Prerequisites and Requirements of Cisco SD-WAN Cloud onRamp for Colocation Solution

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Cisco SD-WAN Cloud onRamp for Colocation Solution Requirements

The following are the hardware, software, Cloud OnRamp for Colocation cluster, and cabling requirements for deploying Cisco SD-WAN Cloud onRamp for Colocation solution.

Hardware Requirements

The following table lists the hardware requirements:

Table 1: Feature History

Feature Name	Release Information	Description
Support for Cisco Cloud Services Platform, CSP-5456	Cisco SD-WAN Release 20.4.1	Starting from this release, Cisco CSP-5456 is supported on the Cloud onRamp for Colocation solution. The CSP-5456 offers a higher capacity of 56 cores, which maximizes the placement of VNFs in service chains.

Table 2: Hardware Requirements

Components	Hardware Requirements
Compute platform	CSP- 5444 and CSP-5456
Physical form factor	Cisco UCS C240 M5SX (2RU)

Components	Hardware Requirements
Processor cores	CSP-5444: 44 physical cores CSP-5456: 56 physical cores
PCIe NIC slots	6
Disk	8 * 1.2 TB = 9.6 TB
Disk slots	26 (24 useable)
Memory	192 GB of RAM
RAID	12-Gbps SAS HW controller, 4 GB flash-backed write cache (FBWC), RAID 10.
Base Networking	4x1PCIE card in M5 6x1GE Intel i350 ports, 2x1GE LoM **Note** 2-GigE interfaces in a port channel configuration are required for the NFVIS and VM management traffic.
Network Interface Cards (NIC)	2xIntel X520 2-port 10G (Niantic) and Intel XL710 4-port 10G SFP+ (Fortville) **Note** Two Fortville 10G interfaces in port-channel configuration and connected to a virtual switch. This connectivity is required for production traffic to or from the VMs, which support only virtio interface. **Note** Two Fortville 10G interfaces in port-channel configuration and connected to a virtual switch. This configuration is required for VNF HA state synchronization between VNFs hosted on two different CSP systems. **Note** Four Niantic 10G interfaces in SR-IOV mode. The VMs that need high performance and low latency network connectivity to bypass the hypervisor or virtual switch require these interfaces. The VMs that can support SR-IOV must be connected to the SR-IOV virtual function (VFs). Link redundancy is not available in this mode. **Note** For prescriptive connections, ensure that the Fortville NIC (X710) is placed in riser 1, slot-2 and Niantic cards (X520) in riser1, slot 1; and riser 2, slot 4.
Processors (2)	2xIntel Xeon Gold 6152 Series
Power Supplies	Dual power

Components	Hardware Requirements
Network fabric	**Catalyst 9500-40X** Supports forty10G ports and two 40G ports
	Catalyst 9500-48Y4C Supports forty-eight 1G/10G/25G ports and four 40G/100G ports
Management network	Any switch with sufficient number of 1G ports and port channel feature can be used as the management switch. Two switches are recommended to support hardware and link redundancy.

Software Requirements

The following table lists the software requirements:

Table 3: Software Requirements

Components	Software Requirements
Virtualization infrastructure software	Cisco NFVIS Cloud OnRamp for Colocation See Release Notes for Cisco SD-WAN Cloud OnRamp for Colocation Solution.
Orchestration	Cisco vManage See • Cisco SD-WAN Product Documentation for more information. • Cisco SD-WAN Release Notes for more information about the latest Cisco vManage features.

All CSP devices and switches must run same version of the software in the Cloud OnRamp for Colocation solution. Any new software version for all devices in a colocation is hosted on Cisco vManage, upon availability.

Supported Platforms and Firmware

The following table lists the supported platform and firmware versions of Cisco NFVIS:

Platform	Firmware	Version
CSP-5444, CSP-5456	BIOS	C240M5.4.2.2b.0.0613220203
	CIMC	4.2(2a)

To upgrade a CIMC version, see the Cisco Host Upgrade Utility User Guide.

Note We recommend that you reach out the Technical Assistance Center (TAC) when upgrading the CIMC version.

