

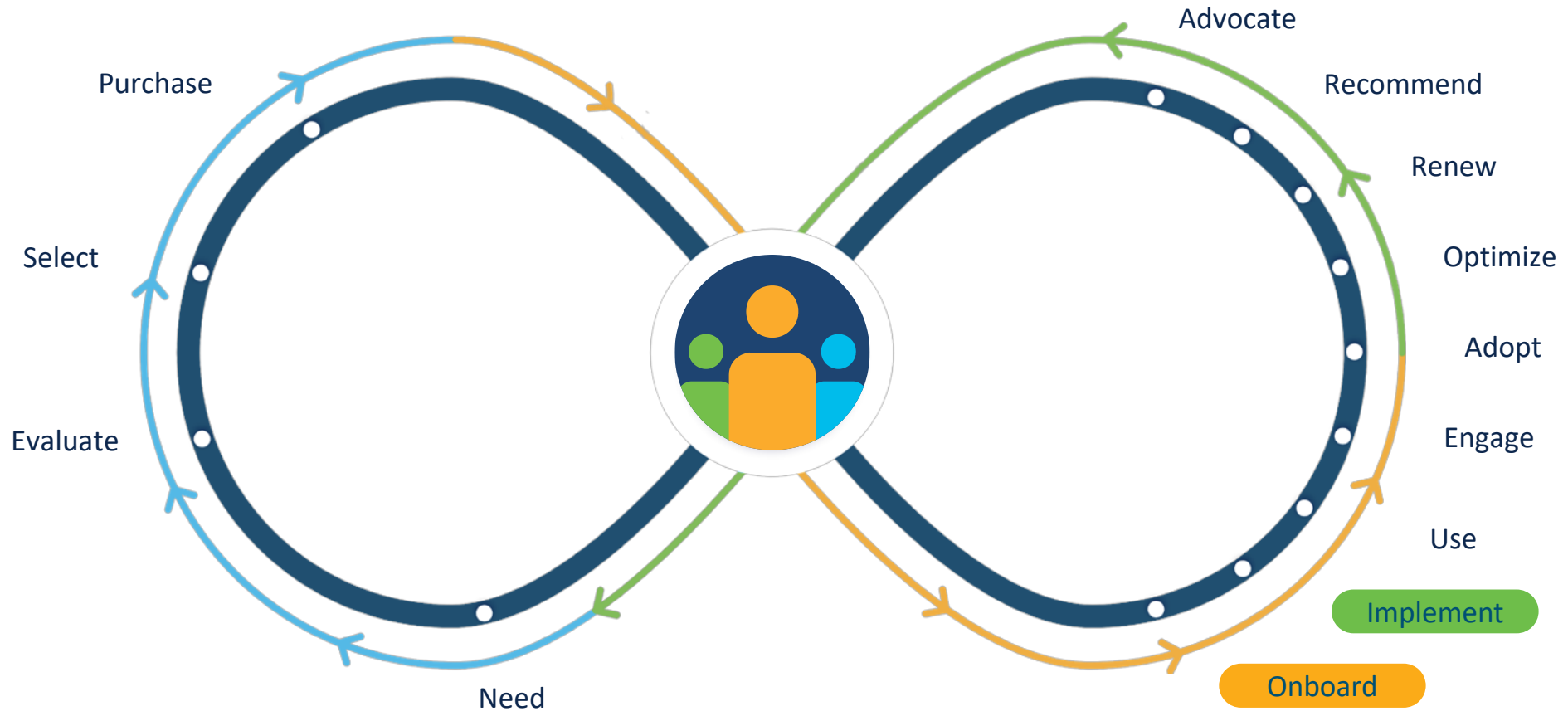


Accelerate Your Implementation Journey of Hyperflex Edge Solution from Day 0 to Day N Operations Via Intersight

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BRKDCN-2638



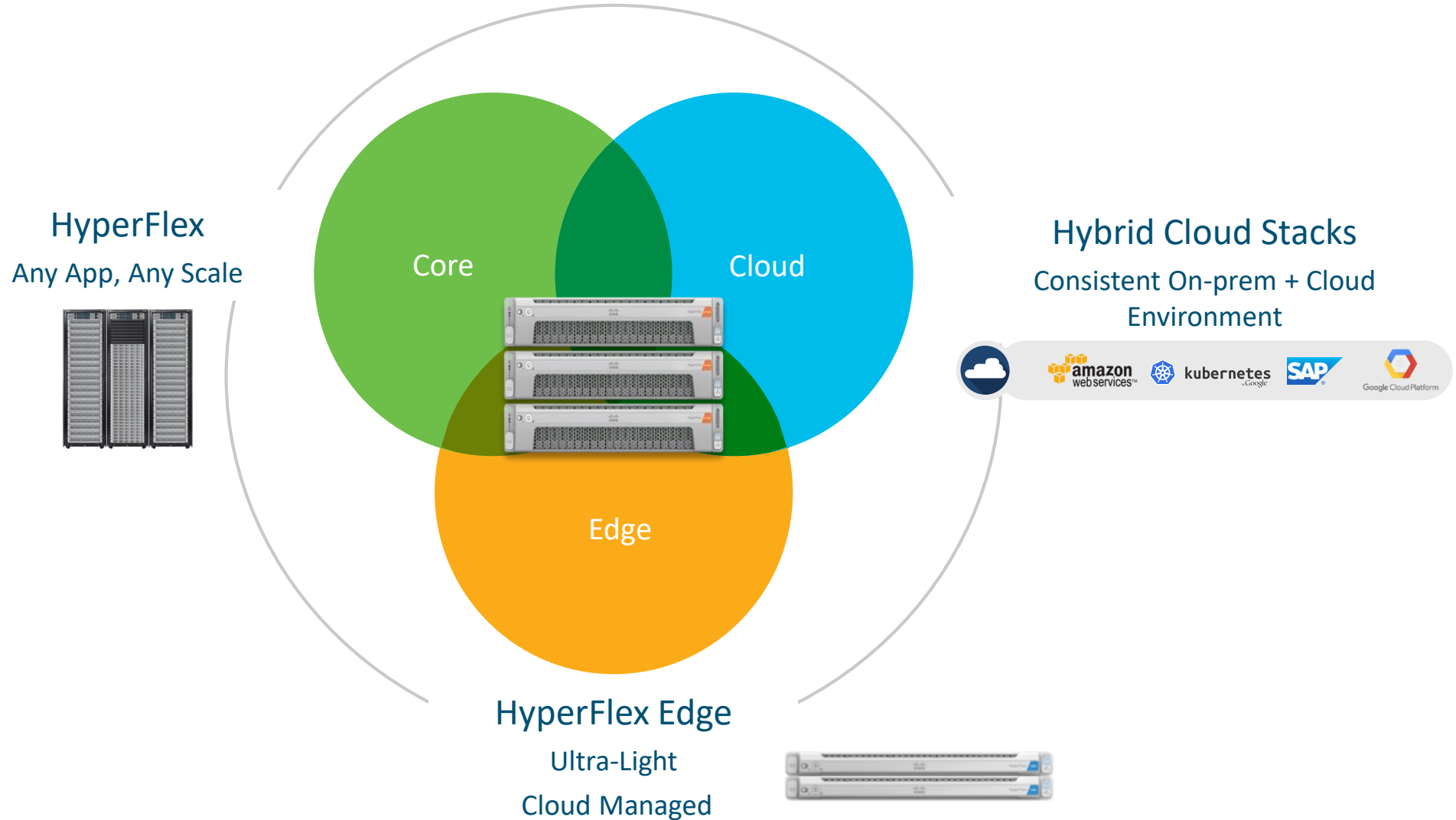
Getting you to your business outcomes faster



Agenda

- Introduction to HX edge and Intersight
- Deployment Planning and Preparing
- Installation Demo via Intersight
- Customer Success (Best Practice, On-field Issues, etc..)






Cisco HyperFlex Anywhere



Cisco HyperFlex Edge

Engineered for the modern edge

Simplicity and distributed scale

-  Optimized for availability and reliability
-  2-4 Node flexible configurability, scalability and investment protection
-  Lights-out deployment and cloud managed
-  GPU support for AI inferencing
-  Single source HCI with connected TAC Support

CISCO *Live!*



Ability to leverage existing branch network



Three-node cluster quorum without physical 3rd node!

Ultra-light 2-node



Invisible Cloud Witness

3-node



4-node



HyperFlex Edge Configurations

HX220c M5 Hybrid Edge



HXAF220c M5 All Flash Edge



Configurable CPU	Single or Dual Socket (10-56 cores)	Single or Dual Socket (10-56 cores)
Configurable Memory	128GB – 3TB	128GB – 3TB
2-Node Usable Capacity Range	3.3TB - 13.2TB	2.6TB - 28.2TB
3-Node Usable Capacity Range	4.9TB - 19.8TB	4.0TB - 42.4TB
4-Node Usable Capacity Range	6.6TB - 26.5TB	5.3TB - 56.5TB

Most Flexible Edge
Appliance
in the Industry

Initial
Cluster Size:
2, 3 or 4

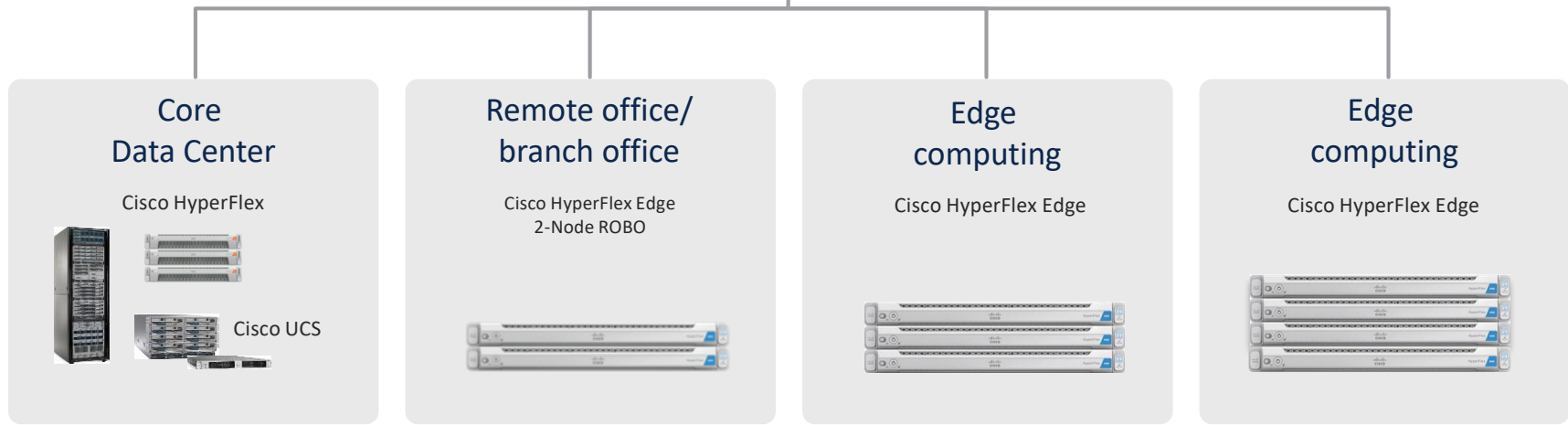
Networking options:
1GbE or 10GbE (bring
your own switch)


Replication
Factor 2 (RF2)

Unlimited cluster
scaling, powered
by Intersight

Note:- Approximate calculations above are before dedupe and compression, the effective capacity will be higher. Please refer to HX sizer tool [here](#) for latest sizing and design guidance

