

The background features a vibrant, abstract design. On the left, there are horizontal, wavy bands of color in shades of red, orange, yellow, and green. On the right, a bright white light source emits a series of colorful rays in shades of blue, cyan, and yellow, creating a sunburst effect.

cisco *Live!*

Let's go

#CiscoLiveAPJC



The bridge to possible

Best Practices for Integrating UCS X-Series with VMware Cloud Foundation

Integrating Cisco Converged Infrastructure as a VCF
Workload Domain

Pablo Noia – Technical Solutions Architect
BRKCOM-2009

CISCO *Live!*

#CiscoLiveAPJC

Cisco Webex App

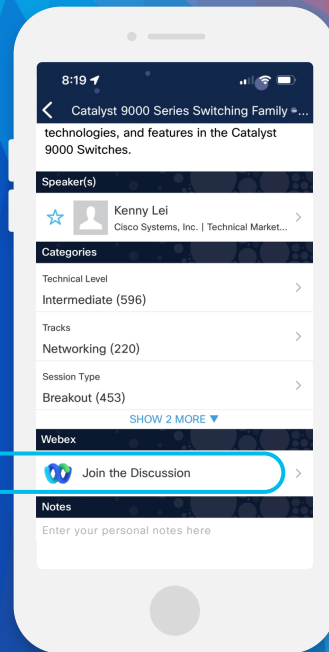
Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until December 22, 2023.

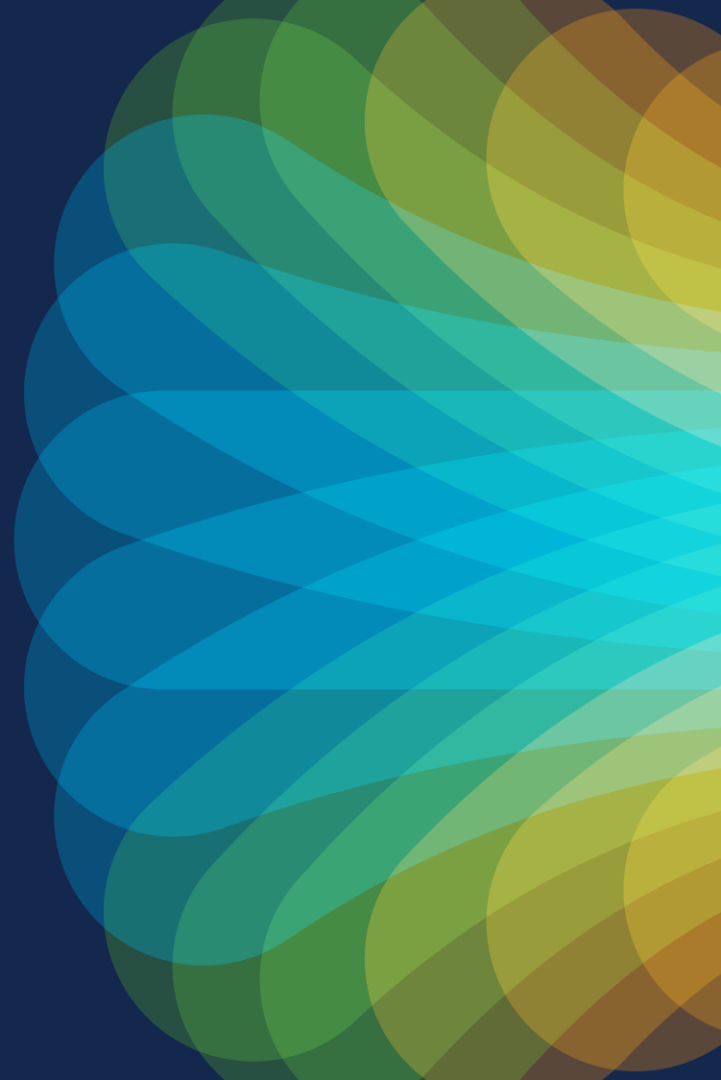


<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCOM-2009>

Agenda

- VMware Cloud Foundation (VCF)
- Cisco Converged Infrastructure (CI) Solutions
- Integrating Cisco CI Solutions with VCF
- Deployment Details and Automation
- Key Takeaways

VMware Cloud Foundation



VMware Cloud Foundation is an integrated software platform incorporating a comprehensive range of software defined services into a single solution.

VMware Cloud Foundation 4.5

An integrated hybrid-cloud virtualisation platform



VMware Cloud Builder Appliance



Planning and Preparation Workbook



VMware Software Defined Data Center Manager (SDDC)



VMware vCenter



VMware NSX



VMware ESXi Hypervisor



VMware vRealize Suite Lifecycle Manager

VMware Cloud Foundation 4.5

An integrated hybrid-cloud virtualisation platform



VMware Cloud Builder Appliance



Planning and Preparation Workbook



VMware Software Defined Data Center Manager (SDDC)



VMware vCenter



VMware NSX



VMware ESXi Hypervisor



VMware **Aria** Suite Lifecycle Manager

VMware Cloud Foundation Components

How they come together...

VMware Cloud Foundation Components

How they come together...



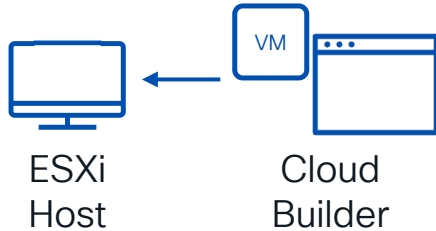
Cloud
Builder



Planning and
Preparation
Workbook

VMware Cloud Foundation Components

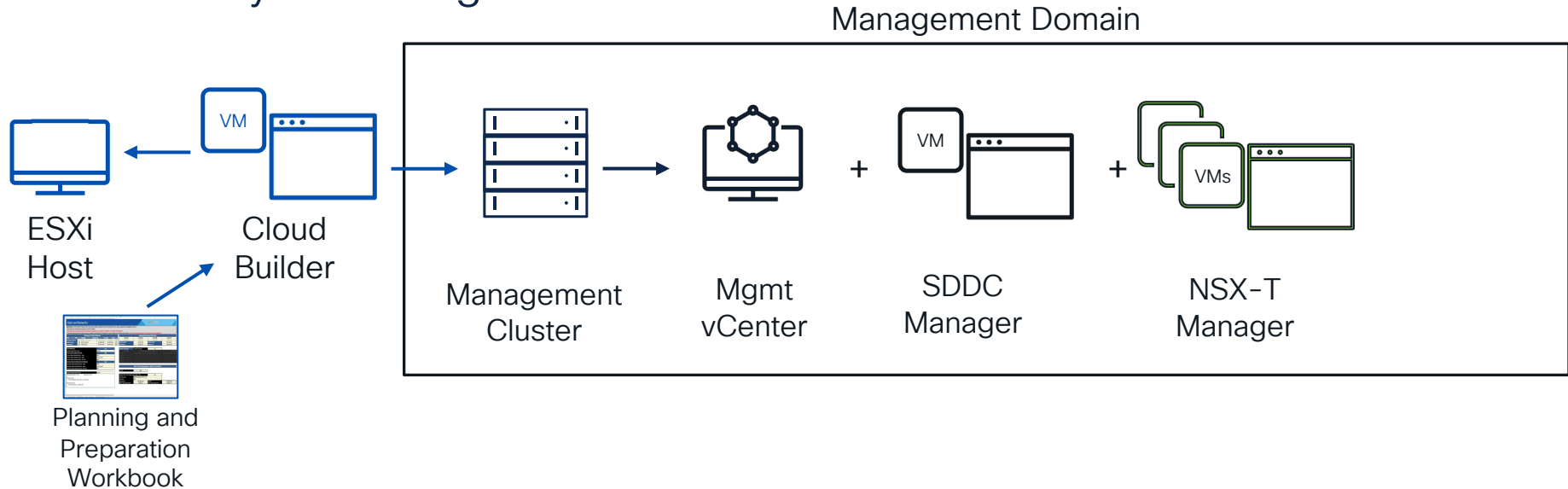
How they come together...



Planning and
Preparation
Workbook

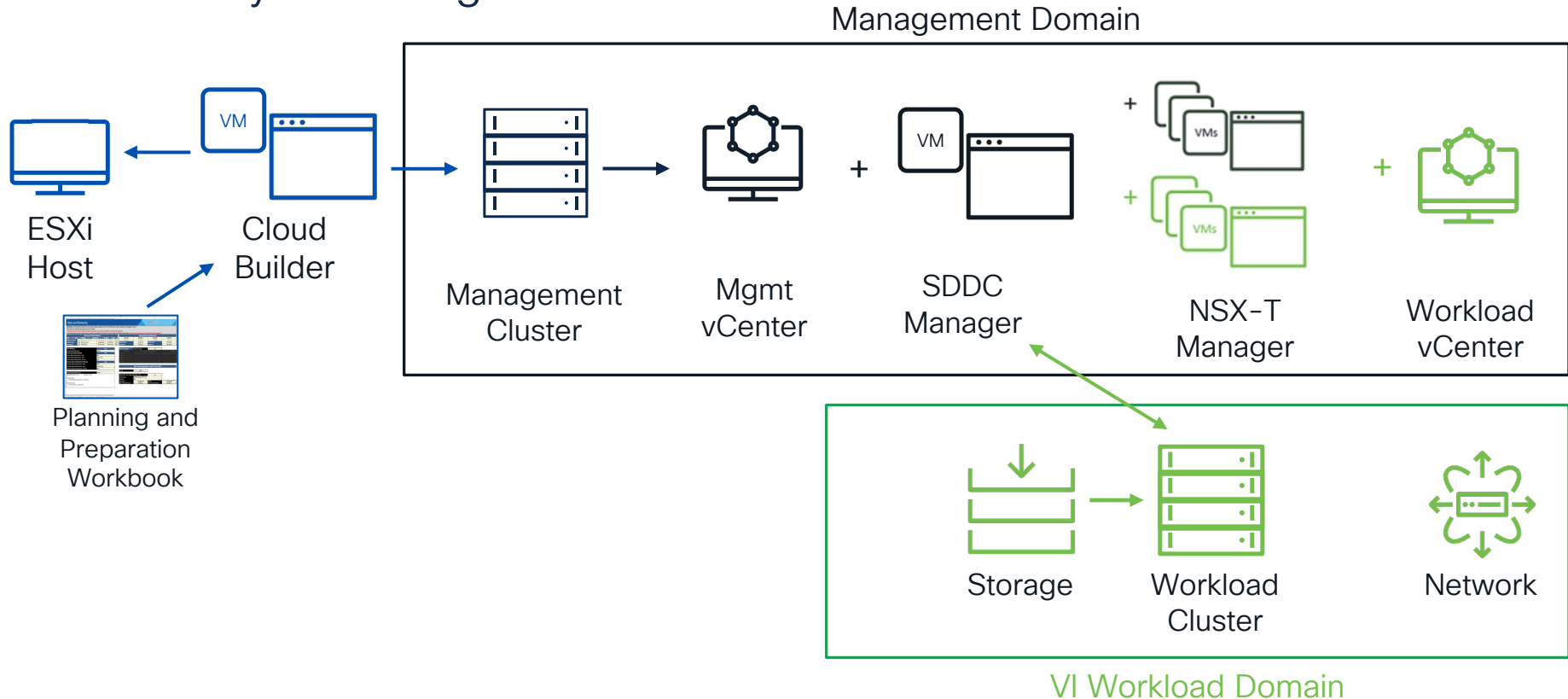
VMware Cloud Foundation Components

How they come together...



