VMware Cloud Foundation 3.9

Architecture and Deployment

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vmware®

About Me…

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- vArchitect, Cloud Technologist
- Content available at:
  - https://blog.virtualbean.org/
  - https://github.com/craigeherring/
- HomeLaber
  - 6 ESXi, Dual E5-2650L v2, 128GB
  - vSAN 12TB cluster
  - 50TB NAS
  - 10GB Networking
  - VCF, NSX, vRealize Suite
- vExpert, VCP-DCV, VCP-NV

DELL Technologies

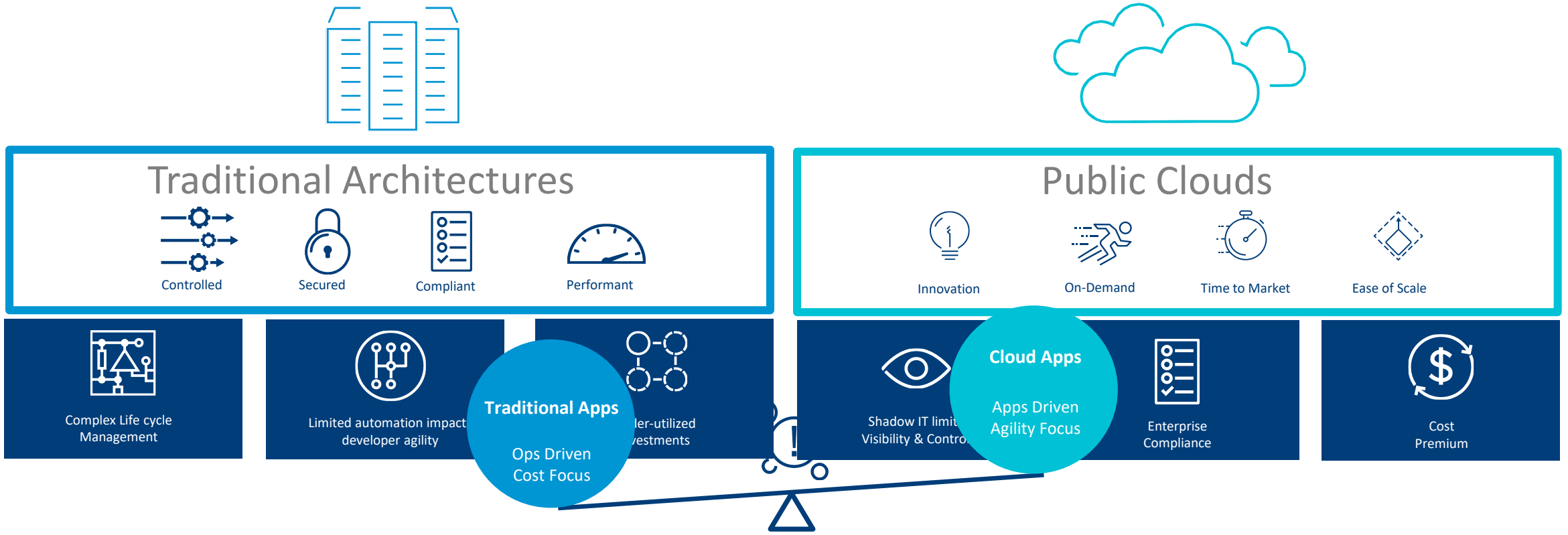
Contents

VMware Cloud Foundation

Overview

Traditional Data Centers are Unable to Keep Up

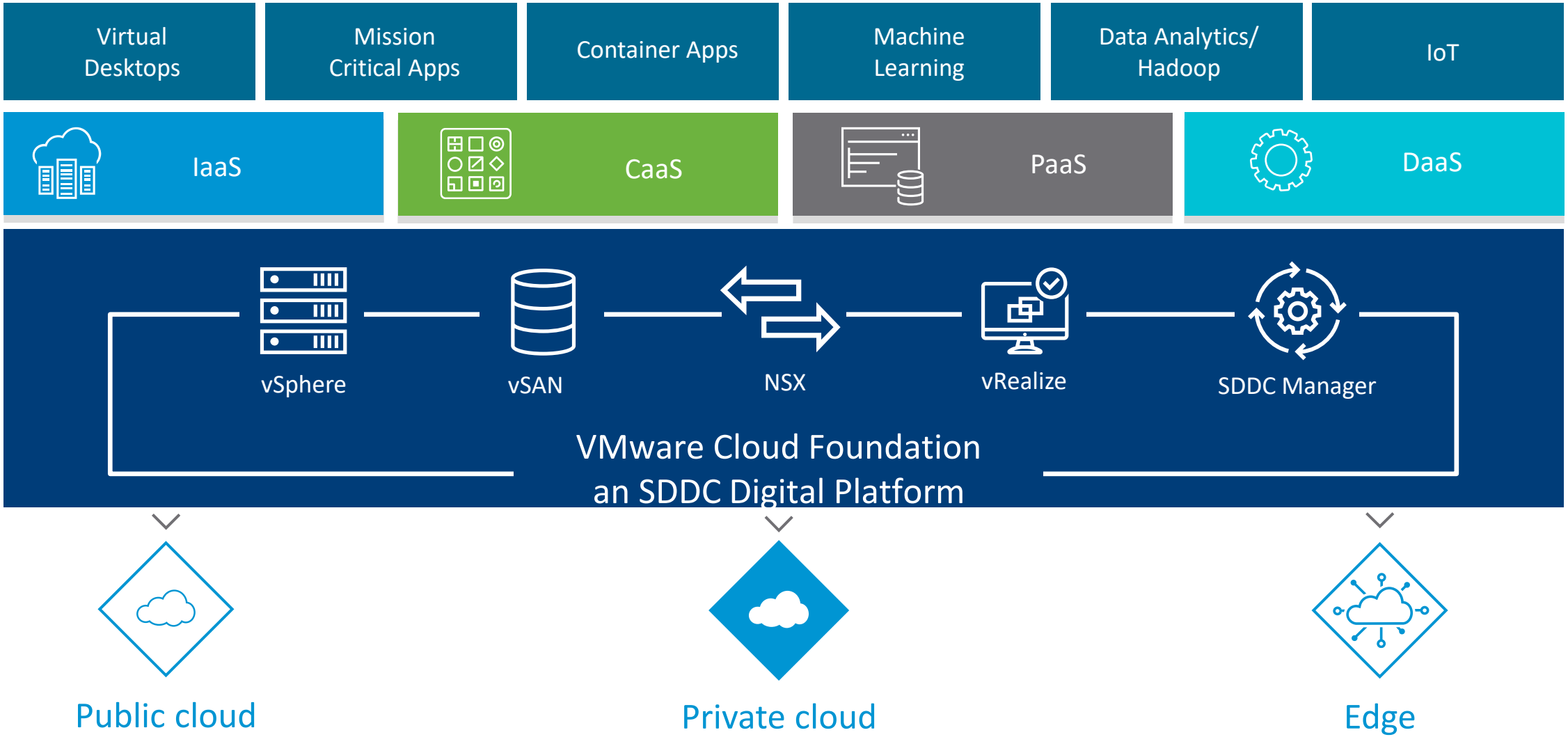
Outdated Systems and Processes Limiting IT Impact



Traditional and Cloud Native Apps need a single modern infrastructure

Cloud Operating Model – Deliver what the Business Cares About

A Universal Workload Platform – Built for Today and The Future



Platform for Traditional and Modern Applications

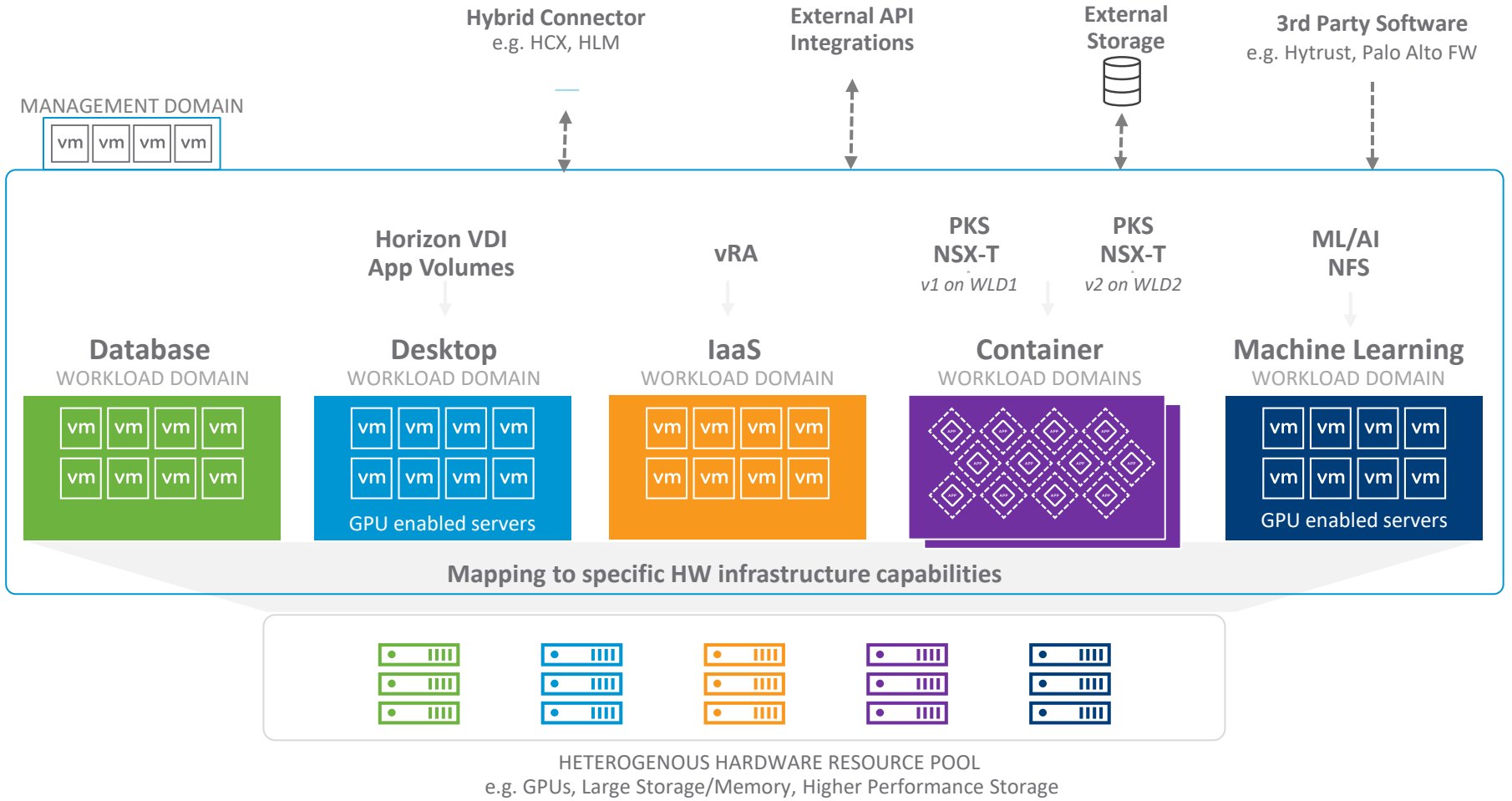
Standardized Repeatable Infrastructure

External Interfaces
Integrate with existing
Data Center Services

Software Flexibility
Products, Versions,
3rd party software

Application Mapped Infrastructure
Capacity, Performance,
Security/Compliance,
HW requirements

