

HT Eronet Multisite Infrastructure Modernization Architecture & Migration – Use Case

29.09.2026

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Virtualization Specialist, KING ICT
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Agenda

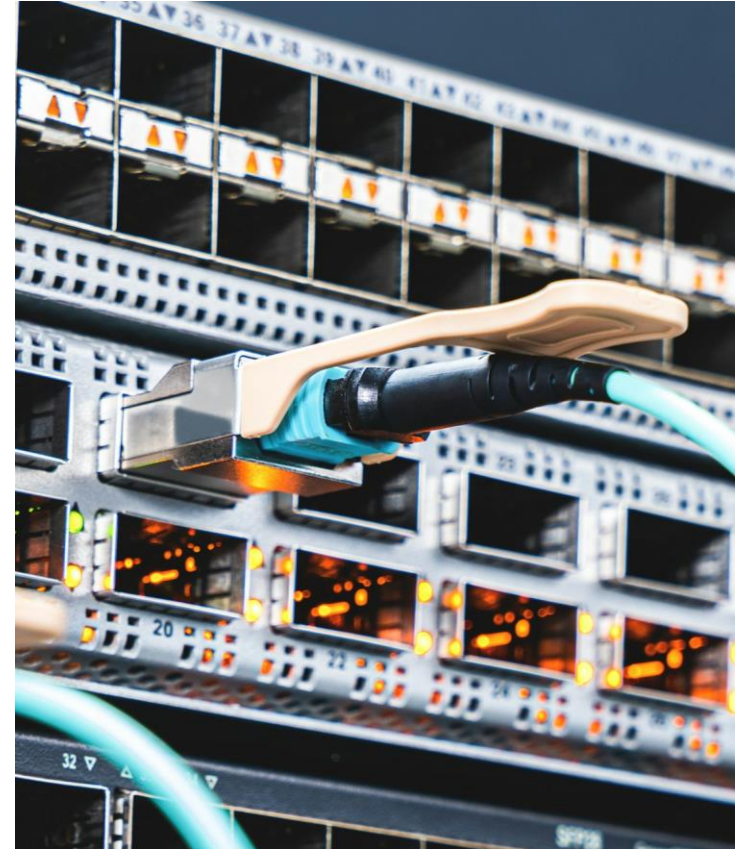
- 01** Existing Infrastructure and Modernization Objectives
- 02** Designing New Multisite Infrastructure Solution
- 03** Key Solution Components
- 04** Migration Strategy and Business Value



01 Existing Infrastructure & Modernization Objectives

Main focus

- Business and IT drivers
- Limitations of the previous two-site model
- Target qualities expected from the new platform
- How the previous model worked
- Why two locations were not enough



Why This Project, Why Now?

Telecom IT services require infrastructure that can absorb failures without becoming an incident multiplier



Modernization Objectives

Each objective maps to a concrete architecture decision

Resiliency

Reduce the impact of site-level failures

Operational simplicity

Centralize visibility and standardize lifecycle tasks

Scalability

Create a consistent foundation for future workloads

Security consistency

Apply segmentation closer to the workload

Service availability

Add application-aware traffic handling

Maintenance flexibility

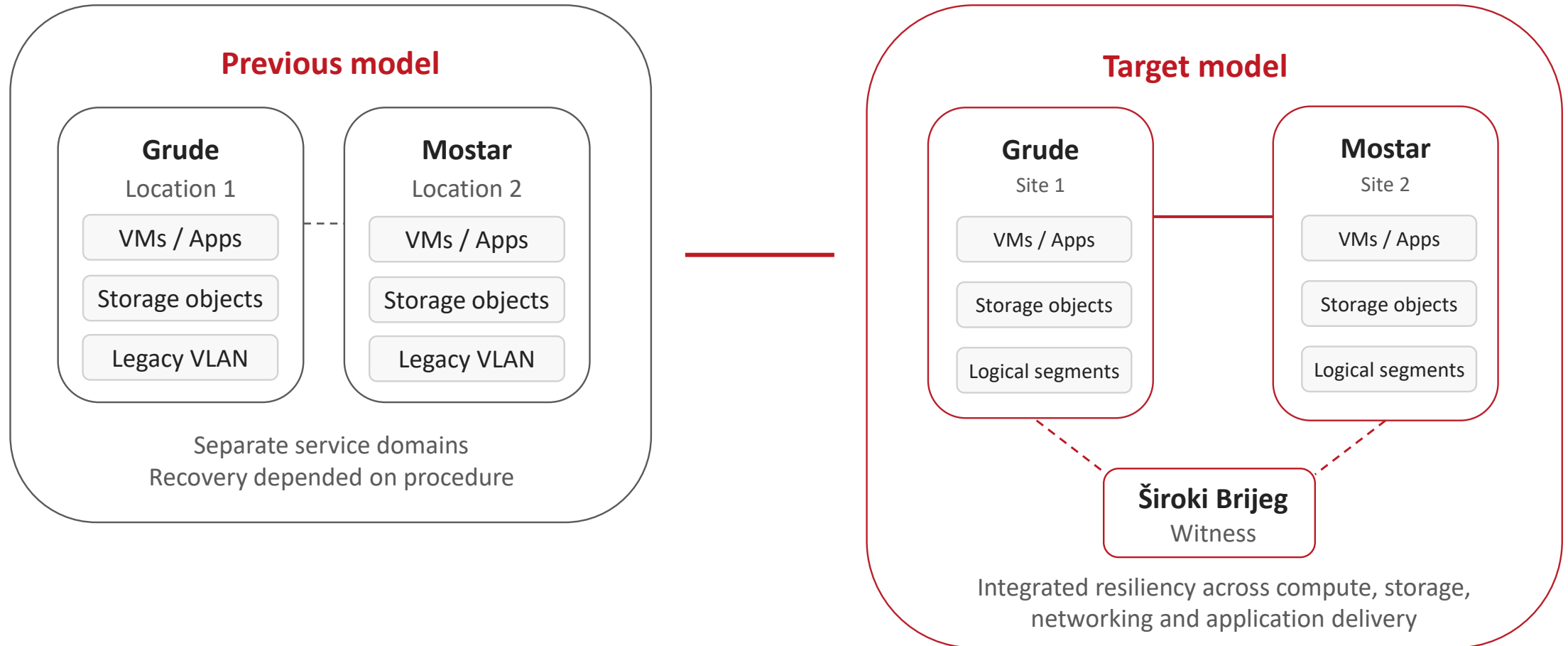
Support planned work with lower service impact

The project success criteria are architectural qualities, not isolated product features.



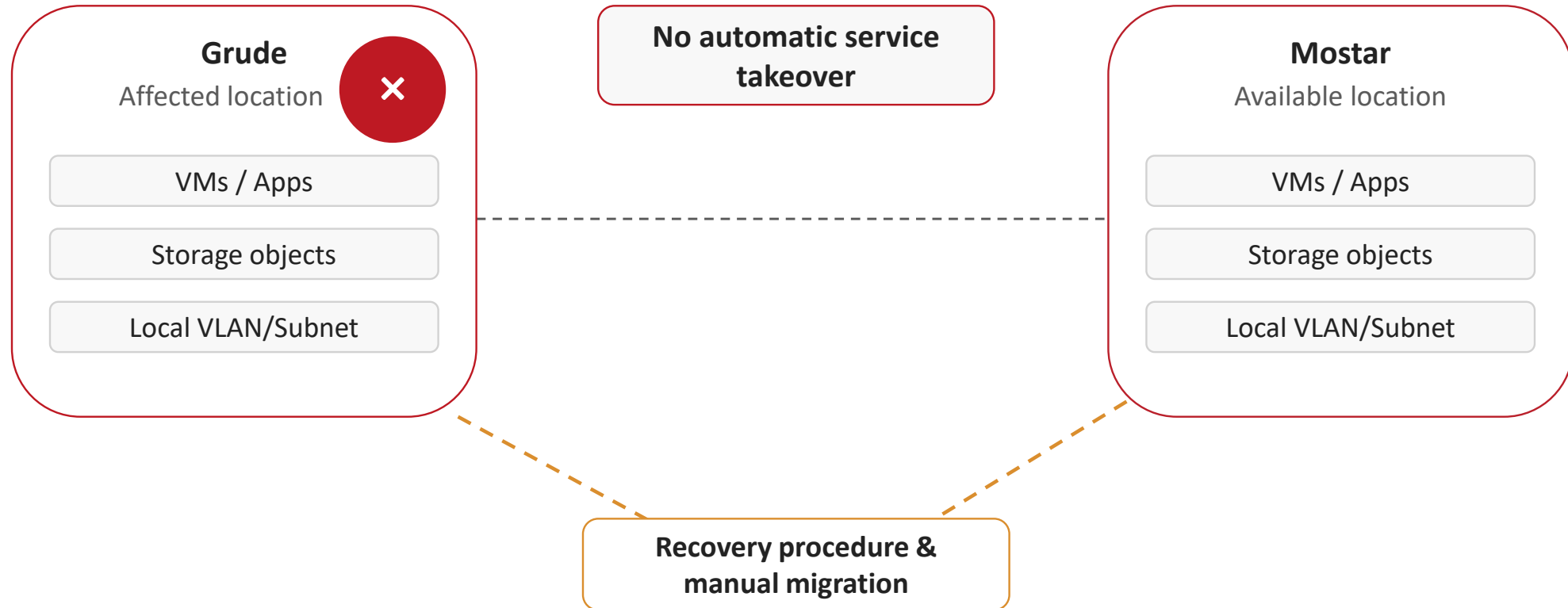
From Two Sites to One Resilient Platform

