



# ROBO vSAN Project

Sacramento VMUG

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December 18, 2019

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# Agenda

## Use Case / Business Challenge

Requirements

## Solution

Configuration

Scalability

## Implementation

Validation & Performance Testing

## Day 2 Operations

Management / Patching

Monitoring & Support

## Business Outcomes

# Use Case / Business Challenge

What problem are we trying to solve?

## Remote Office / Branch Office with:

- Zero existing infrastructure footprint
- Old/Aging infrastructure hardware

A **handful of workloads** are required to run onsite:

- Domain Controller(s)
- DNS
- DHCP
- Print Server(s)
- File Server(s)
- Other Application(s)



# Requirements

## Business & Technical

Simple & Secure

High Performance

Scalable

Highly Availability

- vSphere HA
- BC/DR

Consistent Operations

- Patching (VUM)
- Monitoring (vROps)
- Backup

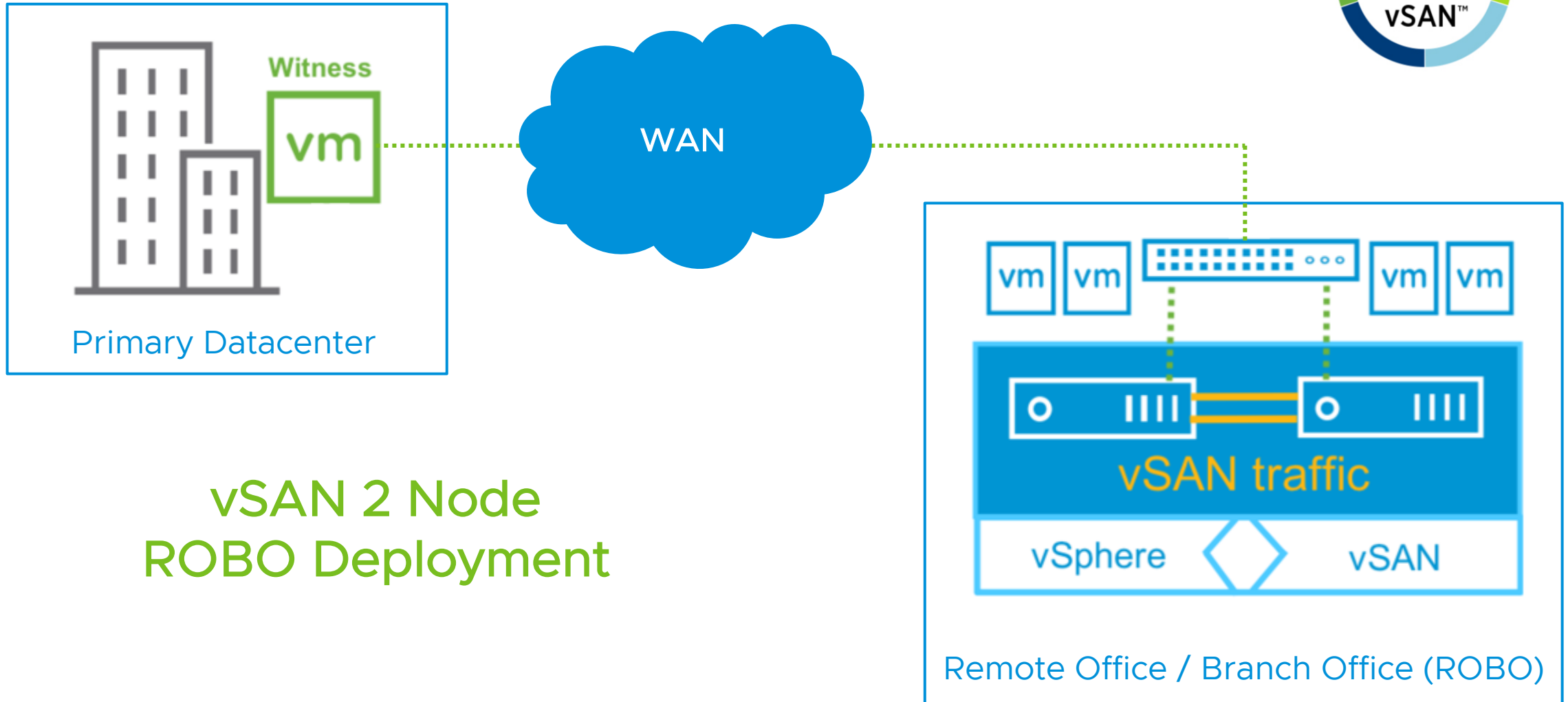
Low Cost





# Solution

## High-Level



# Solution

## Licensing

### VMware vSAN Standard for Retail and Branch Offices (VMs)

- Licenses are priced **per-virtual machine** (per-VM) and sold in **packages of 25 licenses**. A 25-pack of licenses can be shared across multiple locations—for example, five remote offices each running five virtual machines.
- Each remote office is **limited to a maximum of 25 VMs**. If more than 25 VMs are running at a remote office, vSAN Standard, Advanced, or Enterprise licensing must be used.
- It is important to note there is **no upgrade/conversion path** from vSAN for ROBO per-VM licenses to vSAN Standard, Advanced, Enterprise per-CPU licenses.

	ROBO (Standard)	Standard	Advanced	Enterprise
Capacity	Per-VM (up to 25)	CPU Based	CPU Based	CPU Based
Features	<ul style="list-style-type: none"><li>• iSCSI</li><li>• All Flash</li></ul>	<ul style="list-style-type: none"><li>• iSCSI</li><li>• All Flash</li></ul>	<ul style="list-style-type: none"><li>• iSCSI</li><li>• All Flash</li><li>• RAID5/RAID6</li><li>• Dedupe/Compression</li></ul>	<ul style="list-style-type: none"><li>• iSCSI</li><li>• All Flash</li><li>• RAID5/RAID6</li><li>• Dedupe/Compression</li><li>• Stretched Cluster</li><li>• vSAN Encryption</li></ul>