Intersight Intelligent Management



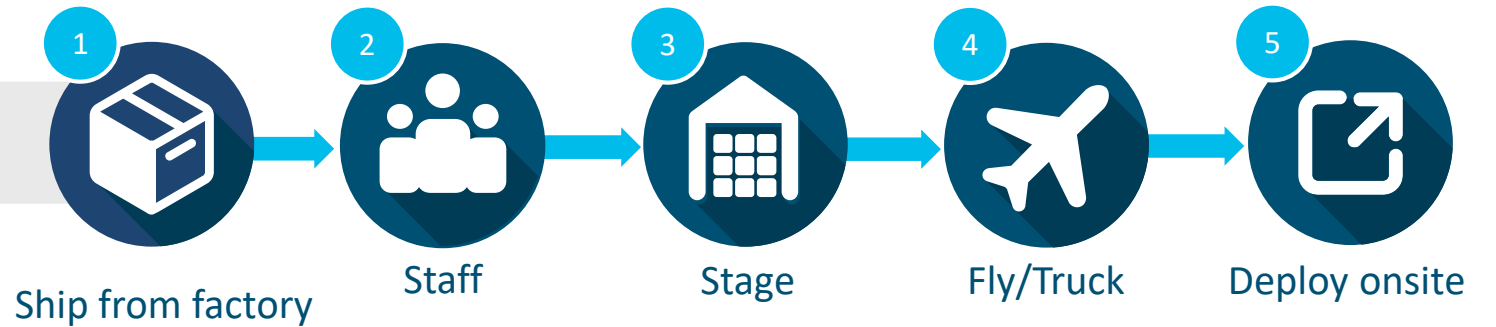

Actionable intelligence


Increased agility

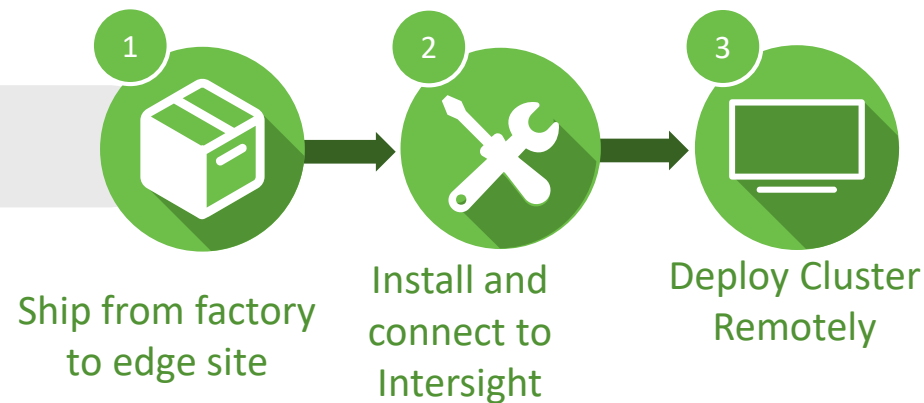

Reduced operational costs

Intelligent Cloud Deployment of HyperFlex Edge

Other HCI and Server/DAS



HyperFlex Edge w/Intersight



Things to Consider

- Hypervisor support and applications Compatibility
- Vcenter Environment
- Scale
- Capacity



Start Planning

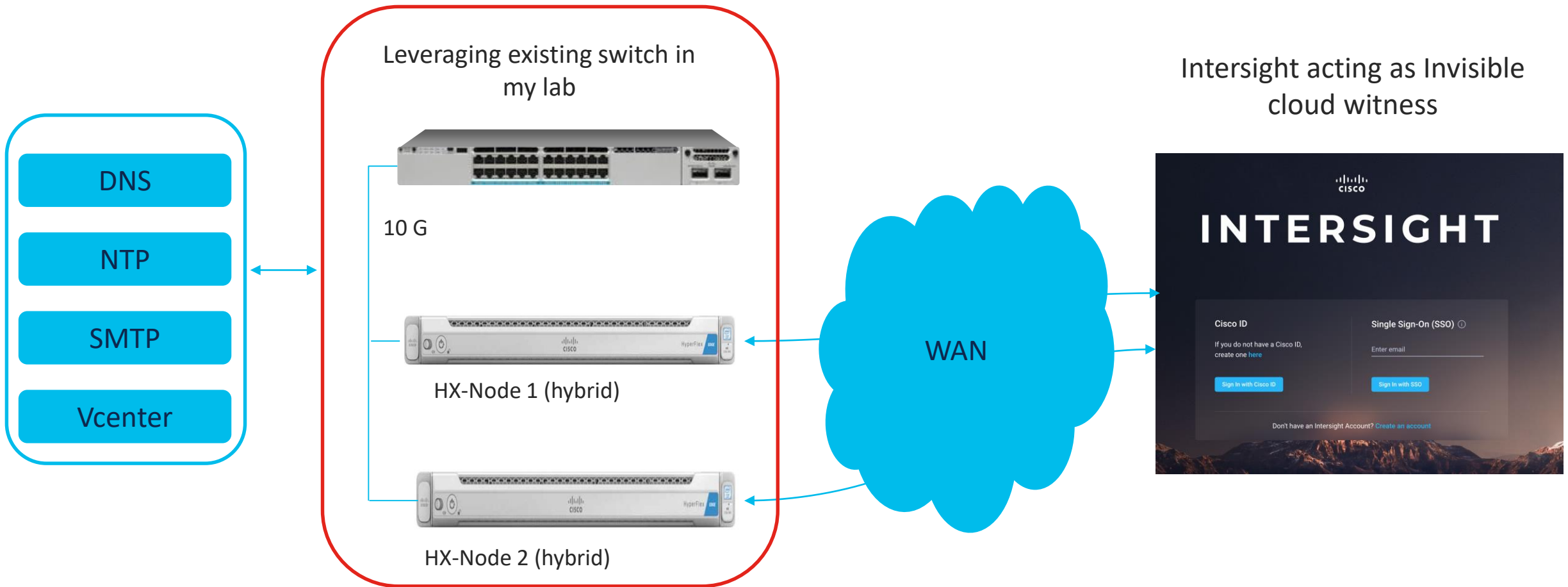


Questions to ask:

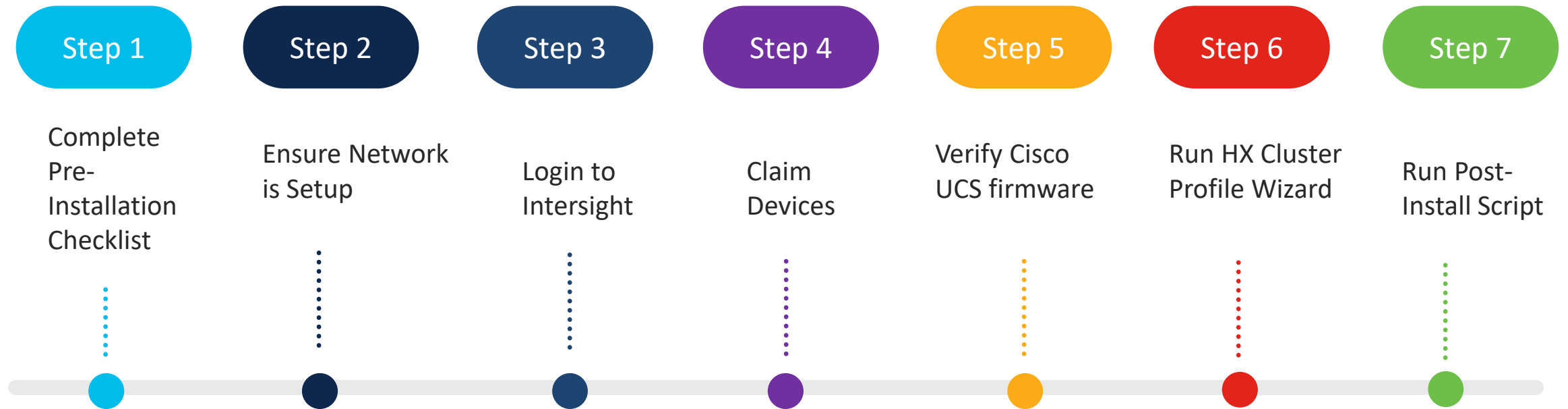
- ✓ Network Topology:-- 2 3 or 4 Node
- ✓ Network Speed:-- 1G or 10 G
- ✓ Uplink:-- Single or Double Switch
- ✓ CIMC Mode:-- Shared or Dedicated
- ✓ Vcenter:-- Single , Multiple or Nested
- ✓ CIMC:-- Static vs DHCP



Demo Topology



HX Edge Installation Workflow





Pre-Install Checklist

Fill out the latest version of the HX pre-install checklist

- ✓ VLANS
- ✓ IP Addresses
- ✓ OS Information and Versions
- ✓ HXDP Information
- ✓ DNS, NTP, Time Zone
- ✓ Auto Support

CHECKLIST



✓

✓

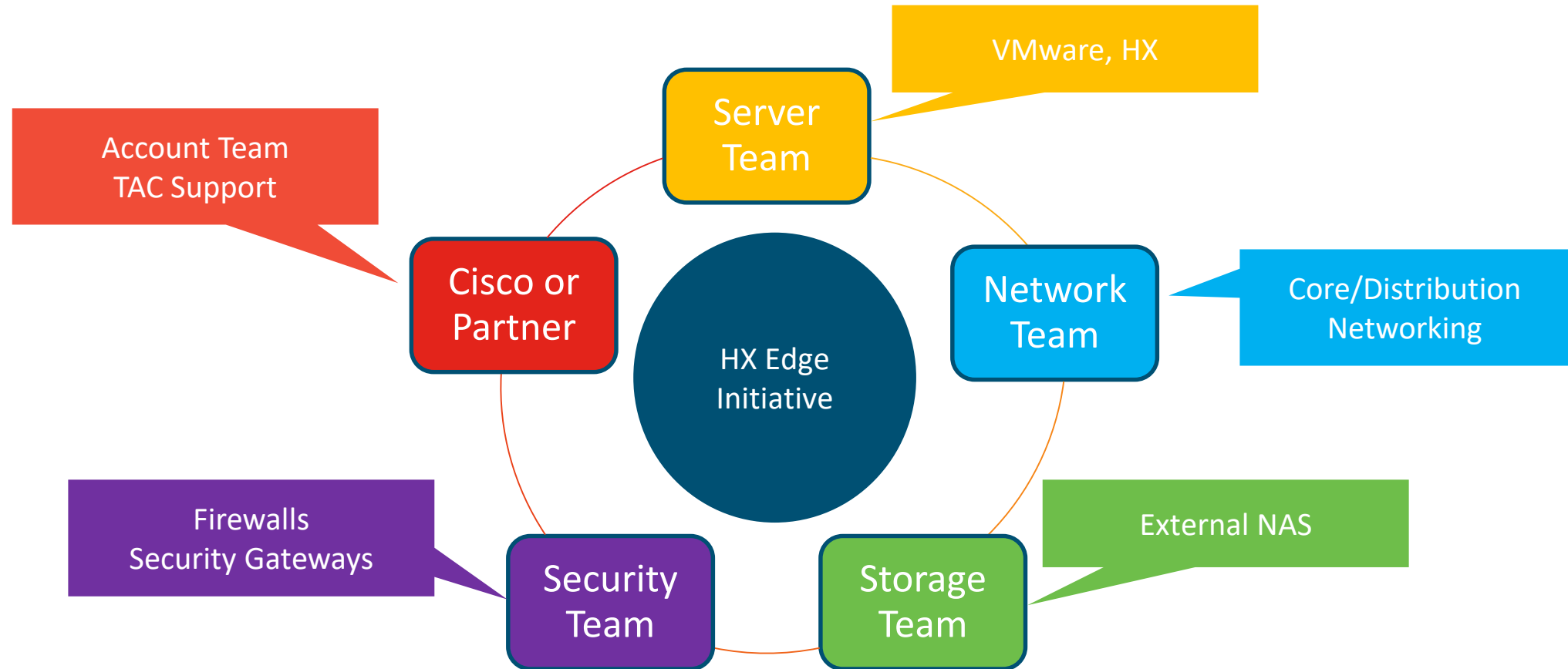
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✓