The architectural objective is not more infrastructure, but a single service foundation across locations



Existing Failure Scenario: Primary Site Unavailable

Workloads located in the affected site were not automatically served from the other location



The infrastructure provided physical separation, but the recovery behavior depended on operational execution.



Two Locations Did Not Mean Site Resilience

A second location is useful, but it is not a failover architecture by itself

What existed

- Two physical locations
- Separate workloads
- Connectivity between sites
- Local operational control

What was missing

- Automatic site-level recovery
- Storage quorum across sites
- Consistent logical networking
- Application traffic steering

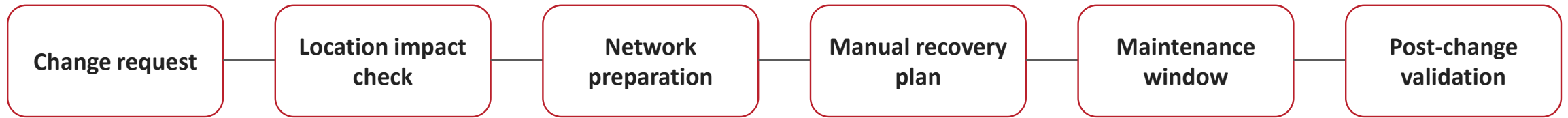
Resulting risk

A site incident could still directly become a service outage until recovery actions were performed.



Previous Model Impact on Service Lifecycle

Manual dependencies slowed changes and increased maintenance risk



Service lifecycle was strongly tied to infrastructure location and manual coordination.



What Success Looks Like

A modernized platform is measured by predictable behavior under stress

Operational behavior

Normal operation

Planned maintenance

Site-level incident

Expected platform qualities

- Clear fault domains and quorum decisions
- Centralized management of virtual infrastructure
- Consistent logical networking across locations
- Application-aware traffic distribution and health monitoring
- Controlled migration and validation workflow



02

Designing New Multisite Infrastructure Solution

Main focus

Target topology with Grude, Mostar and Široki Brijeg

Layered architecture across compute, storage, networking and application delivery

Resiliency model with explicit failure domains



Architecture Design Principles

The design separates responsibilities across infrastructure layers

No single site as the service owner — Workloads must not be logically tied to one site only

Quorum-based failure decisions — Avoid ambiguous states during partition or site failure

Logical networking over physical constraints — Provide consistent connectivity independent of host location

Application-aware delivery — Direct traffic to healthy service endpoints



Infrastructure Layers of the New Platform

Site resiliency is achieved by combining multiple infrastructure layers

Centralized VM management

vCenter provides inventory, operations and lifecycle visibility

Compute

vSphere hosts provide workload execution across production sites

Storage

vSAN stretched cluster aligns data placement with site fault domains

Network virtualization

NSX provides logical segments, routing and security model

Application delivery

Avi provides virtual services, health monitoring and load distribution



Target Multisite Architecture Overview

Grude and Mostar form the production sites; Široki Brijeg provides witness/quorum function



Witness participates in availability decisions; it is not a production site.