# Solution

## Hardware

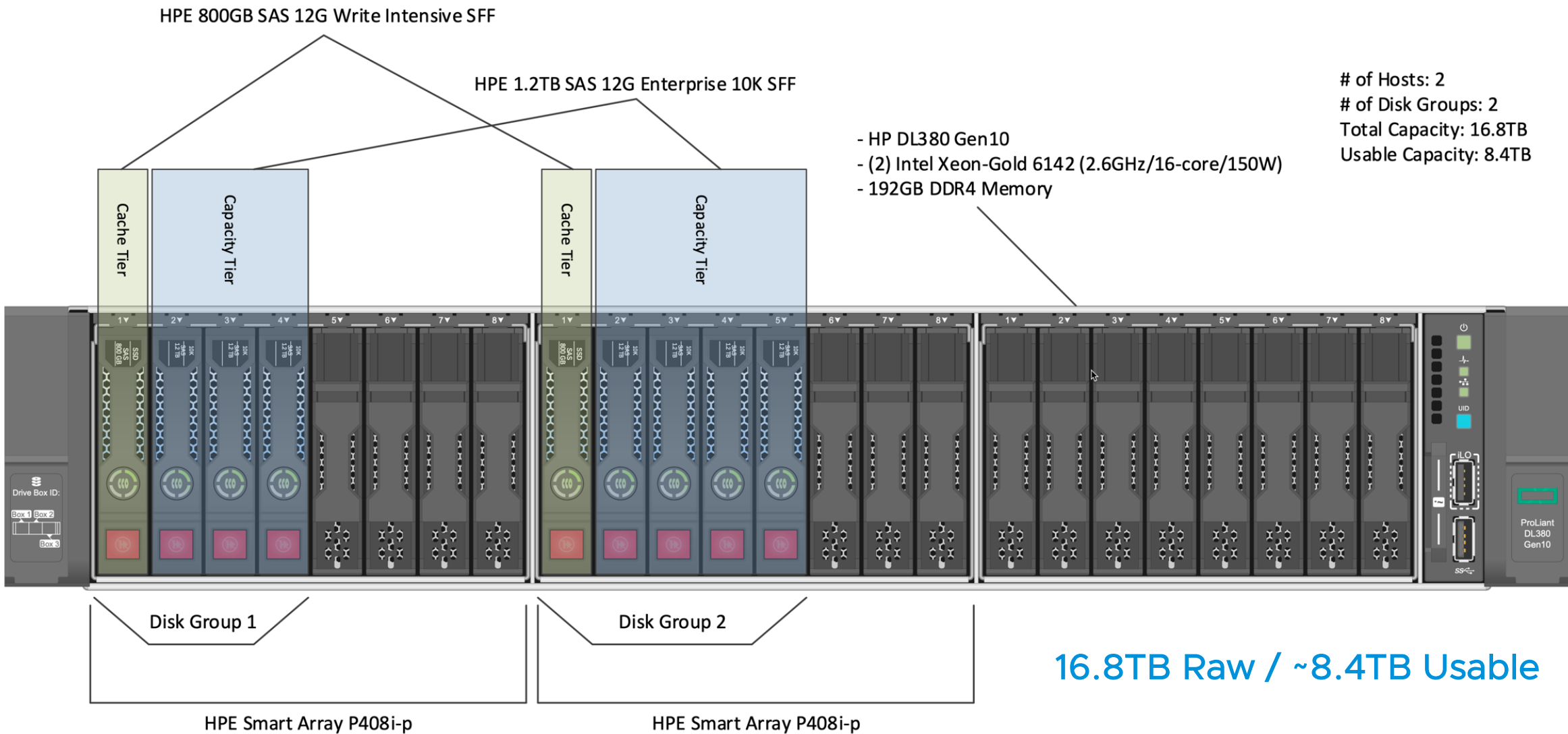
- HPE ProLiant DL380 Gen10 24SFF
- (2) Intel Xeon-Gold 6142 (2.6GHz/16-core/150W)
- 192GB (32GB x 6) DDR4-2666 Memory
- (4) 1GbE Ports
- (4) 10GbE Ports
- (2) 480GB SSD (ESXi)
- (2) 800GB SSD (Write Intensive)
- (7) 1.2TB 10K HDD