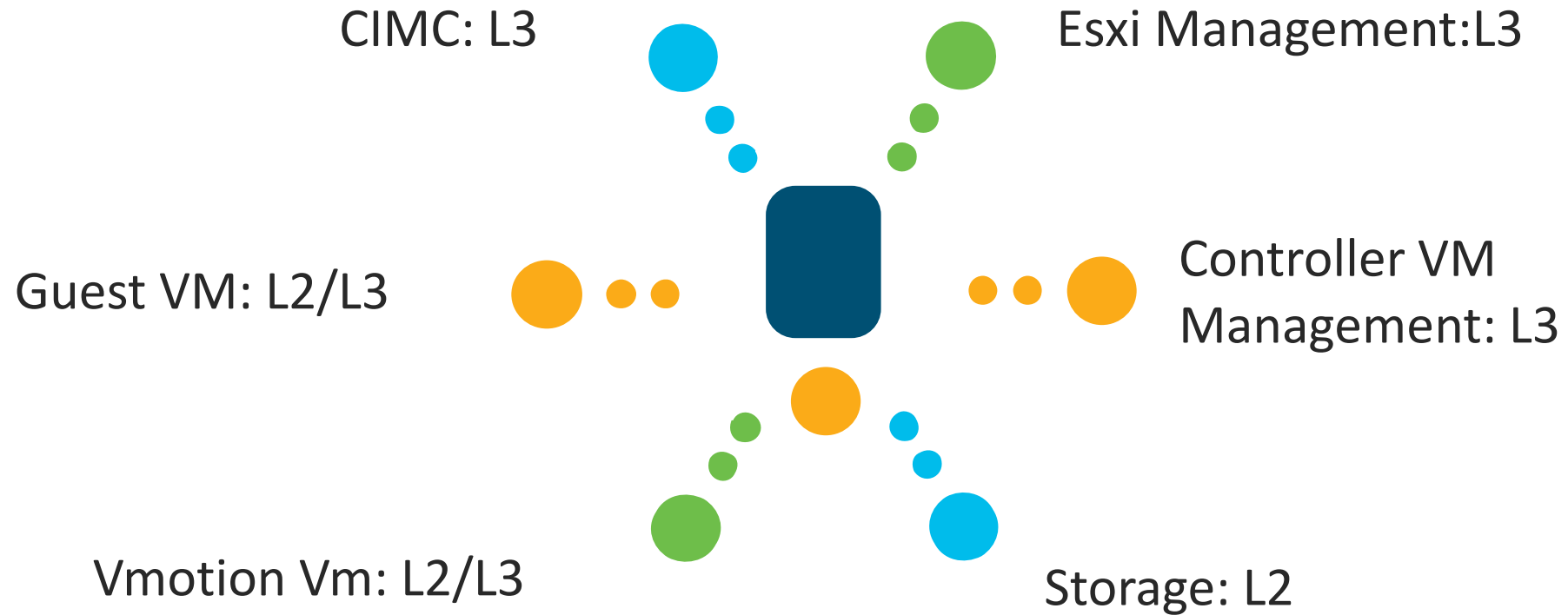
✓



Start the Conversation with Interested Parties



Vlan Considerations



L2 : Layer 2
L3: Layer 3

Vlans and Subnets



VLAN Function	VLAN ID	Purpose	Notes
CIMC Traffic	Customer supplied	Management interface for UCS standalone servers	This VLAN must be routable and must have access to Intersight.
ESXI and HyperFlex Management Traffic	Customer supplied	<ul style="list-style-type: none">ESXi host management interfacesHX Storage Controller VM management interfacesHX Storage Cluster roaming management interface	This VLAN must be routable and must have access to Intersight. It can be same or different from the CIMC VLAN.
HyperFlex Storage Traffic	Customer supplied	<ul style="list-style-type: none">ESXi host storage VMkernel interfacesHX Storage Controller storage network interfacesHX Storage Cluster roaming storage interface	This VLAN is used for storage traffic. Only L2 connectivity is required. It may not be combined with the management VLAN and must be dedicated for storage traffic.
vMotion Traffic	Customer supplied	ESXi host vMotion VMkernel interfaces	This VLAN can be the same as the management VLAN but it is recommended to segregate this traffic onto a unique VLAN.
Guest VM Traffic	Customer supplied	Networks for Guest Virtual Machines	There can be multiple VLAN port groups created for different applications.

Networking Zones

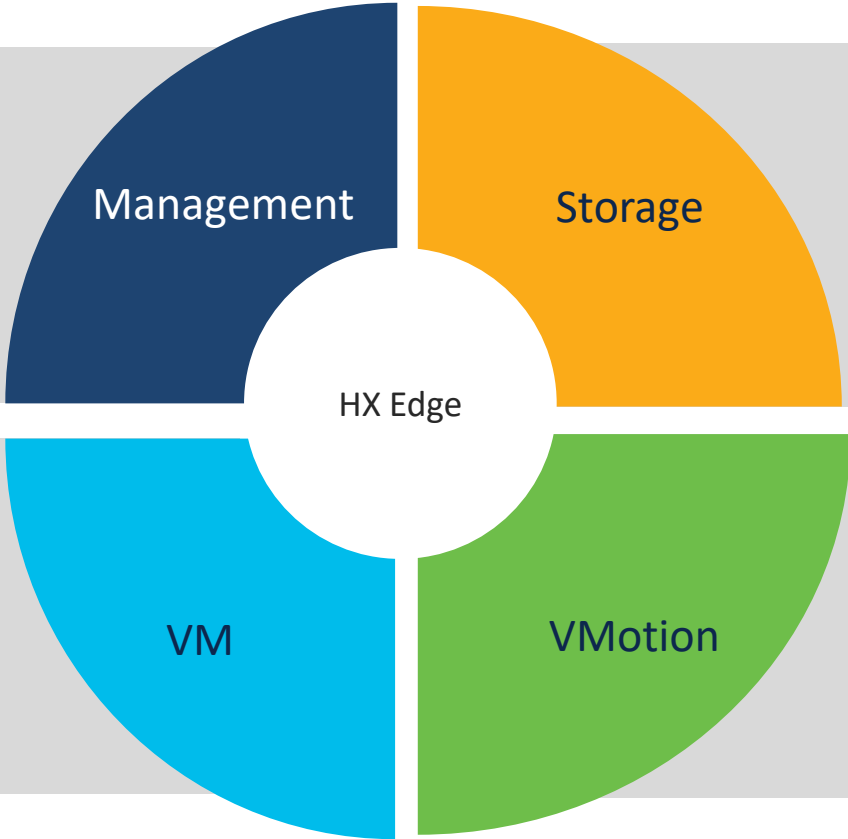
vswitch-hx-inband-mgmt

vswitch-hx-storage-data

vswitch-hx-vm-network

vmotion

Components: Physical Hardware, ESXI Hosts, SCVM
Who: Admin's LAN/WAN
Note: NTP, DNS, SSH
vSwitch: vswitch-hx-inband-mgmt



Components: HXDP, ESXI hosts, SCVM
Who: Internal communication between
Note: Jumbo Frames, Storage switchover for dual switch
vSwitch: vswitch-hx-storage-data

Components: Guest VM's
Who: Guest VM's admins, Other Endpoints
Note: Correct 802.1q tag, Switch configuration
vSwitch: vswitch-hx-vm-network:

Components: Vmotion for guest Vm's
Who: Vmotion for guest Vm's:
Note: Jumbo Frames, Storage switchover for dual switch
vSwitch: vmotion

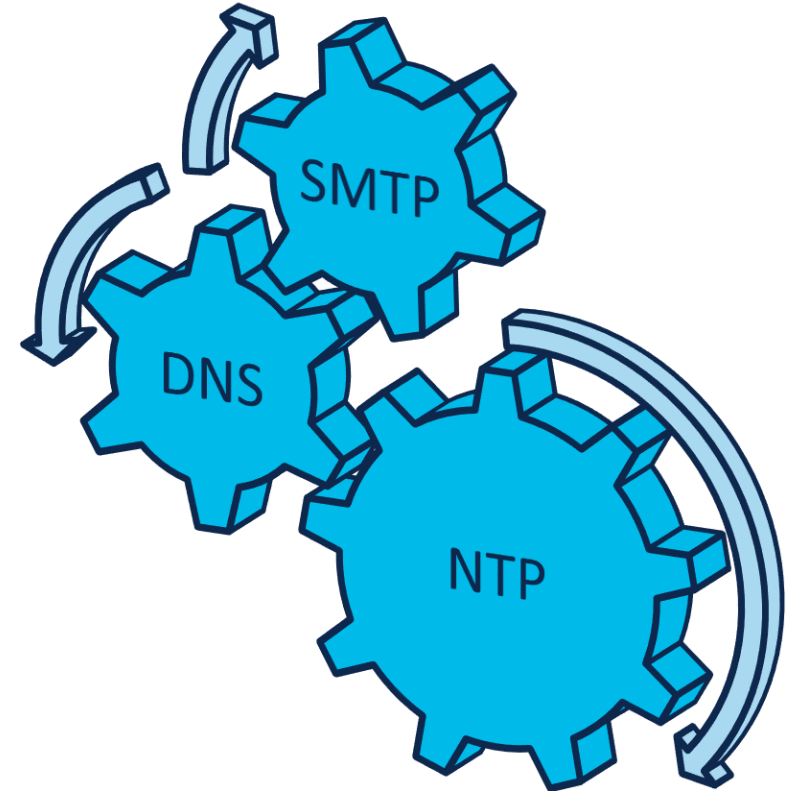
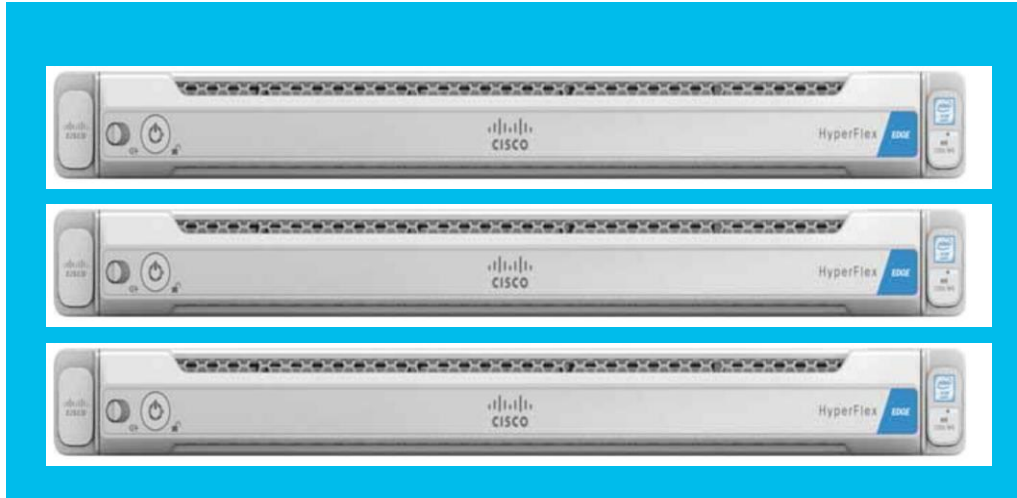


Review the Interoperability Requirements

Hyperflex 2.6	Hyperflex 3.0	Hyperflex 3.5	Hyperflex 4.0
ESXi 6.0 U1b, U2 Patch 4, U3 ESXi 6.5 U1	ESXi 6.0 U3 ESXi 6.5 U1, U2	ESXi 6.0 U3 ESXi 6.5 U1, U2 ESXi 6.7	ESXi 6.7 U2 (Recommended) ESXi 6.5 U2 ESXi 6.0 U3
CIMC 3.2(3)	CIMC 3.2(3) / 4.0(1)	CIMC 3.2(3) / 4.0(1)	CIMC 4.0(1a)
ROBO, SED Support, Veeam Integration, All Flash, Replication, HX Connect, GPU Support, NVME Cache Support	All 2.5/2.6 features + Cloud deployment, Hyper-V Support, Stretch Clusters, Container support with Kubernetes, Logical Availability Zones	All previous features + 3 Node 10g support, 1-click-upgrade (Firmware, OS & HXDP), Kubernetes Persistent Volume Integration	All previous features + 2node and invisible cloud witness, 4 Node support, Multi-site upgrade via Intersight, NVME support and Much more (refer release notes)

