Dell VMware Virtual SAN Ready Nodes with Horizon Factory Installed

A Reference Architecture Brief

Dell Engineering
June 2016

A Dell Reference Architecture
## Revisions

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>June 2016</td>
<td>Initial release</td>
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Solution architecture overview

1.1 Introduction

Dell Wyse Datacenter solutions provide a number of deployment options to meet your desktop virtualization requirements. Our solution is able to provide a compelling desktop experience to a range of employees within your organization from task workers to knowledge workers to power users. The deployment options for Dell Wyse Datacenter include:

- Linked Clones (Non-persistent)
- Full Clone Virtual Desktops (Persistent)

1.2 Solution layers

The Dell Wyse Datacenter Solution leverages a core set of hardware and software components consisting of five primary layers:

- Networking Layer
- Compute Server Layer
- Management Server Layer
- Storage Layer (Virtual SAN)
- Thin Client Layer

These components have been integrated and tested to provide the optimal balance of high performance and lowest cost per user. The Dell Wyse Datacenter stack is designed to be cost effective allowing IT departments to implement high-performance fully virtualized desktop environments.

1.3 What is a Virtual SAN Ready Node?

A Virtual SAN Ready Node is a validated Dell Server configuration in a tested, verified Hardware form factor for Virtual SAN deployments, jointly recommended by Dell and VMware. This makes the process easier for the customer and from the vSRN compatibility page Link they can select any of the Dell Hybrid configuration depending on their requirements. There is also an option of having the ready nodes factory installed so ESXi and Virtual SAN would be installed/configured in the factory/merge center. This also comes with pre-selected Horizon OEM VMware SKU’s for licensing and support of Horizon 7 on Virtual SAN.
Looking for a simplified search? Use the Guided Search Wizard.

Need Help? Try out the Virtual SAN Ready Node Configurator.

STEP 1: Refer to the "Virtual SAN Hardware Quick Reference Guide" for guidance on how to build a Virtual SAN Ready Node.

STEP 2: To build a Virtual SAN Ready Node:

Select your Virtual SAN Ready Node of choice based on following certified Ready Nodes.
2 Software components

2.1 What’s new in this release of Virtual SAN 6.2

This new release of VMware Virtual SAN delivers following important new features and enhancements:

Deduplication and compression: Virtual SAN 6.2 supports deduplication and compression to eliminate duplicate data. This technique reduces the total storage space required to meet your needs. When you enable deduplication and compression on a Virtual SAN cluster, redundant copies of data in a particular disk group are reduced to single copy. Deduplication and compression are available as a cluster-wide setting only available as a feature on all-flash clusters.

Enabling deduplication and compression can reduce the amount of storage consumed by as much as 7x. Actual reduction numbers will vary as this depends primarily on the types of data present, number of duplicate blocks, how much these data types can be compressed, and distribution of these unique blocks.

RAID 5 and RAID 6 erasure coding: Virtual SAN 6.2 supports both RAID 5 and RAID 6 erasure coding to reduce the storage space required to protect your data. RAID 5 and RAID 6 are available as a policy attribute for VMs in all-flash clusters.

Prior to Virtual SAN 6.2, RAID-1 (Mirroring) was used as the failure tolerance method. Virtual SAN 6.2 adds RAID-5/6 (Erasure Coding) to all-flash configurations. While RAID 1(Mirroring) may be favored where performance is the most important factor it is costly with regards to the amount of storage needed.

RAID-5/6 (Erasure Coding) data layout can be configured to help ensure the same levels of availability, while consuming less capacity than RAID-1 (Mirroring). Use of erasure coding reduces capacity consumption by as much as 50% versus mirroring at the same fault tolerance level. This method of fault tolerance does require additional write overhead in comparison to mirroring as a result of data placement and parity.

Quality of Service: With the Quality of Service addition to Virtual SAN 6.2, IOPS limits are now available. Quality of service for Virtual SAN 6.2 is a Storage Policy Based Management (SPBM) rule. Because quality of service is applied to Virtual SAN objects through a Storage Policy, it can be applied to individual components or the entire virtual machine without interrupting the operation of the virtual machine.

The term “noisy neighbor” is often used to describe when a workload monopolizes available I/O or other resources, which negatively affect other workloads on the same platform.

For more information on what’s new in Virtual SAN 6.2, Link

2.2 What’s new in this release of Horizon 7?

This new release of VMware Horizon View delivers following important new features and enhancements:
2.2.1 Just in time delivery with Instant Clone Technology
Reduce infrastructure requirements while enhancing security with Instant Clone technology and App Volumes. Instantly deliver brand new personalized desktop and application services to end users every time they log in. Just in Time Delivery with Instant Clone Technology is turning the traditional VDI provisioning model on its head.

The booted-up parent VM can be “hot-cloned” to produce derivative desktop VMs rapidly, leveraging the same disk and memory of the parent, with the clone starting in an already “booted-up” state. This process bypasses the cycle time incurred with traditional cloning where several power cycle and reconfiguration calls are usually made.