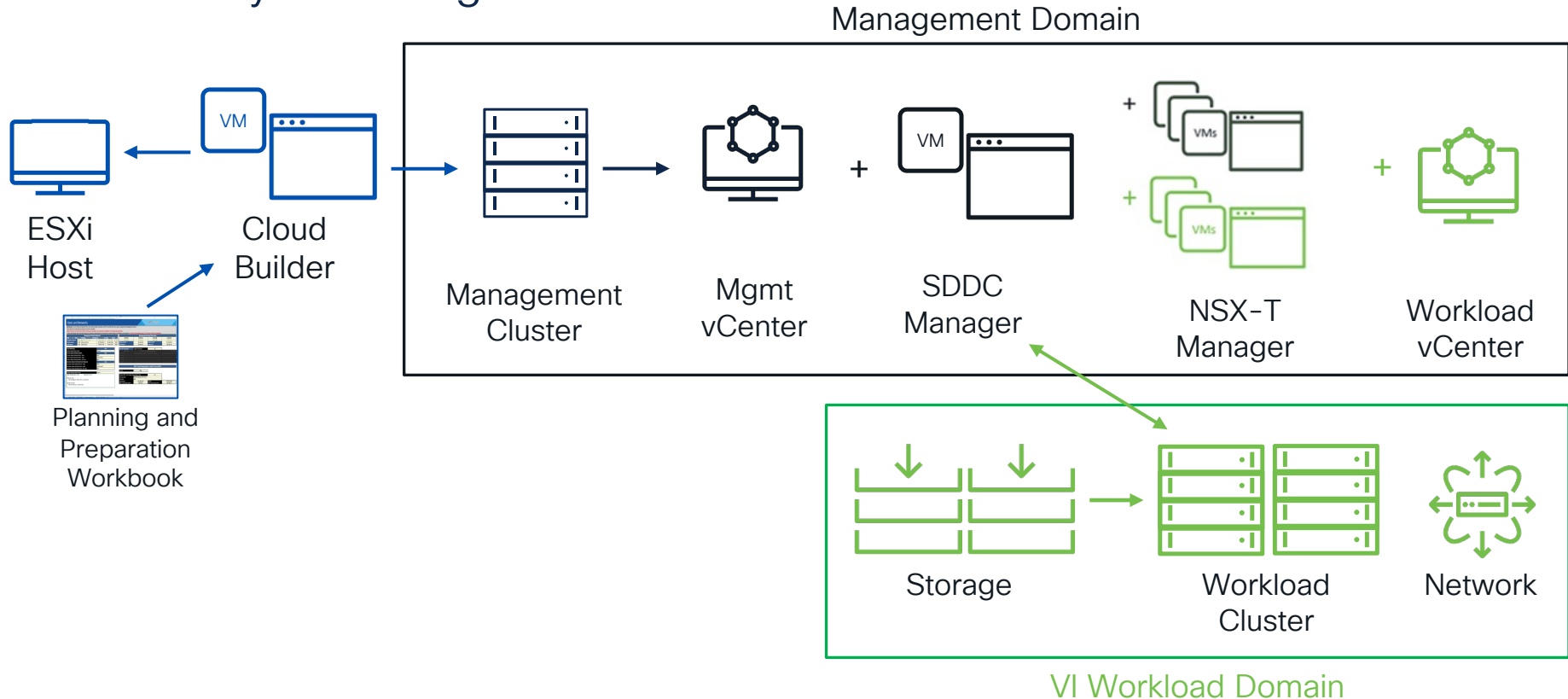
VMware Cloud Foundation Components

How they come together...



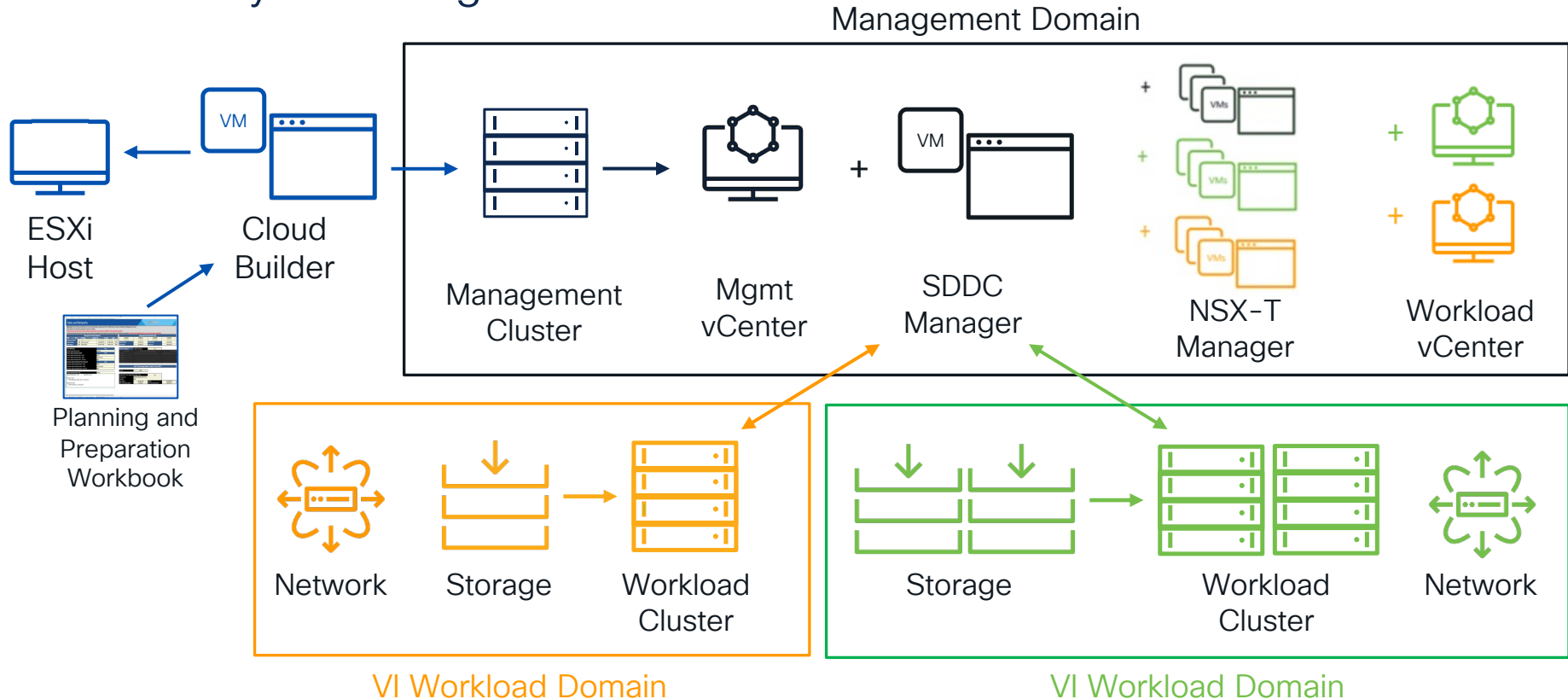
VMware Cloud Foundation Components

How they come together...



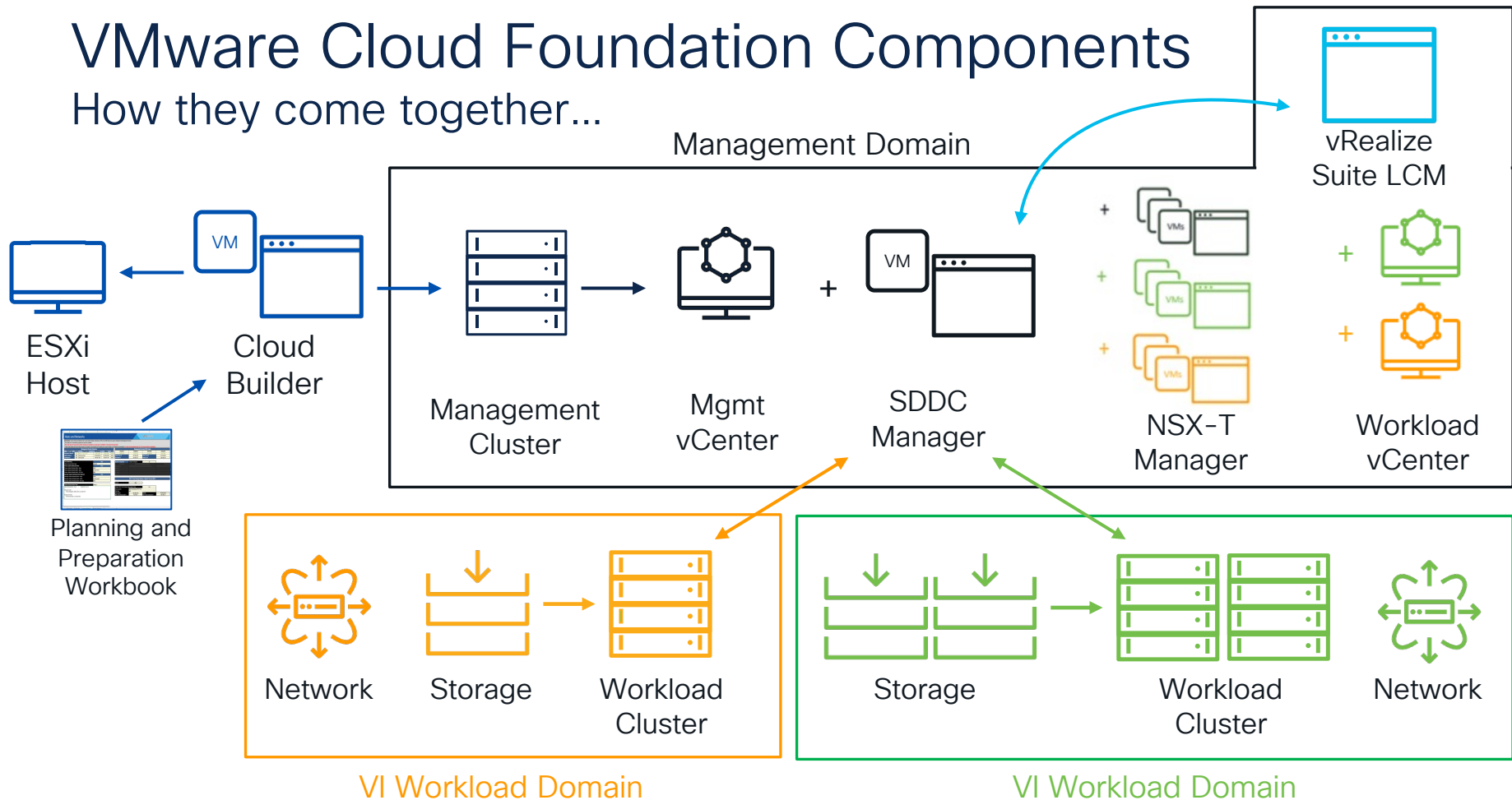
VMware Cloud Foundation Components

How they come together...