Validate Network Services

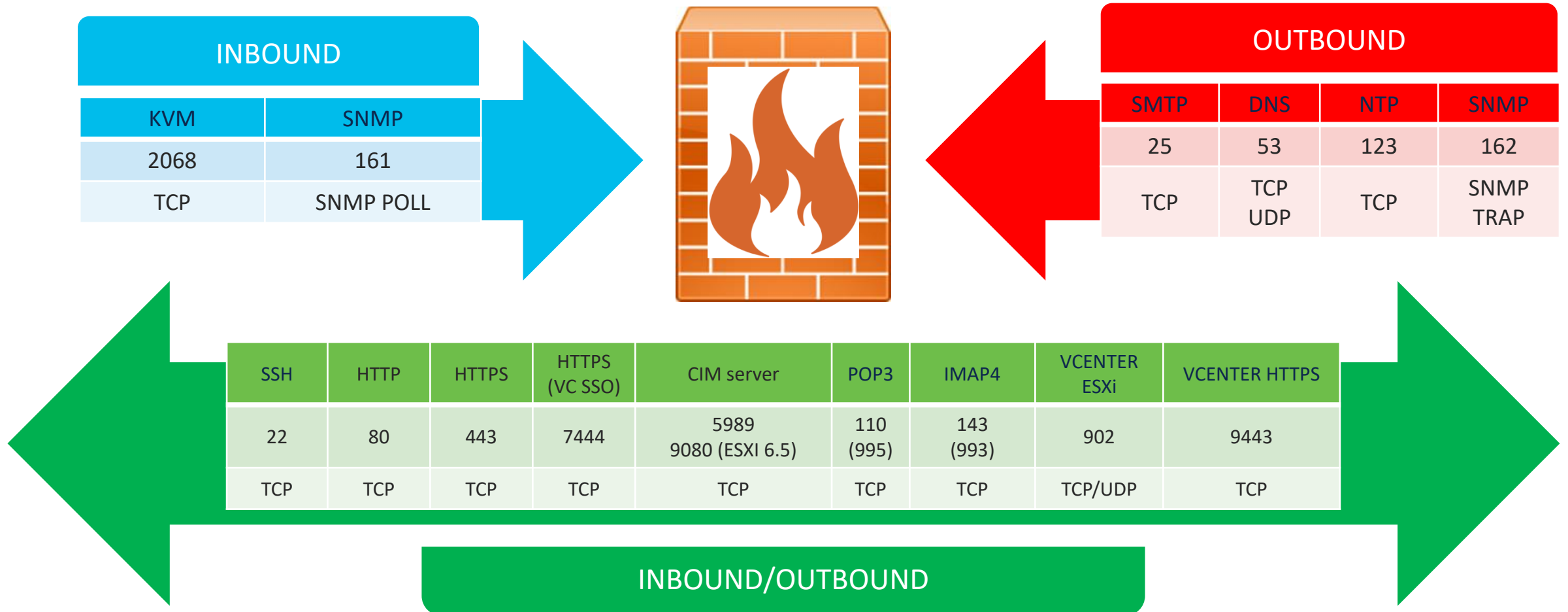
Hyperflex Edge Cluster



NTP is an absolute requirement!



Ensure Ports are Allowed Through the Firewall



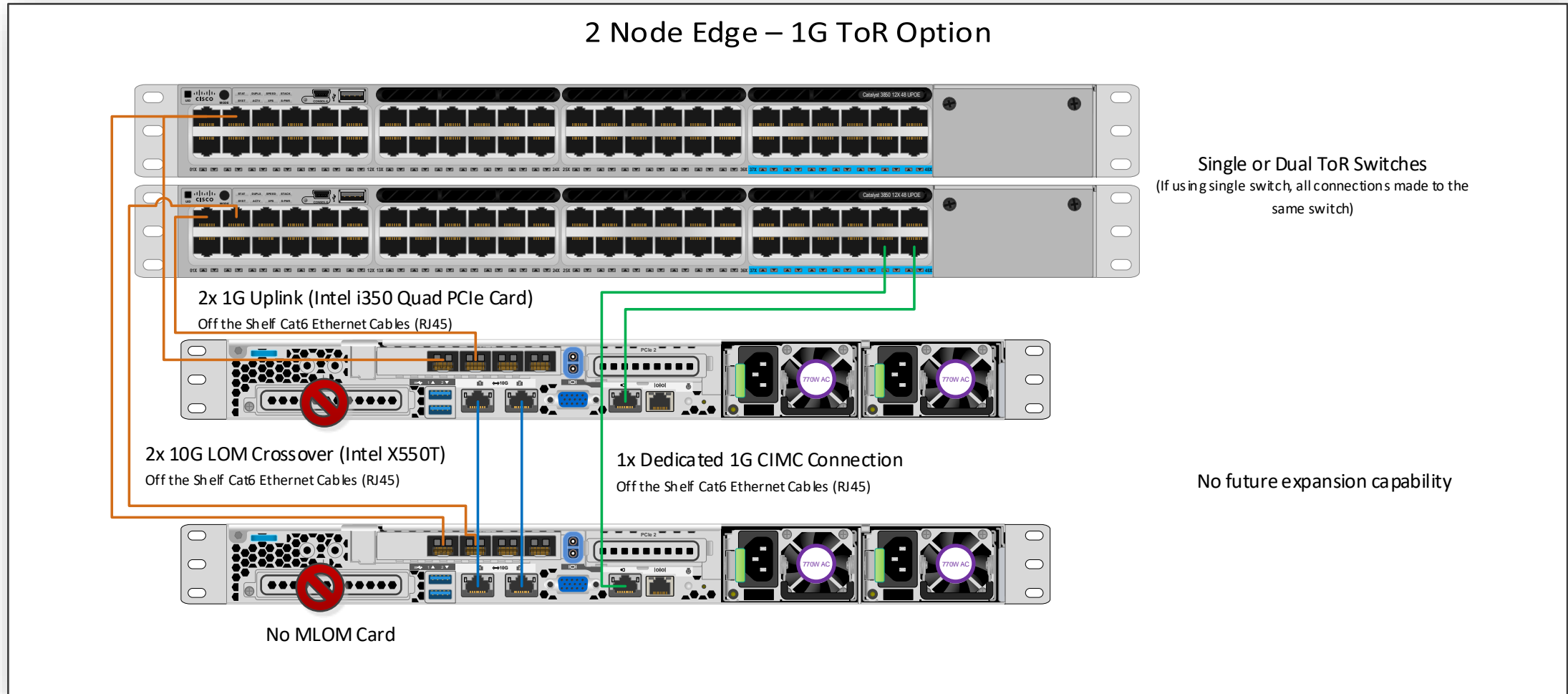


Network is Setup

Connectivity Requirements

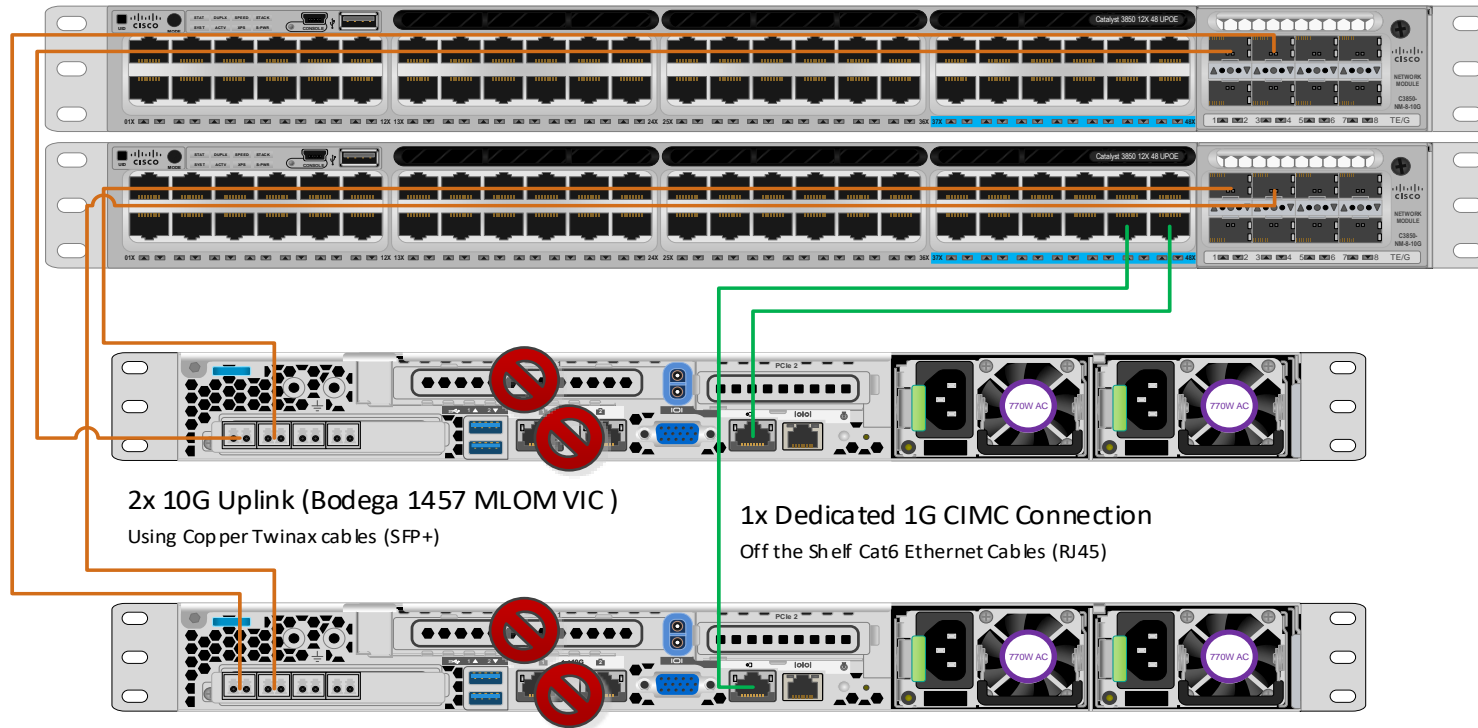
	2 Node 1G	3 node 1G	4 Node 1G	2 Node 10G	3 Node 10G	4 Node 10G
Deployment options	Intersight	OVA or Intersight	OVA or Intersight	Intersight	OVA or Intersight	OVA or Intersight
Single or Dual switch	both	both	both	both	both	both
CIMC mode	Dedicated	Dedicated Recommended	Dedicated Recommended	Dedicated Recommended	Dedicated Recommended	Dedicated Recommended
TOR switch port requirements for dual switch	6	15	20	6	9	12
LOM Cross over connected	Yes	N/A	N/A	N/A	N/A	N/A
PCIE NIC requirement	Intel i350	Intel i350	Intel i350	N/A	N/A	N/A
LOM	Intel x550	Intel x550	Intel x550	N/A	N/A	N/A
MLOM	N/A	N/A	N/A	VIC1457	VIC1457	VIC1457

2 Node 1G Physical Topology



2 Node 10G Physical Topology

2 Node Edge – 10G ToR Option



2x 10G Uplink (Bodega 1457 MLOM VIC)
Using Copper Twinax cables (SFP+)

1x Dedicated 1G CIMC Connection
Off the Shelf Cat6 Ethernet Cables (RJ45)

No LOM Crossover
No PCIe Card

Single or Dual ToR Switches
(If using single switch, all connections made to the same switch)

Future expansion capability to 3N and 4N HX Edge Clusters (post 4.0 release)

Set Ports Connecting on Upstream Cisco Devices as STP Edge and Appropriate Vlan's

For Cisco NX-OS configuring trunk port example

```
switch# configure terminal  
switch(config)# interface ethernet 1/1  
switch(config)# switchport trunk allowed vlan 100-110  
switch(config-if)# spanning-tree port type edge
```

For Cisco NX-OS configuring access port example

```
switch# configure terminal  
switch(config)# interface ethernet1/1  
switch(config)# switchport access vlan 100  
switch(config)# spanning-tree port type edge
```