x 2

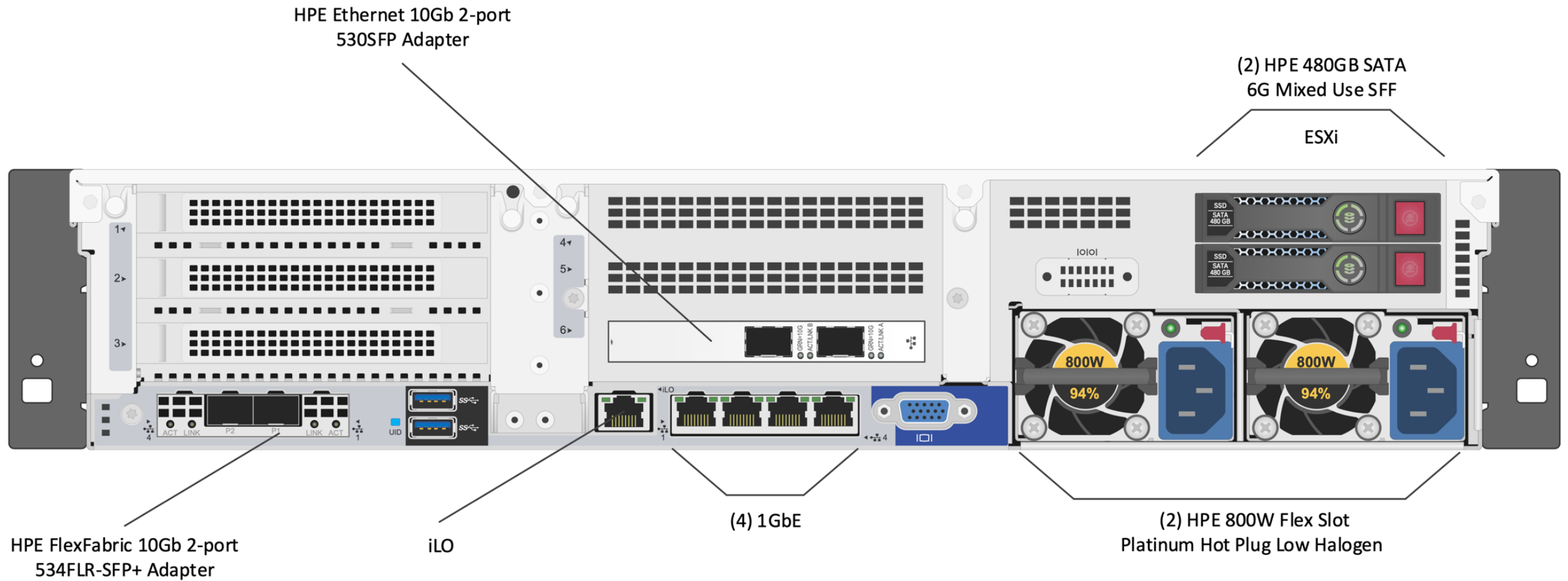
# Configuration

## ESXi Host (Front)



# Configuration

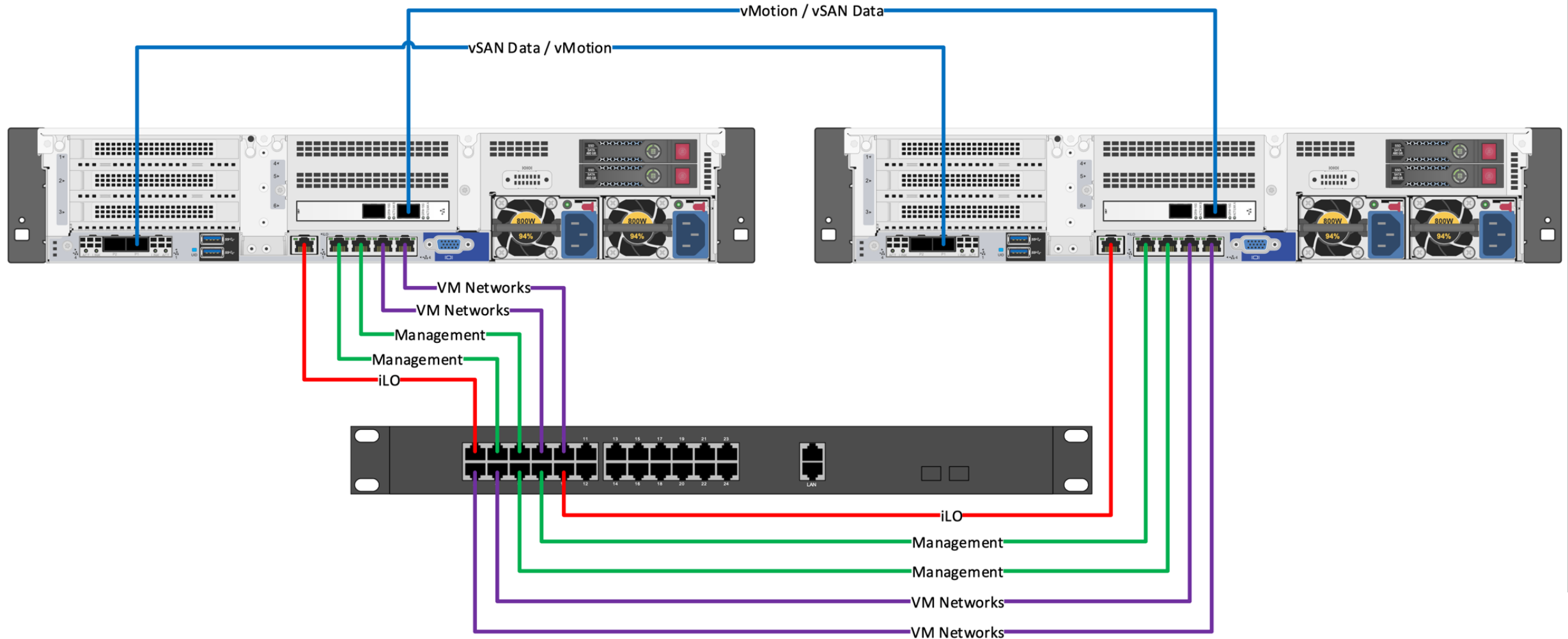
## ESXi Host (Back)