Hardware Choice
Vendors, Configuration
Composability

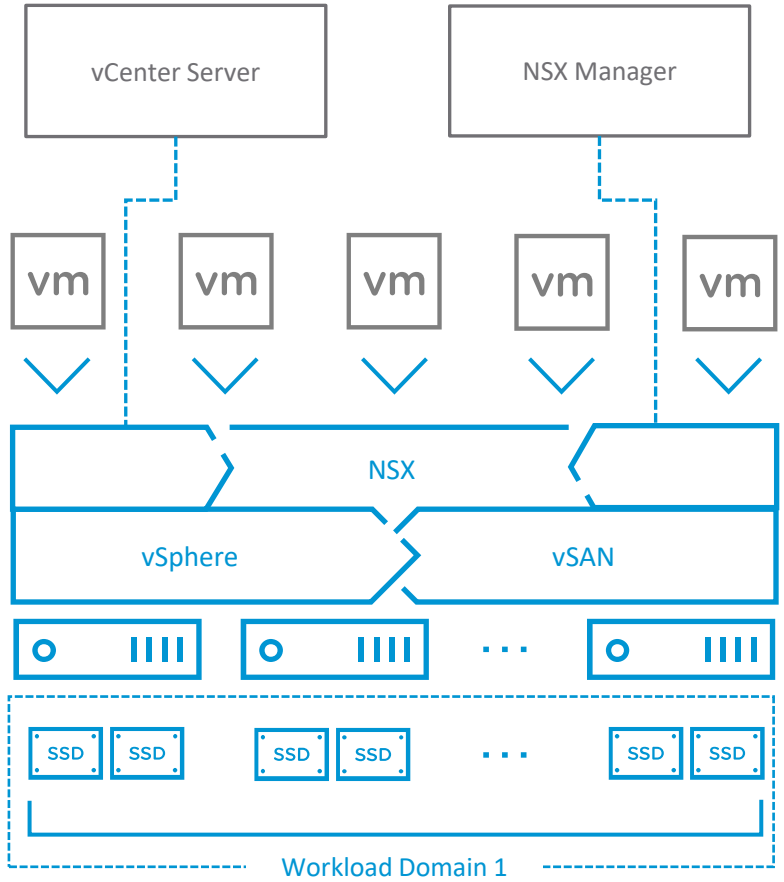


VMware Cloud Foundation

Workload Domains

Workload Domain Overview

- Purpose Built SDDC Environment
  - Dedicated vSAN Ready Nodes
  - Dedicated vCenter / NSX Manager
  - Create, expand, and delete independently
- Automated provisioning
  - Management Domain provisioned at initial Bring Up
  - Virtual Infrastructure (VI) WLD provisioned on-demand
  - Horizon – automated deployment to an existing VI WLD
  - Enterprise PKS - automated deployment to an existing VI WLD
- Up to 15 Workload domains can be created
- Configure multiple vSphere Clusters per Workload Domain



Management Domain

Special purpose domain

- Created during Bring-up

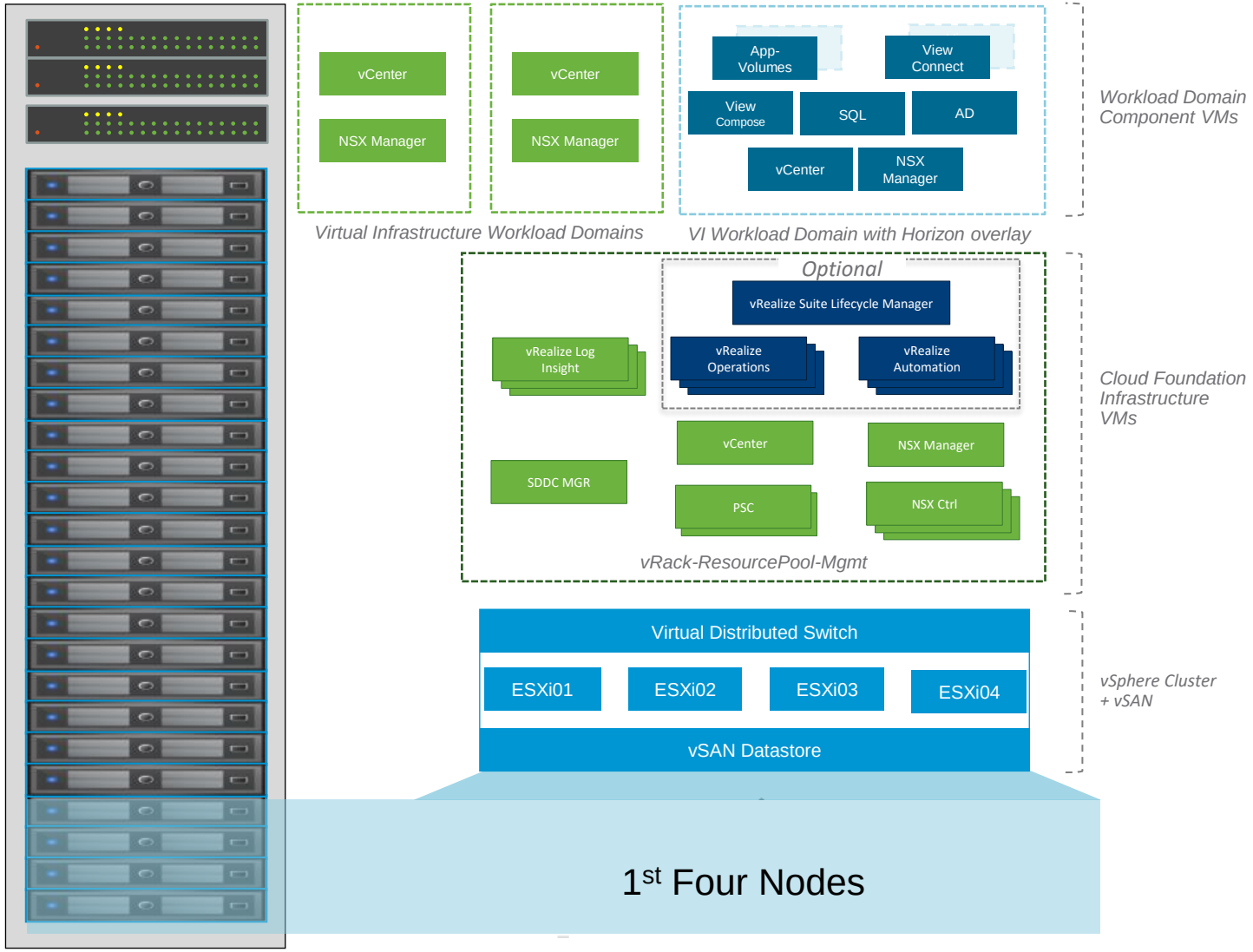
One per VCF instance

- Minimum 4 hosts
- Built using vSAN and NSX-V

Runs infrastructure components

- SDDC Manager, PSCs, vCenter Server, NSX-V, vRealize Log Insight. Optional: vRealize Operations, vRealize Automation
- Can be used for AD, Backup, 3rd party tools etc

vCenter & NSX Manager instances for all WLDs run in Management Domain



Virtual Infrastructure Domain

VMware Cloud Foundation Architecture Deep Dive

Dedicated vCenter Server

- Shared SSO with Management domain

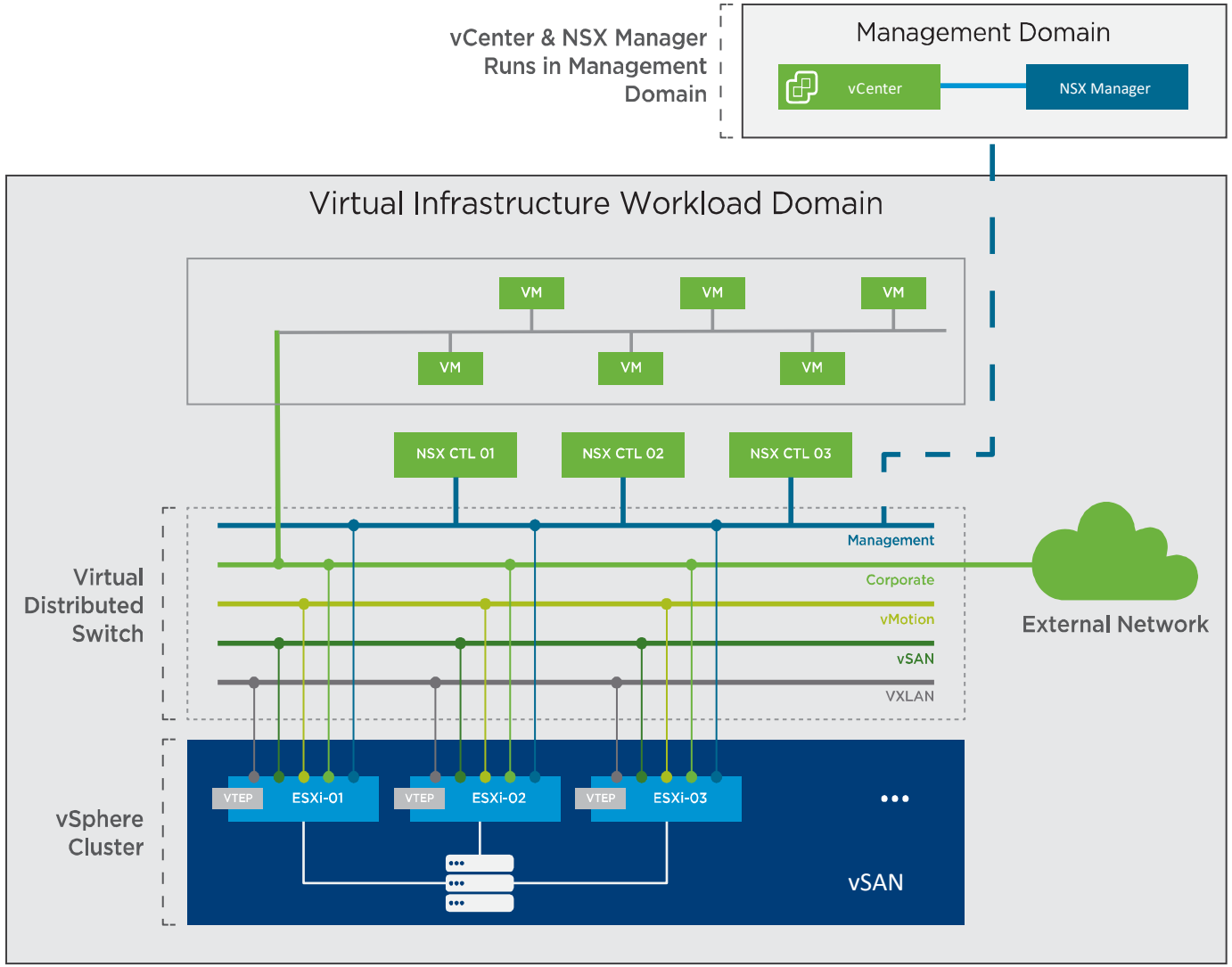
Minimum of 3 hosts

One or more vSphere Clusters

- Choice of:
  - Dedicated vSAN Datastore per VI domain
  - NFS backed VI workload domain
  - FC backed VI workload domain
- Choice of:
  - NSX-V based VI domain
  - NSX-T based VI-domain