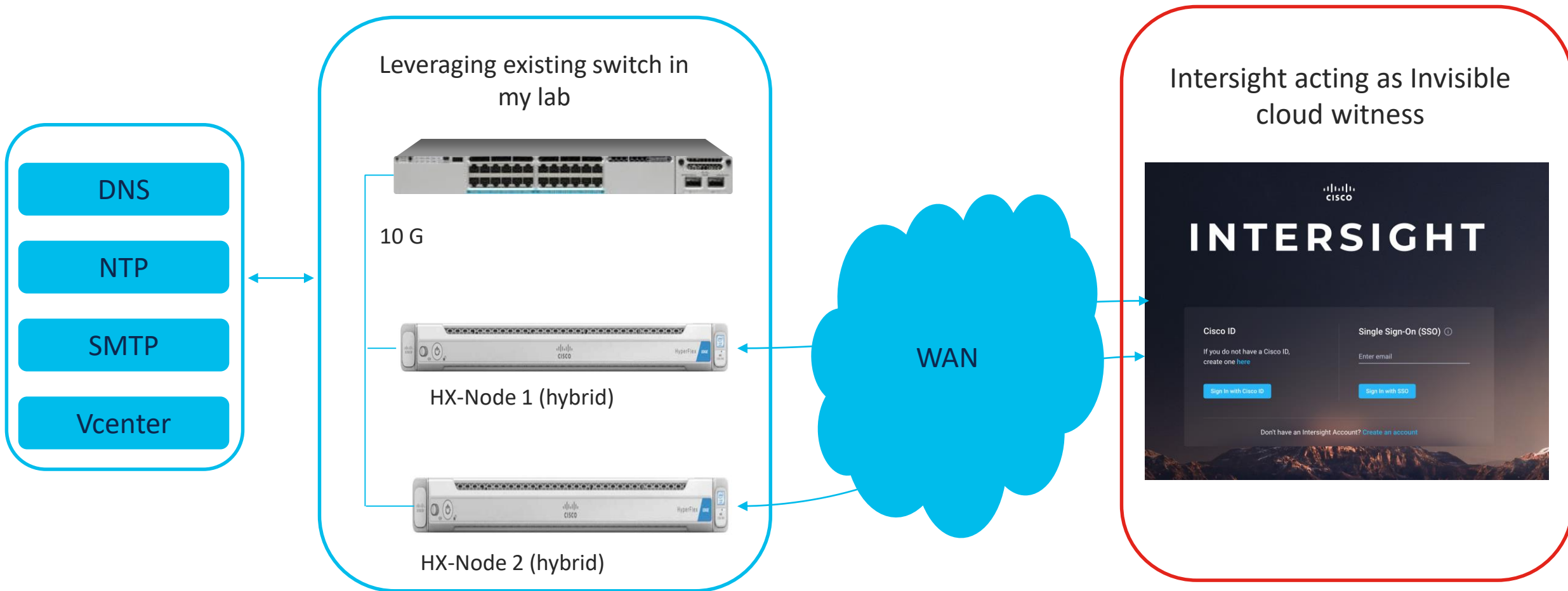
Configuring edge port ensures that if a link flaps, the port immediately comes back up





Claim Devices from Intersight

Demo Topology

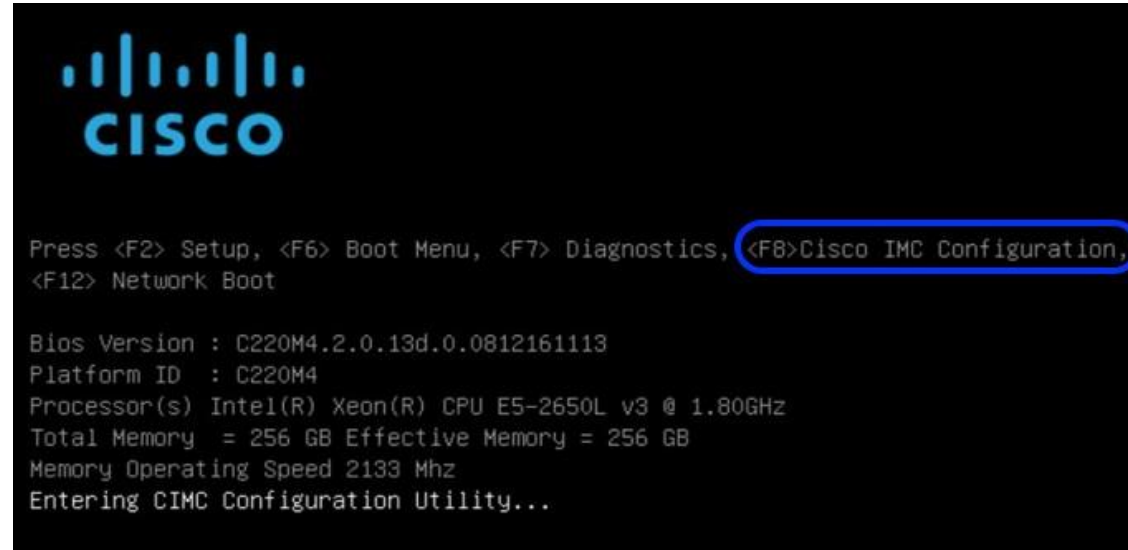


Intersight Connectivity Requirements

- A valid Cisco ID to create a Cisco Intersight account
- All device connectors and controller VM must properly resolve *svc.intersight.com* and allow outbound initiated HTTPS connections on port 443.
- IP connectivity (L2 or L3) is required from the CIMC management IP on each server to all of the following: ESXi management interfaces, HyperFlex controller VM management interfaces, and vCenter server.



Configuring CIMC



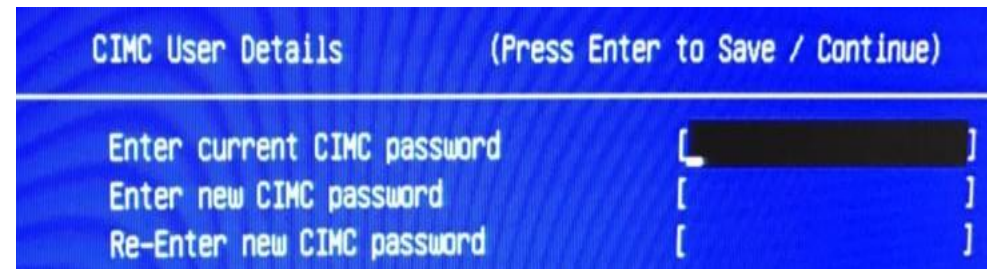
```

CISCO

Press <F2> Setup, <F6> Boot Menu, <F7> Diagnostics, <F8> Cisco IMC Configuration,
<F12> Network Boot

Bios Version : C220M4.2.0.13d.0.0812161113
Platform ID : C220M4
Processor(s) Intel(R) Xeon(R) CPU E5-2650L v3 @ 1.80GHz
Total Memory = 256 GB Effective Memory = 256 GB
Memory Operating Speed 2133 Mhz
Entering CIMC Configuration Utility...

```



```

CIMC User Details          (Press Enter to Save / Continue)

Enter current CIMC password [XXXXXXXXXX]
Enter new CIMC password    [          ]
Re-Enter new CIMC password [          ]

```

Configuring CIMC

Continued

```
Cisco IMC Configuration Utility Version 2.0 Cisco Systems, Inc.
*****
NIC Properties
NIC mode                               NIC redundancy
Dedicated: [ ]                         None: [ ]
Shared LOM: [X] ①                      Active-standby: [ ]
Cisco Card:                               Active-active: [X] ④
  Riser1: [ ]                             VLAN (Advanced)
  Riser2: [ ]                             VLAN enabled: [X]
  MLOm: [ ]                               VLAN ID: 101 ⑤
Shared LOM Ext: [ ]                     Priority: 0
IP (Basic) ②
IPv4: [X] IPv6: [ ]
DHCP enabled [ ]
CIMC IP: 10.100.101.246
Prefix/Subnet: 255.255.255.0 ③
Gateway: 10.100.101.1
Pref DNS Server: 0.0.0.0
*****
<Up/Down>Selection <F10>Save <Space>Enable/Disable <F5>Refresh <ESC>Exit
<F1>Additional settings ⑥
Hit the Refresh key in 45 seconds to get the latest network settings.
```



Note: Above NIC mode is shared due to internal lab setup, however dedicated is recommended

Demo : Install HX Edge via Intersight





Post-Install Script

Post-Install Script

- Runs a set of tasks to implement some further best practice configuration
- SSH to the cluster management IP address
- Login using <root> username and the controller VM password provided during installation
- Run the following command in the shell and press enter:
 - `/usr/share/springpath/storfs-misc/hx-scripts/post_install.py`

Post-Install Script

```
root@Cisco-HX:~# /usr/share/springpath/storfs-misc/hx-  
scripts/post_install.py
```

```
Enter HX root password.  
HX Edge configuration detected  
Uplink speed is detected as: 1G  
Uplink count is detected as: 2  
  
Enter vSphere license key? (y/n) n  
  
Enable HA/DRS on cluster? (y/n) y  
Successfully completed configuring cluster HA.  
  
Disable SSH warning? (y/n) y  
  
Add vmotion interfaces? (y/n) n  
  
Add VM network VLANs? (y/n) n  
  
Run health check? (y/n) y  
  
Validating cluster health and configuration...  
  
Cluster Summary:  
Version - 4.0.1a-33028  
Model - HX220C-M5SX  
Health - HEALTHY
```

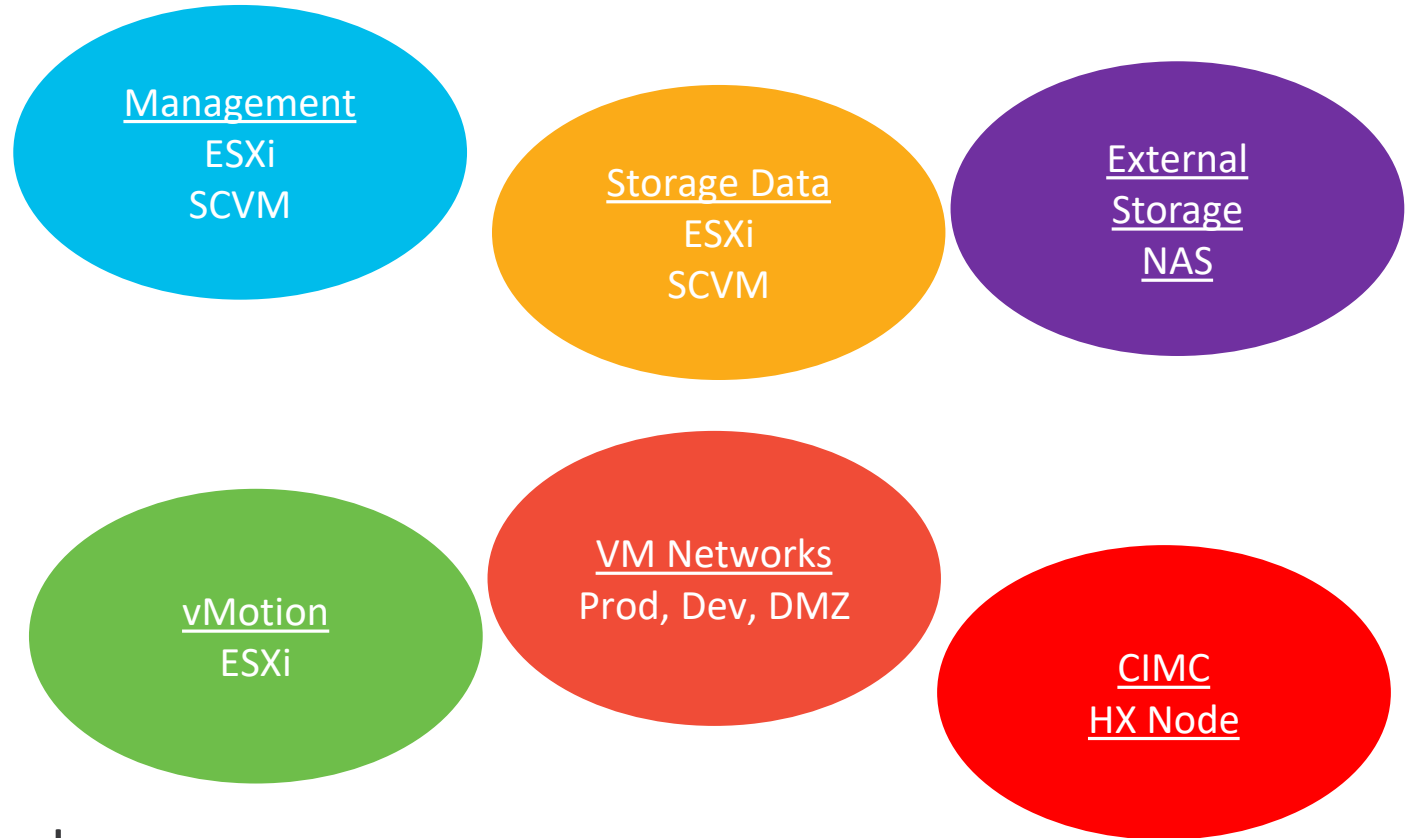
- This applies only to the initial HX deployment
- It allows:
 - Assigning licenses
 - Enable HA/DRS on the cluster per best practices.
 - Suppress SSH/Shell warnings in vCenter.
 - Configure vMotion per best practices.
 - Add additional guest VLANs/portgroups.
 - Perform HyperFlex Edge configuration check.