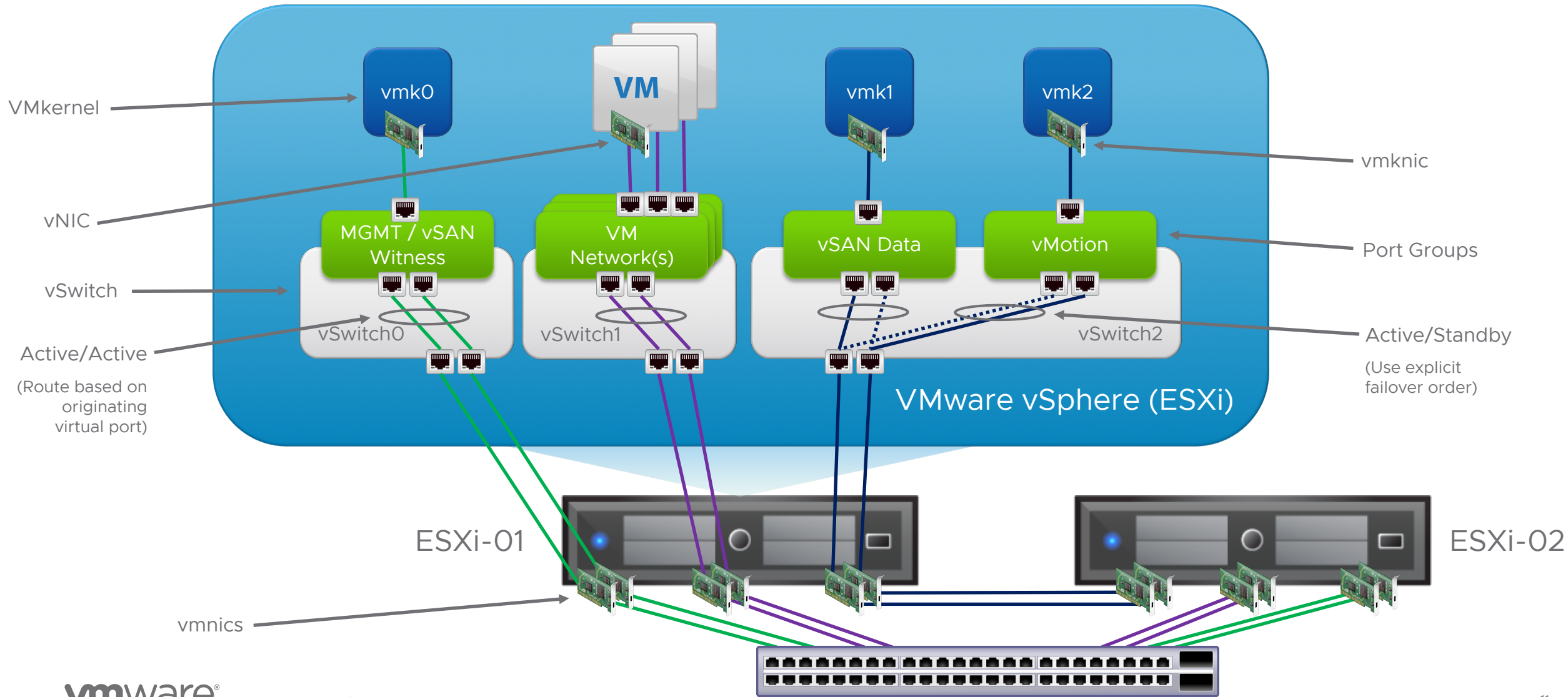
# Configuration

## Network Connectivity



# Configuration

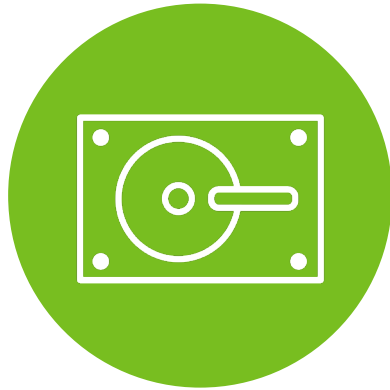
## vSphere Networking



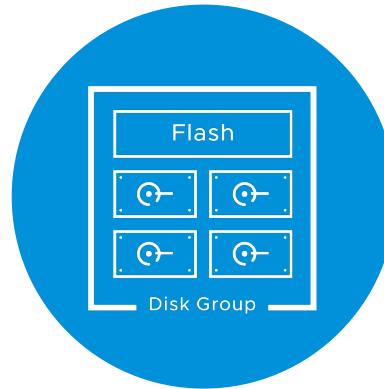
# Scalability

## Future Expansion

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### Add Disk(s)

Fill existing Disk Groups  
Add (14) Capacity  
Disks

(33.6TB Raw / ~16.8TB Usable)

### Add Disk Group

Add (1) Controller, (2)  
Cache Disks, (14)  
Capacity Disks

(50.4TB Raw / ~25.2TB Usable)

### Add Host & Switch

Add (1) Host, (1) Switch,  
(6) Cache Disks, (42)  
Capacity Disks

(75.6TB Raw / ~37.8TB Usable)

# Implementation

## Steps to Success

### Pre-vSAN Configuration

- Upgrade vCenter
- Rack/Stack at HQ
- Upgrade Firmware
- Install ESXi
- Configure Networking
- Ship to ROBO Site
- Connect Hosts to vCenter

### vSAN Configuration

- Validate Networking
- Install Witness at HQ
- Modify Witness Networking
- Specify Witness Traffic vmk
- Configure vSAN
- Create Disk Groups
- Configure Cluster
  - HA
  - DRS

### Post vSAN Configuration

- Basic Validation Testing
- Execute vSAN Test Plan
- Configure vROps
- HCI Bench Performance Testing
- vSAN Enablement Training
  - Hands-on Labs
  - TAM Knowledge Sharing
  - Paid Course(s)

# Implementation

## Basic Validation Testing

Test Description	Action/Input	Expected Results
vSAN VMkernel Network Interface	All hosts should have a separate VMkernel with vSAN traffic enabled.	All Hosts should have a separate VMkernel with vSAN traffic enabled.
Inter-Host vSAN VMkernel Network Connectivity	All hosts should have vSAN VMkernel on the same subnet/VLAN.	All host should be able to communicate with other hosts in the cluster via vSAN VMkernel interface.
vSAN Port Group Load Balancing	vSAN port group created with proper load balancing and failover policy.	All vSAN port groups should be in active/passive mode.
vMotion VMkernel Network Interface	Verify separate VMkernel for vSphere vMotion.	All hosts should have a separate VMkernel with vSphere vMotion traffic enabled.
Management VMkernel Network Interface	Verify separate VMkernel for management.	All hosts should have a separate VMkernel with management traffic enabled.
Cluster HA/DRS Settings	Verify cluster HA/DRS settings. When creating the cluster, it is important to not enable HA as it will create issues. After vSAN is enabled, HA can then be enabled.	DRS should be enabled; HA should not be enabled.
vSphere Client Connectivity	Administrators and users can access vCenter through Web client.	Login to vCenter from the Web client is successful.
Validate Active Directory, NTP, DNS	Validate VMware dependent IT Infrastructure (Active Directory, NTP, DNS).	Configuration matches environment.
Create VM	Right-click vSAN cluster and create new Virtual Machine.	VM is created successfully.
Migrate VM	Right-click VM and migrate to the other vSAN cluster host.	VM is successfully migrated.