VMware Cloud Foundation Components

How they come together...

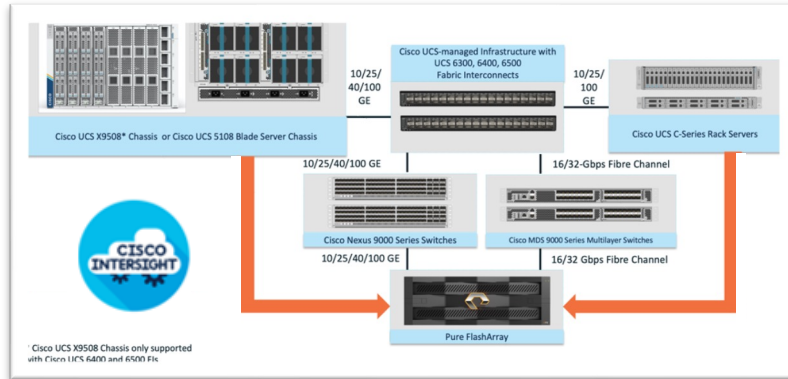


Cisco Converged Infrastructure Solutions

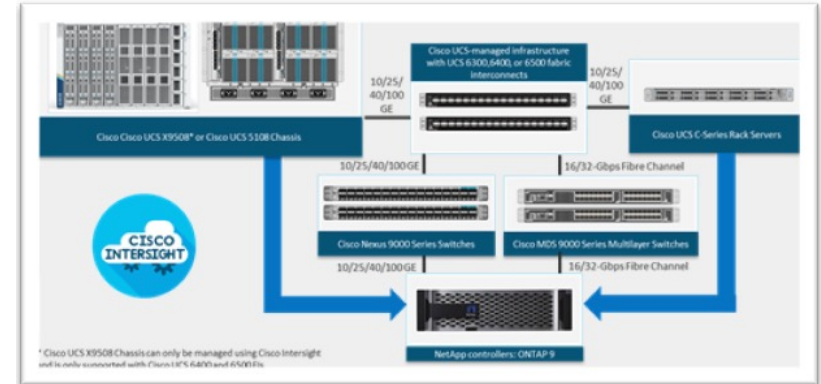
Cisco FlashStack and FlexPod Solutions

Product Overview

Cisco FlashStack Converged Infrastructure



Cisco FlexPod Converged Infrastructure



- Cisco UCS X-Series Compute, Cisco UCS Fabric Interconnects, Cisco InterSight.
- Cisco Nexus 9000 Data Centre switches, Cisco MDS Fibre Channel switches.
- Pure Storage Flash Arrays (FlashStack) or NetApp All Flash Arrays (FlexPod).

Benefits of Cisco Converged Infrastructure

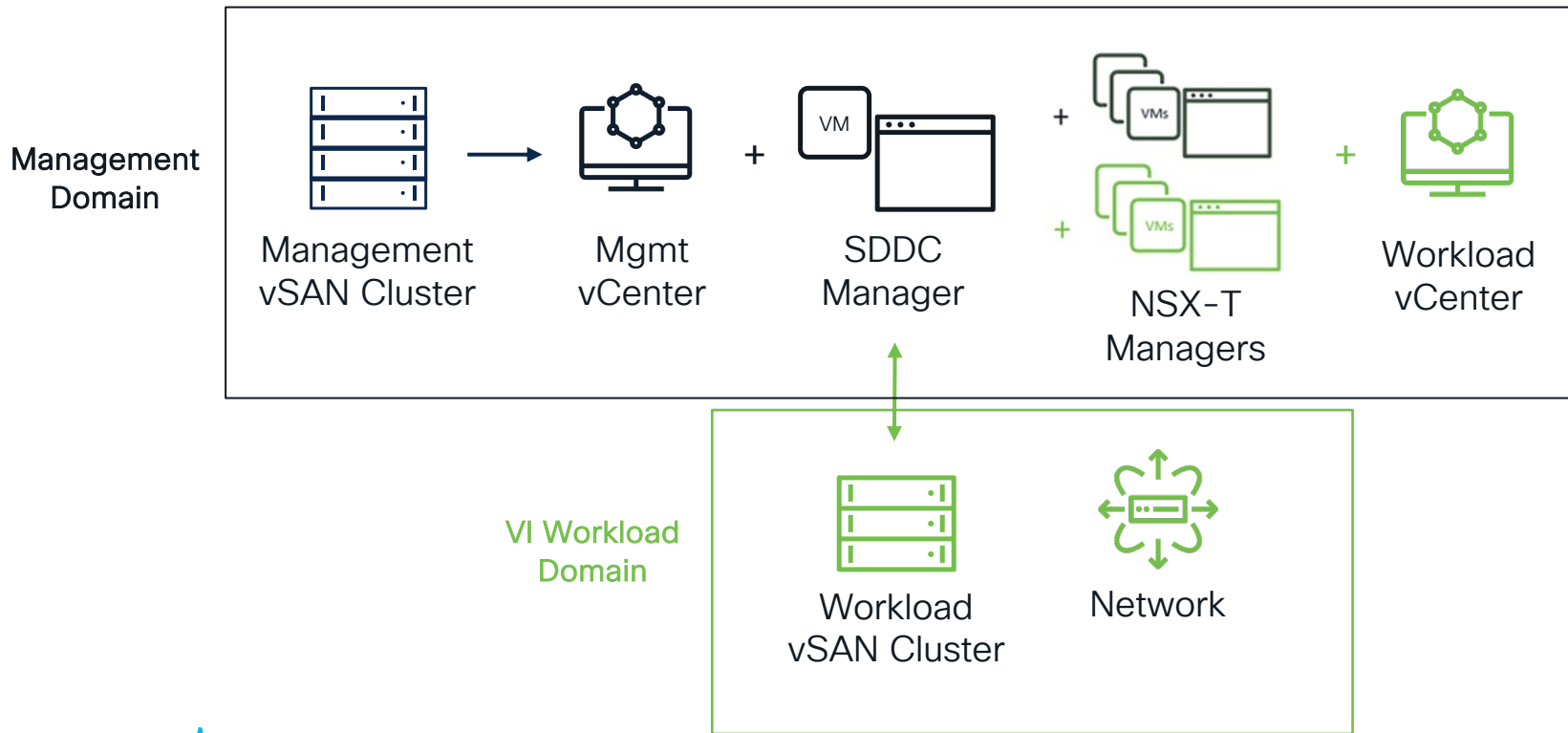


- Integrated but flexible solution Co-Developed, Co-Engineered by Cisco and Technology Partners.
- Cisco Post-Sale technical support for the entire technology stack.
- CI Solution validated for use with VMware vSphere suite.
- Leverage and take advantage of the CI CVD automation offerings.
- Delivers better predictive application performance for the best user experience from your mission critical applications.