03

Key Solution Components

Main focus

vCenter for centralized VM operations

vSAN for stretched storage and witness/quorum

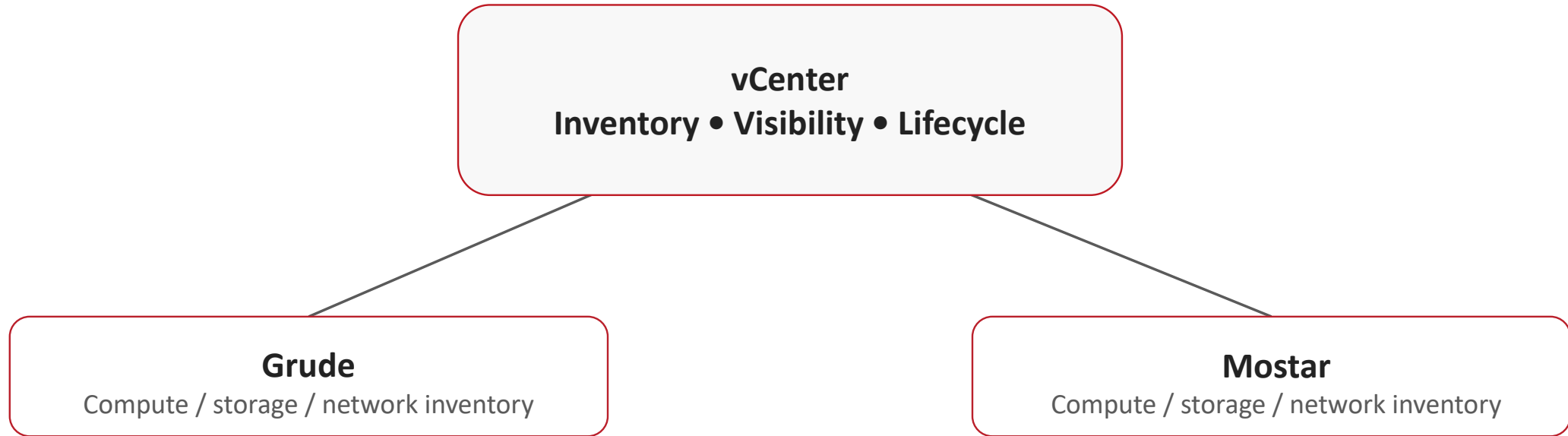
NSX for logical networking and security

Avi for application delivery and health-aware traffic handling



vCenter – Centralized Infrastructure Management

A single operational control point reduces fragmentation across sites

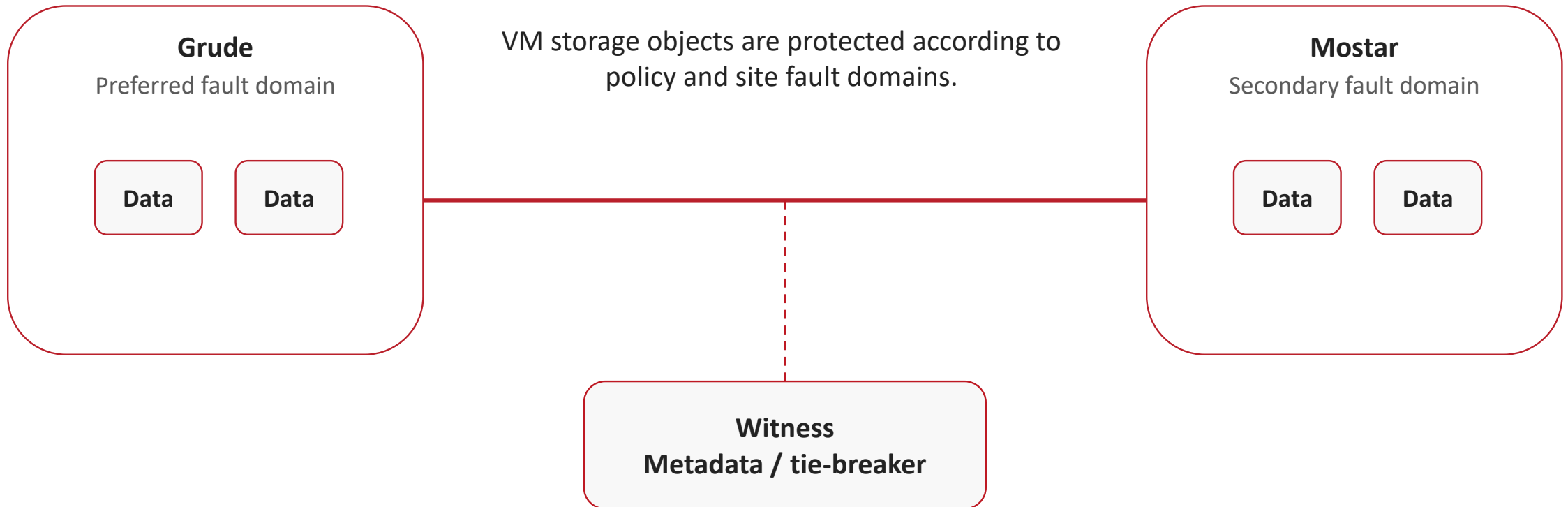


- Standardized operations view across locations
- Common entry point for cluster health, alarms, inventory and lifecycle workflows



vSAN Stretched Cluster Concept

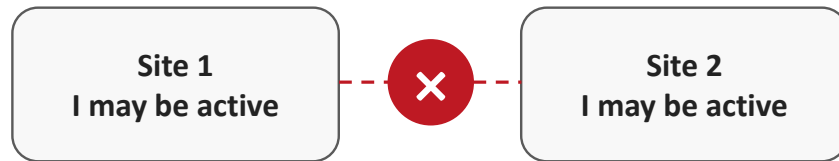
Data placement is aligned with site fault domains and witness metadata



The Witness Enables an Unambiguous Failure Decision

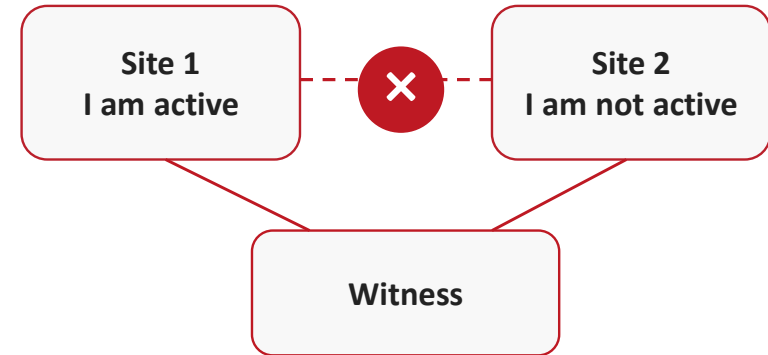
Witness provides a third vote so the platform can avoid split-brain behavior

Without a third decision point



Ambiguous during partition

With witness/quorum



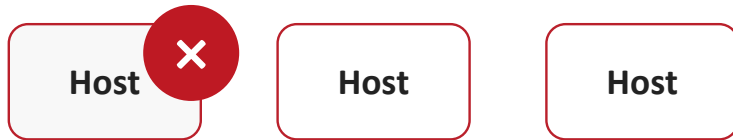
One side retains quorum; the other is fenced from ownership



vSAN Failure Scenarios: Host vs Site

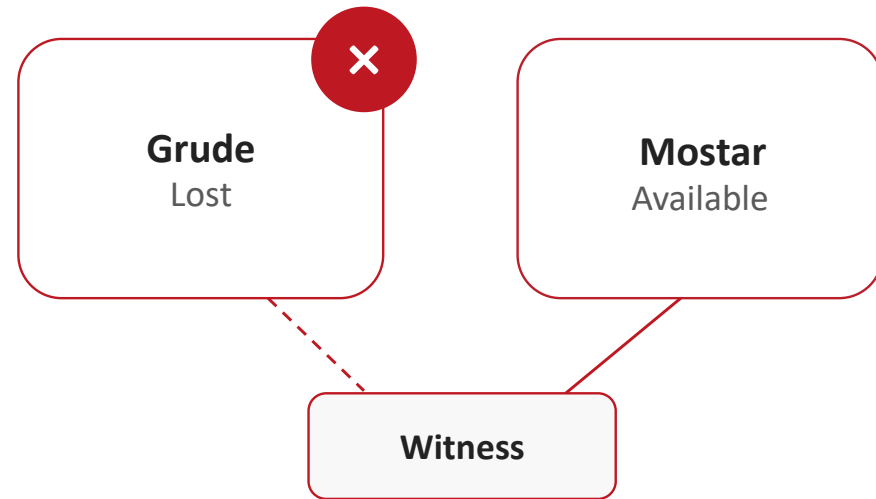
Different failures trigger different infrastructure behaviors

Single host failure



The cluster can keep services running if placement, capacity and policy requirements are satisfied.

Site failure



The surviving site and witness allow a clear ownership decision for protected objects.

📁

📁

📁

📁

▼

sddcvc.10.10.10.10

▼

📁 Eronet

▼

📁 Cluster01

📁 gresxi01.10.10.10.10

📁 gresxi02.10.10.10.10

📁 gresxi03.10.10.10.10

📁 gresxi04.10.10.10.10

📁 moesxi01.10.10.10.10

📁 moesxi02.10.10.10.10

📁 moesxi03.10.10.10.10

📁 moesxi04.10.10.10.10

➤ ⌚ Avi Load Balancer

➤ ⌚ Backup

➤ ⌚ CSC

➤ ⌚ Documentum

➤ ⌚ ESX Agents

➤ ⌚ GIS

➤ ⌚ Haloo

➤ ⌚ IN

➤ ⌚ neaktivno

➤ ⌚ Obracun

➤ ⌚ OpenShift

➤ ⌚ PKI

➤ ⌚ Privileged Access Manager

➤ ⌚ Razno

➤ ⌚ Servicedesk

➤ ⌚ SIEM

➤ ⌚ Sigurnost

➤ ⌚ SPS

➤ ⌚ SQL

Cluster01

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VMs

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Updates

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General

Key Provider

VMware EVC

VM/Host Groups

VM/Host Rules

VM Overrides

I/O Filters

Host Options

Host Profile

Licensing

vSAN Cluster

Trust Authority

Alarm Definitions

Scheduled Tasks

vSphere Cluster Services

General

Datastores

vSAN

Services

Disk Management

Fault Domains

Datastore Management

Desired State

Image

Configuration

Disk Management

CLUSTER >

📁 9 hosts

📁 49 claimed disks

VIEW CLUSTER OBJECTS

CLAIM UNUSED DISKS (0)

CHANGE DISK CLAIM MODE

VIEW DISKS

VIEW HOST OBJECTS

GO TO PRE-CHECK

	Host name	Health	Disks in use	State	Capacity	Fault domain	Network partition group
🔍	📁 gresxi01.10.10.10.10	🟢 Healthy	6/6	Connected		Grude	Group 1
🔍	📁 gresxi02.10.10.10.10	🟢 Healthy	6/6	Connected		Grude	Group 1
🔍	📁 gresxi03.10.10.10.10	🟢 Healthy	6/6	Connected		Grude	Group 1
🔍	📁 gresxi04.10.10.10.10	🟢 Healthy	6/6	Connected		Grude	Group 1
🔍	📁 moesxi01.10.10.10.10	🟢 Healthy	6/6	Connected		Mostar	Group 1
🔍	📁 moesxi02.10.10.10.10	🟢 Healthy	6/6	Connected		Mostar	Group 1
🔍	📁 moesxi03.10.10.10.10	🟢 Healthy	6/6	Connected		Mostar	Group 1
🔍	📁 moesxi04.10.10.10.10	🟢 Healthy	6/6	Connected		Mostar	Group 1
🔍	📁 sbwitness.10.10.10.10 (External witness host for vSAN Stretched Cluster)	🟢 Healthy	1/1	Connected			Group 1