Create, expand, shrink and delete

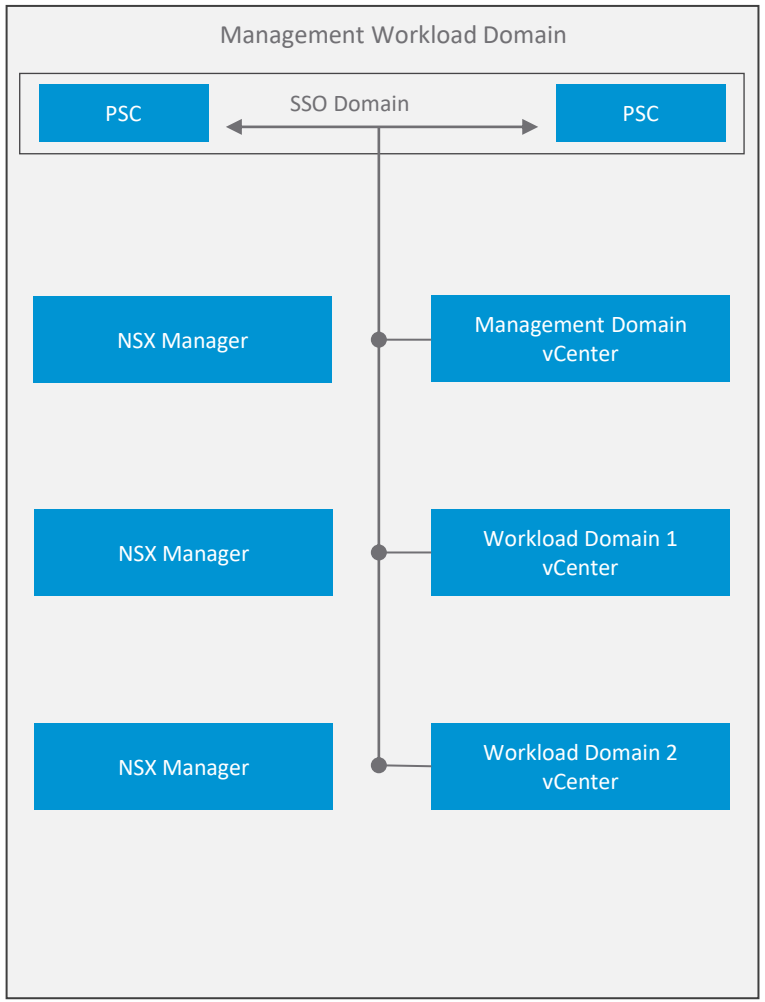
Used in a VCF Standard Architecture

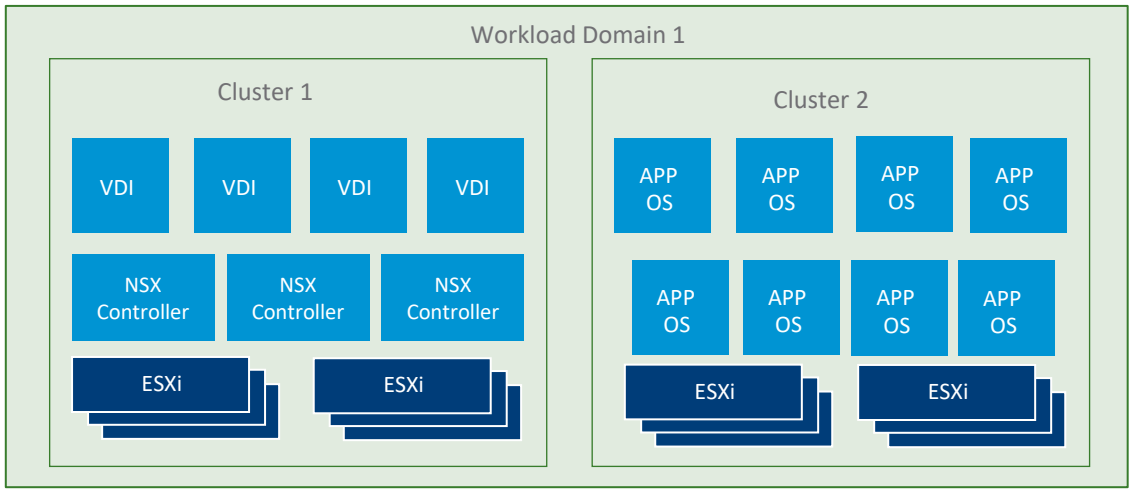


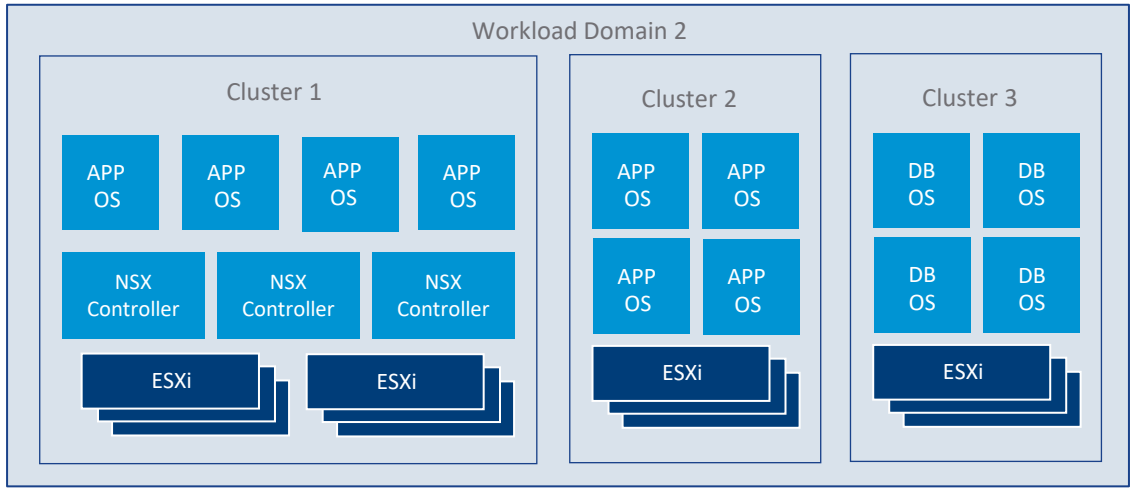
Multi-Cluster Domains

Made Easy with Cloud Foundation

- Scale workload domains by adding new cluster(s)
- Pair apps with the appropriate physical resources needed to support them
- Increased granularity for resource management