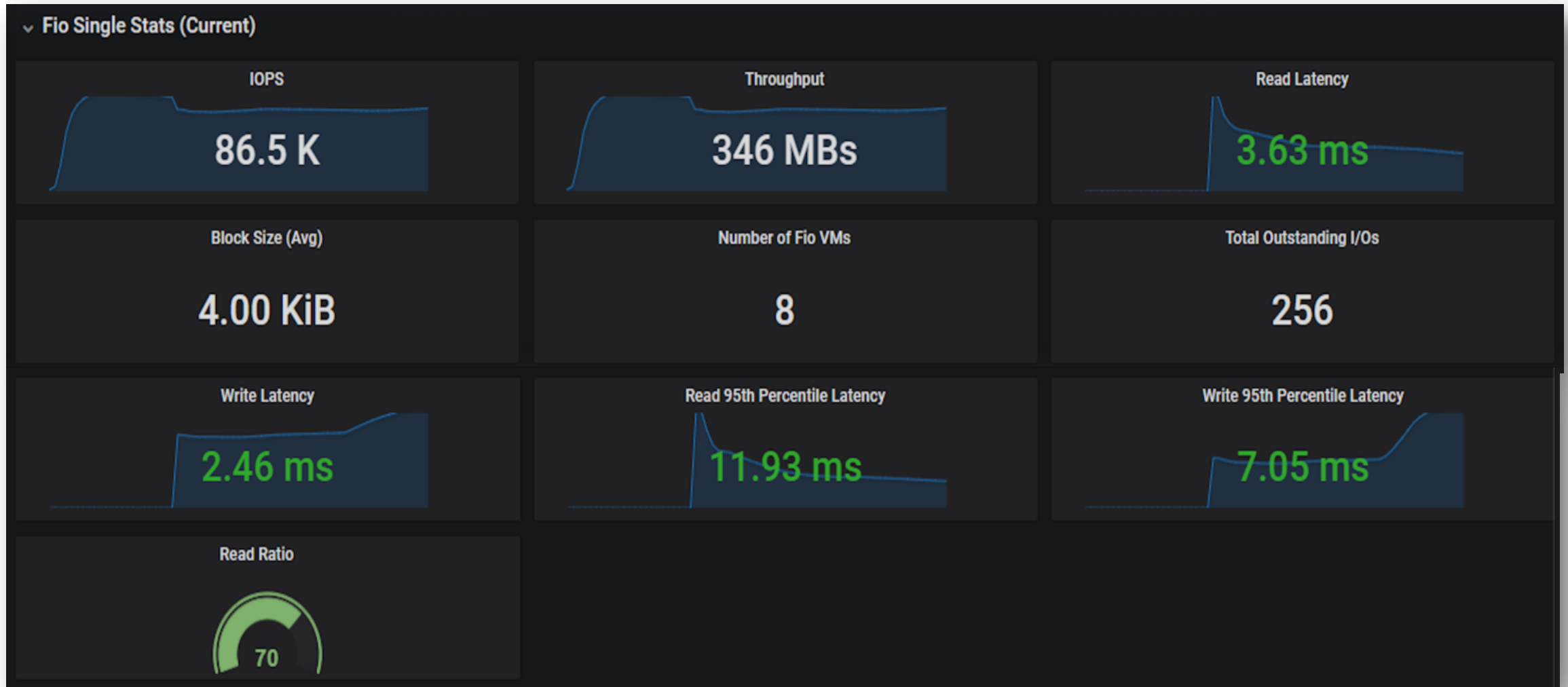
# Implementation

## vSAN Test Plan

Scenario	vSAN Behavior	Impact/Observed VMware HA Behavior
Cache disk failure	Disk Group is marked as failed and all components present on it will rebuild on another Disk Group after 60 minutes.	VM will continue running.
Capacity disk failure (Dedupe and Compression OFF)	Disk marked as failed and all components present on it will rebuild on another disk after 60 minutes.	VM will continue running.
Disk Group failure/offline	All components present on the Disk Group will rebuild on another Disk Group after 60 minutes.	VM will continue running.
RAID/HBA card failure	All Disk Groups backed by the HBA/RAID card will be marked absent and all components present will rebuild on other Disk Groups after 60 minutes.	VM will continue running.
Host failure	Component on the host will be marked as absent by vSAN.	VM will continue running if on the alternate host. If the VM was running on the same host as the failure a HA restart of the VM will take place if HA is enabled.
vSAN Witness Host loss / failed / isolated from one or both nodes	vSAN Witness Host loss counts as a site (PFTT) failure, as such the cluster will be placed in a degraded state until the witness comes back online or is redeployed.	VM will continue running.
Node failure or partition, ISL failure / connectivity loss	Host is declared lost; quorum is established between the vSAN Witness Host and the remaining node.	VMs running on the partitioned/failed node are powered off. HA will restart the VMs from the secondary fault domain/host on the preferred fault domain/host. If the preferred fault domain/host has failed, VMs will restart on the secondary fault domain/host.
Loss of both hosts	Cluster offline.	VMs stop running. HA cannot restart VMs until quorum is re-established.