Show Or Hide Columns

📄

9 items



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📁

📁

📁

📁 sddcvc123456789

📁 Eronet

📁 Cluster01

📁 gresxi01

📁 gresxi02

📁 gresxi03

📁 gresxi04

📁 moesxi01

📁 moesxi02

📁 moesxi03

📁 moesxi04

📁 Avi Load Balancer

📁 Backup

📁 CSC

📁 Documentum

📁 ESX Agents

📁 GIS

📁 Haloo

📁 IN

📁 neaktivno

📁 Obracun

📁 OpenShift

📁 PKI

📁 Privileged Access Manager

📁 Razno

📁 Servicedesk

📁 SIEM

📁 Sigurnost

📁 SPS

📁 SQL

Cluster01

ACTIONS

SummaryMonitorConfigurePermissionsHostsVMsDatastoresNetworksUpdates

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Services

Disk Management

Fault Domains

Datastore Management

Desired State

Image

Configuration

Fault Domains

Fault domain failures to tolerate	1		
Configuration type	Stretched cluster	DISABLE STRETCHED CLUSTER	
Witness host	sbwitness.intra.eronet.ba		CHANGE WITNESS HOST

Grude (preferred)

Used capacity 49%

gresxi04

54%

gresxi01

44%

gresxi03

55%

gresxi02

45%

Mostar

Used capacity 46%

moesxi04

32%

moesxi01

51%

moesxi03

48%

moesxi02

53%

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sddcvc1234567890

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Eronet

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Cluster01

📁 gresxi011234567890

📁 gresxi021234567890

📁 gresxi031234567890

📁 gresxi041234567890

📁 moesxi011234567890

📁 moesxi021234567890

📁 moesxi031234567890

📁 moesxi041234567890

➤ 🔄 Avi Load Balancer

➤ 🔄 Backup

➤ 🔄 CSC

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➤ 🔄 SPS

➤ 🔄 SQL

Cluster01

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vmware score

CPU Utilization

Memory Utilization

Network Utilization

vsphere HA

Summary

Heartbeat

Configuration Issues

Datastores under APD or...

Resource Allocation

CPU

Memory

Persistent Memory

Storage

Utilization

Storage Overview

Security

vsphere Cluster Services

Health

vsan

Skyline Health

Virtual Objects

Resyncing Objects

Proactive Tests

Capacity

Performance

Support

Skyline Health

OVERVIEW

Last checked: Sep 16, 2026, 1:20:15 PM

RETEST

Cluster health score ⓘ

60

80

100

0

Unhealthy

Healthy

Health score trend

24 H

CUSTOM

09/08/2026, 1:31 PM ~ 09/09/2026, 1:31 PM

100

9/08, 14:03

9/08, 18:00

9/08, 21:00

9/09, 00:00

9/09, 03:00

9/09, 06:00

9/09, 09:00

9/09, 12:51

VIEW DETAILS

Health findings

UNHEALTHY (0)

INFO (2)

SILENCED (1)

ALL (68)

Sort by ⓘ

Root cause ▼

🔍

There are no unhealthy health findings in this cluster.

📁

Cluster01

📁

Cluster01

gresxi01.1234567890

gresxi02.1234567890

gresxi03.1234567890

gresxi04.1234567890

moesxi01.1234567890

moesxi02.1234567890

moesxi03.1234567890

moesxi04.1234567890

⌵

Avi Load Balancer

⌵

Backup

⌵

CSC

⌵

Documentum

⌵

ESX Agents

⌵

GIS

⌵

Haloo

⌵

IN

⌵

neaktivno

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Obracun

⌵

OpenShift

⌵

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SPS

⌵

SQL

Cluster01

ACTIONS

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Virtual Objects

Browse all virtual objects and check their state in real time and view their placement across the physical infrastructure. Get information about each object state and common remediation.

About vSAN Object Health

VIEW PLACEMENT DETAILS

VIEW PERFORMANCE

CLEAR FILTERS

	☐	Name	Type	Object State	Storage Policy
>	☐	GISportal-test	VM	Healthy	ESA-R5 Stretched
>	☐	GISportal2	VM	Healthy	ESA-R5 Stretched
>	☐	GISserver	VM	Healthy	ESA-R5 Stretched
>	☐	GISserver-test	VM	Healthy	ESA-R5 Stretched
>	☐	GISworkforce-dev	VM	Healthy	ESA-R5 Stretched
>	☐	GISworkforce-test	VM	Healthy	ESA-R5 Stretched
>	☐	gitlab	VM	Healthy	ESA-R5 Stretched
>	☐	gitlab-runner01	VM	Healthy	ESA-R5 Stretched
>	☐	GrElasticSearch	VM	Healthy	ESA-R5 Stretched
>	☐	GrFSQ2	VM	Healthy	ESA-R5 Stretched
>	☐	GrNPS1	VM	Healthy	ESA-R5 Stretched
>	☐	GrNPS2	VM	Healthy	ESA-R1 Stretched
>	☐	GrSQLent	VM	Healthy	ESA-R5 Stretched
>	☐	GrudeCA	VM	Healthy	ESA-R5 Stretched

Show Or Hide Columns

76 - 100 of 216 items

4 / 9

Virtual Objects

CPU Utilization

Memory Utilization

Network Utilization

vsphere HA

Summary

Heartbeat

Configuration Issues

Datstores under APD or...