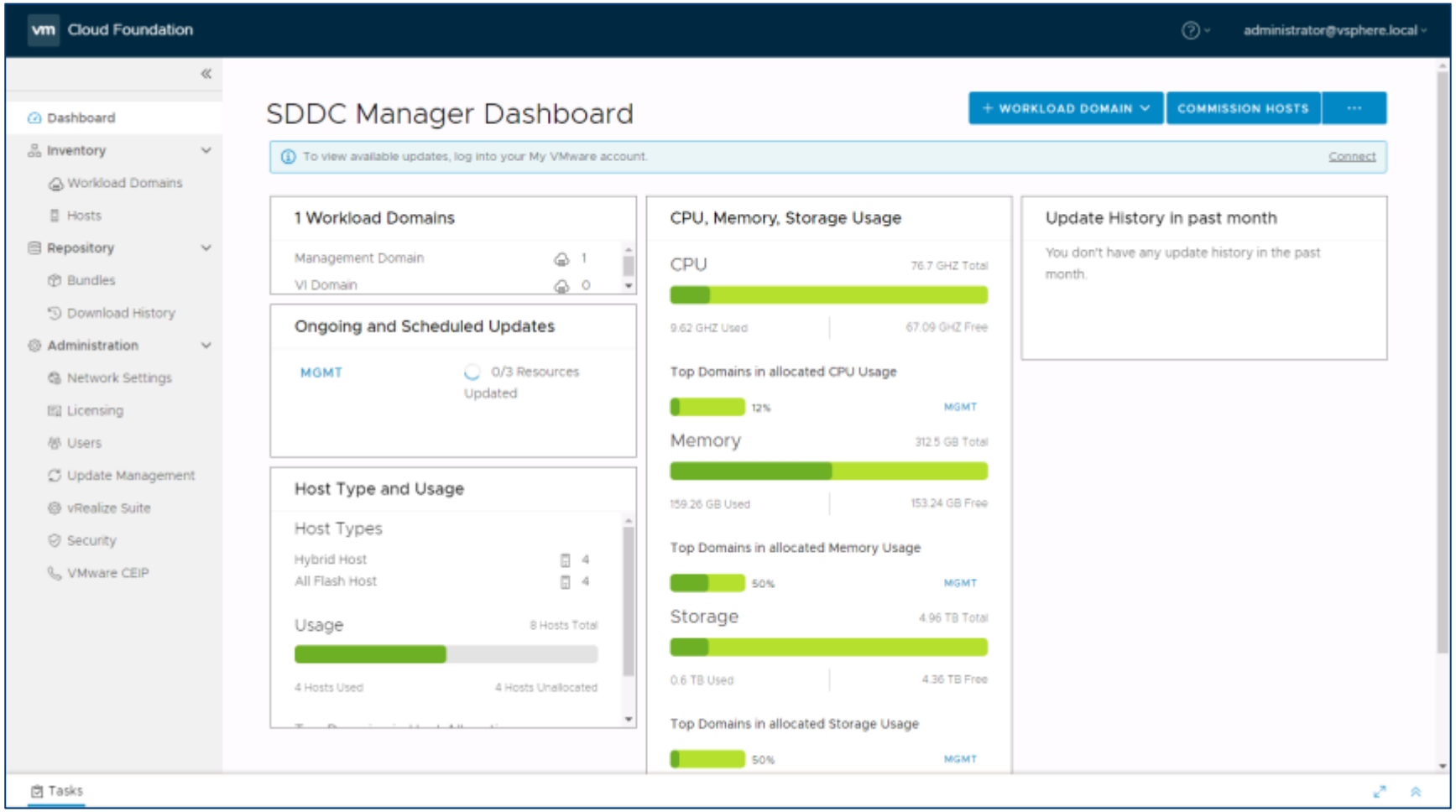


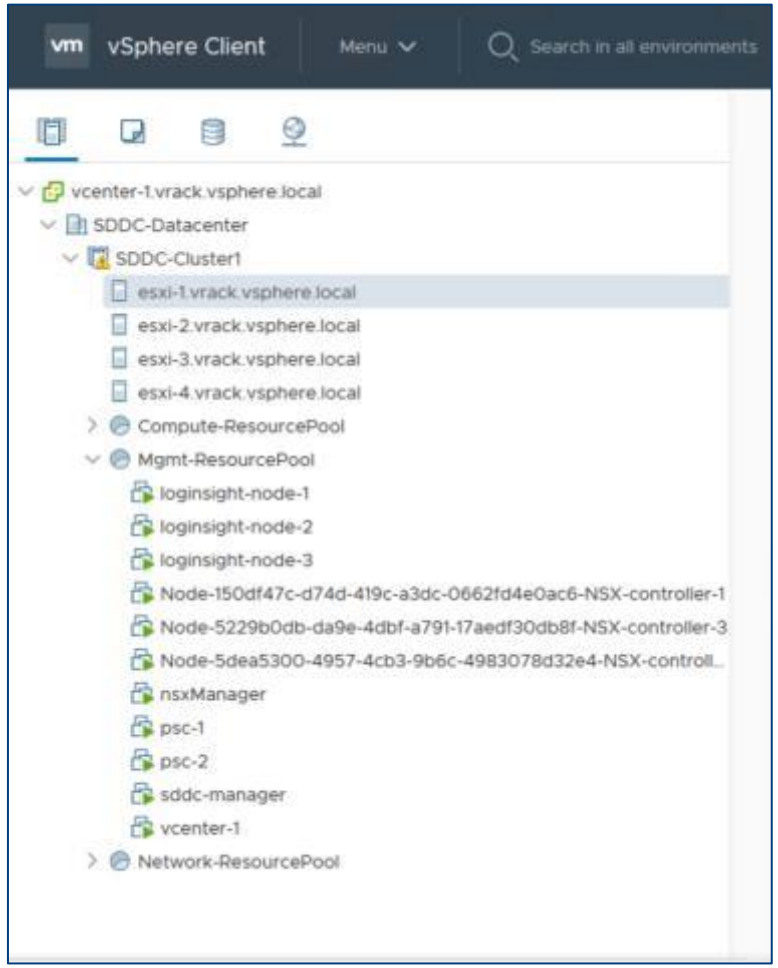




SDDC Manager interface

Streamlined Operations, Visually Appealing (built with VMware Clarity UI Framework)

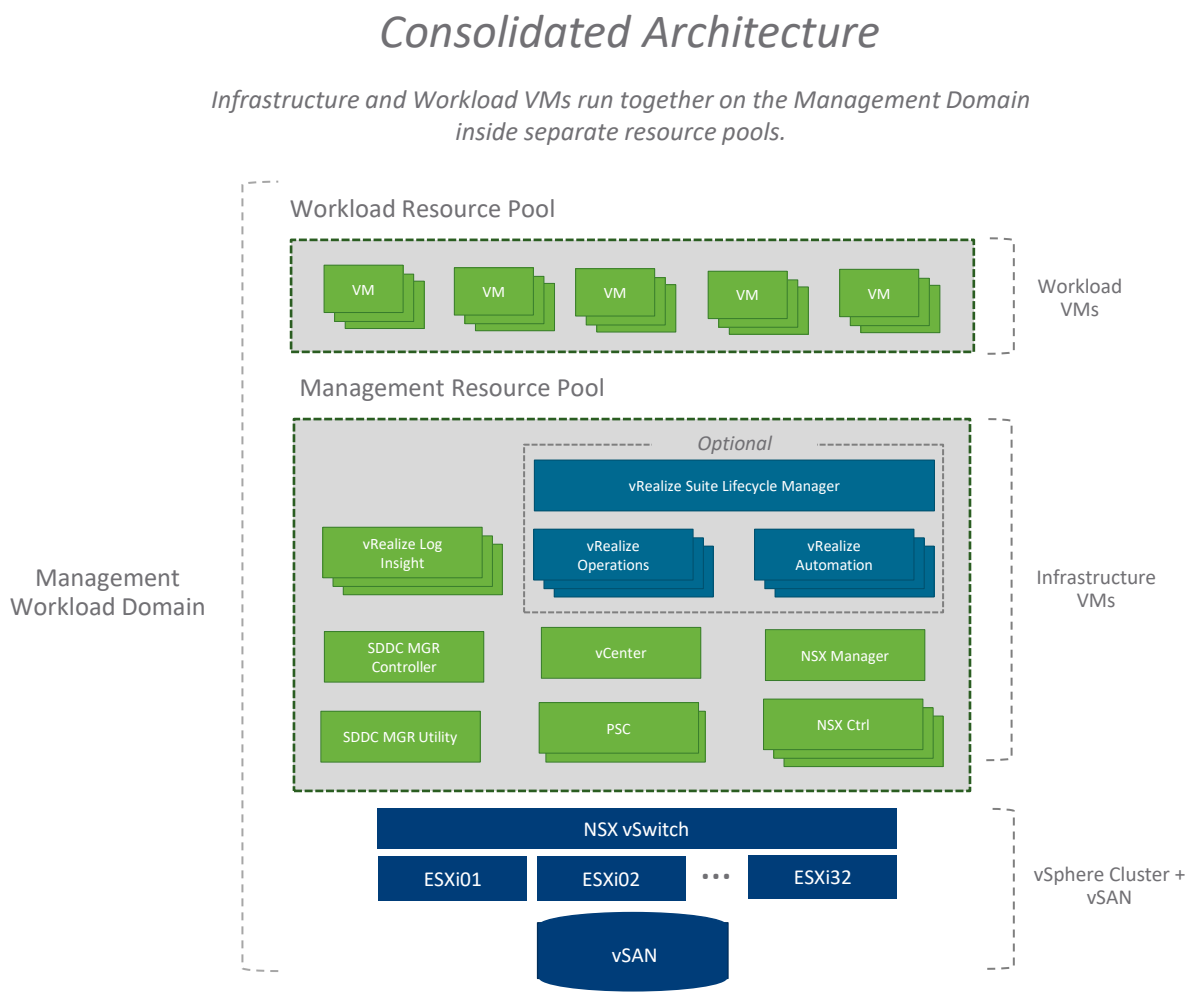




VMware Cloud Foundation

Deployment Options

Consolidated Architecture



Targets smaller deployments

- Minimum of 4 servers

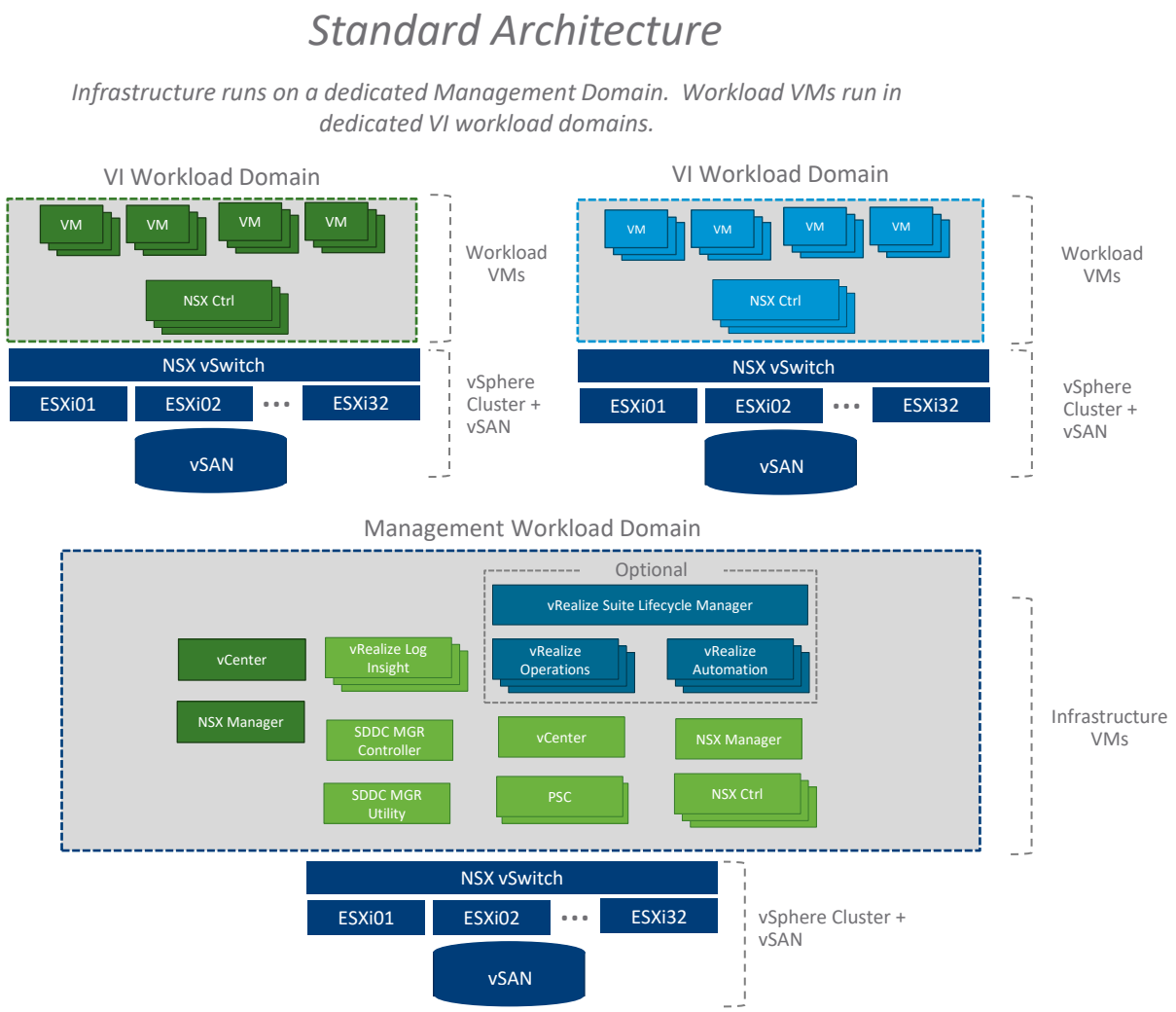
Infrastructure and compute VMs run together on shared management domain