When Instant Clone technology is used in conjunction with VMware App Volumes and User Environment Manager, administrators can use Instant Clone Technology to rapidly spin up desktops for users that retain user customization and persona from session to session, even though the desktop itself is destroyed when the user logs out. Virtual desktops benefit from the latest O/S and application patches automatically applied between user logins, without any disruptive recompose.

2.2.2 Transformational user experience with Blast Extreme
A new VMware controlled protocol for a richer app & desktop experience Protocol optimized for mobile and overall lower client TCO. All existing Horizon remote experience features work with Blast Extreme and updated Horizon clients. Deliver rich multimedia experience in lower bandwidth Rapid client proliferation from strong Horizon Client ecosystem.

Blast Extreme is network-friendly, leverages both TCP and UDP transports, powered by H.264 to get the best performance across more devices, and reduces CPU consumption resulting in less device power consumed for longer battery life.

2.2.3 Modernize application lifecycle management with App Volumes
Transform application management from a slow, cumbersome process into a highly scalable, nimble delivery mechanism that provides faster application delivery and application management while reducing IT costs by up to 70%.

VMware App Volumes is a transformative solution that delivers applications to View virtual desktops. Applications installed on multi-user AppStacks or user-specific writable volumes attach instantly to a desktop at user login. The App Volumes user experience closely resembles that of applications natively installed on the desktop with App Volumes, applications become VM-independent objects that can be moved easily across data centers or to the cloud and shared with thousands of virtual machines.

2.2.4 Smart policies with streamlined access
Improve end user satisfaction by simplifying authentication across all desktop and app services while improving security with smarter, contextual, role-based policies tied to a user, device or location.
**Policy-Managed Client Features**, which enables IT to use policy to define which specific security-impacting features, are accessible upon login. These include clipboard redirection, USB, printing, and client-drives. All of these can be enforced contextually, based on role, evaluated at logon/logoff, disconnect/reconnect and at pre-determined refresh intervals for consistent application of policy across the entirety of the user experience. For example, a user logging in from a network location considered unsecured, can be denied access to USB and printing. Additionally, PCoIP bandwidth profile settings allow IT to customize the user experience based on user context and location.

**True SSO** streamlines secure access to a Horizon desktop when users authenticate via VMware Identity Manager. A short lived VMware Horizon virtual certificate is generated, enabling a password-free Windows login, bypassing the usual secondary login prompt users would encounter before getting to their desktop.

### 2.3 VMware Horizon View

The solution is based on VMware Horizon View which provides a complete end-to-end solution delivering Microsoft Windows virtual desktops to users on a wide variety of endpoint devices. Virtual desktops are dynamically assembled on demand, providing users with pristine, yet personalized, desktops each time they log on.

VMware Horizon View provides a complete virtual desktop delivery system by integrating several distributed components with advanced configuration tools that simplify the creation and real-time management of the virtual desktop infrastructure. For the complete set of details, please see the Horizon View resources page at [http://www.vmware.com/products/horizon-view/resources.html](http://www.vmware.com/products/horizon-view/resources.html)

### 2.4 Hypervisor platforms

#### 2.4.1 VMware vSphere 6

The vSphere hypervisor also known as ESXi is a bare-metal hypervisor that installs directly on top of your physical server and partitions it into multiple virtual machines. Each virtual machine shares the same physical resources as the other virtual machines and they can all run at the same time. Unlike other hypervisors, all management functionality of vSphere is done through remote management tools. There is no underlying operating system, reducing the install footprint to less than 150MB.

VMware vSphere 6 includes three major layers:
Virtualization, Management and Interface. The Virtualization layer includes infrastructure and application services. The Management layer is central for configuring, provisioning and managing virtualized environments. The Interface layer includes the vSphere web client.

Throughout the Dell Wyse Datacenter solution, all VMware and Microsoft best practices and prerequisites for core services are adhered to (NTP, DNS, Active Directory, etc.). The vCenter 6 VM used in the solution
is a single Windows Server 2012 R2 VM (Check for current Windows Server OS compatibility at http://www.vmware.com/resources/compatibility) or vCenter 6 virtual appliance, residing on a host in the management Tier. SQL server is a core component of the Windows version of vCenter and is hosted on another VM also residing in the management Tier. It is recommended that View Composer is installed on a standalone Windows Server 2012 R2 VM when using the vCenter Server Appliance.

For more information on VMware vSphere, visit http://www.vmware.com/products/vsphere
Solution performance and testing

At the time of publication, here are the available density recommendations. The below user densities were achieved by following the VMware best practices of FTT=1 and a reserved slack space of 30%.

<table>
<thead>
<tr>
<th>Hypervisor</th>
<th>Provisioning</th>
<th>Profile</th>
<th>Template OS</th>
<th>Config</th>
<th>User Density</th>
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<td>Linked Clone</td>
<td>Task</td>
<td>Windows 10</td>
<td>X8</td>
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For detailed validation results and analysis of these reference designs and more, please visit: Link
About the authors

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