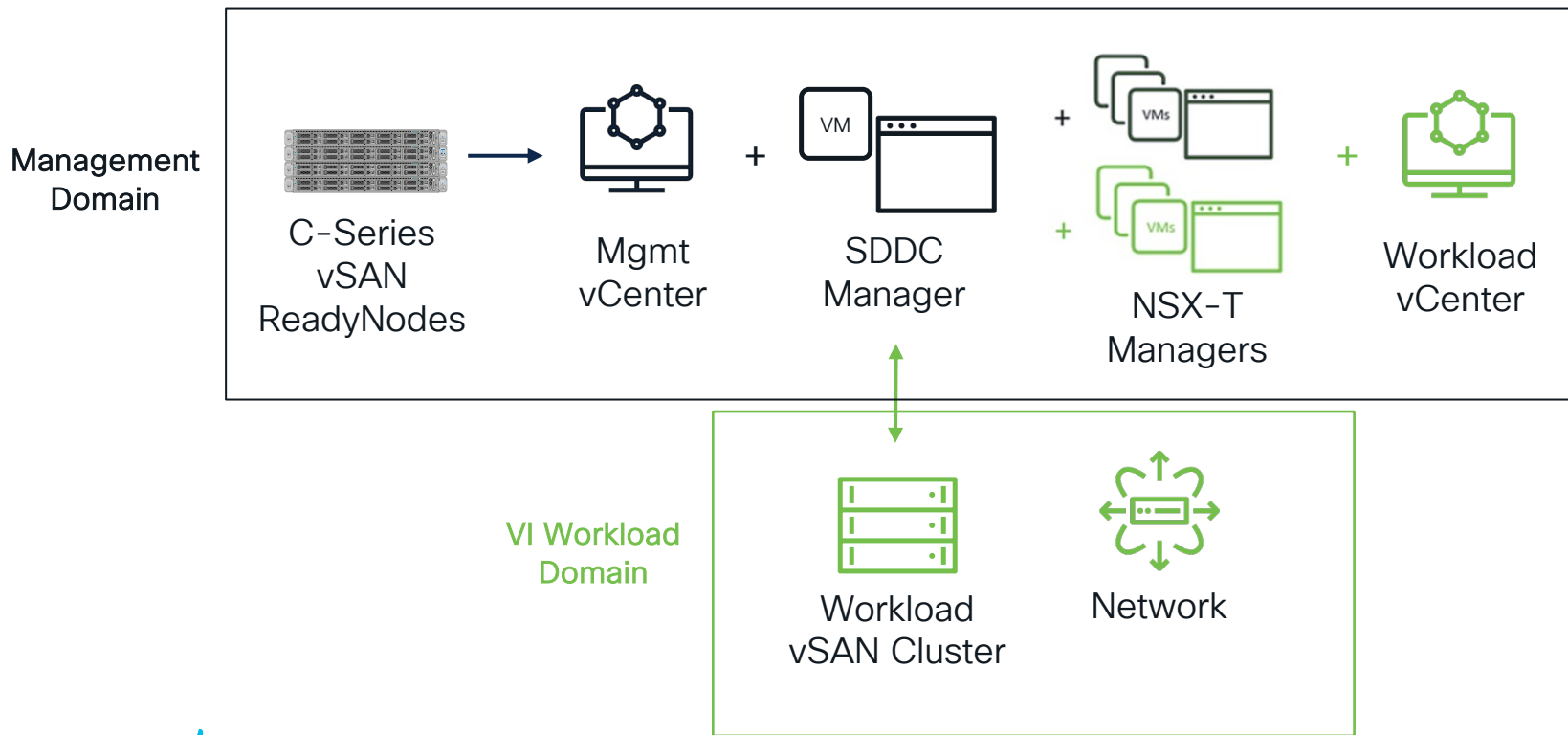


Integrating Cisco CI Solutions with VCF

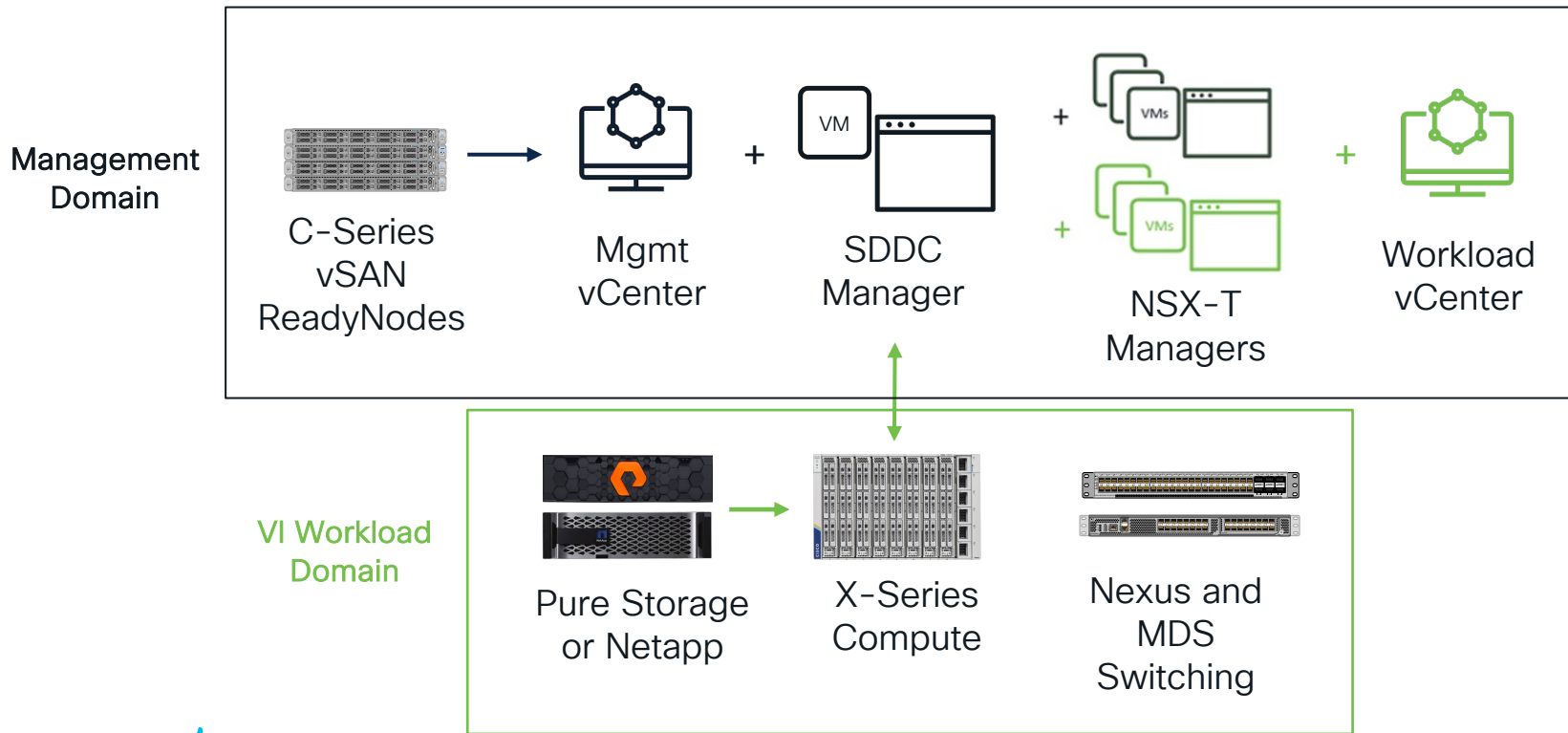
VCF Standard Architecture Environment



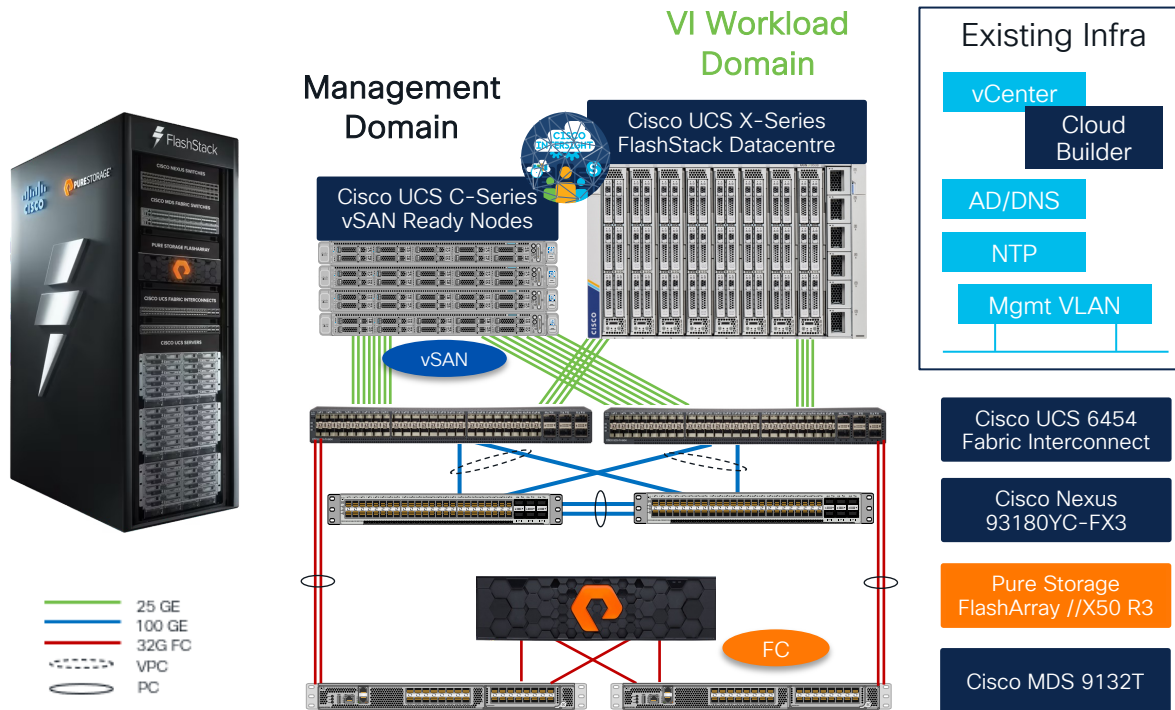
VCF Converged Infrastructure CVDs



VCF Converged Infrastructure CVDs

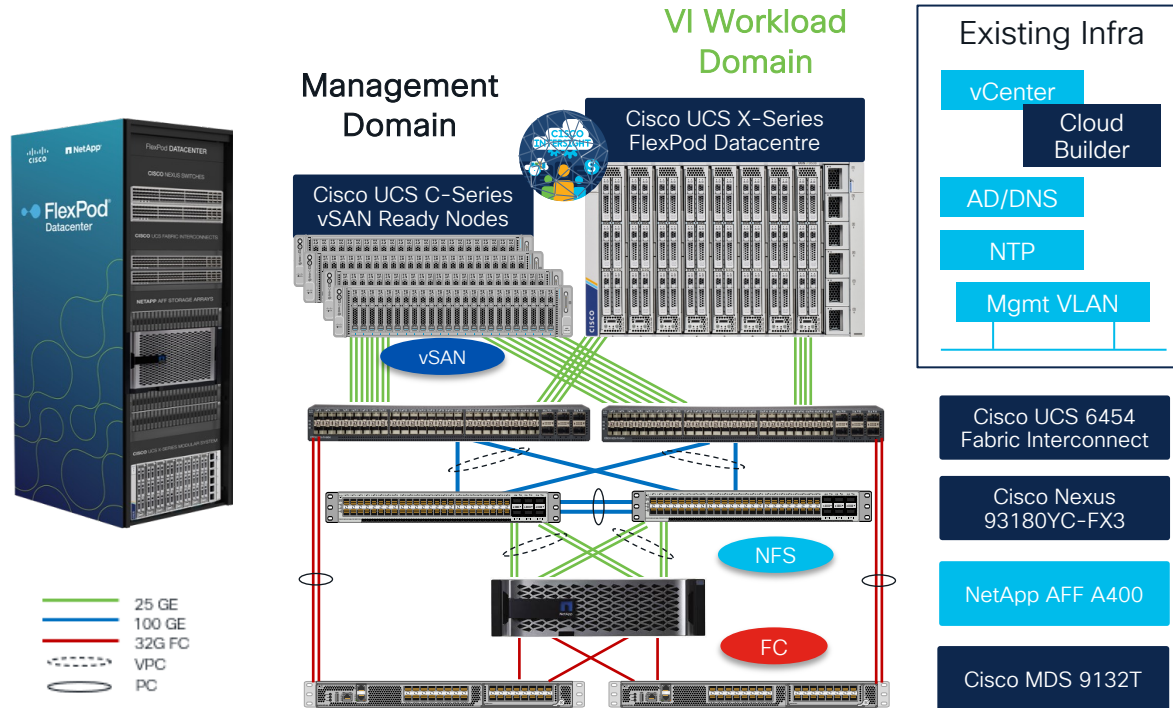


FlashStack as a Workload Domain for VMware Cloud Foundation CVD



- Management domain is hosted on four vSAN nodes.
- X-Series Compute Nodes boot from SAN via Fibre Channel for true stateless compute; these compute nodes host the Workload Domains.
- **FC** is used as **Principal Storage** option for FlashStack.
- Additional storage options (FC, NFS, iSCSI or vVol) are available post domain-setup.

FlexPod as a Workload Domain for VMware Cloud Foundation CVD



- Management domain is hosted on four vSAN nodes.
- X-Series Compute Nodes boot from SAN via Fibre Channel for true stateless compute; these compute nodes host the Workload Domains.
- **NFS** is used as **Principal Storage** option for FlexPod.
- Additional storage options (FC, NFS, iSCSI or vVol) are available post domain-setup.