Resource Pools used to segregate / isolate workload types

Supports multiple clusters and scale to documented vSphere maximums

All nodes within a Consolidated Architecture deployment must be vSAN ready nodes

Standard Architecture



Targets medium to large deployments

- Requires a minimum of 7 servers (recommend 8)

Management domain dedicated to infrastructure

Dedicated VI domain(s) for user workloads

- Each WLD can consist of multiple clusters

Up to 15 WLD including Management Domain

- vCenter instances run in linked-mode
- Each WLD can consist of multiple clusters

VMware Cloud Foundation

Multi-site Architectures

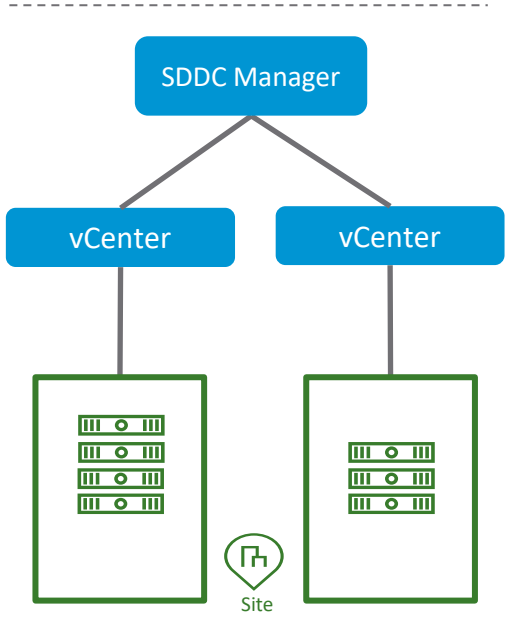
- Deployment Options
- Multi-instance Management
- VCF Edge
- Stretched Cluster Deployments

Cloud Foundation Deployment Options

Single site, Stretched and Multi-site Deployments

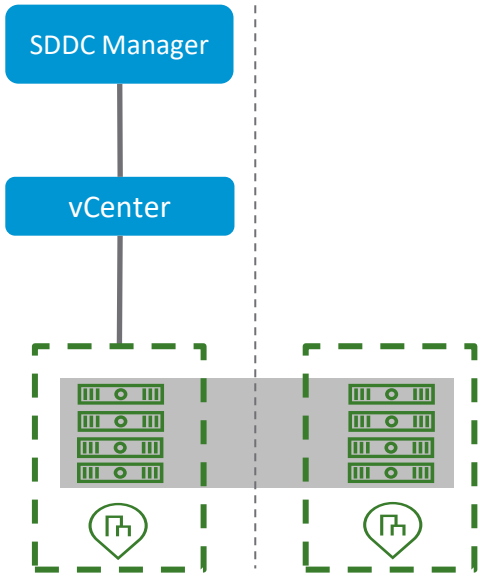
Updated for VCF 3.9

1 VCF Single Site Deployment



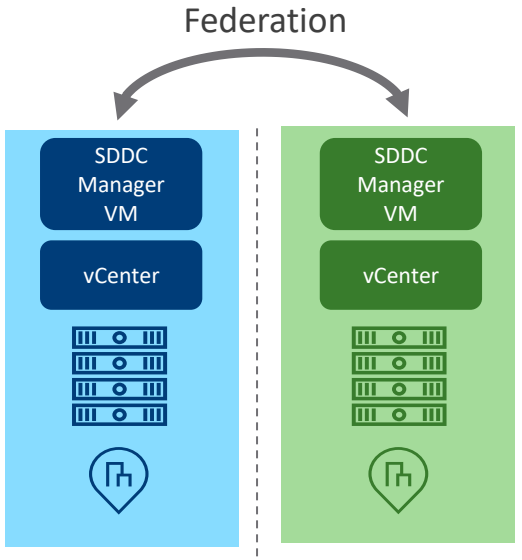
Single site deployment of one or more workload domains. Each workload domain can be multi- clustered

2 VCF Stretched Deployment



Stretched vSAN workload domain(s) between 2 sites. Each cluster has option to be stretched

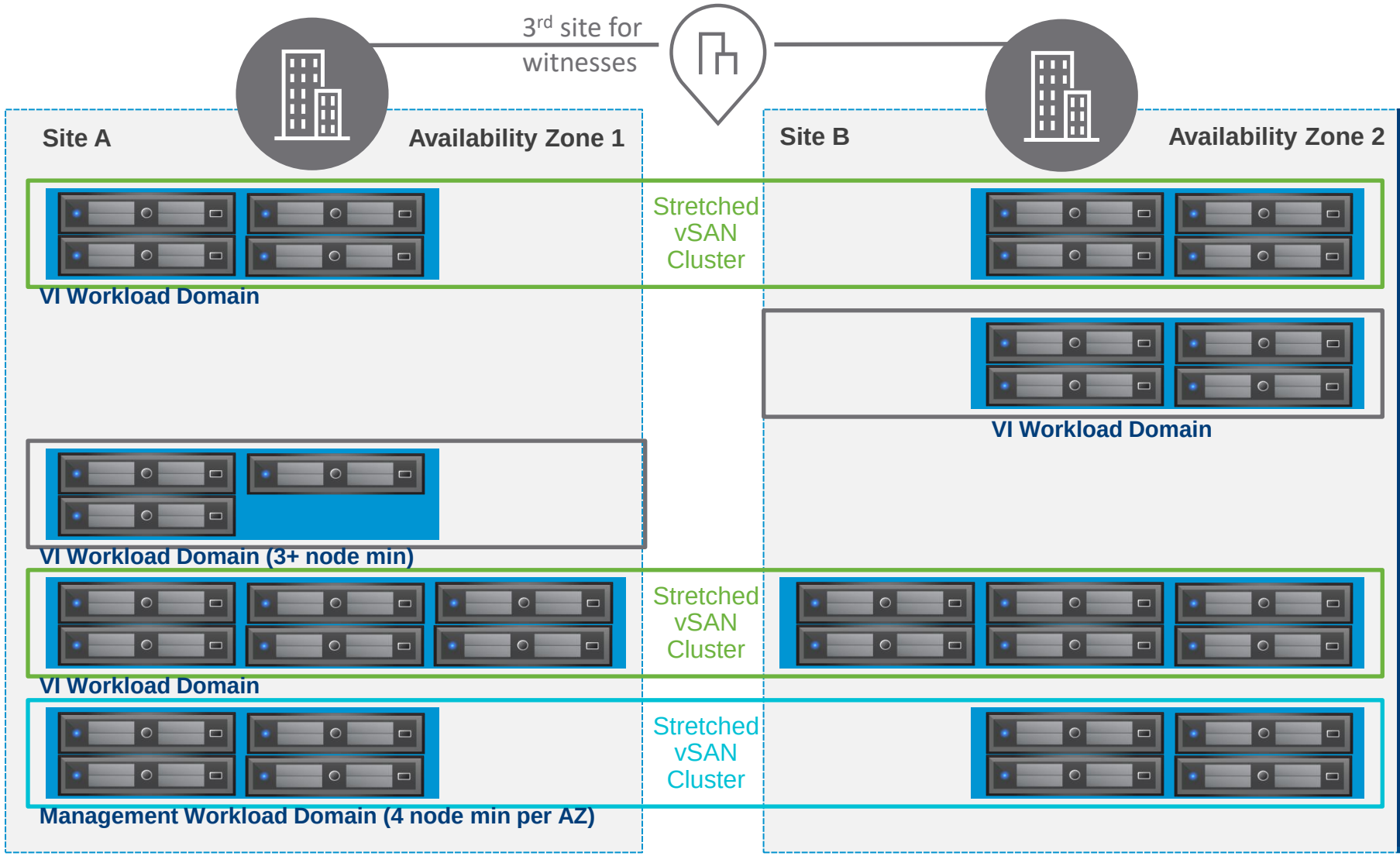
3 VCF Multi-instance Management



Multiple VCF instances connected via a Federation for aggregated visibility and ease of management

Site Boundary

Cloud Foundation Stretched Cluster Workload Domains



- Increased availability with minimal downtime & data loss
- Inter-site load balancing
- Stretched cluster support in both management and selected workload domains *from the site that is being stretched*
- Both Availability Zones (AZ) are active
- Ability to expand, delete and upgrade clusters
- Utilizes a L2 stretched network
- Each stretched workload domain utilizes a 3rd site for a vSAN witness.