Wiring Requirements

Table 4: Feature History

Feature Name	Release Information	Description
Support for SVL Port Configuration on 100G Interfaces	Cisco IOS XE Release 17.8.1a Cisco vManage Release 20.8.1 Cisco NFVIS Release 4.8.1	With this feature, you can configure SVL ports on 100-G Ethernet interfaces of Cisco Catalyst 9500-48Y4C switches, thus ensuring a high level of performance and throughput.
Common Port Channel for Ingress and Egress Traffic	Cisco vManage Release 20.9.1 Cisco NFVIS Release 4.9.1	This feature introduces a common port channel for ingress and egress traffic from the time of creation of a colocation cluster. This feature facilitates an uninterrupted traffic flow by bringing all connected member links into a single port channel, which in turn load balances the traffic. The ingress port number is used to create a single port channel.

The solution supports both flexible and prescriptive connections between Cisco CSP devices and Cisco Catalyst 9500 switches.

Prescriptive Connections

Prescriptive connections are supported on both Cisco Catalyst 9500-48Y4C and Cisco Catalyst 9500-40X switches.

Ensure that you connect the SVL ports and uplink ports of the Catalyst 9500 switches based on the following information:

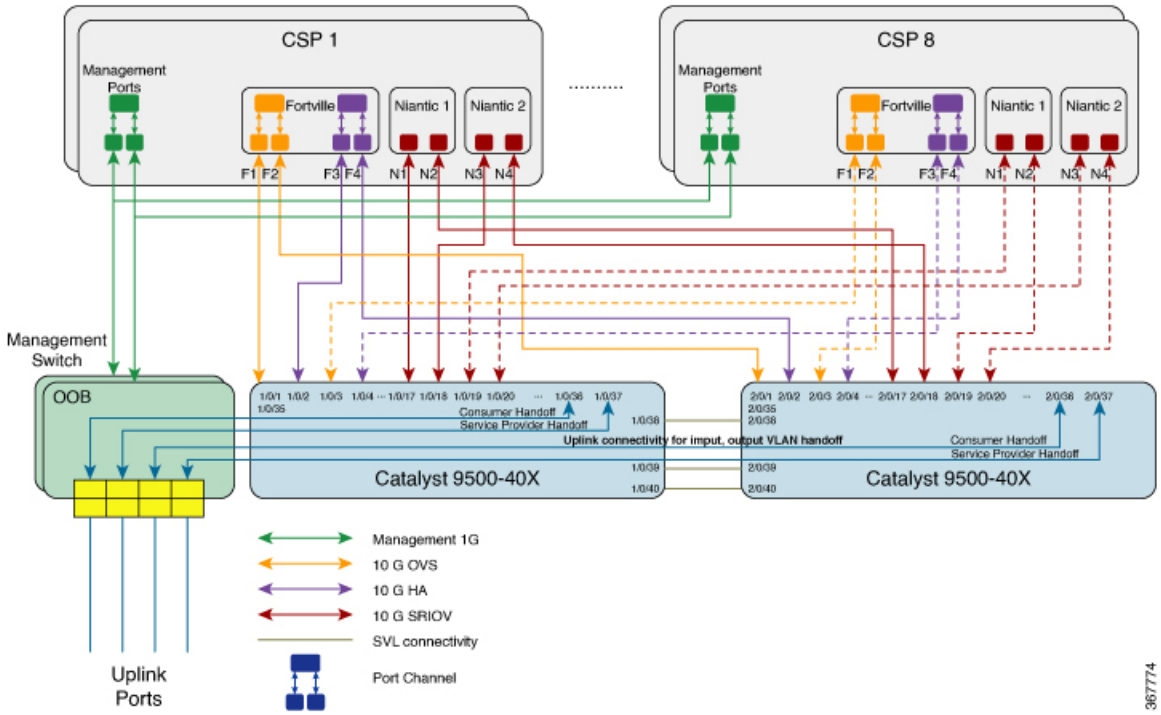
Cisco Catalyst 9500-40X

- Stackwise Virtual Switch Link (SVL) ports: 1/0/38-1/0/40, and 2/0/38-2/0/40
- Uplink ports: 1/0/36, 2/0/36 (input VLAN handoff) and 1/0/37, 2/0/37 (output VLAN handoff)

Cisco Catalyst 9500-48Y4C

The following image shows the high-level design of the physical connectivity for Cisco Catalyst 9500-40X switch.