Resource Allocation

CPU

Memory

Persistent Memory

Storage

Utilization

Storage Overview

Security

vsphere Cluster Services

Health

vsAN

Skyline Health

Virtual Objects

Resyncing Objects

Proactive Tests

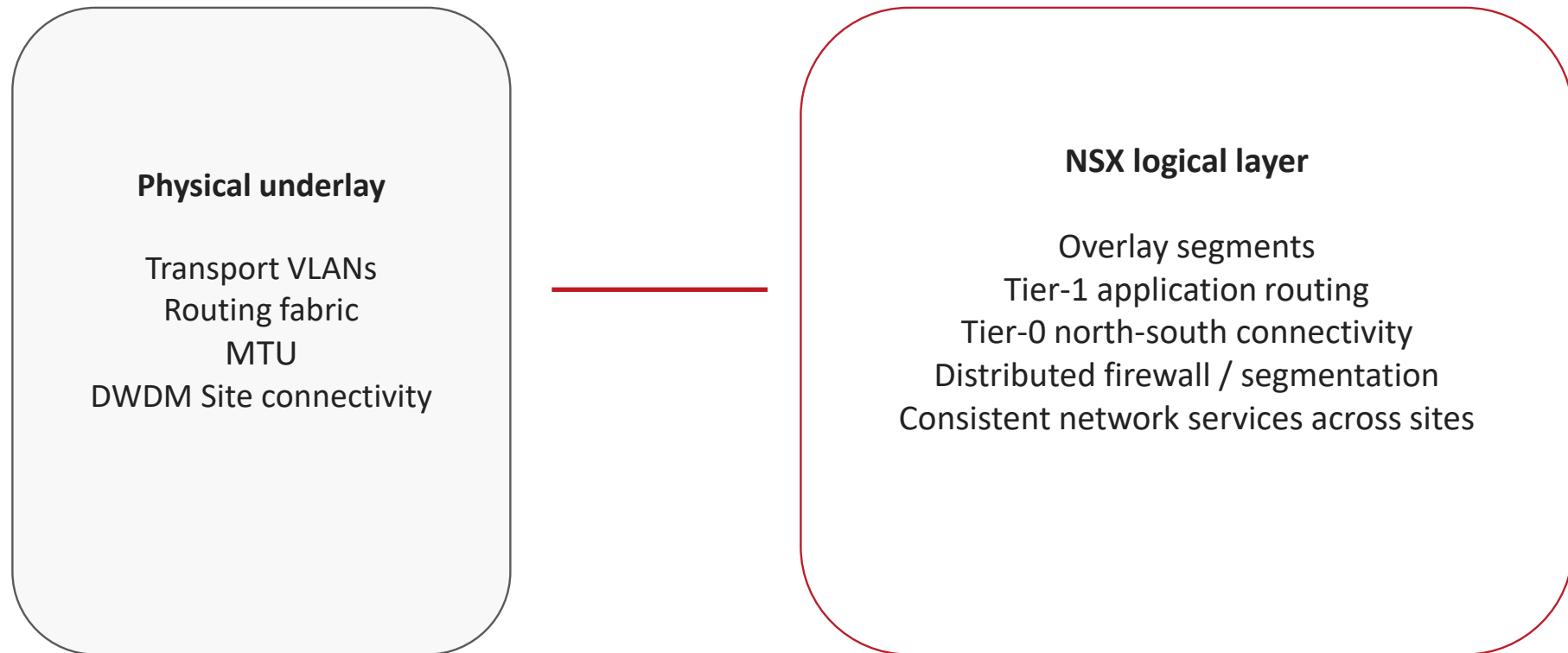
Capacity

Performance

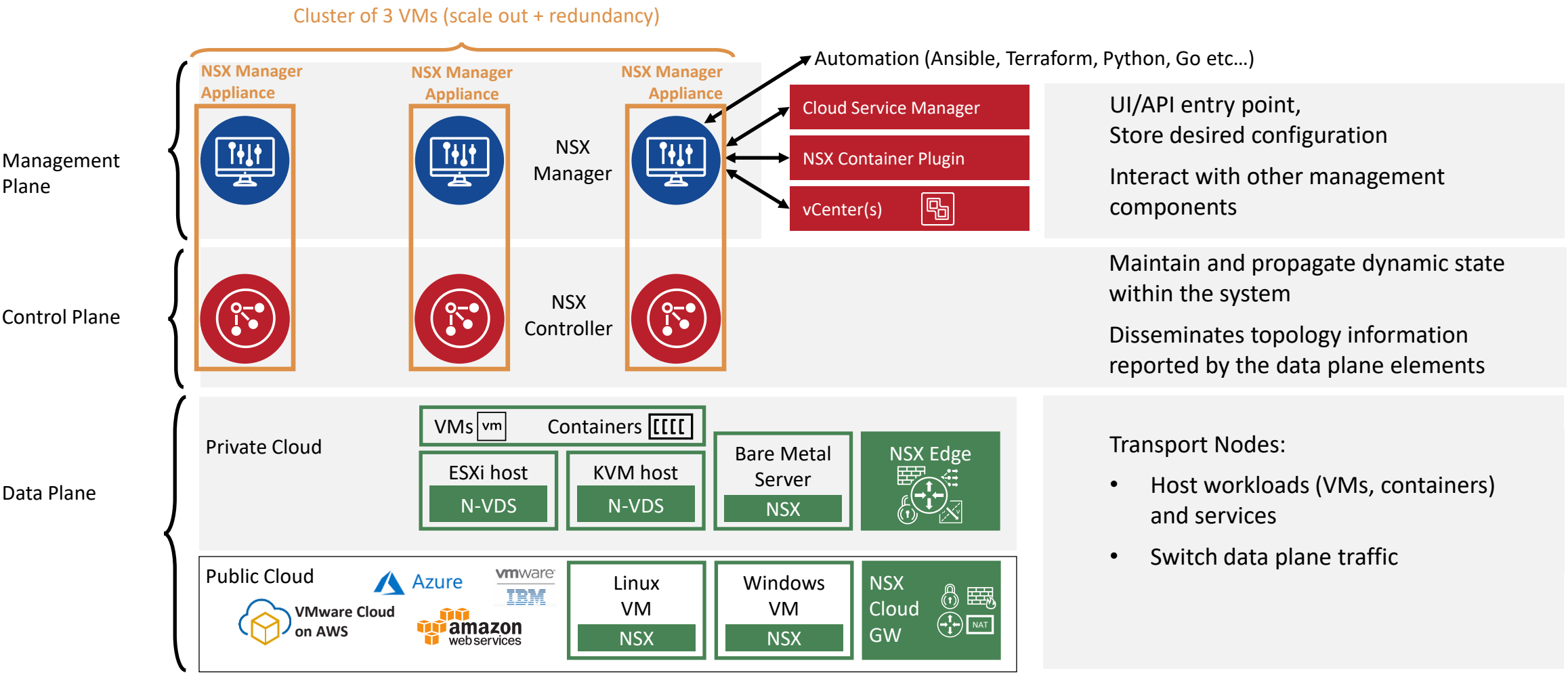
Support

NSX – Network Virtualization Layer

Logical networks are no longer tied one-to-one to the physical network layout

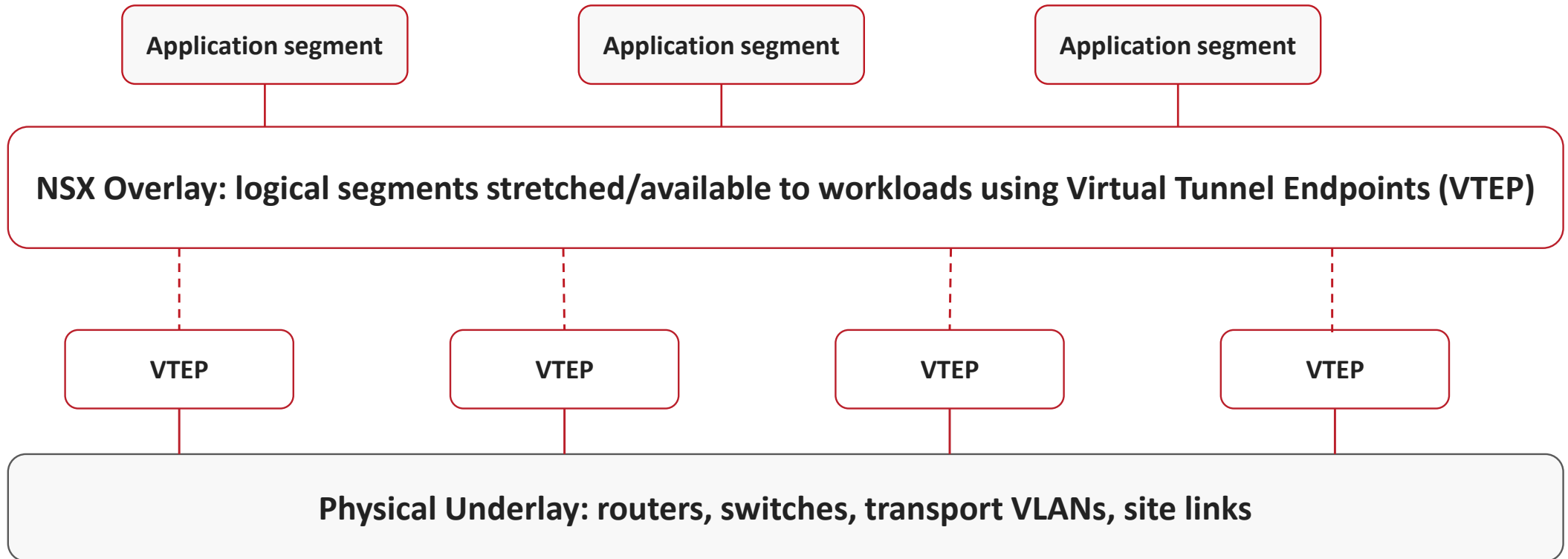


NSX High-Level Architecture



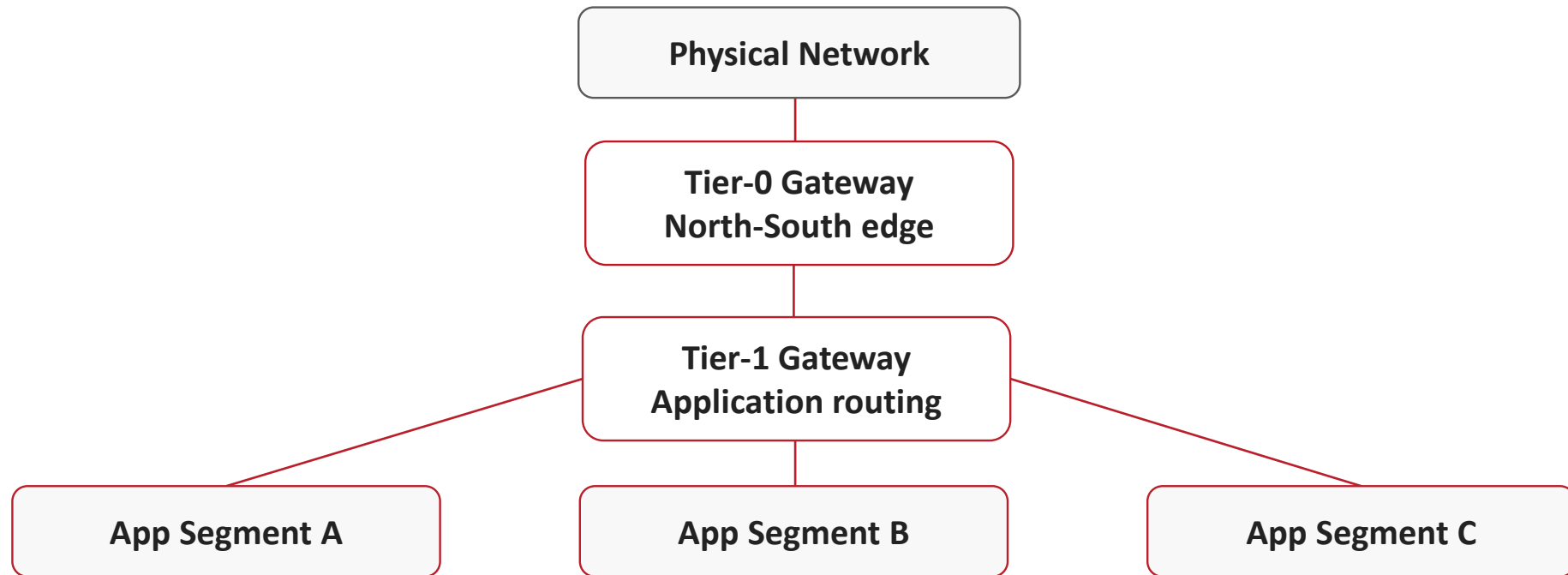
Underlay vs Overlay

The underlay provides reachability; the overlay provides workload-oriented networking



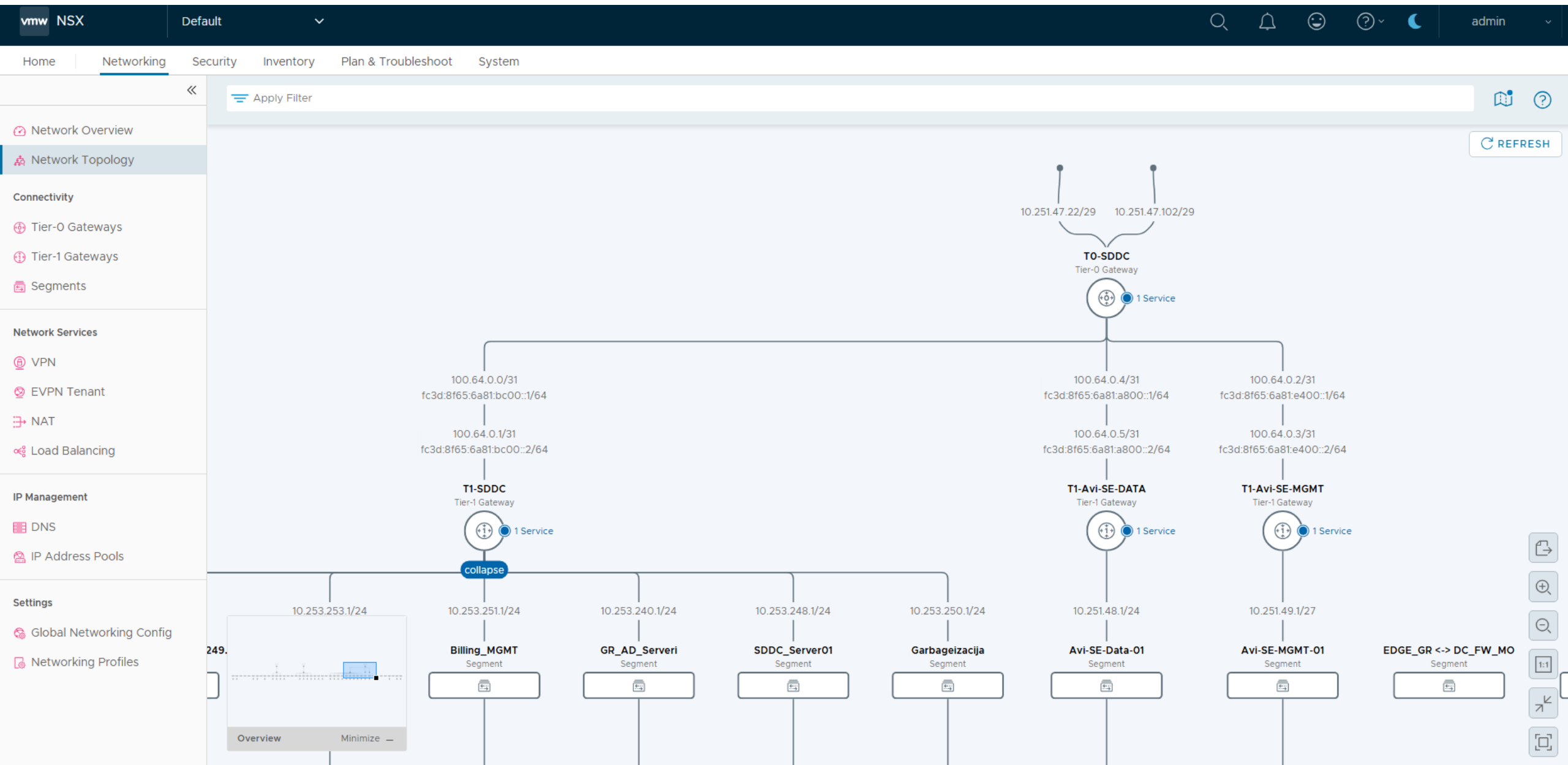
NSX Logical Routing and Connectivity

Tier-0 connects to the physical world; Tier-1 organizes application domains



This model keeps external connectivity and application-domain routing responsibilities separate.





vmw NSX

Default

admin

HomeNetworkingSecurityInventoryPlan & TroubleshootSystem

System Overview

Configuration

Quick Start

Appliances

NSX Application Platform

Fabric

Hosts

Nodes

Profiles

Transport Zones

Compute Managers

Settings

Service Deployments

Identity Firewall AD

Lifecycle Management

Backup & Restore

Upgrade

Migrate

Settings

General Settings

Peer Management

Hosts

Clusters

Standalone

Unmanaged

Transport Node Profile

CONFIGURE NSX

REMOVE NSX

ACTIONS

Filter by Name and more

Showing 2 of 2 clusters | Refresh

Clusters

NSX on DVPGs

Compute Manager

Hosts

Sub-cluster

Applied Profile

Node Status

Cluster01

vLCM

VLAN

Overlay

No

sddcvc-1-1-1-1-1-1-1-1 (v8.0.3)

8

2

TNP_Global

8 Hosts Up

Prepared