Deployment Details and Automation



VMware Cloud Foundation Software Versioning

- FlashStack and FlexPod VCF CVDs are based on version 4.5.
- VCF follows strict version requirements for all of its software components.
- The Cloud Builder OVA includes the correct versions of VCenter, SDDC and NSX-T but does not include ESXi.
- Create a custom ESXi image based on version 7 Update 3g which is supported by VCF 4.5.
 - Need to add Cisco Ethernet and Fibre Channel Drivers to customer image
 - Instructions for creating the custom ISO image are included in the VCF FlashStack CVD.

VMware Cloud Foundation 4.5 Storage Types

- VCF has the concept of **Principal** and **Supplemental** storage.
- Management Domain can only use vSAN as **Principal** storage.
- VI Workload Domains can use FC, NFS 3.0, vVol (FC, iSCSI or NFS) and vSAN as the **Principal** storage types.
- Management and VI Workload domains support FC, NFS 3.0 or 4.1, vVol (FC, iSCSI or NFS) and iSCSI for **Supplemental** storage.

VMware Cloud Foundation 5.x Storage Types

- VCF has the concept of **Principal** and **Supplemental** storage.
- Management Domain can only use vSAN as **Principal** storage.
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- Management and VI Workload domains support FC, NFS 3.0 or 4.1, vVol (FC, iSCSI or NFS), iSCSI and **NVMe-oF/TCP** for **Supplemental** storage.

CISCO *Live!*

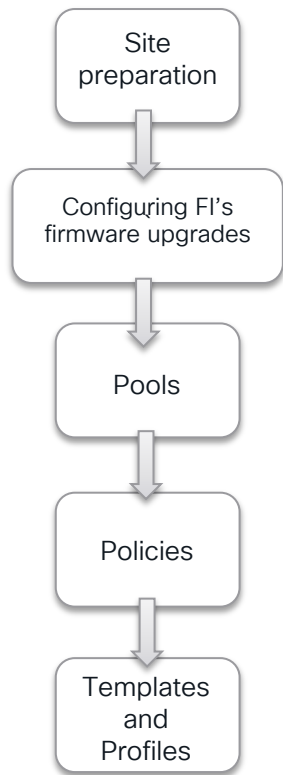


1

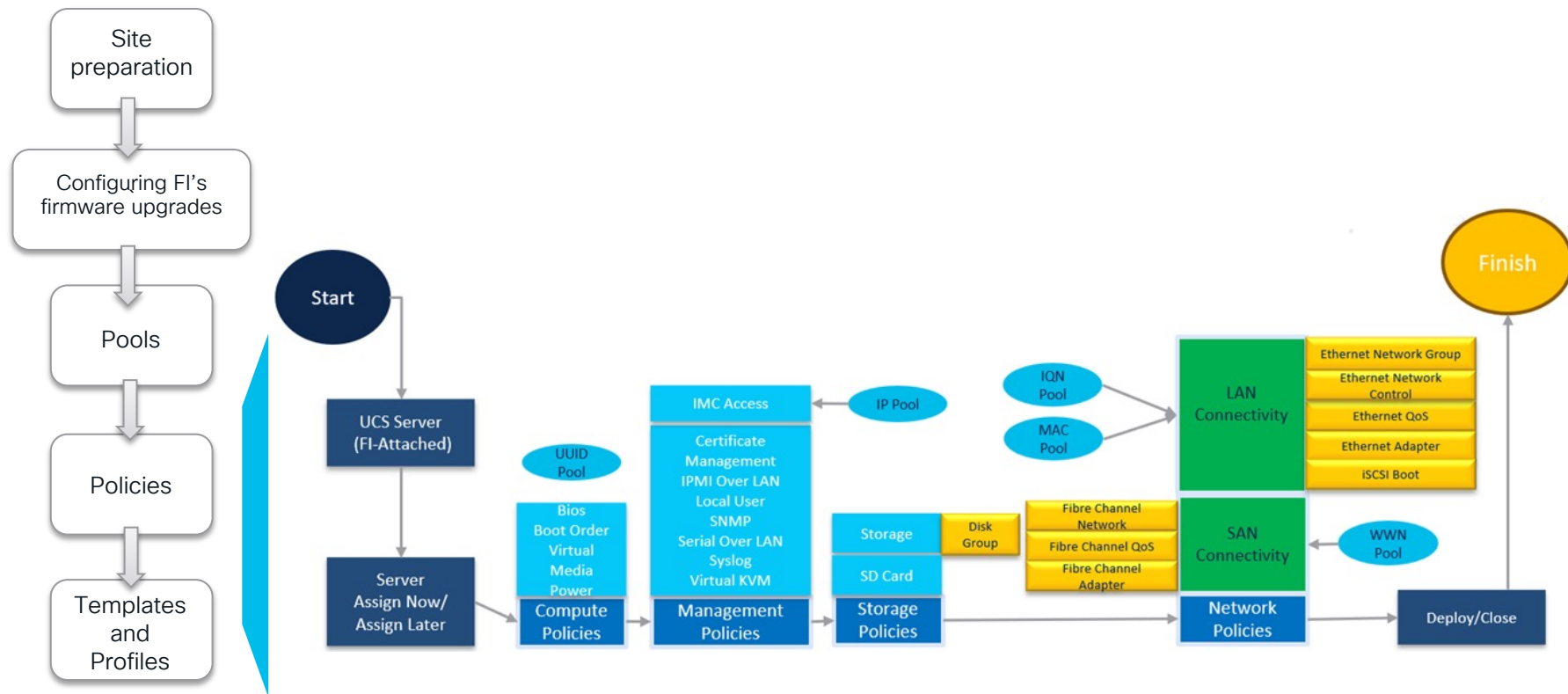
2

[illegible]

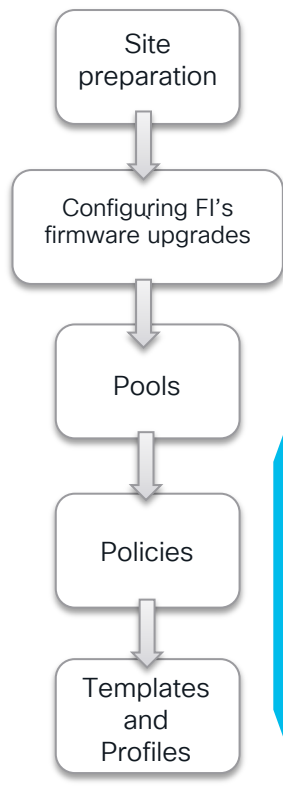
UCS X-Series **Deployment** Best Practice Workflow