# Implementation

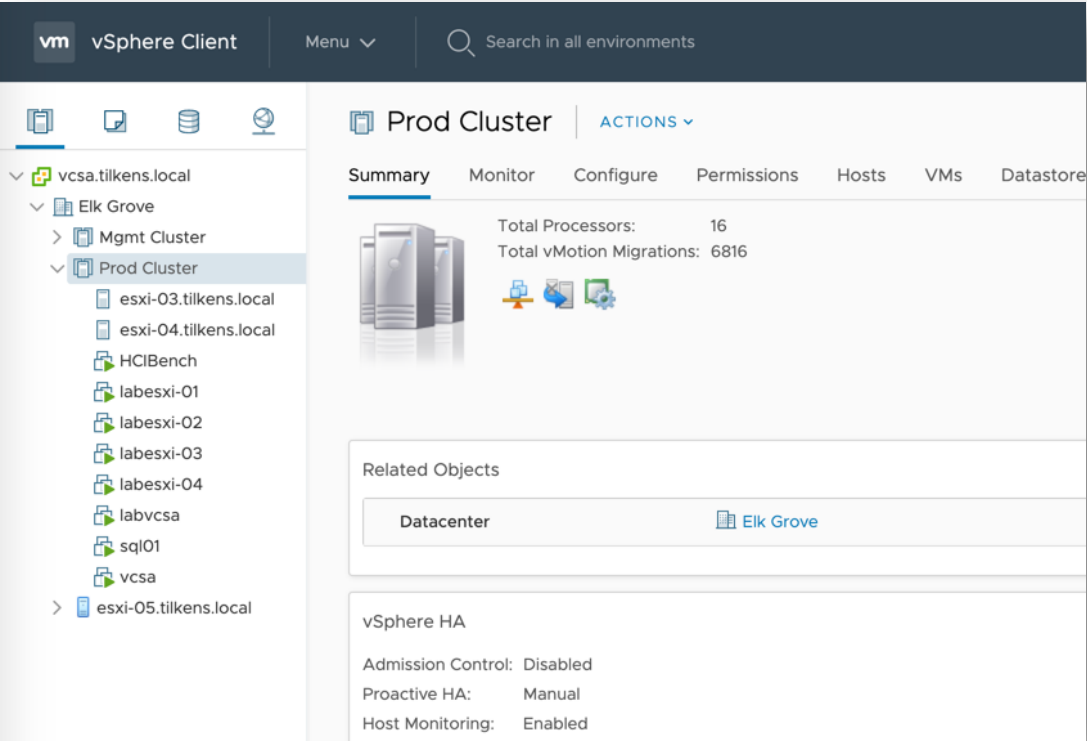
## HCIBench Performance Testing



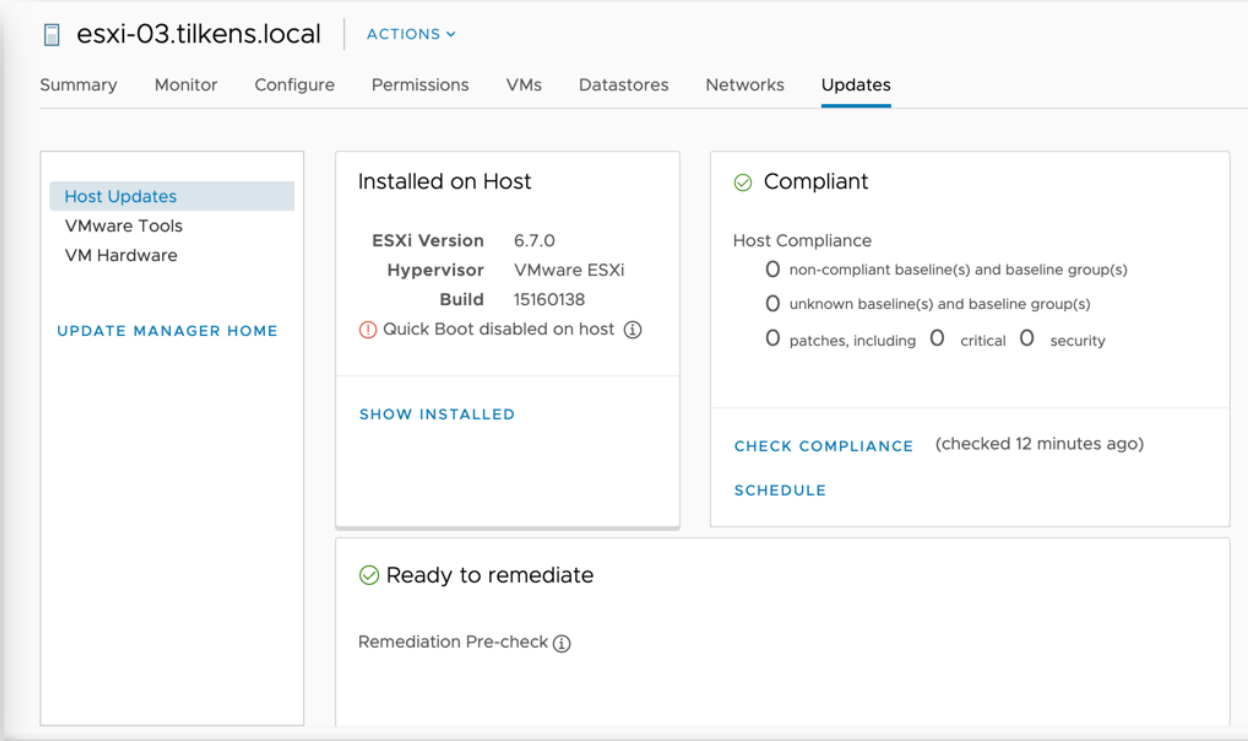
# Day 2 Operations

## Management / Patching

### vCenter



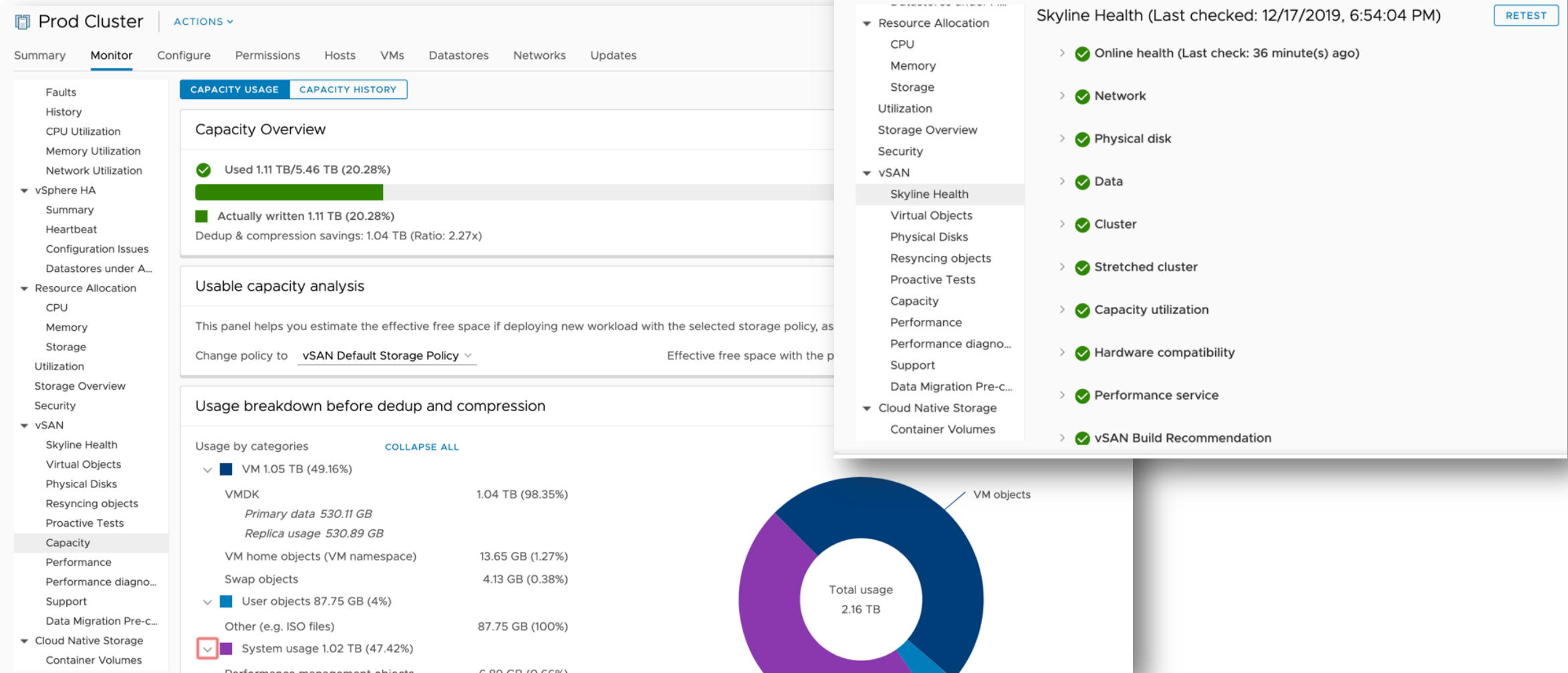
### Update Manager



Same Tools!