	Node	Sub-cluster	IP Addresses	OS Type	TEP IP Address	Tunnels	NSX Configuration	Status	Alarms	
	gresxi01	SubCluster_GR	10.251.1.1 and 4 more...	ESXi 8.0.3	10.251.1.1 and 1 More	39	Success	Up	0	View Details
	gresxi02	SubCluster_GR	10.251.1.2 and 4 more...	ESXi 8.0.3	10.251.1.2 and 1 More	39	Success	Up	0	View Details
	gresxi03	SubCluster_GR	10.251.1.3 and 4 more...	ESXi 8.0.3	10.251.1.3 and 1 More	41	Success	Up	0	View Details
	gresxi04	SubCluster_GR	10.251.1.4 and 4 more...	ESXi 8.0.3	10.251.1.4 and 1 More	46	Success	Up	0	View Details
	moesxi01	SubCluster_MO	10.16.6.1 and 4 more...	ESXi 8.0.3	10.16.6.1 and 1 More	33	Success	Up	0	View Details
	moesxi02	SubCluster_MO	10.16.6.2 and 4 more...	ESXi 8.0.3	10.16.6.2 and 1 More	42	Success	Up	0	View Details
	moesxi03	SubCluster_MO	10.16.6.3 and 4 more...	ESXi 8.0.3	10.16.6.3 and 1 More	40	Success	Up	0	View Details



vmwNSX

Default

HomeNetworkingSecurityInventoryPlan & TroubleshootSystem

System OverviewConfigurationQuick StartAppliancesNSX Application PlatformFabricHostsNodesProfilesTransport ZonesCompute ManagersSettingsService DeploymentsIdentity Firewall ADLifecycle ManagementBackup & RestoreUpgradeMigrateSettingsGeneral Settings

Hosts

ClustersStandaloneUnm

CONFIGURE NSXREMO

Cluster01

Node

gresxi01.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

gresxi02.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

gresxi03.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

gresxi04.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

moesxi01.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

moesxi02.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

moesxi03.intra.eroneL.baSubCluster_MO10.16.61.2034 more...