Best Practices

VLAN Provisioning

- Separate VLANs are required
- Upstream devices need to trunk these VLAN's

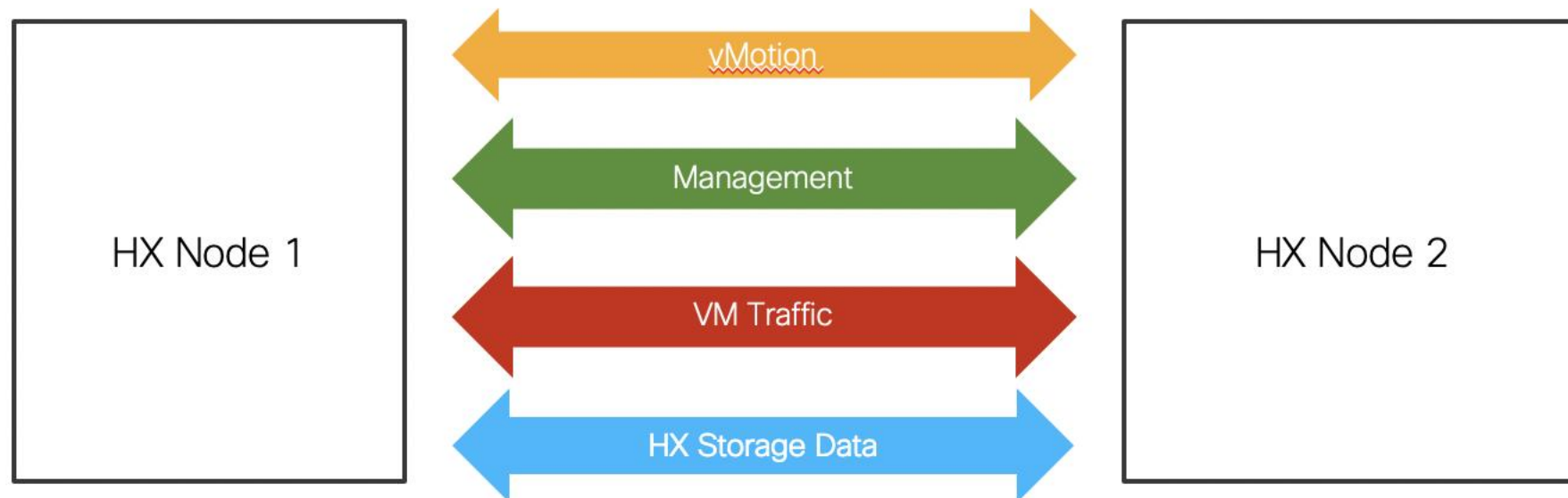


VLAN 1 is NOT recommended

- All switches use VLAN 1 as default

Enable Jumbo Frames End-to-End

- Optional for **Management**, **vMotion** and **VM Traffic**
- Not Required for **Storage Data** Traffic

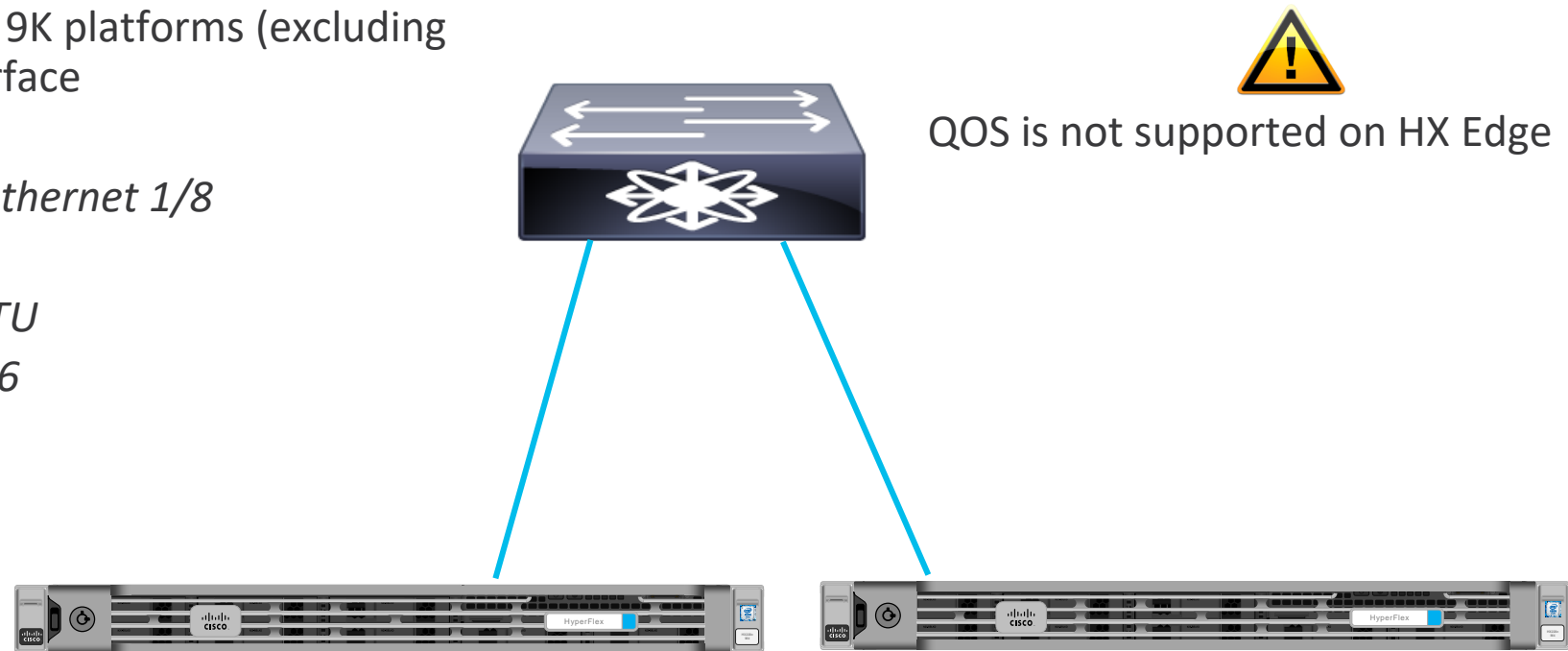


Jumbo Frames on HX Edge

- Make sure to configure Jumbo frames on your upstream devices

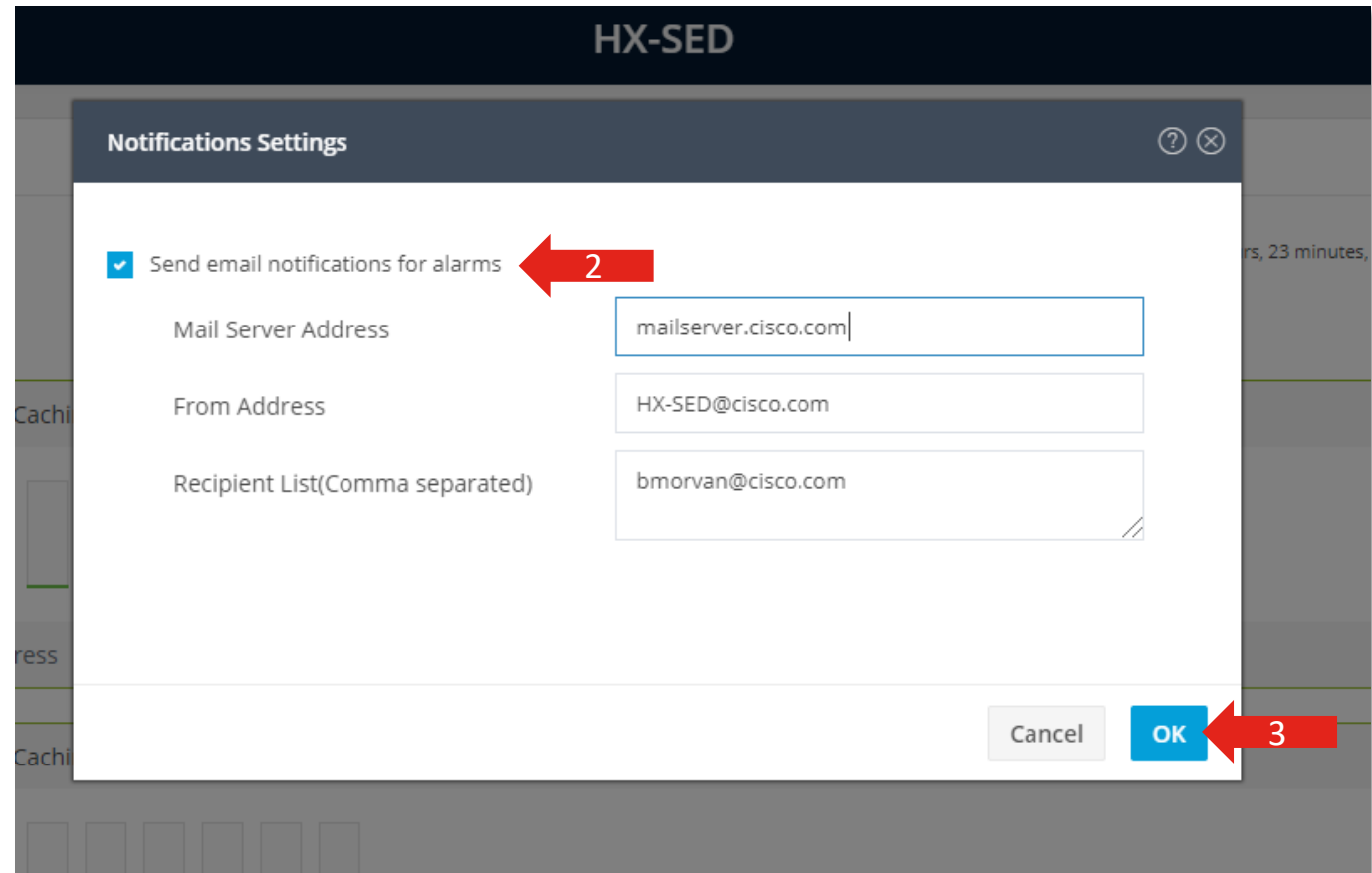
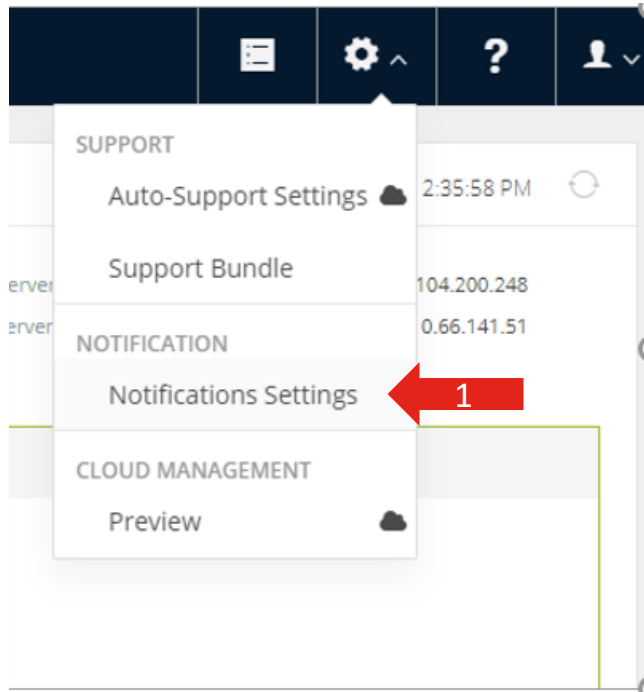
Eg:- Cisco NX-OS 7K and 9K platforms (excluding FEX), configure per interface

```
N9K(config)# interface ethernet 1/8
N9K(config-if)# mtu ?
<1500-9216> Enter MTU
N9K(config-if)# mtu 9216
```



Refer to your switch documentation on configuring jumbo frames

Configure Auto-Support Email Alerts - GUI



Configure HX Smart Call Home - GUI

The screenshot displays the HX-SED GUI with the 'Auto-Support Settings' dialog box open. The dialog box contains the following configuration options:

- Enable Auto-Support (Recommended) ⓘ ☁️ ← 2
- Send service ticket notifications to:
- Enable Remote Support ⓘ ☁️ ← 3
- Web Proxy Settings**
 - Use Proxy Server

At the bottom right of the dialog box, there are 'Cancel' and 'OK' buttons. The 'OK' button is highlighted with a red arrow labeled '4'.