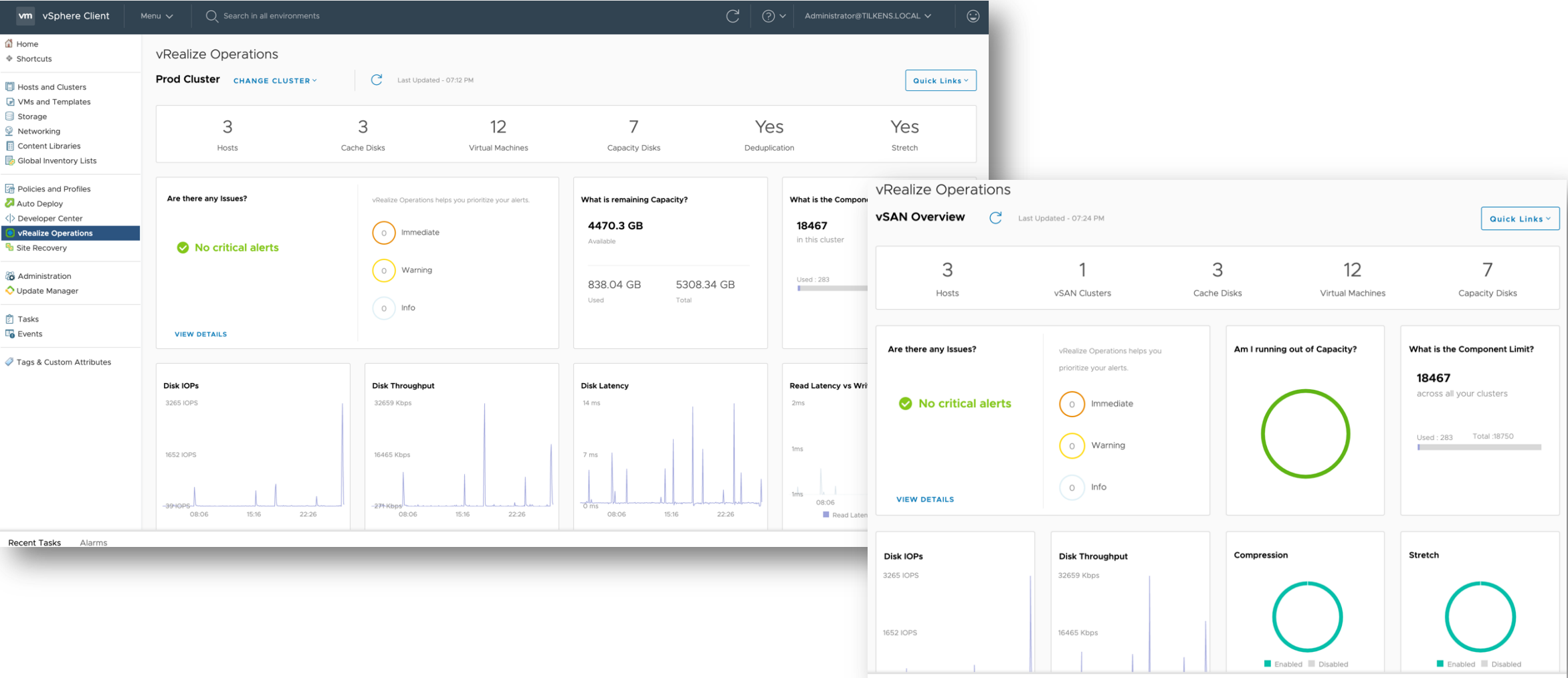
# Day 2 Operations

## Monitoring (vCenter)



# Day 2 Operations

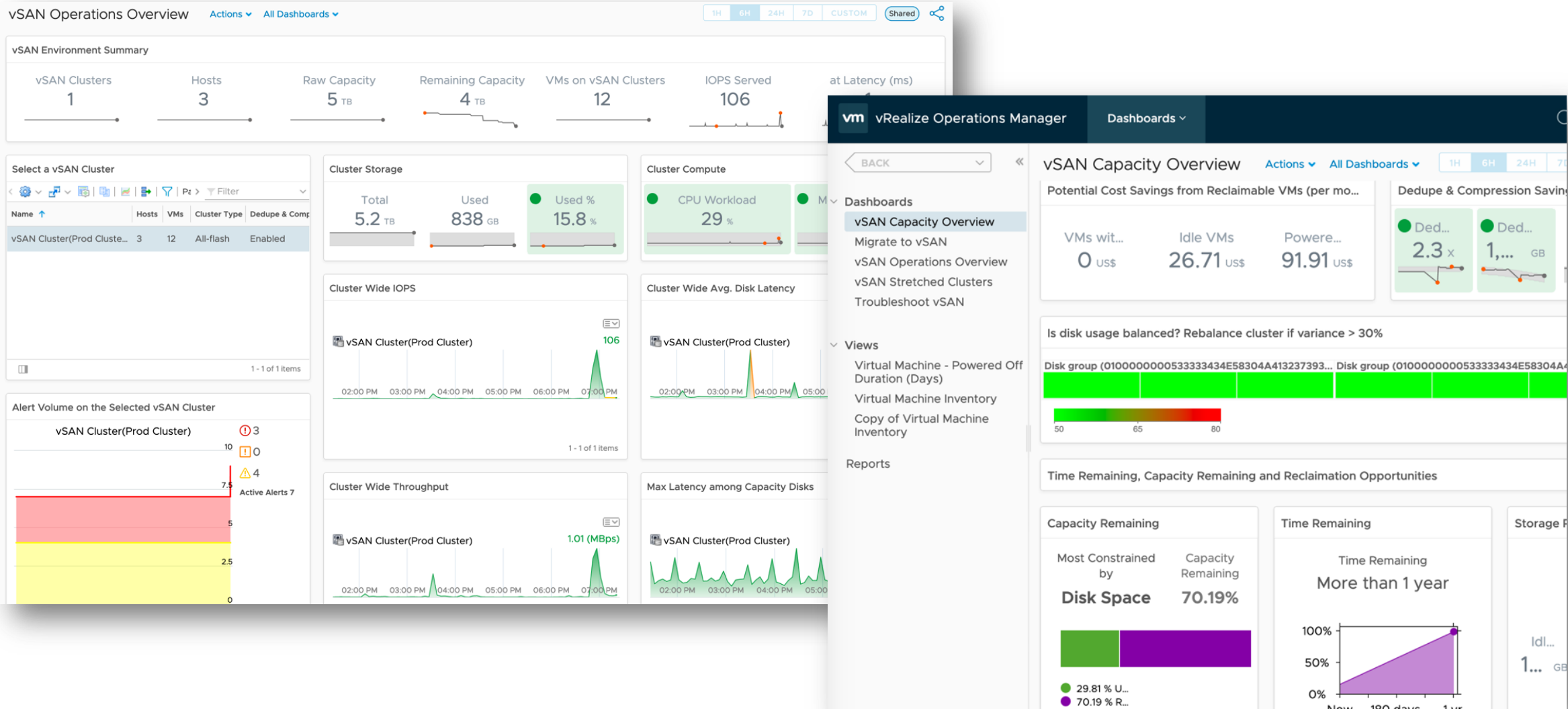
## Monitoring (vRealize Operations/vCenter Integration)





