Often times this cost per client pricing comparison is based solely on the cost of Horizon View plus the cost of its thin client versus ThinManager plus the cost of its thin client. This is really only part of the story, and a completely one-sided comparison. As discussed in the Complexity section above, Horizon View requires a substantially more complex architecture to deploy. With this complexity comes added hardware costs to host the management servers and the VDI content servers. For this comparison, VDI is utilized for the Horizon View architecture because it is the strength of Horizon View and because only ELO touchscreens can be supported when deploying RDS sessions using Horizon View (USB port redirection is not supported in RDS sessions, and USB touchscreen drivers would not be supported in a Horizon View deployment utilizing RDS). Furthermore, vSphere Standard was specified for the Horizon View architecture to provide High Availability for the VDI sessions and to provide growth beyond three (3) physical servers, which will be required as the VDI deployment grows even nominally. The Horizon View deployment is split evenly between floating and dedicated desktops. The floating desktop essentially resets each time a user logs in, providing a fresh OS each time, whereas the dedicated desktop is dedicated to a particular user and therefore retains itself after each subsequent restart. It is expected that the dedicated desktop pool would be used for thin clients requiring FactoryTalk View SE, whereas the floating desktop pool would be utilized for non-critical

applications like VantagePoint report display, etc. Lastly, as of Oct 2015, there are three (3) Horizon View editions. The reference pricing below is for a ten pack with the first year of Basic Support included.

Horizon View Edition	Price
Horizon View Standard Edition 10 Concurrent Users (Named User Not an Option)	$3,025.00
Horizon View Advanced Edition 10 Named Users	$3,025.00
Horizon View Advacned Edition 10 Concurrent Users	$4,840.00
Horizon View Enterprise Edition 10 Named Users	$4,130.00
Horizon View Enterprise Edition 10 Concurrent Users	$6,800.00

The Horizon View Advanced Named User license pricing was utilized as the basis for the pricing examples that follow.

The true cost per client when factoring in the server side architecture is almost identical for a 50 client deployment. Horizon View comes in at $1,841.02/client and ThinManager comes in at $1,885.66/client. It is important to note that the ThinManager Enterprise Server license included in this comparison provides a fully redundant and automatically synchronized pair of ThinManager Servers with an unlimited number of terminal connections. Therefore, as the number of terminals increases, ThinManager's cost/client will drop much more quickly than the Horizon View alternative. Scaling the cost analysis up to 100 clients proves this out as Horizon View's true cost/client is at $1,516.98, while ThinManager drops to $1,216.65. The details of this cost comparison follows.

50 SEATS - HORIZON WITH VIEW

	Image Name	Qty	OS	RAM	CPU	HDD		
Management	View Connection Server	1	Server 2012 R2	4 GB	2 vCPU	70 GB		
	View Replica Server	1	Server 2012 R2	4 GB	2 vCPU	70 GB		
	View Security Server	1	Server 2012 R2	4 GB	2 vCPU	70 GB		
	View Composer Server	1	Server 2012 R2	4 GB	2 vCPU	40 GB		
	vCenter Server	1	Server 2012 R2	8 GB	4 vCPU	40 GB		
	SQL Server for View Composer and Events Database	1	Server 2012 R2	8 GB	2 vCPU	80 GB		
	Domain Controller	2	Server 2012 R2	4 GB	2 vCPU	40 GB		
		7		**36 GB**	**16 vCPU**	**410 GB**		

	Image Name	Qty	OS	RAM	CPU	HDD		
FactoryTalk	FactoryTalk Directory & Activation Server	1	Server 2012 R2	4 GB	1 vCPU	20 GB		
	FactoryTalk View SE Primary HMI Server	1	Server 2012 R2	4 GB	2 vCPU	20 GB		
	FactoryTalk View SE Secondary HMI Server	1	Server 2012 R2	4 GB	2 vCPU	20 GB		
		3		**12 GB**	**5 vCPU**	**60 GB**		

	Image Name	Qty	OS	RAM	CPU	HDD	IOPS	Bandwicth
Desktop	Floating Desktop	25	Windows 8.1	50 GB	7 vCPU	250 GB	1875 IOPS	5000 Kbps
	Dedicated Desktop	25	Windows 8.1	100 GB	7 vCPU	500 GB	1875 IOPS	5000 Kbps
		50		**150 GB**	**14 vCPU**	**750 GB**	**3750 IOPS**	**10 Mbps**