On the left side of the main GUI, a navigation menu is visible with the following items:

- SUPPORT
 - Auto-Support Settings ☁️
 - Support Bundle
- NOTIFICATION
 - Notifications Settings ← 1
- CLOUD MANAGEMENT
 - Preview ☁️

Configure HX Smart Call Home



- Smart Call Home must also be configured on the Cisco side for automatic case opening
- Contact your Cisco Accounts team or open a “Smart Call Home” TAC case for assistance setting it up



- Hyperflex Remote Support IS NOT Remote Login
- Remote Support allows the Hyperflex cluster to heartbeat back to Cisco servers

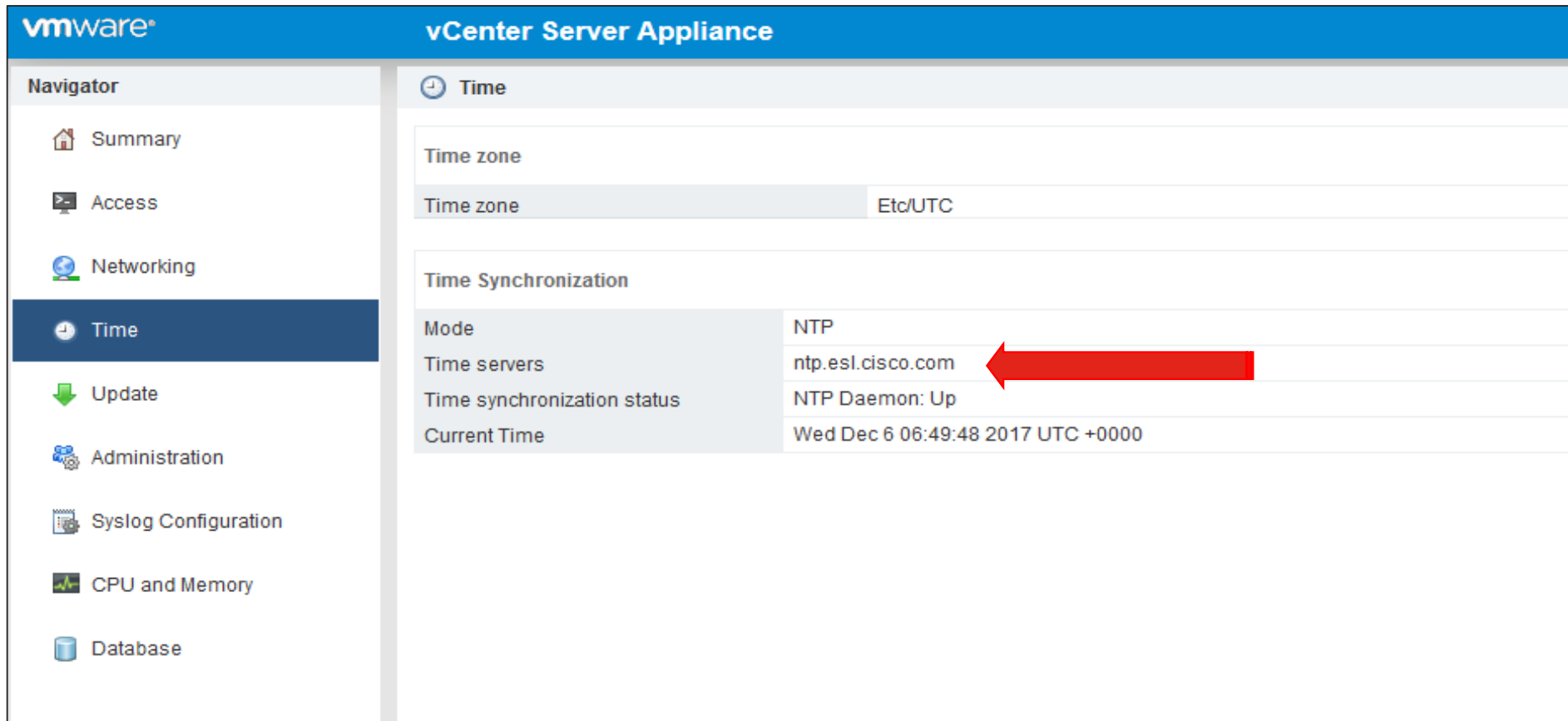
Open TAC Case from Intersight

The screenshot shows the Cisco Intersight interface for a server named 'MelbourneUCS-1-5'. The interface is divided into several sections:

- Properties:** Displays server details such as Name (MelbourneUCS-1-5), Serial (FCH1804J1MM), PID (UCSB-B200-M3), Vendor (Cisco Systems Inc), and Health (Healthy).
- Alarms:** Lists active alarms, including 'UCS-F1256 Local disk 2 missing on server 1/5' and 'UCS-F1256 Local disk 1 missing on server 1/5'. A red arrow points to the 'Open TAC Case' option in the 'Actions' dropdown menu for the first alarm.
- Actions:** A dropdown menu is open, showing options like 'Set License Tier', 'Launch KVM', 'Launch UCSM', and 'Open TAC Case'.
- Server View:** A central image shows the server rack with a 'Health Overlay' toggle.

Sync vCenter With NTP

<https://<vcenter IP>:5480>



The screenshot shows the VMware vCenter Server Appliance configuration interface. The left sidebar contains a 'Navigator' menu with options: Summary, Access, Networking, Time (selected), Update, Administration, Syslog Configuration, CPU and Memory, and Database. The main content area is titled 'Time' and contains two sections: 'Time zone' and 'Time Synchronization'. The 'Time Synchronization' section is expanded to show the following configuration:

Time Synchronization	
Mode	NTP
Time servers	ntp.esl.cisco.com
Time synchronization status	NTP Daemon: Up
Current Time	Wed Dec 6 06:49:48 2017 UTC +0000

A red arrow points to the 'ntp.esl.cisco.com' value in the 'Time servers' row.

Best Practices Summary

- ✓ VLAN Provisioning
- ✓ Jumbo Frames
- ✓ Auto Support Email
- ✓ Connected TAC

CHECKLIST

✓

✓

✓

✓

✓





On Field Issues

Firmware / Version Mismatch

- Check the release notes and the respective HCL
- HXDP Version
- UCS (CIMC) Version
- ESXi Version
- vCenter Version
- Driver Version

Components

HXDP

CIMC (UCS)

ESXI

Networking Issues

- Duplicate IP
- Multiple clusters with the same storage VLAN
- Firewall not allowing all required ports
- DNS/NTP not reachable
- VLAN missing on switch
- Access/Trunk misconfiguration

Components

Networks
(Switches, routers,
firewalls, etc..)

Intersight Connectivity

- Claim in Intersight prior to HX cluster install
- All devices must be able to resolve `svc.ucs-connect.com`
- All Devices must allow outbound connections on port 443
- All Controller VMs must be able to resolve `download.intersight.com`

Components

Intersight

HX Nodes

On Field Issues Summary

- ✓ Firmware Mismatch
- ✓ Networking Issues
- ✓ Intersight Connectivity

CHECKLIST



✓

✓

✓

✓

✓



Summary



“They may forget what you said — but they will never forget how you made them feel”

— Carl W. Buehner



Appendix

Additional References:

- Admin Guide

<https://www.cisco.com/c/en/us/support/hyperconverged-systems/hyperflex-hx-data-platform-software/products-user-guide-list.html>

- Cisco Live On-Demand Library

<https://www.ciscolive.com/global/on-demand-library.html>

- Cisco Design Zone for Hyperconverged Infrastructure

<https://www.cisco.com/c/en/us/solutions/design-zone/data-center-design-guides/data-center-design-guides-all.html#Hyperconverged>

- Cisco Intersight Help Guide

https://intersight.com/help/getting_started#cisco_intersight_overview



Cabling Requirements

Cabling Requirements for 2 Node 1G

The following requirements are common to both 1GE topologies and must be met before starting deployment:

- Dedicated 1 Gigabit Ethernet (GE) Cisco IMC management port per server (required)
- Intel i350 Quad Port PCIe NIC Card (installed in a PCIe slot in each server) (required)
- 2 x 10GE DirectConnect LAN-on-Motherboard (LOM) connections (do not consume switchports)
- 2 x Category 6 straight through ethernet cables for direct connect links (customer supplied)
- 6 x 1GE Top of Rack (ToR) switchports and 6x Category 6 ethernet cables (customer supplied)

Cabling Requirements for 2 Node 10G

The following requirements are common to both 10GE topologies and must be met before starting deployment:

- Dedicated 1 Gigabit Ethernet (GE) Cisco IMC management port per server (recommended)
 - 2 x 1GE ToR switch ports and two (2) Category 6 ethernet cables for dedicated Cisco IMC management port (customer supplied)
- Cisco VIC 1457 (installed in the MLOM slot in each server)
 - Prior generation Cisco VIC hardware is not supported for 2 node or 4 node HX Edge clusters.
 - 4 x 10GE ToR switch ports and 4 x 10GE SFP+ or SFP28 cables (customer supplied. Ensure the cables you select are compatible with your switch model).
 - Only 10GE speeds are supported (no 1GE, 25GE, or 40GE).

Cabling Requirements for 3 and 4 Node 1G

The following requirements must be met before starting deployment:

- Dedicated 1 Gigabit Ethernet (GE) Cisco IMC management port per server (recommended).
 - 1 x 1GE ToR switch port and 1 x Category 6 ethernet cable for dedicated Cisco IMC management port per HyperFlex server (customer supplied)
- Intel i350 PCIe NIC [HX-PCIE-IRJ45] (installed in a PCIe slot in each server).
 - This NIC may be selected at ordering time and shipped preinstalled from the factory. The NIC may also be field-installed if ordered separately. Either riser #1 or #2 may be used, although riser #1 is recommended as it supports single socket CPU configurations.
 - 2 x 1GE ToR switch ports and 2 x Category 6 Ethernet Cables per HyperFlex server (customer supplied).
 - Cisco VIC is not used in this topology.
 - Intel i350 in MLOM form factor is not supported.