Figure 1: Prescriptive Connections for Cisco Catalyst 9500-40X



In the preceding topology, each CSP has two 1-GB management ports configured as port channels to the OOB management switch. Each of the Cisco Catalyst 9500-40X switch is connected to the 1-GB port. This connectivity requires two ports on the Management switch per cloud onramp for colocation. The service provider handoff is connected to 10-GB ports on this switch. All service providers ports are trunked into the Cisco Catalyst 9500-40X switch. All the VLANs are configured on all ports of Cisco Catalyst 9500-40X switch.

You can similarly connect the CSP devices with the Cisco Catalyst 9500-48Y4C switches in a prescribed manner.

Note The management switches are not orchestrated and must be manually provisioned. Although the management switches are not orchestrated, ensure that the management switches and devices are connected as per the defined connections.

Flexible Connections

Flexible connections are supported on Cisco Catalyst 9500-40X and Cisco Catalyst 9500-48Y4C switches. For flexible connections:

- Exactly two Niantic cards and one Fortville card should be inserted into a Cisco CSP device in any riser card slot.

Note If you insert the Niantic cards into slots other than riser slots 1 and 4, and Fortville card into any slot other than slot 2, then clean install Cisco NFVIS on the Cisco CSP device after connecting all the cards.

- All data ports on a Cisco CSP device connected to any available ports on Cisco Catalyst 9500-40X or Cisco Catalyst 9500-48Y4C switches.

Note Ensure that you connect all ports on Cisco CSP devices and they are connected in a redundant manner to the primary and secondary switch ports. If all Cisco CSP ports are not connected, the cluster activation process fails.

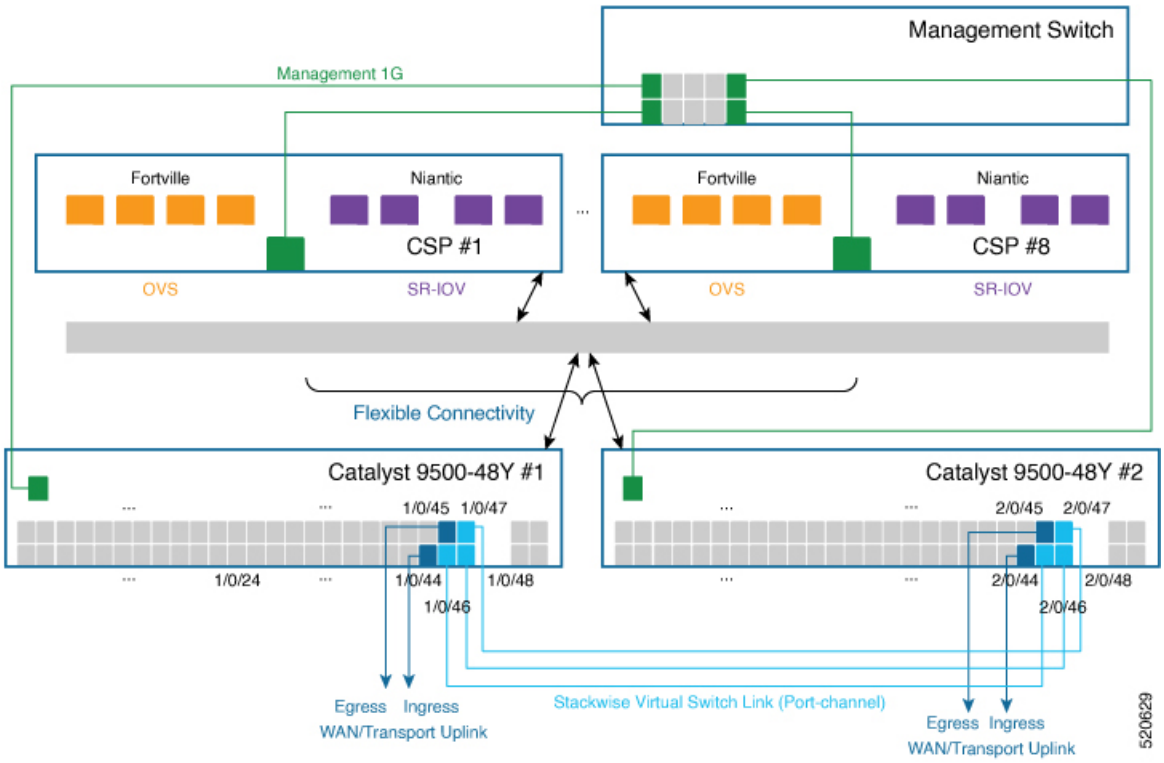
- Connect SVL ports anywhere between 1/0/1-1/0/48 and 2/0/1-2/0/48 or 1/0/48-1/0/52 and 2/0/48-2/0/52.
- Connect Uplink ports anywhere between 1/0/1-1/0/48 and 2/0/1-2/0/48 for 10G/25G throughput, or between 1/0/49-1/0/52 and 2/0/49-2/0/52 for 40G/100G throughput
- Connect all Niantic and Fortville ports of a Cisco CSP device for redundancy. For example, if Niantic ports are plugged into riser slots 1 and 2 and Fortville ports are plugged into riser slot 4, then you can connect the Cisco CSP interfaces to the switches in either of the following ways:
  - Primary switch: eth1-1, eth2-1, eth4-1, eth4-3