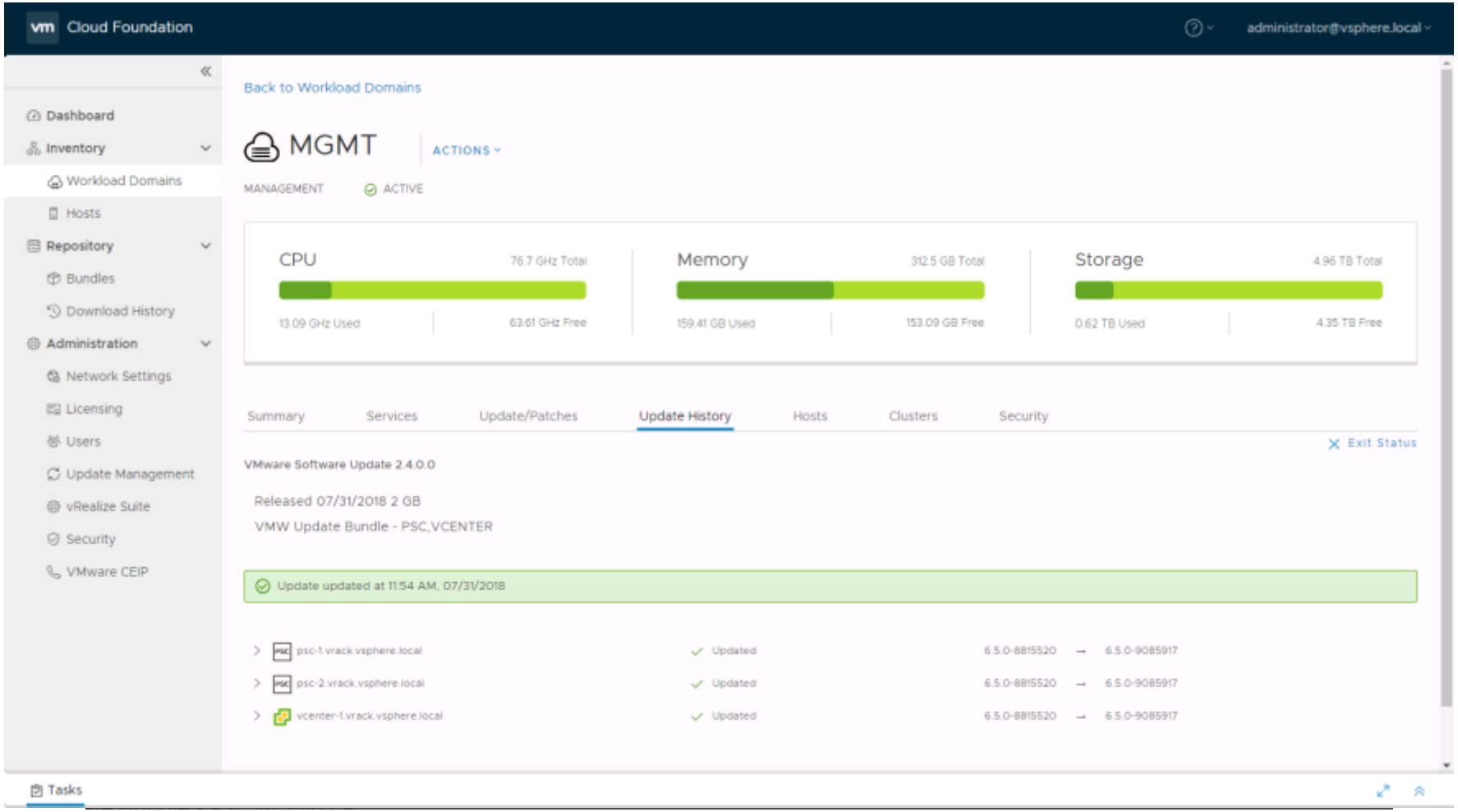
VMware Cloud Foundation

Life Cycle Management

Lifecycle Automation – Automated Upgrading and Patching

Made Easy with Cloud Foundation

- Notification
- View Details
- Precheck
- Schedule or Update now
- Monitor
- Complete



Cluster-level Upgrade Support

Option to select individual clusters within a workload domain for ESXi upgrades

Scenario

Performing ESXi updates within large workload domains often requires large maintenance windows

Host evacuation, host rebalancing and reboots during a vmkernel upgrade impacts available capacity for running workloads, degraded quality of service and availability protection

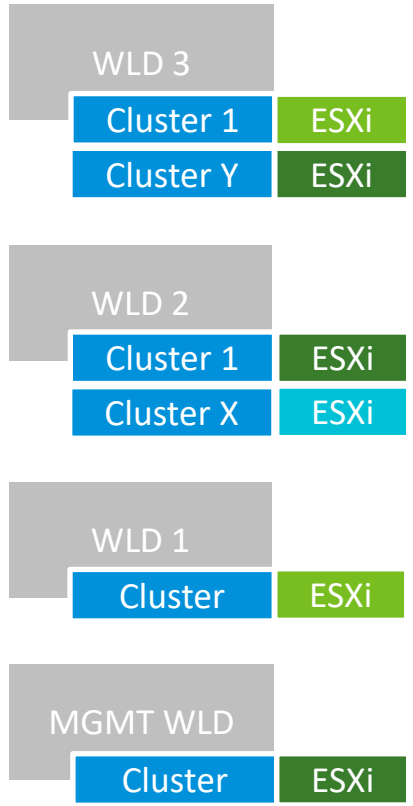
Benefit

Cluster level upgrade support caters to smaller maintenance windows

Customers can deploy multi-cluster workload domains with independent clusters running their desired component levels

Allows flexibility for clusters within a workload domain to run different ESXi versions

ESXi updates applied per Cluster

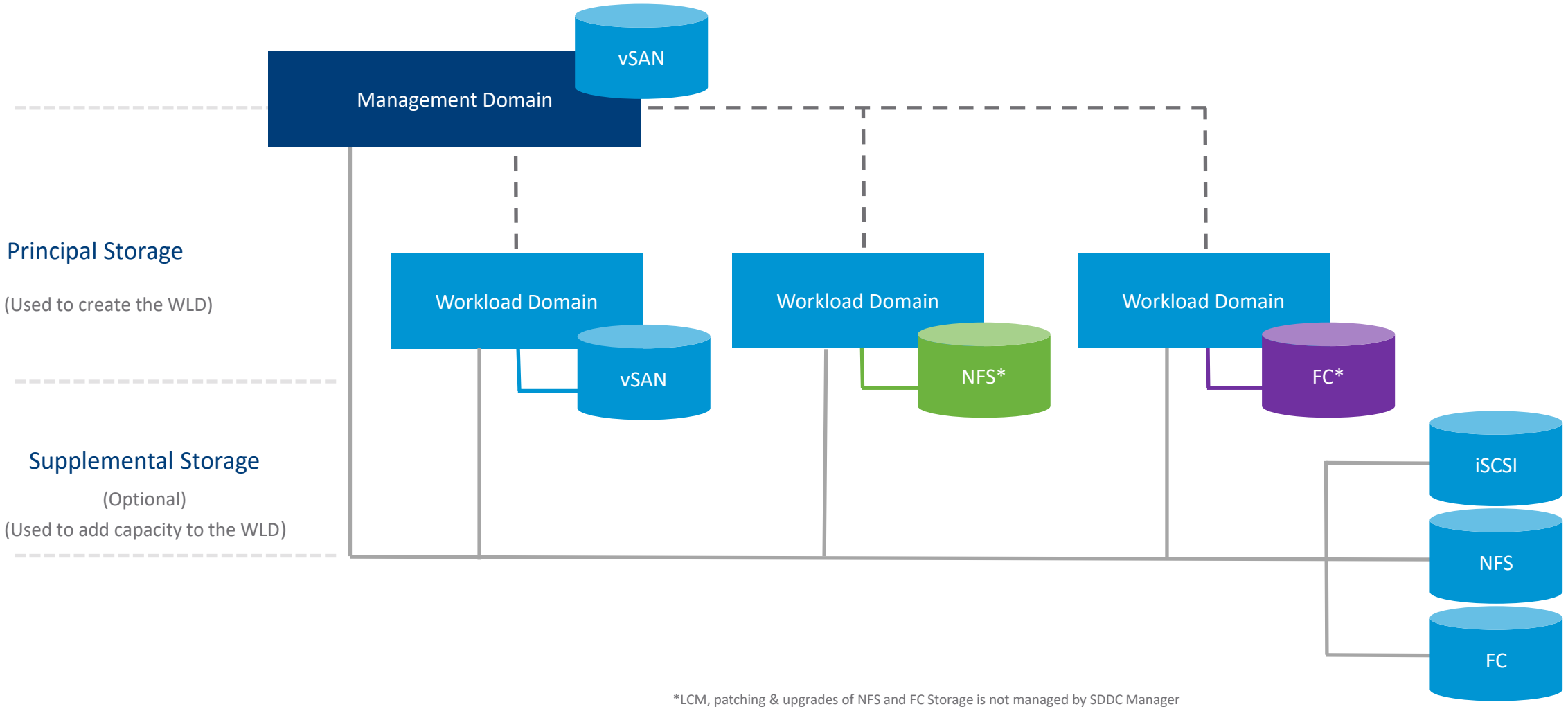


VMware Cloud Foundation

Storage Options

VMware Cloud Foundation Principal & Supplemental Storage

Updated for VCF 3.9



*LCM, patching & upgrades of NFS and FC Storage is not managed by SDDC Manager

External Storage Connectivity

Preserve Storage Investments and ease transition to SDDC

Updated for VCF 3.9

IP and FC storage can be used as Principal or Supplemental Storage

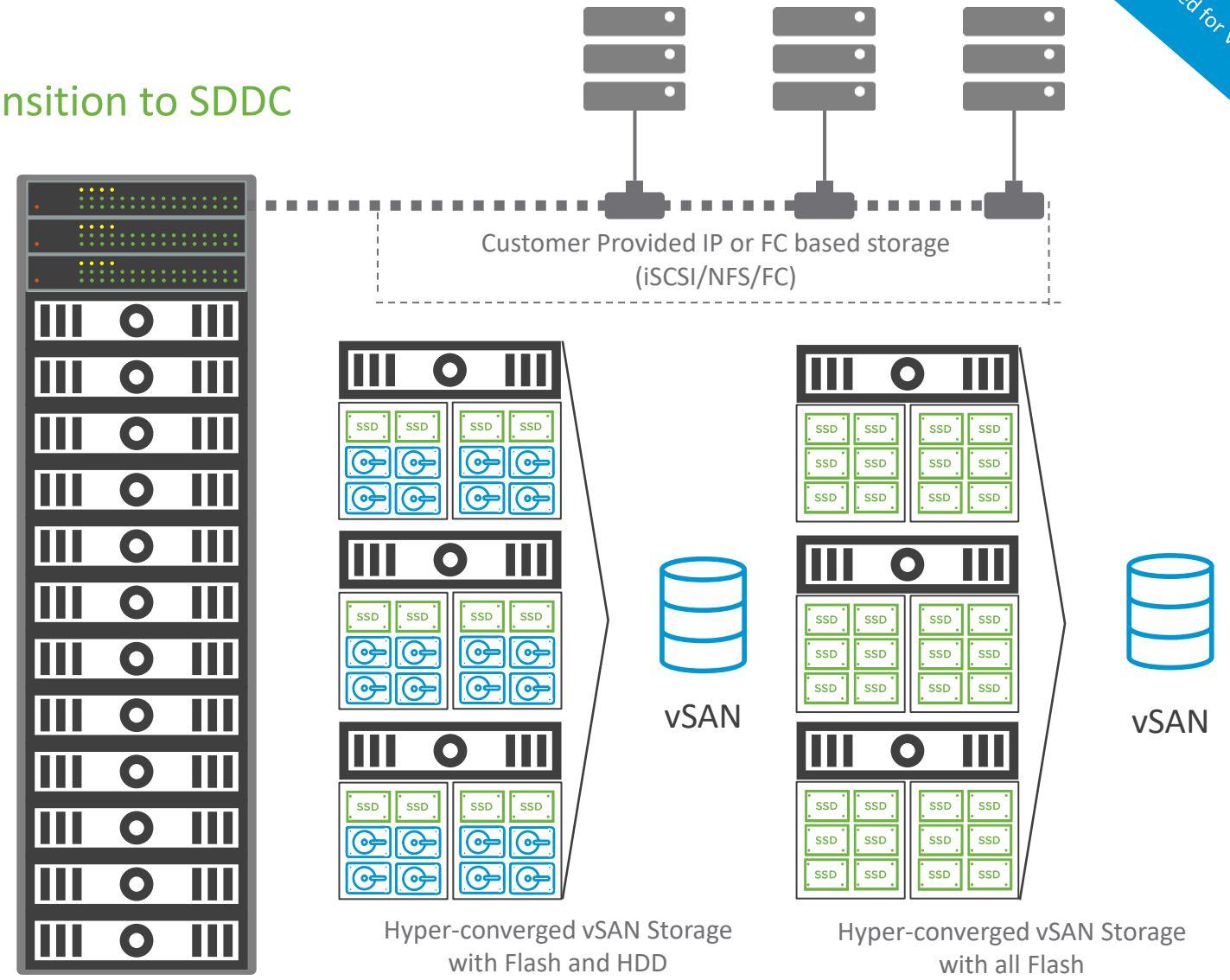
Principal Storage:

- Provisioning automated in SDDC Manager when creating Workload Domain(s)

Supplemental Storage:

- Targets:
  - Data protection (File/Image backups)
  - Data at rest (templates, backups, archives)
  - Migration to a full SDDC
- Connect/mount:
  - Use vSphere web client to connect storage to workload domains

Check HCL for FC array & HBA compatibility



*LCM, patching & upgrades of Supplemental Storage is not managed by SDDC Manager

VMware Cloud Foundation

Networking

VMware Cloud Foundation Networking Overview

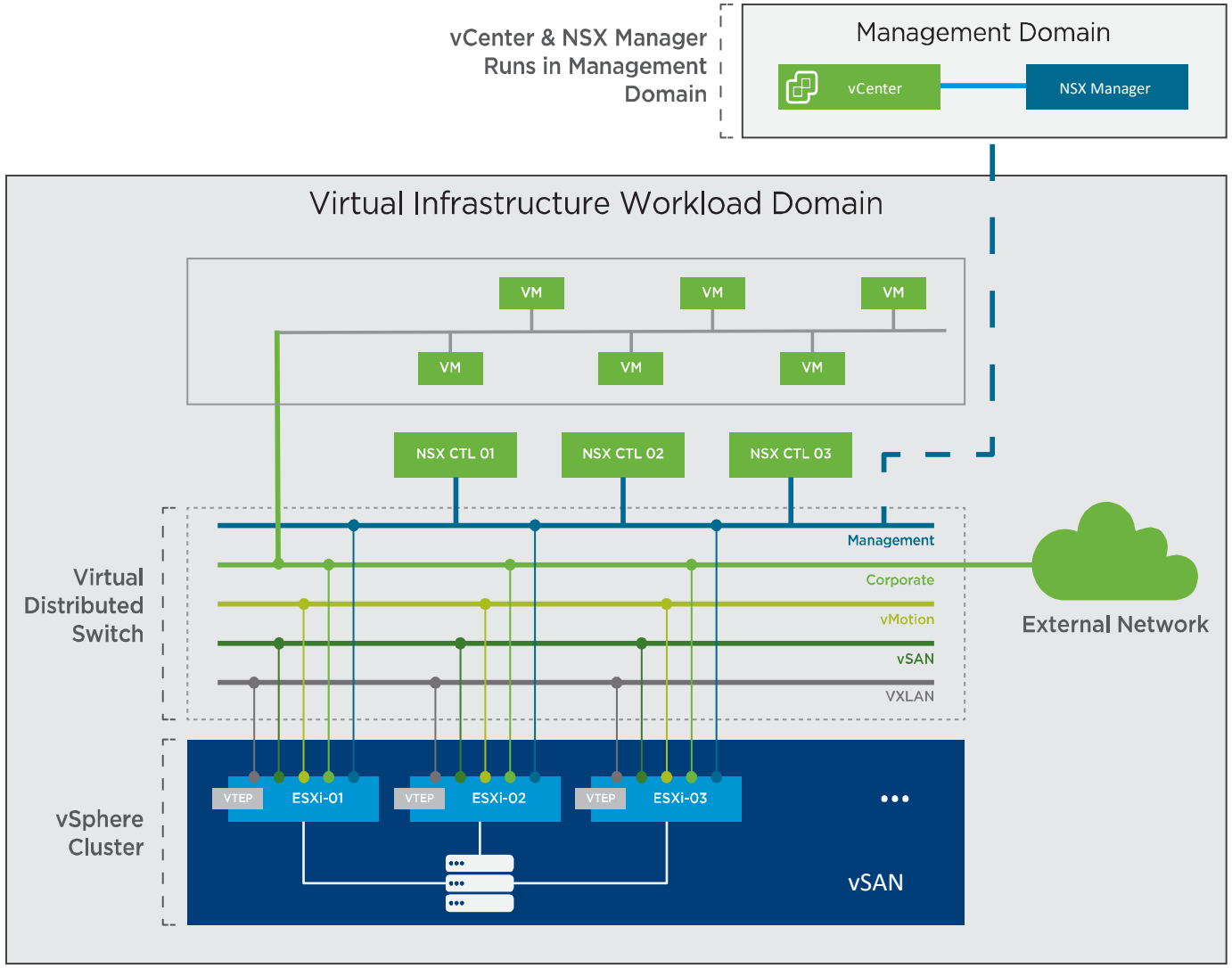
Utilize the Deployment Parameters Sheet used for Bring up to plan VLANs

Cloud Foundation requires VLANs for :

- Management
- vSAN
- vMotion
- VxLAN

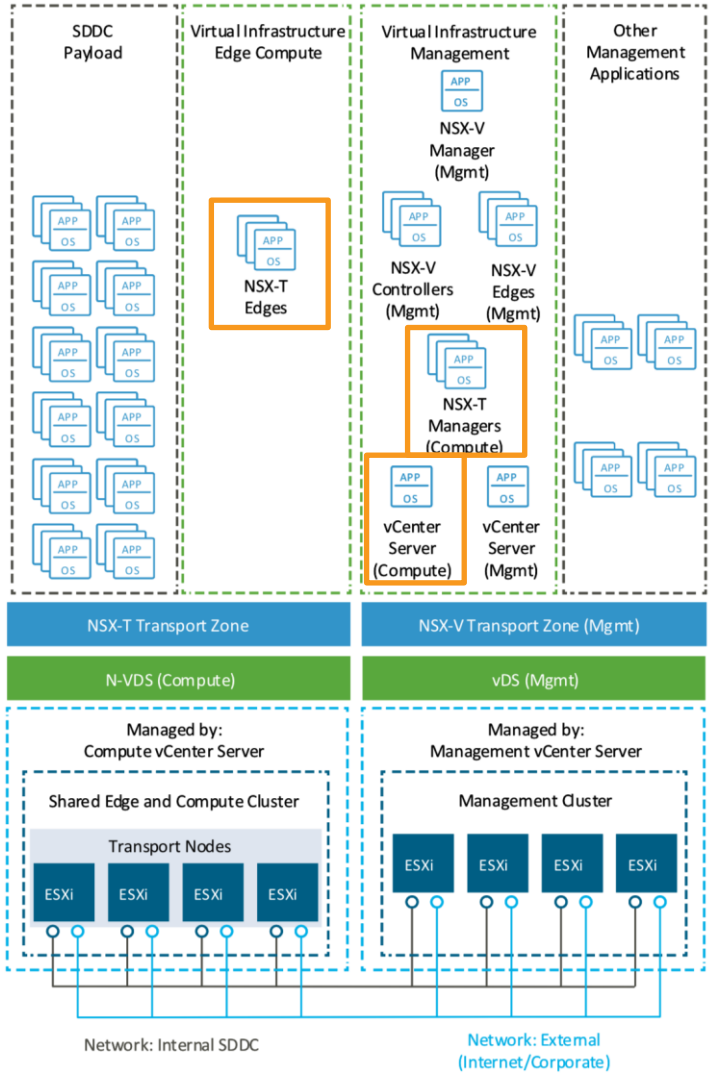
Create new Network Pools within SDDC Manager when new VLANs are required

Configure NSX Networking and Security Policies to your own requirements post deployment



NSX-V and NSX-T Architecture within VMware Cloud Foundation

High Level Design



Management Domain

- Serviced by NSX-V today
- Uses universal DLR to be multi-region and multi-availability zone ready
- NSX Load Balancers for vRealize Suite and PSC requirements

Compute Workload Domains

- NSX-T Manager/Controller cluster deployed in Management domain with the first NSX-T Compute WLD
- First cluster in the Compute WLD runs the NSX-T edge node VMs
- SDDC workload is deployed either into the first cluster or additional clusters in the Compute WLD
- All additional compute WLDs using NSX-T leverage the existing Manager/Controller cluster and edge cluster(s)

Demo

VCF using VCF Lab Constructor (VLC)

VCF using VCF Lab Constructor

- Gather licenses. VMUG Advantage
- Define VLAN and IPs and decide what ESXi host(s) to deploy to.
- Setup deployment workstation
  - Cloud Builder
  - VLC configuration files
- Begin deployment
- Validate and Construct!
- Register VLC > tiny.cc/getVLC
- Download VLC > https://tiny.cc/getVLCBits
- Subscribe to Slack channel! > http://tiny.cc/getVLCSlack

This content available at:

- https://github.com/craigeherring/

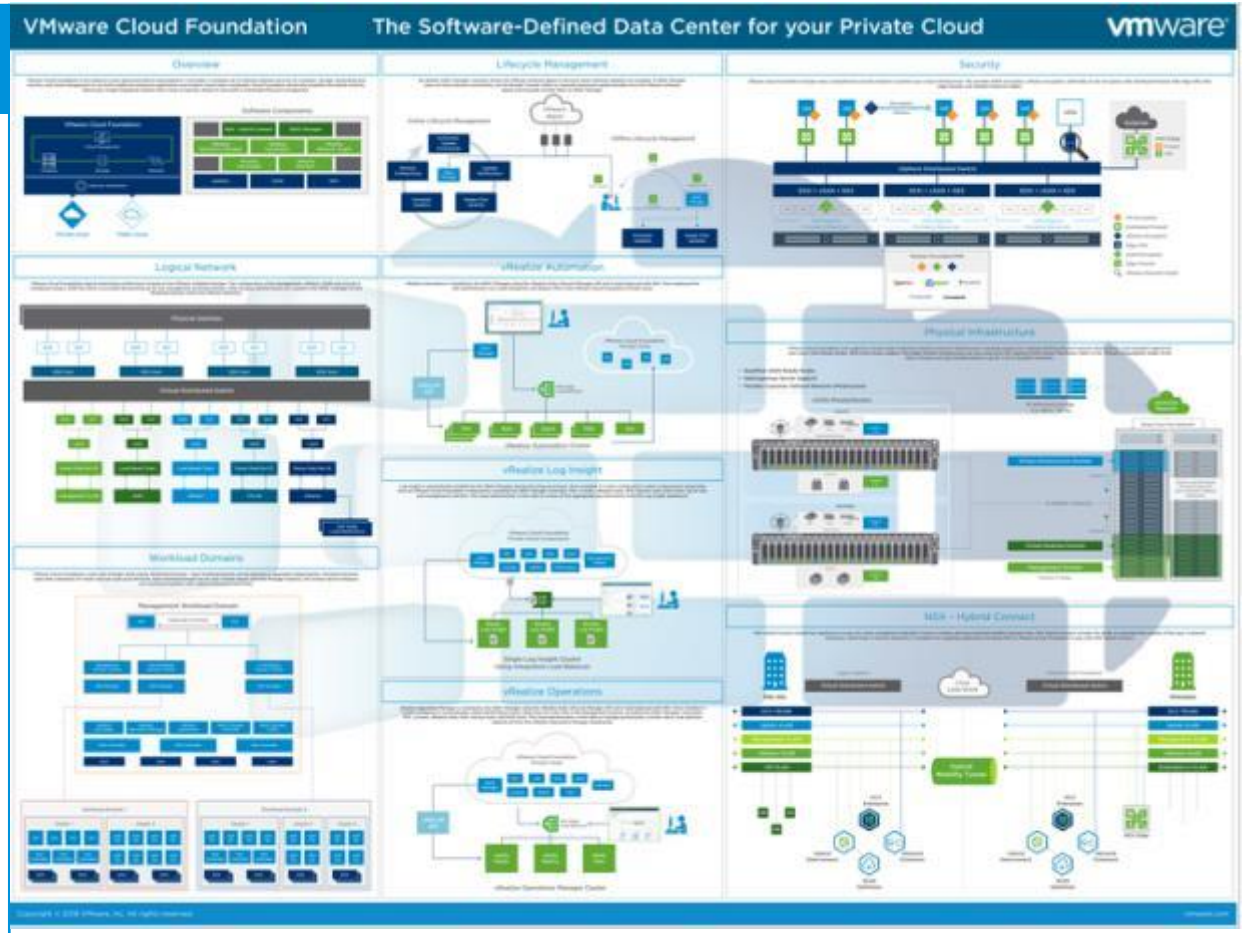
Resources

Links

VMware Cloud Foundation

Updated for VCF 3.9

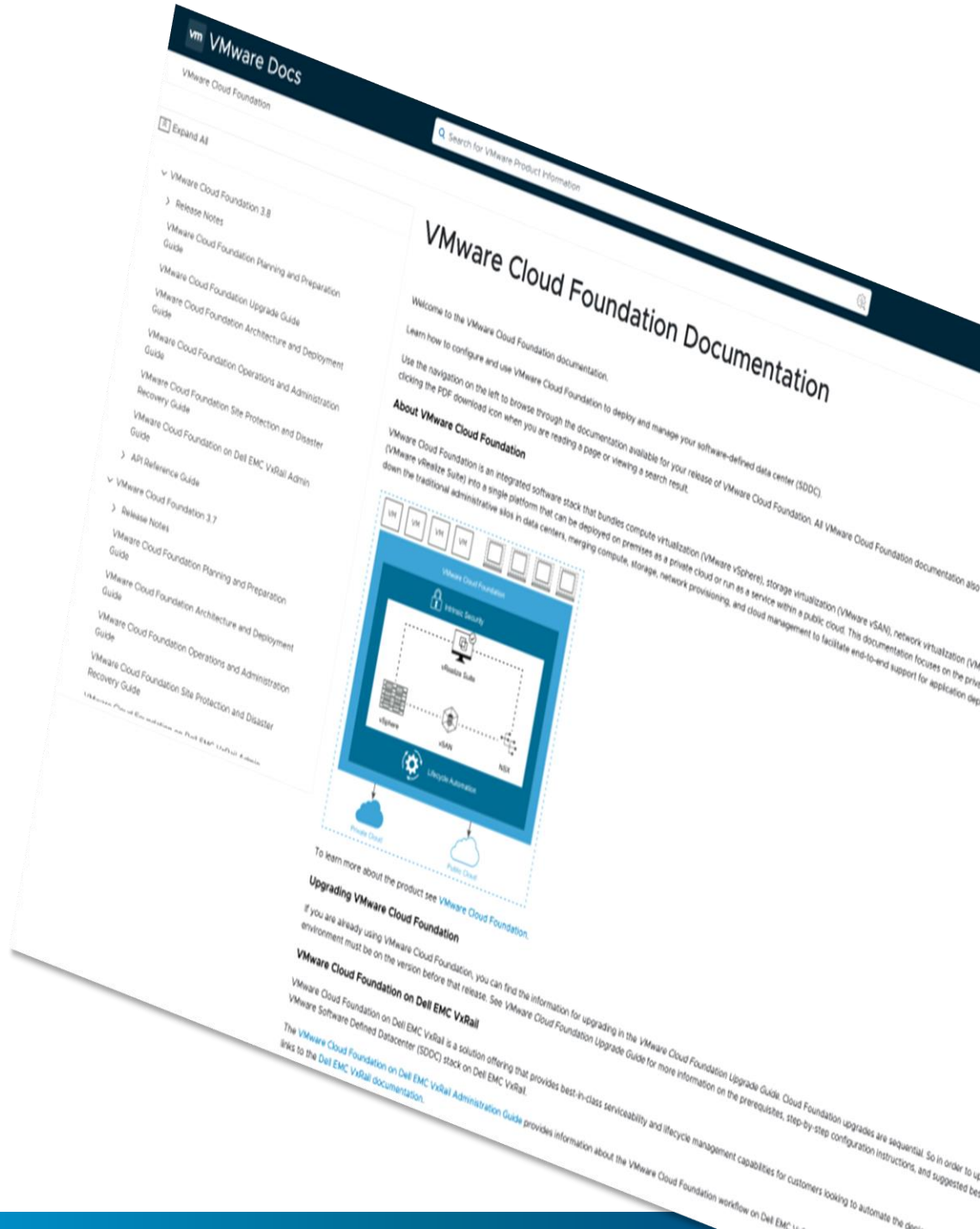
Resource	URL
Product Page	vmware.com/go/cloudfoundation
Documentation	vmware.com/go/cloudfoundation-docs
Poster	vmware.com/go/cloudfoundation-poster
Blog	blogs.vmware.com/cloud-foundation
HOL	vmware.com/go/vcfhol
Community	vmware.com/go/cloudfoundation-community
FAQ	vmware.com/go/cloudfoundation-faq
Twitter	@vmwarevcf
YouTube	youtube.com/c/VMwareCloudFoundation



Cloud Foundation Documentation

Detailed Documentation for every VCF version

- Link https://docs.vmware.com/en/VMware-Cloud-Foundation/index.html
- Documentation Includes:
  - Release Notes
  - Planning and Preparation Guide
    - Includes min hardware requirements
    - Includes capacity planning guidelines
  - Upgrade Guide
  - Architecture and Deployment Guide
    - Includes deployment parameter sheet instructions
  - Operations and Administration Guide
  - API Reference Guide
- vSAN Sizer Tool: https://vsansizer.vmware.com



Flexible Workload Domain Licensing

Use editions as needed by use cases

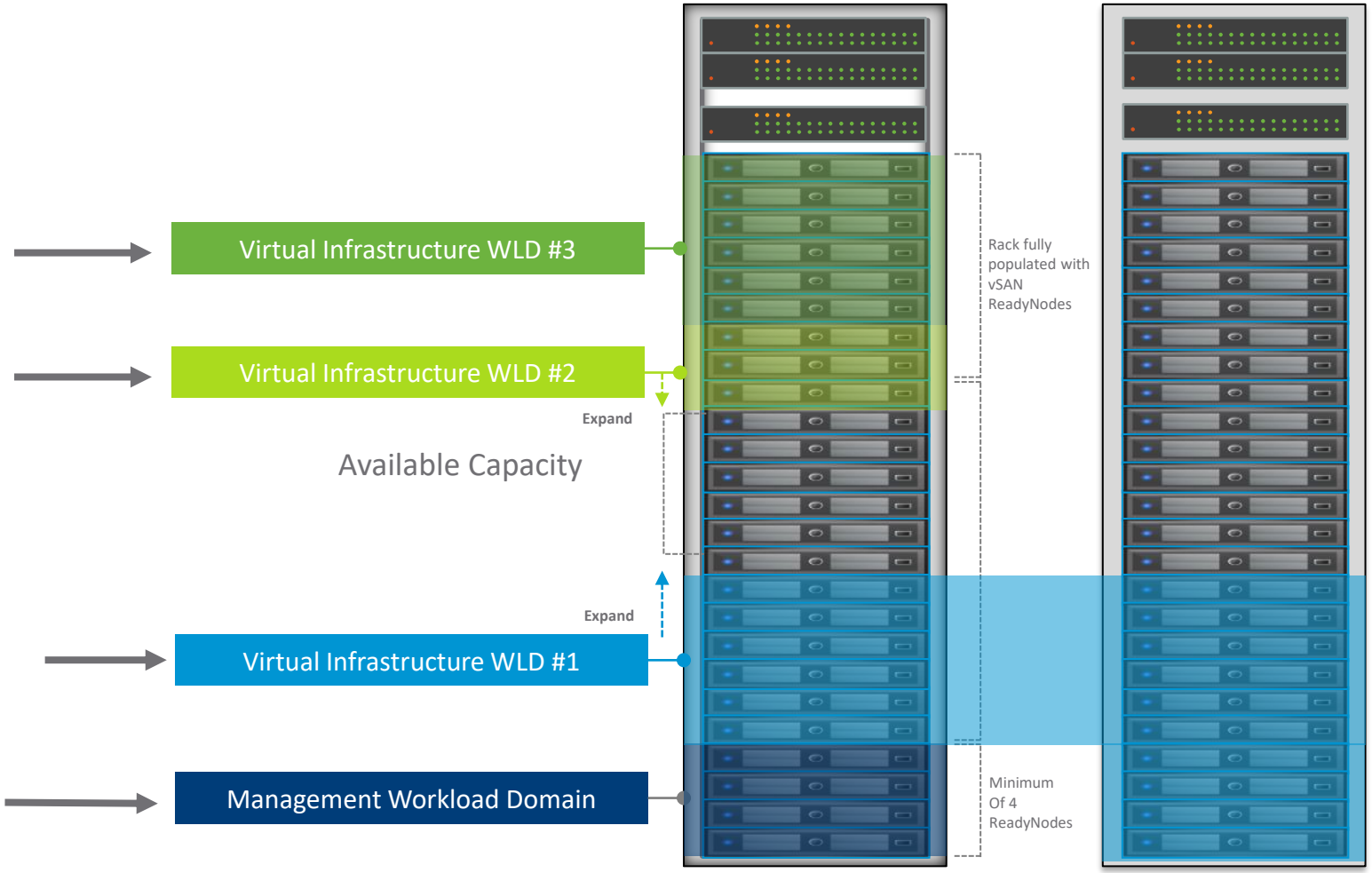
Examples of different SKUs per workload domain:

12 CPUs **Advanced** Edition

6 CPUs **Platinum** Edition

32 CPUs **Enterprise** Edition

8 CPUs **Standard** Edition



Thank You