UCS X-Series Configuration Best Practice Workflow

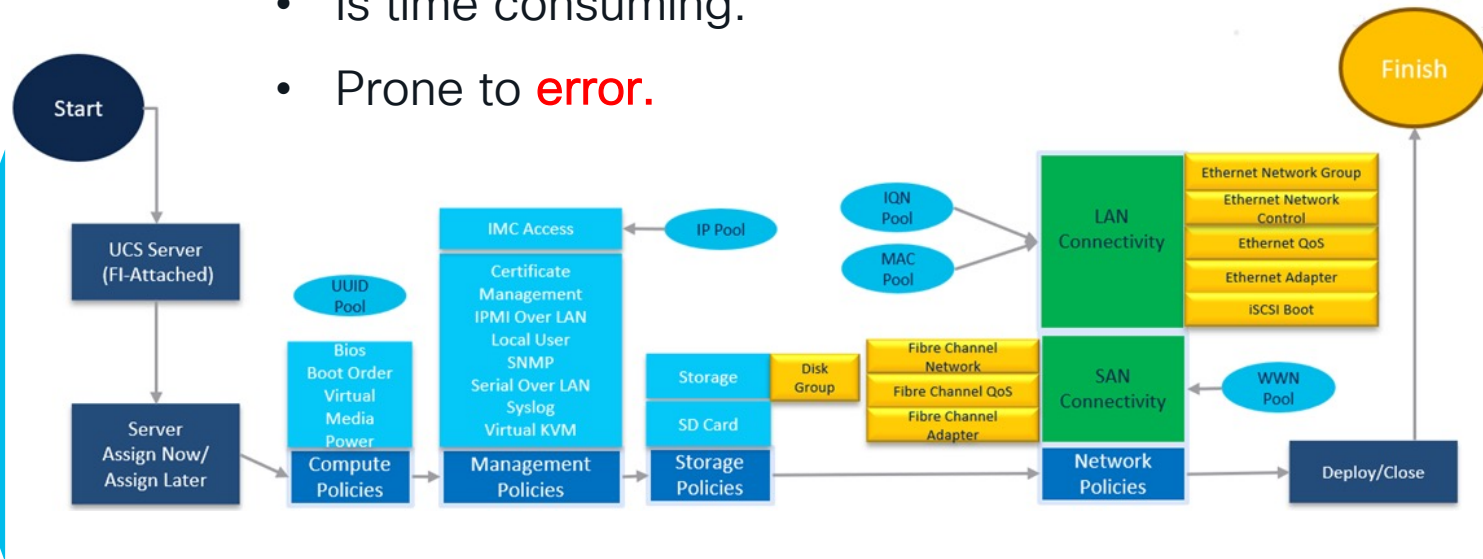


UCS X-Series Configuration Best Practice Workflow

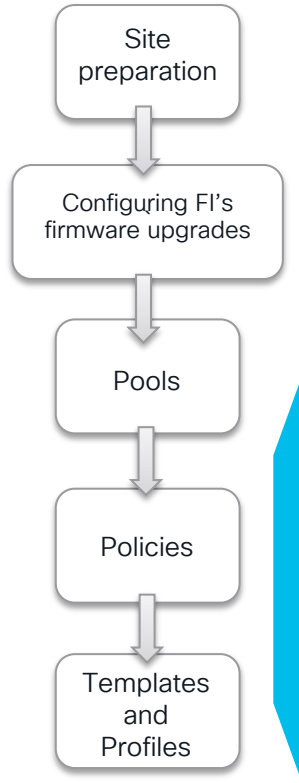


A traditional manual approach to configuring hardware

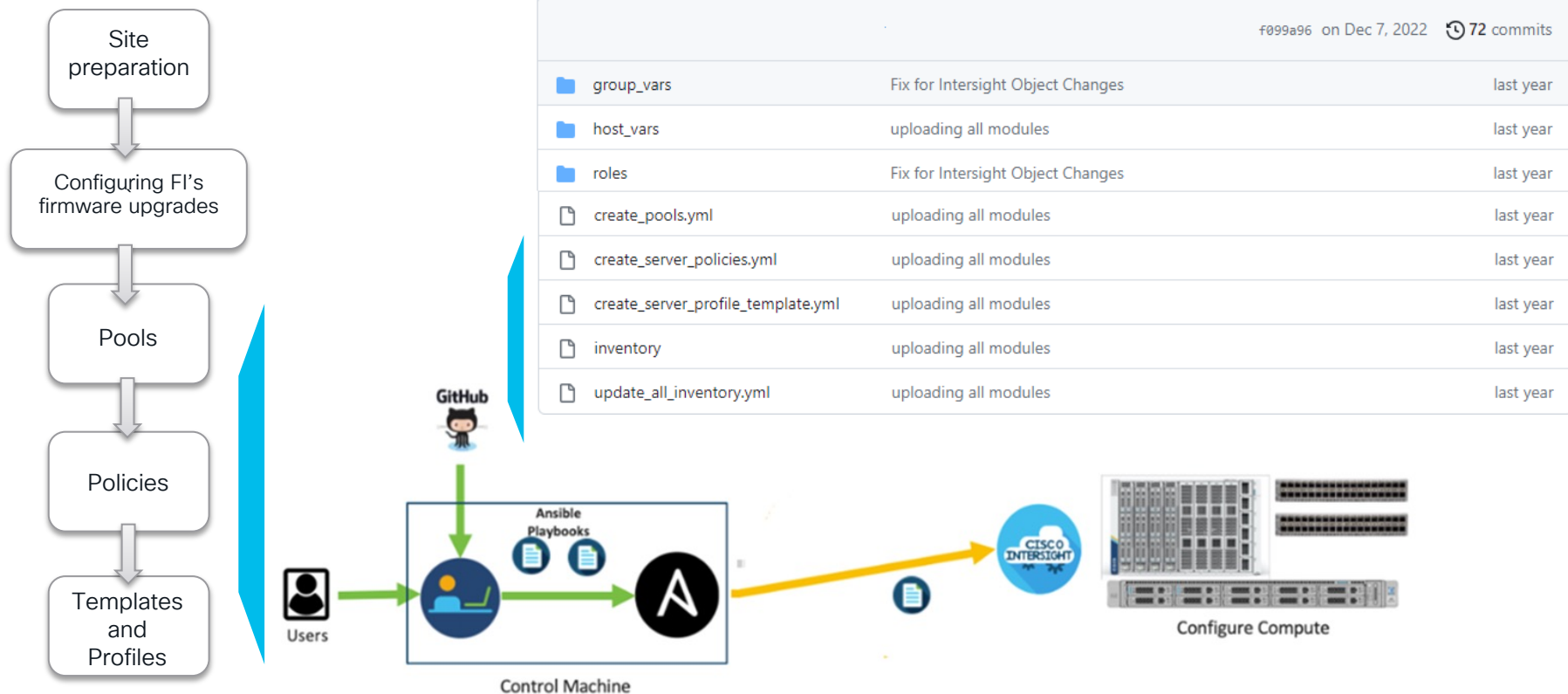
- Is time consuming.
- Prone to **error**.



UCS X-Series Configuration Best Practice Workflow

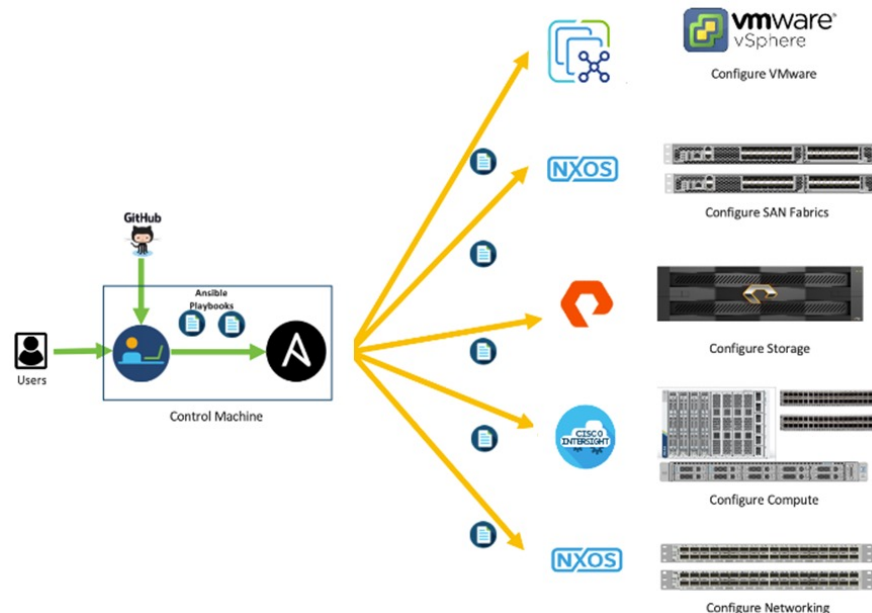


Power of the Playbook

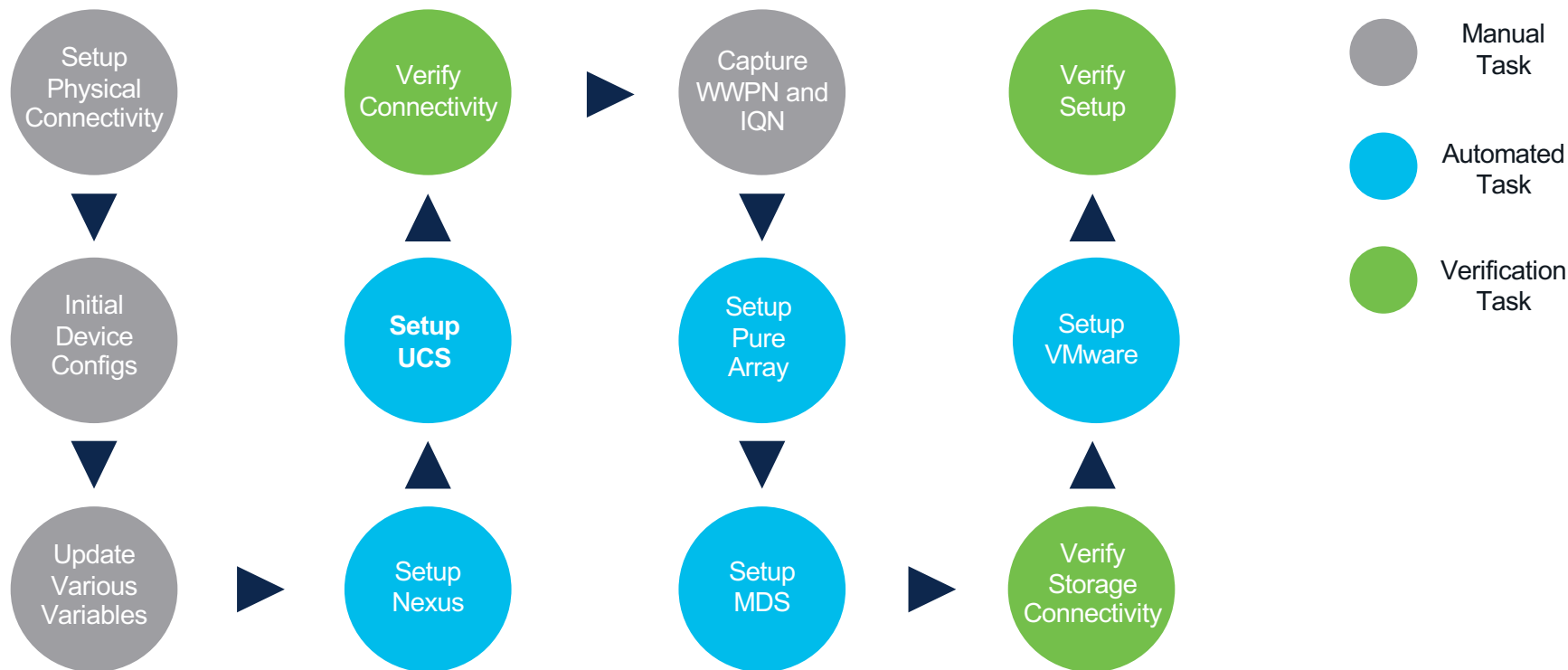


FlashStack VCF CVD Automation

 pkoppa Fix for Intersight Object Changes	#099a96 on Dec 7, 2022	 72 commits
 group_vars	Fix for Intersight Object Changes	last year
 host_vars	uploading all modules	last year
 roles	Fix for Intersight Object Changes	last year
 .gitignore	Ignore IDE files	last year
 LICENSE	uploading all modules	last year
 README.md	Update README.md	last year
 Setup_ESXi.yml	uploading all modules	last year
 Setup_MDS.yml	uploading all modules	last year
 Setup_Nexus.yml	uploading all modules	last year
 Setup_Pure.yml	uploading all modules	last year
 Setup_vCenter.yml	uploading all modules	last year
 create_pools.yml	uploading all modules	last year
 create_server_policies.yml	uploading all modules	last year
 create_server_profile_template.yml	uploading all modules	last year
 inventory	uploading all modules	last year
 update_all_inventory.yml	uploading all modules	last year



FlashStack VCF CVD Deployment Workflow



Getting Started...



ANSIBLE



GitHub



```
TASK [create_server_profile_template : Get IMC Access Policy Details] ***
ok: [localhost]

TASK [create_server_profile_template : Get Power Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get IPMI over LAN Policy Details]
ok: [localhost]

TASK [create_server_profile_template : Get Local User Policy Details] ***
ok: [localhost]

TASK [create_server_profile_template : Get KVM Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get Virtual Media Policy Details]
ok: [localhost]

TASK [create_server_profile_template : Get BIOS Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get RAID Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get Network Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get Storage Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get Security Policy Details] *****
ok: [localhost]

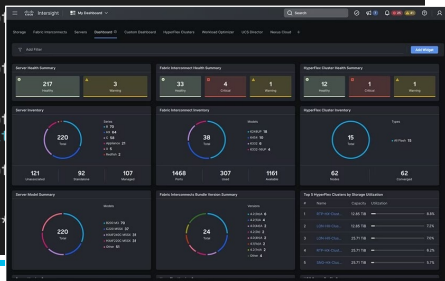
TASK [create_server_profile_template : Get System Policy Details] *****
ok: [localhost]

TASK [create_server_profile_template : Get Virtual Machine Policy Details]
ok: [localhost]

TASK [create_server_profile_template : Get Virtual Machine Policy Details]
ok: [localhost]

TASK [create_server_profile_template : Get Virtual Machine Policy Details]
ok: [localhost]

PLAY RECAP *****
localhost
```



Physically connect, initialise and configure the hardware.

1

Claim Fabric Interconnects and create the UCS Domain in Intersight.

2

Create Intersight API keys in preparation to run the Ansible playbooks.