# Day 2 Operations

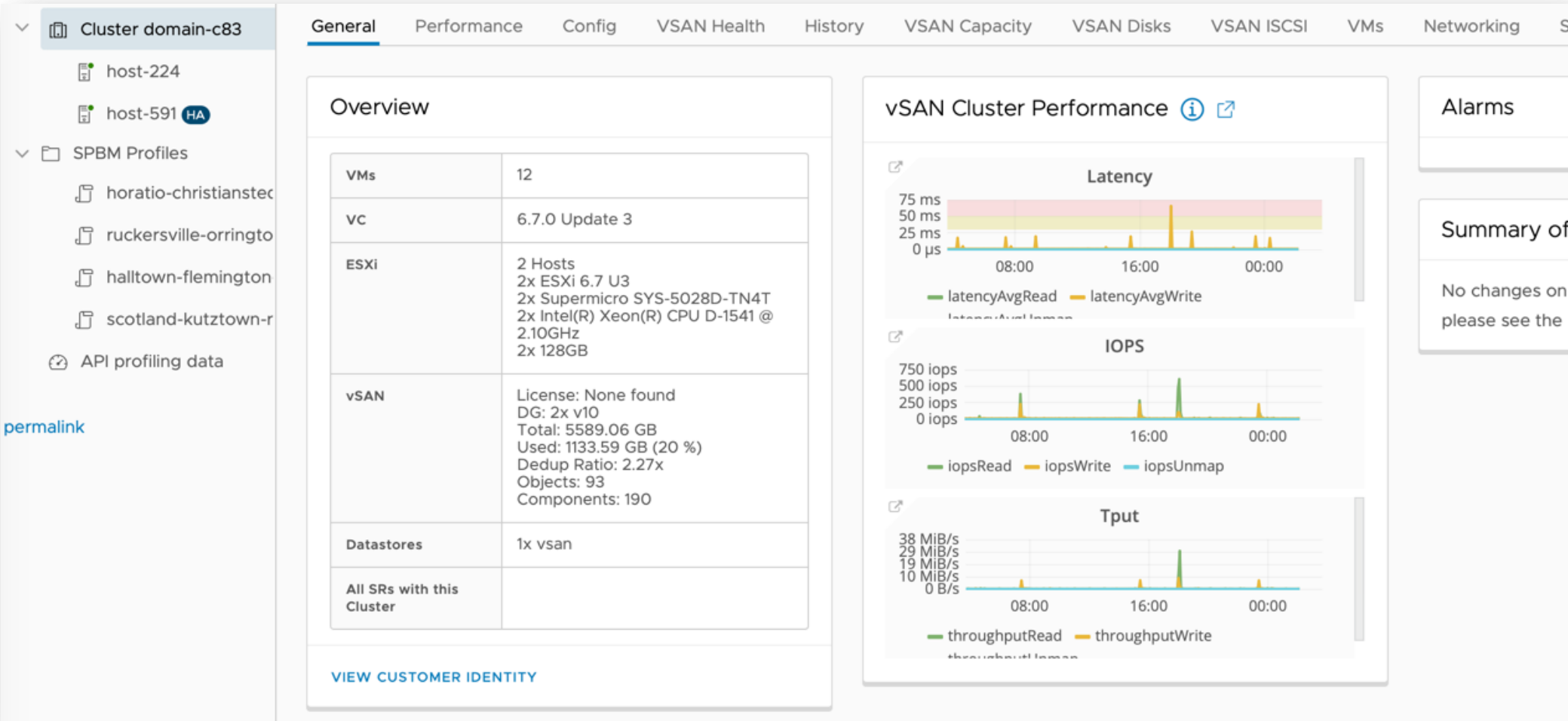
## Monitoring (vRealize Operations)



# Day 2 Operations

## Support

### vSAN Support Insight



# Business Outcomes

## Measuring Success



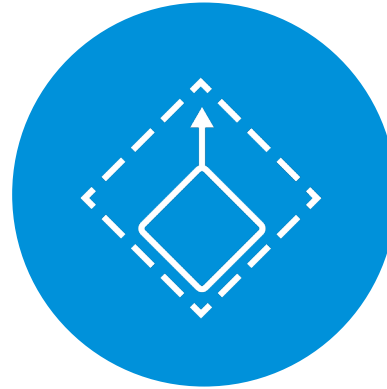
High  
Performance

Happy Customers



Highly  
Available

Less Downtime



Highly  
Scalable

Future Proof



Easy to  
Operate

Familiar Tools



Cost  
Efficient

Budget Friendly

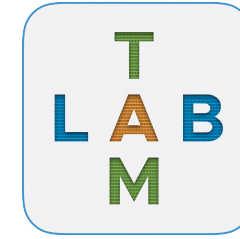
# vSAN Resources

## Helpful Links

- VMware vSAN blog - <https://blogs.vmware.com/virtualblocks/>
- vSAN ReadyNode Site - <https://vsanreadynode.vmware.com>
- vSAN 2 Node Guide - <https://storagehub.vmware.com/t/vmware-vsan/vsan-2-node-guide/>
- Solution Overview - <https://storagehub.vmware.com/t/vmware-vsan/vsan-remote-office-deployment/solution-overview-41/>
- Configure Network Interface for Witness Traffic - <https://docs.vmware.com/en/VMware-vSphere/6.7/com.vmware.vsphere.vsan-planning.doc/GUID-03204C22-C069-4A18-AD96-26E1E1155D21.html>
- Converting 2 Node vSAN to 3 Node vSAN using the vSphere 6.7 U1 Cluster Quickstart - <https://youtu.be/C3-RDxBprfc>
- VMware vSAN 6.7 U3 Licensing Guide - <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/products/vsan/vmware-vsan-67-licensing-guide.pdf>
- vSAN Support Insight - <https://storagehub.vmware.com/t/vmware-vsan/vsan-support-insight/>

# VMware TAM Lab

## Purpose/Mission



*“The purpose of TAM Lab is to provide in-depth technology workshop sessions led by VMware Technical Account Managers (TAMs) to enable a culture of learning and partnership across the VMware organization and our customers.*

- Sessions are highly technical and relatively unscripted – **NO PowerPoint!**
- All sessions are **recorded**.
- Sessions are **led by VMware Technical Account Managers (TAMs)**.
- Many sessions are made public facing via the **TAM Services Portal** & **YouTube**.



Go to YouTube – Search for “**VMware TAM Lab**”



# VMware TAM Lab

Stickers Available



Go to YouTube – Search for “**VMware TAM Lab**”



# Thank You

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