	Description	Qty	Unit	Extended
Software	Wyse Device Manager Enterprise Edition	50	$49.00	$2,450.00
	VMWare vCenter Server Standard	1	$4,995.00	$4,995.00
	VMWare vCenter Server Standard 1 Year Annual Support	1	$1,249.00	$1,249.00
	VMWare vSphere Standard 1 Processor	6	$995.00	$5,970.00
	VMWare vSphere Standard 1 Processor 1 Year Annual Support	6	$273.00	$1,638.00
	VMWare Horizon Advanced 10 Pack Named User with 1 Year Support	5	$3,025.00	$15,125.00
	Windows Server 2012 R2 Standard (2 Virtual Instances)	7	$882.00	$6,174.00
	Windows 8.1 Enterprise with 1 Year Software Assurance	50	$150.00	$7,500.00
				$45,101.00

	Description	Qty	Unit	Extended
Hardware	PowerEdge R430, Dual Xeon 8 Core, 192GB RAM	3	$6,000.00	$18,000.00
	Traditional 6TB SAN	1	$9,000.00	$9,000.00
	Wyse 5000 Thin Client with PCoIP, Dual Display, Single Network	50	$399.00	$19,950.00
				$46,950.00

Total Cost:	**$92,051.00**
Cost/Client:	**$1,841.02**

100 SEATS - HORIZON WITH VIEW

	Image Name	Qty	OS	RAM	CPU	HDD		
Management	View Connection Server	1	Server 2012 R2	4 GB	2 vCPU	70 GB		
	View Replica Server	1	Server 2012 R2	4 GB	2 vCPU	70 GB		
	View Security Server	1	Server 2012 R2	4 GB	2 vCPU	70 GB		
	View Composer Server	1	Server 2012 R2	4 GB	2 vCPU	40 GB		
	vCenter Server	1	Server 2012 R2	8 GB	4 vCPU	40 GB		
	SQL Server for View Composer and Events Database	1	Server 2012 R2	8 GB	2 vCPU	80 GB		
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FactoryTalk	FactoryTalk Directory & Activation Server	1	Server 2012 R2	4 GB	1 vCPU	20 GB		
	FactoryTalk View SE Primary HMI Server	1	Server 2012 R2	4 GB	2 vCPU	20 GB		
	FactoryTalk View SE Secondary HMI Server	1	Server 2012 R2	4 GB	2 vCPU	20 GB		
		3		**12 GB**	**5 vCPU**	**60 GB**		

	Image Name	Qty	OS	RAM	CPU	HDD	IOPS	Bandwicth
Desktop	Floating Desktop	50	Windows 8.1	100 GB	14 vCPU	500 GB	3750 IOPS	10000 Kbps
	Dedicated Desktop	50	Windows 8.1	200 GB	14 vCPU	1000 GB	3750 IOPS	10000 Kbps
		100		**300 GB**	**28 vCPU**	**1500 GB**	**7500 IOPS**	**20 Mbps**

	Description	Qty	Unit	Extended
Software	Wyse Device Manager Enterprise Edition	50	$49.00	$2,450.00
	VMWare vCenter Server Standard	1	$4,995.00	$4,995.00
	VMWare vCenter Server Standard 1 Year Annual Support	1	$1,249.00	$1,249.00
	VMWare vSphere Standard 1 Processor	10	$995.00	$9,950.00
	VMWare vSphere Standard 1 Processor 1 Year Annual Support	10	$273.00	$2,730.00
	VMWare Horizon Advanced 10 Pack Named User with 1 Year Support	10	$3,025.00	$30,250.00
	Windows Server 2012 R2 Standard (2 Virtual Instances)	7	$882.00	$6,174.00
	Windows 8.1 Enterprise with 1 Year Software Assurance	100	$150.00	$15,000.00
				$72,798.00