3

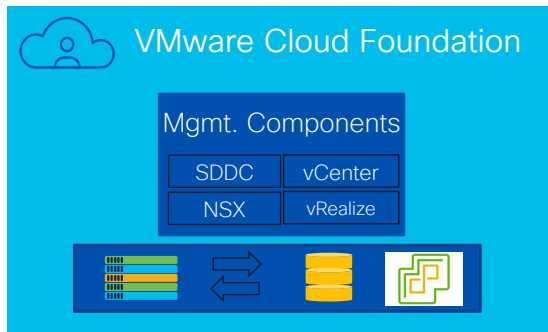
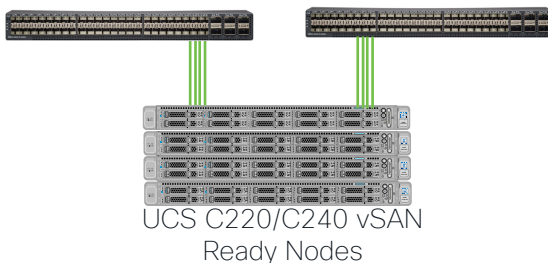
Fill in your environment variable, run the Playbooks to create compute service profile templates.

4

Use these templates to instantiate the Management And VI Workload Domain physical hosts.

5

Deploying the VCF Management Domain...



Create customized ESXi ISO image with the Cisco nenic and nfnic drivers.

1

Install and configure ESXi on C-Series Rackmount servers; run Ansible Post-Installation playbook.

2

Complete the Planning and Preparation Workbook.

3

Deploy Cloud Builder Appliance.

4

Start VCF Management Domain deployment..

5

VMware Cloud Builder Spreadsheet

A	B	C	D	E	F	G	H	I	J	K	L
<h2>Hosts and Networks</h2> 											
<p>Instructions: Use the <i>Hosts and Networks</i> tab to input network details, hostname and IPs for the ESXi hosts to be used to implement the Management Domain.</p> <ul style="list-style-type: none">- Grey cells are for information purposes and cannot be modified.- Red cells mean the input data is either missing or some type of validation of the input data has failed.- Yellow cells indicate input data, default values are included to help illustrate the formatting to be used and align to the VMware documentation. If a value is not required enter 'n/a', if it turns red then its mandatory.											
Management Domain Networks						Management Domain ESXi Hosts					
Network Type	VLAN #	Portgroup Name	CIDR Notation	Gateway	MTU	vcf-esxi-01	vcf-esxi-02	vcf-esxi-03	vcf-esxi-04		
Management Network	1011	MGMT_10_101_1_NET	10.101.1.0/24	10.101.1.254	1500	10.101.1.81	10.101.1.82	10.101.1.83	10.101.1.84		
vMotion Network	3030	vds01-pg-vmotion	192.168.30.0/24	192.168.30.254	9000	vMotion Start IP	192.168.30.81	vMotion End IP	192.168.30.90		
vSAN Network	3001	vds01-pg-vsan	192.168.1.0/24	192.168.1.254	9000	vSAN Start IP	192.168.1.81	vSAN End IP	192.168.1.90		
Virtual Networking			Value								
vSphere Standard Switch Name			vSwitch0								
Primary vSphere Distributed Switch			Value								
Primary vSphere Distributed Switch - Name			vds01								
Primary vSphere Distributed Switch - pNICs			vmnic0,vmnic1								
Primary vSphere Distributed Switch - MTU Size			9000								
Secondary vSphere Distributed Switch (Optional)			Value								
Secondary vSphere Distributed Switch - Name			vds02								
Secondary vSphere Distributed Switch - pNICs			vmnic2,vmnic3								
Secondary vSphere Distributed Switch - MTU Size			9000								
vSphere Distributed Switch Profile			Profile-3								
vSphere Distributed Switch = Two (2) / Physical NICs = Four (4)											
Primary vDS - vds01											
- Traffic for Management, vMotion, vSAN - e.g. vmnic0,vmnic1											
Secondary vDS - vds02											
- Traffic for Host Overlay - e.g. vmnic2,vmnic3											
Security Thumbprints						Validate Thumbprints		No			
ESXi Hosts						SSH RSA Key Fingerprints (SHA256)		SSL Thumbprints			
Example Input						SHA256:RBA205XimupENSaoBcYzcc0aR9gWjlkY8Vqptub9w		27:09:80:C3:59:00:73:F0:80:93:15:36:7E			
vcf-esxi-01											
vcf-esxi-02											
vcf-esxi-03											
vcf-esxi-04											
NSX-T Host Overlay Network - Static IP Pool in NSX-T											
VLAN ID						3002					
Configure NSX-T Host Overlay Using a Static IP Pool						Yes					
Pool Description						ESXi Host Overlay TEP IP Pool					
Pool Name						tep01					
CIDR Notation						192.168.2.0/24		Gateway		192.168.2.254	
NSX-T Host Overlay Start IP						192.168.2.1		NSX-T Host Overlay End IP		192.168.2.10	

VCF Management Domain Deployment

 Cloud Builder™ ? admin

VMware Cloud Foundation

Cloud Builder will deploy your SDDC.

✓

✓

✓

✓

○

Select PlatformReview PrerequisitesPrepare ConfigurationValidate ConfigurationDeploy Cloud Foundation

✓ Deployment of VMware Cloud Foundation is successful.

[DOWNLOAD](#) [PRINT](#)

SDDC Bringup finished at 3/9/23, 8:01 PM. 0 tasks in progress

Status

Tasks	Start Time	End Time	Status
✓ Validate SSH/SSL Thumbprints			✓ Success
Generate Security Thumbprints Input Data	6:40:02 PM	6:40:02 PM	✓ Success
Validate Security Thumbprints	6:40:02 PM	6:40:02 PM	✓ Success
✓ Add Certificates in Trust-Store			✓ Success
Generate input for Trust Certificates	6:40:03 PM	6:40:03 PM	✓ Success
Trust Certificates	6:40:04 PM	6:40:04 PM	✓ Success
✓ Import SSH Keys			✓ Success
Generate input for Import SSH Keys	6:40:05 PM	6:40:08 PM	✓ Success

[BACK](#) [RETRY](#) [FINISH](#)

SDDC Manager Dashboard

vmw Cloud Foundation

⌂

?

administrator@vsphere.local

Dashboard

Solutions

Inventory

Workload Domains

Hosts

Lifecycle Managem...

Administration

Network Settings

Storage Settings

Licensing

Single Sign On

Proxy Settings

Online Depot

Composable Infrastruc...

vRealize Suite

Backup

VMware CEIP

BACK TO WORKLOAD DOMAINS

RTP-AA01

ACTIONS

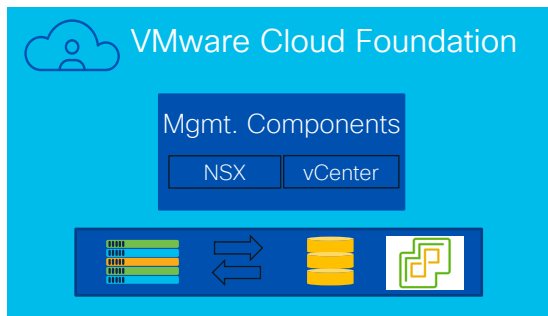
MANAGEMENT ACTIVE Version : 4.5.0.0

Summary Services Update/Patches Update History **Hosts** Clusters Edge Clusters Certificates

FQDN	Host IP	Network Pool	Configuration Status	Cluster	CPU Usage	Memory Usage	Storage Type	Data Store Type
vcf-esxi-01.vcf.local	10.101.1.81	np01	Active	VCf-Cluster	4%	25%	Hybrid	VSAN
vcf-esxi-02.vcf.local	10.101.1.82	np01	Active	VCf-Cluster	5%	26%	Hybrid	VSAN
vcf-esxi-03.vcf.local	10.101.1.83	np01	Active	VCf-Cluster	6%	21%	Hybrid	VSAN
vcf-esxi-04.vcf.local	10.101.1.84	np01	Active	VCf-Cluster	3%	14%	Hybrid	VSAN

Hosts 1 - 4 of 4

Deploying the VCF VI Workload Domain



or



1 Configure boot LUNs, principal storage volumes, datastore and FC zoning.

2 Install and configure ESXi on the UCS X-Series compute nodes; run Ansible Post-Installation playbooks.

3 Commission and add ESXi hosts to SDDC.

4 Create a JSON parameter file for creating two vDS and the appropriate storage config.

5 Use VCF API to deploy the VI Workload Domain.

Commission New Hosts

Workload Domain hosts are commissioned using VMware SDDC Manager.