Filter by Name and more

Showing 2 of 2 clusters | Refresh

Applied ProfileNode Status

TNP_Global8 Hosts UpPrepared

ConfigurationStatusAlarmsView Details

SuccessUp0View Details

SuccessUp0View Details

SuccessUp0View Details

SuccessUp0View Details

SuccessUp0View Details

SuccessUp0View Details

SuccessUp0View Details

SuccessUp0View Details

Set Host Nodes

Sub-ClusterSubCluster_...#Host Node4

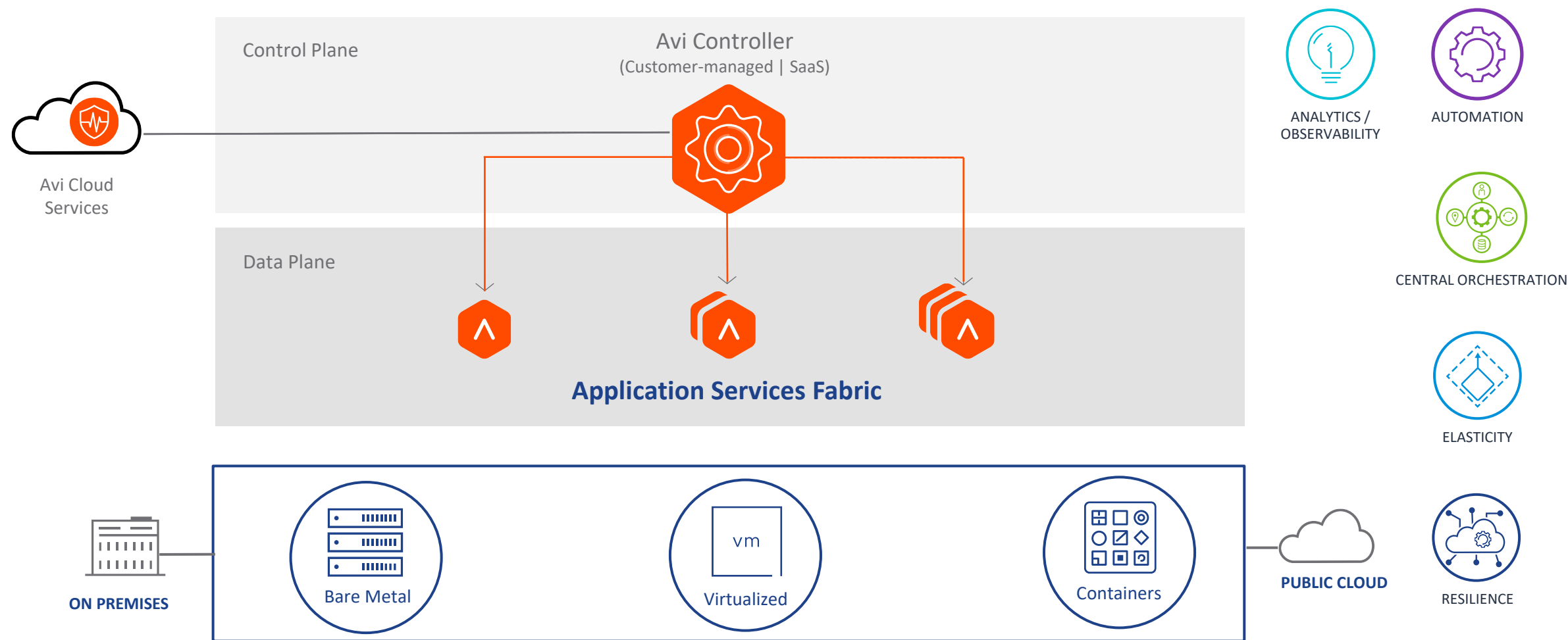
To edit below content, click EDIT

Node	IP Addresses	OS Type	NSX Configuration
✓ gresxi01.intra.eroneL.ba	10.16.61.203 and 4 more...	ESXi 8.0.3	✓ Success
✓ gresxi02.intra.eroneL.ba	10.16.61.203 and 4 more...	ESXi 8.0.3	✓ Success
✓ gresxi03.intra.eroneL.ba	10.16.61.203 and 4 more...	ESXi 8.0.3	✓ Success
✓ gresxi04.intra.eroneL.ba	10.16.61.203 and 4 more...	ESXi 8.0.3	✓ Success
✓ 4	REFRESH		1 - 4 of 4

CLOSE



VMware Avi - Next-Generation Software Defined Platform for Application Delivery



Product Capabilities



App
Services

**Local Load
Balancing**



**Global Load
Balancing**



**App Security
& WAF**



**Kubernetes
Ingress Services**



Analytics & Observability

App, User, & Security Insights

Log Analytics

Behavioral & ML Engine

Software-Defined
Platform



Orchestration
Central management



Automation
Decision automation
/ Self-service



Auto-Scale
Elasticity/capacity
management



Auto-Heal
High availability
and resiliency



**Cloud
Console**

Eronet Configuration

Cloud is the highest-level object representing the infrastructure environment in which the Controller deploys resources. Cloud defines how the Controller connects to the underlying platform — including VM orchestration, networking, and addressing.

Two Cloud objects have been created here:

INTRA-ERONET - Integration with the NSX and vCenter environment for internal services.

CLOUD-HTERONET - Integration with the vCenter environment for external services.

Clouds

CREATE ▾

☐	Name	Type	Status		
☐	CLOUD-HTERONET	VMware vCenter/vSphere ESX			▾
☒	Default-Cloud	No Orchestrator			▾
☐	INTRA-ERONET	NSX Cloud			

Items per page 10 ▾ 3 Total

Eronet Configuration

Select Cloud:

CLOUD-HTERONET

Service Engine Group

CREATE

☐	Name	Version	# Service Engines	Maximum Number of Service Engines	# Virtual Services	Maximum Number of Virtual Services per Service Engine	HA Mode	
☐	CLOUD-SEG1	31.2.2-9059	2	2	17	1000	Active/Active	

Select Cloud:

CLOUD-HTERONET

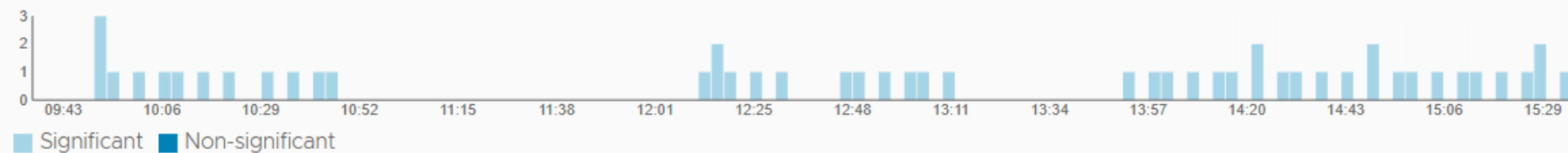
Displaying Past Year	Average Values	
☐ Name	Health	Status
☐ CloudAvi-se-ivdok	100	Up
☐ CloudAvi-se-xpxpz	100	Up

Select Cloud:

INTRA-ERONET

Displaying Past Year	Average Values	
☐ Name	Health	Status
☐ INTRA_Avi-se-jalgn	100	Up
☐ INTRA_Avi-se-mbuyo	100	Up