Cabling Requirements for 3 and 4 Node 1G

The following requirements must be met before starting deployment:

- Intel x550 Lan-on-motherboard LOM (built into Cisco UCS motherboard)
 - 2 x 1GE ToR switch ports and 2 x Category 6 Ethernet Cables per HyperFlex server (customer supplied)

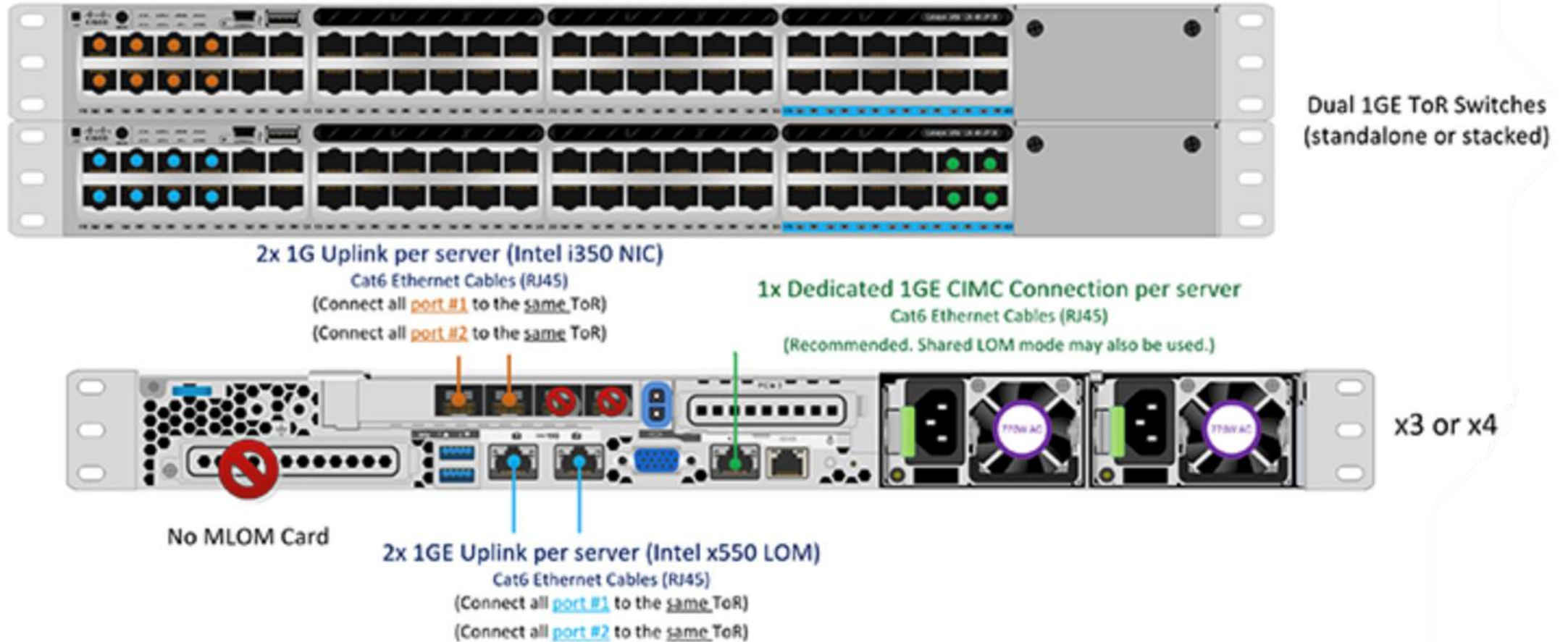
Cabling Requirements for 3 and 4 Node 10G

The following requirements are common to both 10GE topologies and must be met before starting deployment:

- Dedicated 1 Gigabit Ethernet (GE) Cisco IMC management port per server (recommended)
 - 1 x 1GE ToR switch ports and one (1) Category 6 ethernet cable for dedicated Cisco IMC management port per HyperFlex node (customer supplied)
- Cisco VIC 1457 (installed in the MLOM slot in each server)
 - Prior generation Cisco VIC hardware is not supported for 2 node or 4 node HX Edge clusters.
 - 2 x 10GE ToR switch ports and 2 x 10GE SFP+ or SFP28 cables per HyperFlex node (customer supplied. Ensure the cables you select are compatible with your switch model).
 - Only 10GE speeds are supported (no 1GE, 25GE, or 40GE).

3 or 4 Node 1G Physical Topology

3 & 4 Node Edge – Dual 1GE ToR Switches



3 or 4 Node 10G Physical Topology

3 & 4 Node Edge – Dual 10GE ToR Switches



Dual 1GE ToR Switches
(standalone or stacked)

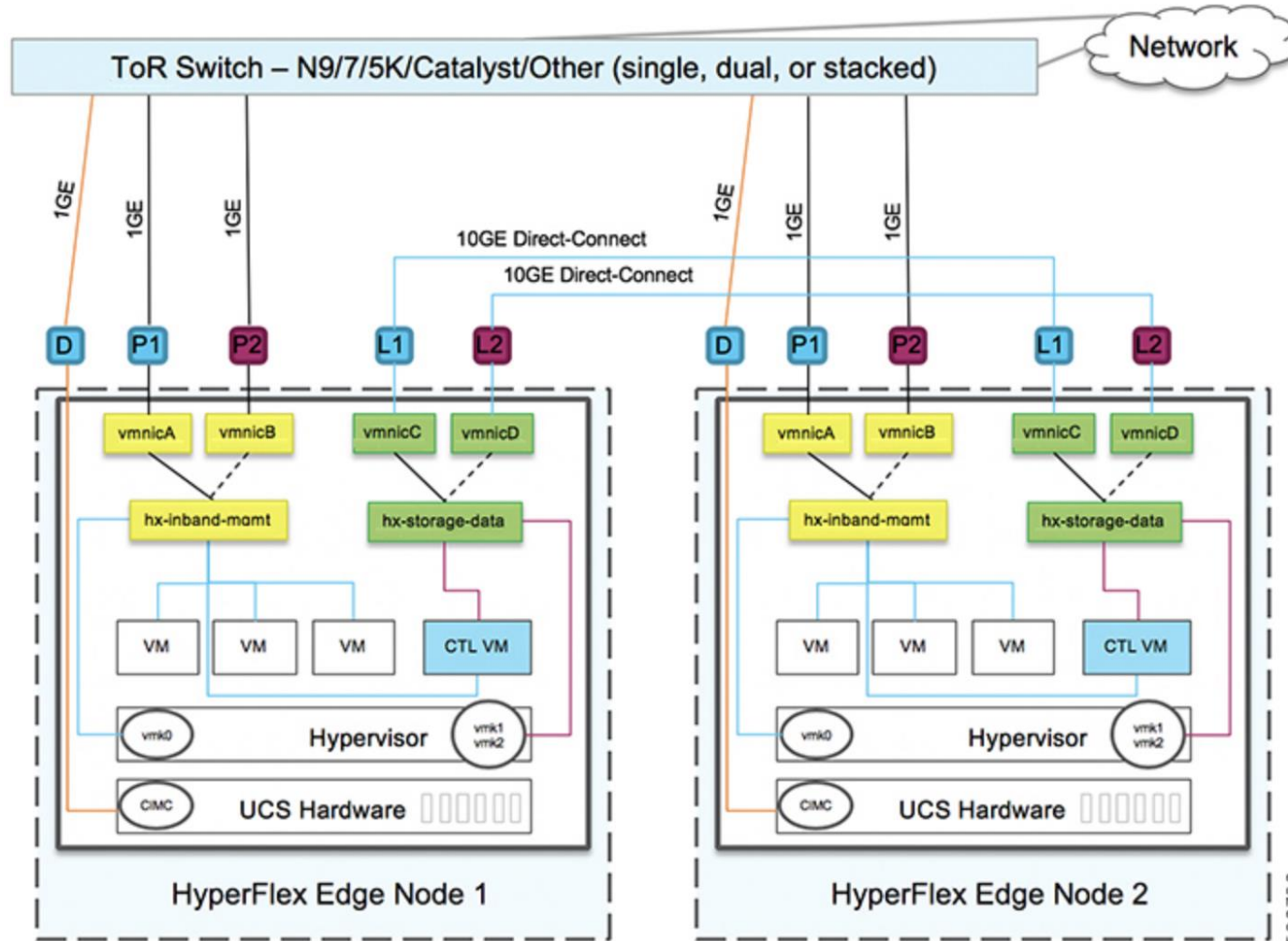
2x 10G Uplink per server (VIC 1457 MLOM)
Copper Twinax Cables (SFP+ or SFP28)
(Connect all **port #1** to the same ToR)
(Connect all **port #2** to the other ToR)



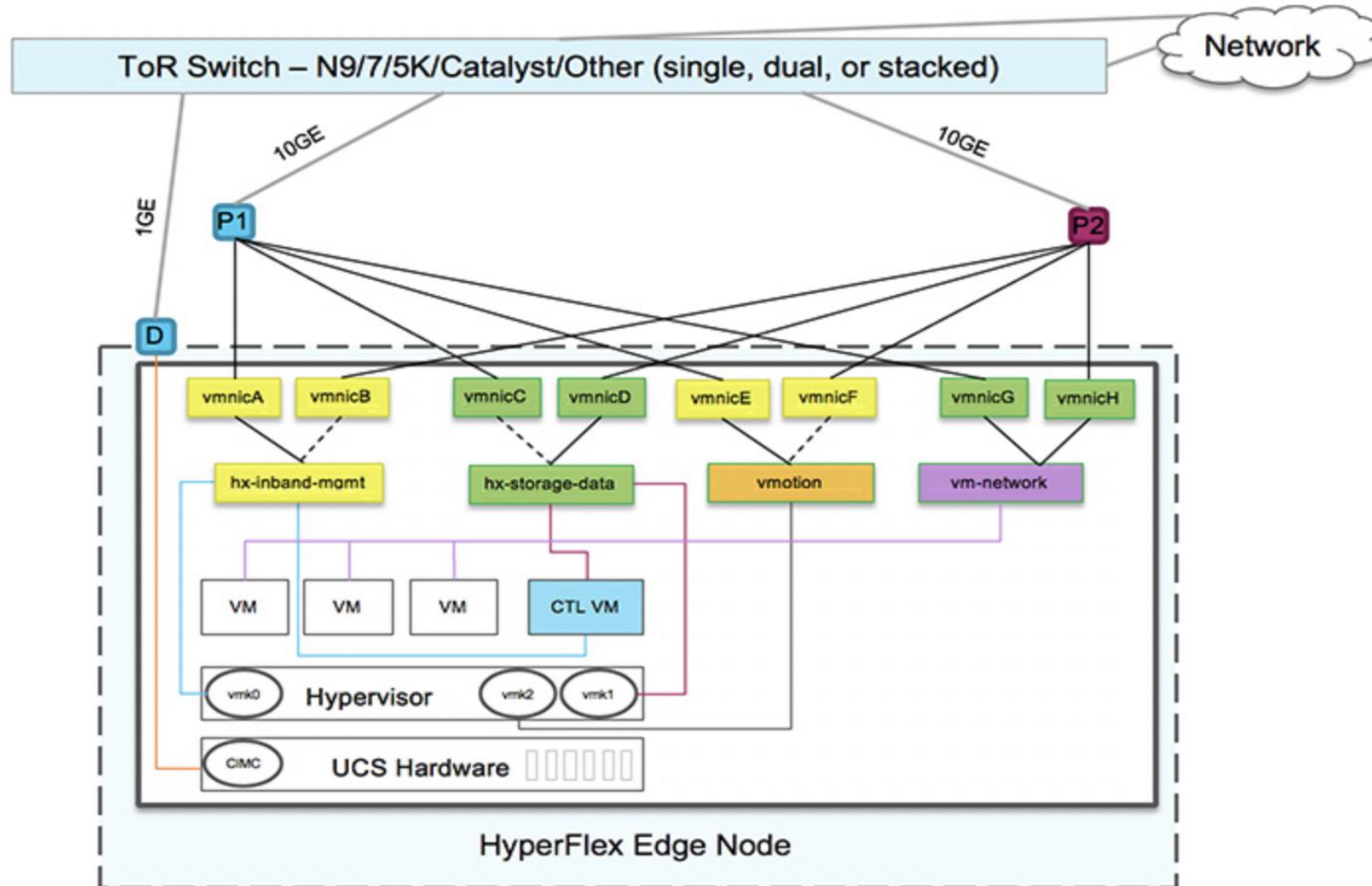
x3 or x4

1x Dedicated 1GE CIMC Connection per server
Cat6 Ethernet Cables (RJ45)
(Connect to any open port on either switch)

2 Node 1G Topology



2 and 3 Node 10G Topology



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Recommendation

- 1G: Do not connect more than two ports on the Intel i350 PCIe NIC prior to cluster installation. After cluster deployment, using the additional two ports is optional and allowed.
- 10G: Do not connect additional 10GE ports on the Cisco VIC 1457 prior to cluster installation. After cluster deployment, using the additional two 10GE ports for guest VM traffic is optional and is allowed.
- To deploy 10GE HyperFlex Edge clusters, Cisco VIC card that supports 10GE connectivity is required on each server. M5 servers require VIC 1387 and two QSAs, or VIC1457 to support 10GE connection. For 2-node and 4-node 10GE edge clusters only VIC 1457 is supported. VIC 1457 is highly recommended for M5 servers.
- HX Edge nodes can be configured with a single CPU of more than eight cores. Lower bin CPU SKUs below HX-CPU-4114 or HX-CPU-I4210 such as HX-CPU-3106, HX-CPU-4108, HX-CPU-4110 or HX-CPU-I4208 are only supported in dual CPU configured HyperFlex Edge systems.



Thank you





You make **possible**