Hosts

Capacity Utilization across Hosts

CPU 315.2 GHz Total 10.54 GHz Used 304.66 GHz Free

Memory 149 TB Total 0.22 TB Used 1.27 TB Free

Hosts 4 Total 4 Used 0 Unallocated

COMMISSION HOSTS

Lifecycle Management

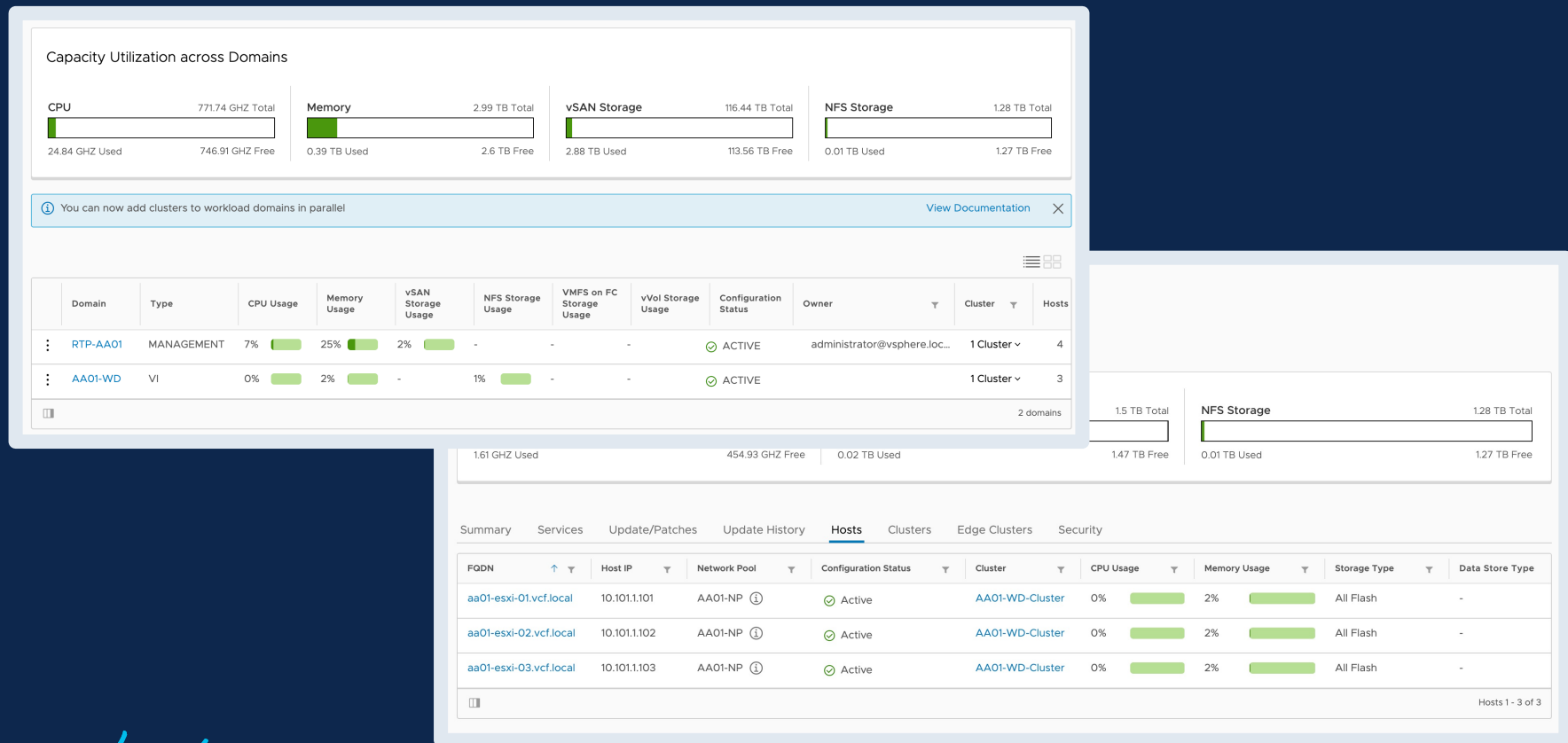
- Release Versions
- Bundle Management
- Image Management
- Administration**
 - Network Settings
 - Storage Settings
 - Licensing
 - Users
 - Repository Settings
 - Composable Infrastructure
 - vRealize Suite
 - Security

ALL HOSTS **ASSIGNED HOSTS** **UNASSIGNED HOSTS**

Displays all hosts in VMware Cloud Foundation inventory.

FQDN	Host IP	Network Pool	Configuration Status	Host State	Cluster
aa01-esxi-01.vcf.local	10.101.1.101	AA01-NP	Active	Unassigned	-
aa01-esxi-02.vcf.local	10.101.1.102	AA01-NP	Active	Unassigned	-
aa01-esxi-03.vcf.local	10.101.1.103	AA01-NP	Active	Unassigned	-
vcf-esxi-01.vcf.local	10.101.1.81	np01	Active	Assigned (RTP-AA01)	VCF-cluster
vcf-esxi-02.vcf.local	10.101.1.82	np01	Active	Assigned (RTP-AA01)	VCF-cluster
vcf-esxi-03.vcf.local	10.101.1.83	np01	Active	Assigned (RTP-AA01)	VCF-cluster
vcf-esxi-04.vcf.local	10.101.1.84	np01	Active	Assigned (RTP-AA01)	VCF-cluster

SDDC Manager – VI Workload Domain



Day 2+ Activities



NSX-T Design

- Overlay network availability
- Edge Server Cluster Deployments
- Upstream router configurations



Management & Automation

- [Cisco Intersight](#)
 - VMware, Pure Storage and Netapp plugins
- [Cisco Nexus Dashboard](#)
 - NDFC & NDFC-SAN
 - ND Insights

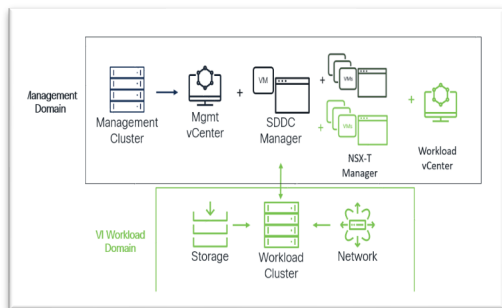


Deploy Workloads

[Cisco UCS X-Series](#)

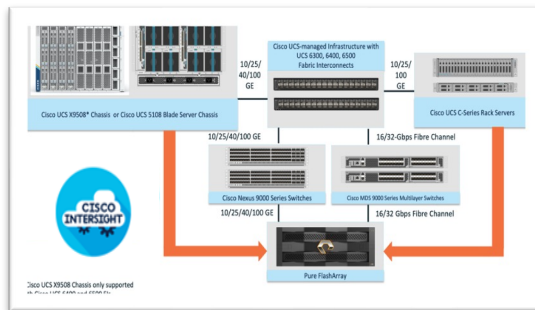
- Enterprise Applications
- VDI
- RedHat OpenShift
- AI/ML Applications

Key Takeaways



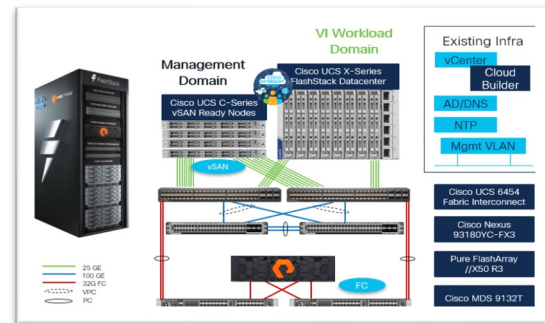
VCF

Simplifies your path to creating Hybrid Cloud environments.



Cisco CI Solution

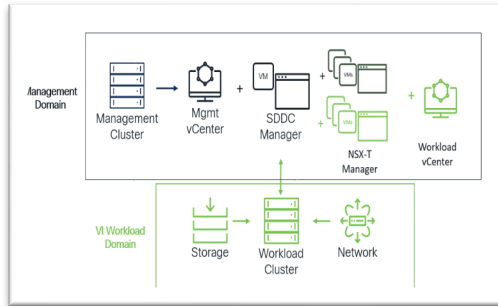
Delivers a validated solution for hosting VI Workload Domains.



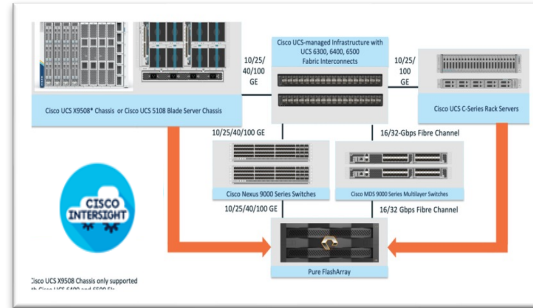
VCF CVDs

Provides automation based on best practice to quickly Bring Up your VMware Cloud Foundation environment.

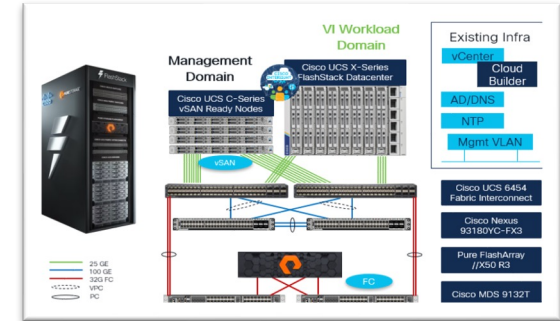
In Summary...



VCF



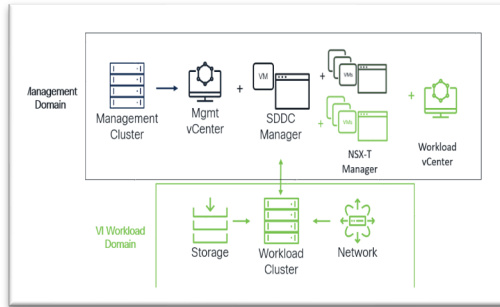
CI Solution



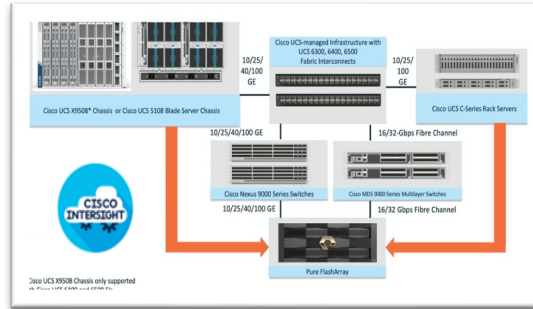
VCF CVD

You choose your path...

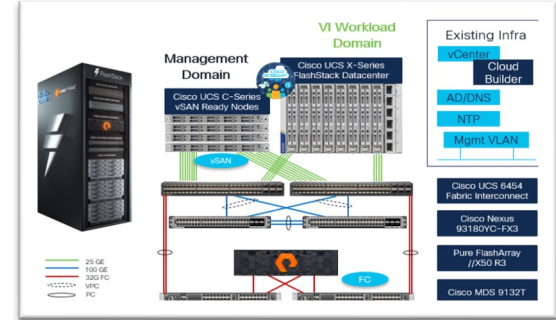
In Summary...



VCF



CI Solution



VCF CVD

You choose your path... we make it easy!

Learn More

- Cisco FlashStack for VCF CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flashstack_vcf.html
- Cisco FlexPod for VCF CVD: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/flexpod_vcf.html
- FlexPod for VCF GitHub repo: <https://github.com/ucs-compute-solutions/IMM-VCF-MgmtDomain>
- FlashStack for VCF GitHub repo: <https://github.com/ucs-compute-solutions/CVD-FlashStack-IMM-VCF>
- Cisco FlexPod: <https://www.cisco.com/c/en/us/solutions/data-center-virtualisation/flexpod/index.html>
- Cisco FlashStack: <https://www.cisco.com/c/en/us/solutions/global-partners/purestorage.html>
- VMware Validated Solutions: <https://core.vmware.com/vmware-validated-solutions>
- UCS X-Series: Architecture, Deployment Best Practices and Migration – BRKDCN-2961
<https://www.ciscolive.com/on-demand/on-demand-library.html?search=2961#/session/1675722362845001tcqn>

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Tuesday	3:00pm – 7:00pm
Wednesday	11:15am – 7:00pm
Thursday	9:30am – 4:00pm
Friday	10:30am – 1:30pm

Session Surveys

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- Complete a minimum of four session surveys and the overall event surveys to claim a Cisco Live T-Shirt.



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The bridge to possible

Thank you

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The background of the slide is a vibrant, multi-colored abstract graphic. It features a series of overlapping, wavy bands of color in shades of red, orange, yellow, green, and blue, creating a sense of movement and energy. On the right side, there is a bright, circular light source that radiates outwards, with rays of light extending across the entire frame. The overall effect is one of a bright, sunny day or a burst of energy.

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Let's go

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