	Description	Qty	Unit	Extended
Hardware	PowerEdge R430, Dual Xeon 8 Core, 192GB RAM	5	$6,000.00	$30,000.00
	Traditional 6TB SAN	1	$9,000.00	$9,000.00
	Wyse 5000 Thin Client with PCoIP, Dual Display, Single Network	100	$399.00	$39,900.00
				$78,900.00

Total Cost:	**$151,698.00**
Cost/Client:	**$1,516.98**

50 SEATS - THINMANAGER

Management	Image Name	Qty	OS	RAM	CPU
	Primary Remote Desktop Server/ThinManager Server	1	Server 2012 R2	16 GB	4 vCPU
	Secondary Remote Desktop Server/ThinManager Server	1	Server 2012 R2	16 GB	4 vCPU
	Domain Controller	2	Server 2012 R2	4 GB	2 vCPU
		3		36 GB	10 vCPU

FactoryTalk	Image Name	Qty	OS	RAM	CPU
	FactoryTalk Directory & Activation Server	1	Server 2012 R2	4 GB	1 vCPU
	FactoryTalk View SE Primary HMI Server	1	Server 2012 R2	4 GB	2 vCPU
	FactoryTalk View SE Secondary HMI Server	1	Server 2012 R2	4 GB	2 vCPU
		3		12 GB	5 vCPU

Software	Description	Qty	Unit	Extended
	ThinManager Enterprise Server, Unlimited Terminals, 1 Year Platform Maintenance	1	$56,695.00	$56,695.00
	VMWare Essentials	1	$495.00	$495.00
	VMWare Essentials 1 Year Annual Support	1	$65.00	$65.00
	Windows Server 2012 R2 Standard (2 Virtual Instances)	4	$882.00	$3,528.00
	Windows Server 2012 R2 RDSCAL 5 Pack	10	$500.00	$5,000.00
				$65,783.00

Hardware	Description	Qty	Unit	Extended
	PowerEdge R430, Xeon 8 Core, 32GB RAM	2	$2,500.00	$5,000.00
	Traditional 1TB SAN	1	$4,000.00	$4,000.00
	Logic Supply Industrial Thin Client, Dual Display, Single Network	50	$390.00	$19,500.00
				$28,500.00

Total Cost:	$94,283.00
Cost/Client:	$1,885.66

100 SEATS - THINMANAGER

Management	Image Name	Qty	OS	RAM	CPU
	Primary Remote Desktop Server/ThinManager Server	1	Server 2012 R2	16 GB	4 vCPU
	Secondary Remote Desktop Server/ThinManager Server	1	Server 2012 R2	16 GB	4 vCPU
	Primary Remote Desktop Server #2	1	Server 2012 R2	16 GB	4 vCPU
	Secondary Remtote Desktop Server #2	1	Server 2012 R2	16 GB	4 vCPU
	Domain Controller	2	Server 2012 R2	4 GB	2 vCPU
		5		68 GB	18 vCPU

FactoryTalk	Image Name	Qty	OS	RAM	CPU
	FactoryTalk Directory & Activation Server	1	Server 2012 R2	4 GB	1 vCPU
	FactoryTalk View SE Primary HMI Server	1	Server 2012 R2	4 GB	2 vCPU
	FactoryTalk View SE Secondary HMI Server	1	Server 2012 R2	4 GB	2 vCPU
		3		12 GB	5 vCPU

Software	Description	Qty	Unit	Extended
	ThinManager Enterprise Server, Unlimited Terminals, 1 Year Platform Maintenance	1	$56,695.00	$56,695.00
	VMWare Essentials	1	$495.00	$495.00
	VMWare Essentials 1 Year Annual Support	1	$65.00	$65.00
	Windows Server 2012 R2 Standard (2 Virtual Instances)	5	$882.00	$4,410.00
	Windows Server 2012 R2 RDSCAL 5 Pack	20	$500.00	$10,000.00
				$71,665.00

Hardware	Description	Qty	Unit	Extended
	PowerEdge R430, Dual Xeon 8 Core, 64GB RAM	2	$3,500.00	$7,000.00
	Traditional 1TB SAN	1	$4,000.00	$4,000.00
	Logic Supply Industrial Thin Client, Dual Display, Single Network	100	$390.00	$39,000.00
				$50,000.00

Total Cost:	$121,665.00
Cost/Client:	$1,216.65

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