Past 30 Minutes



Cloud

REFRESH

EXPORT ▾



VIF



PO



Timestamp

Client IP

Client Port

Server IP

Server Port

Total Bytes

Duration (Total Time) ▾

09/09, 3:34:30 PM

10.251.16.7

60046

10.251.243.173

443

47.7 KB

2m 5s



Significance



Connection closed abnormally: server ended connection

Client IP 10.251.16.7:60046 ← Virtual Service IP 10.251.48.23:443

Server Connection IP 10.251.48.2:8777 → Server IP K2-test-Pool(10.251.243.173:443)

Service Engine INTRA-Avi-se-mbuya (vcpu:0)

Location Internal

Start Time Sep 9, 2026 3:32:25 PM

End Time Sep 9, 2026 3:34:30 PM

VIEW FULL LOG



09/09, 3:29:30 PM

10.251.16.7

52382

10.251.243.173

443

47.8 KB

2m 6s



09/09, 3:29:30 PM

10.251.16.7

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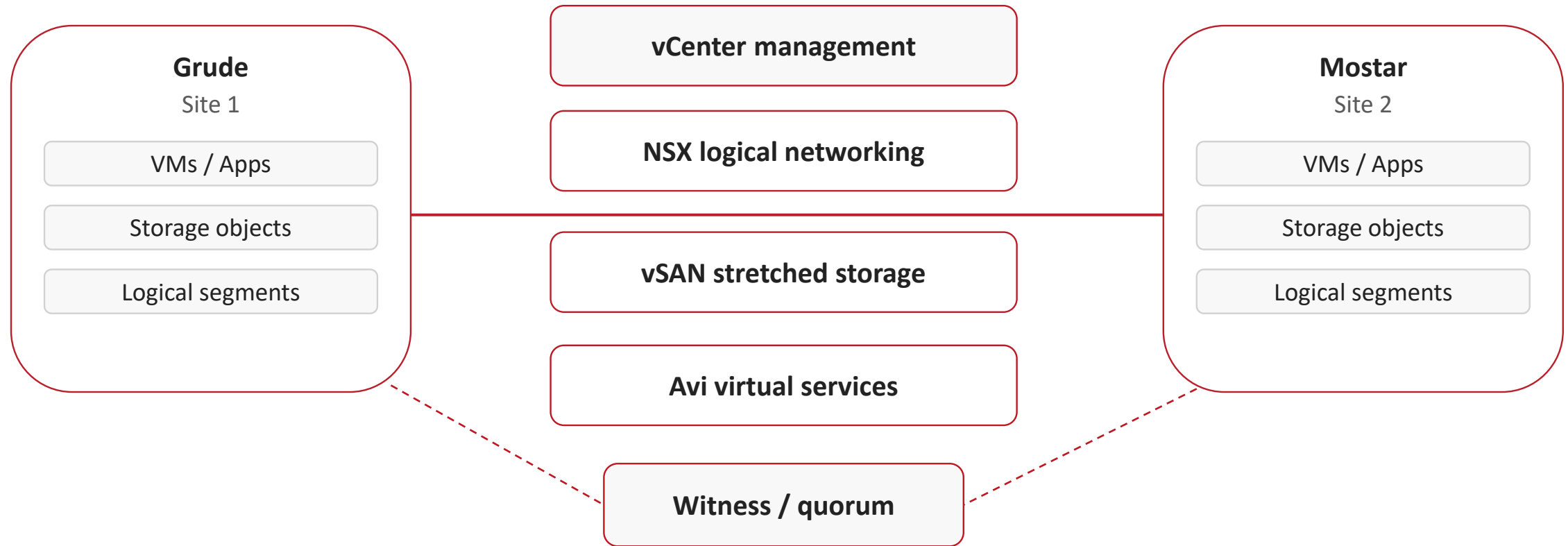
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Integrated Architecture – Putting It All Together

Compute, storage, network virtualization and application delivery operate as one design



The architecture is resilient because responsibilities are distributed across layers and sites.



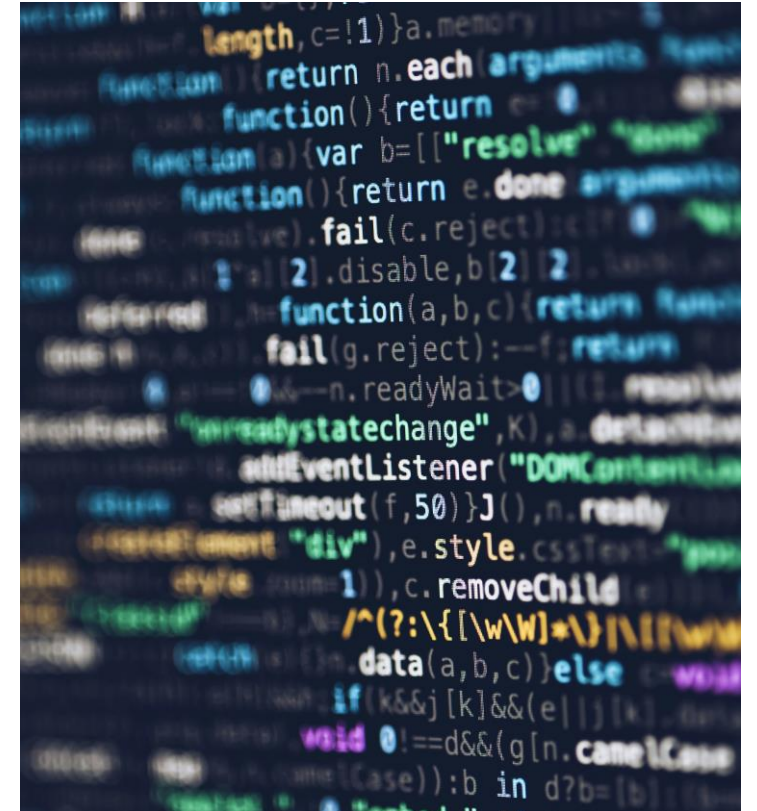
04 Migration Strategy and Business Value

Main focus

Controlled migration from the previous model

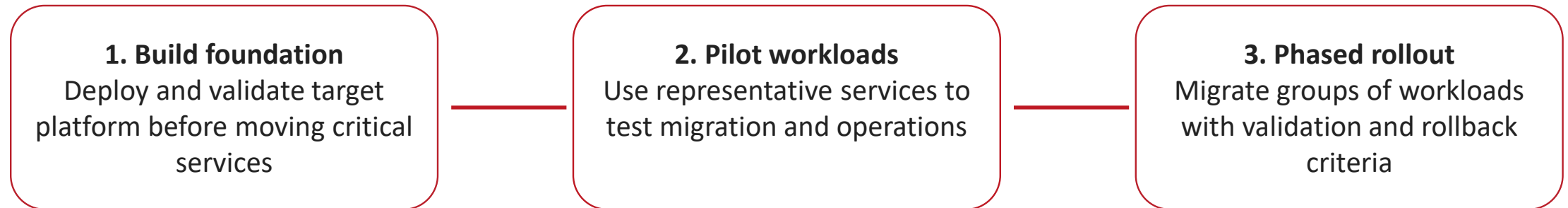
Pilot workloads, phased migration and validation

Technical capabilities translated into operational outcomes



Migration Strategy: Controlled Transition

The migration approach reduces risk by separating foundation, pilot and rollout activities



Risk control is achieved through sequencing, validation checkpoints and clear operational ownership.



Technical Capabilities to Business Outcomes

Business value is the result of specific architecture changes

vSAN stretched cluster + witness

Reduced impact of site-level infrastructure failures

NSX logical networking

Consistent connectivity and segmentation across locations

Avi virtual services

Application-aware traffic distribution and health monitoring

vCenter operations view

Centralized management, alarms and lifecycle visibility

Phased migration model

Lower transition risk and clearer rollback decisions



Key Takeaways

The new platform removes the site as a single service failure domain

- Two locations are not enough without a designed failover and quorum model.
- vSAN, NSX, Avi and vCenter each solve a different part of the availability problem.
- The witness site supports decision-making; it is not a production workload site.
- Application availability requires health-aware traffic management, not only VM availability.
- Migration success depends on discovery, phased rollout, validation and operational handover.

The result is a more predictable, manageable and resilient service foundation for HT Eronet.





Thank you for your attention!

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