    Secondary Switch: eth1-2, eth2-2, eth4-2, eth4-4
  - Primary switch: eth1-2, eth2-1, eth4-1, eth4-2

    Secondary Switch: eth1-1, eth2-2, eth4-3, eth4-4
- Connect Physical Network functions (PNFs) to any available Cisco Catalyst 9500-40X or Cisco Catalyst 9500-48Y4C switches
- Connect each of the Cisco Catalyst 9500-40X or Cisco Catalyst 9500-48Y4C switch to the 1-GB management port. Each Cisco CSP device has two 1-GB management ports configured as port channels to the OOB management switch. The management switches are not orchestrated through Cisco vManage. Therefore, ensure that you connect the management switches and management ports as shown in the following image.

The following image shows the flexible connectivity between the Cisco CSP devices and Cisco Catalyst 9500-48Y4C switches where the SVL and uplink ports are connected to the default ports.

Figure 2: Cisco SD-WAN Cloud onRamp for Colocation Solution Flexible Connections



Prerequisites for Deploying Solution

The following are prerequisites for deploying the Cisco SD-WAN Cloud onRamp for Colocation solution:

- A minimum of two CSP PID (two Niantics and one Fortville) required. You can order more CSP devices as per the number of service chains that are required per cluster (including HA instances). Also, consider the throughput requirement or number of sessions terminating the cloud onramp for colocation when ordering the number of CSP devices.
- A smart account that is required to propagate the ordered devices to the PNP cloud and vOrchestrator.
- Two Cisco Catalyst 9500-40X or Cisco Catalyst 9500-48Y4C and OOB switches, and a DHCP server per cluster are required.
- Port channel, RJ45 and data SFP along with cables for connectivity are required.
- A router for WAN termination is required.
- Terminal server for configuring switches and CIMC is required.
- Split management IP pool per cluster into two parts. Configure one part on a DHCP server by considering number of physical devices in a cluster and IP addresses required for broadcast and gateway. Configure the other part of management IP pool on the Cisco vManage for VNFs and Cisco Colo Manager. The first IP address in the Cisco vManage management pool is used for Cisco Colo Manager. Ensure that you configure this IP address and PNP server for the switch.

Sizing Requirements of Cisco SD-WAN Cloud onRamp for Colocation Solution Devices

The cloud onramp for colocation cluster requirements can be categorized into small, medium, large, and extra large clusters that are based on throughput and compute demands.

Consider the following criteria to determine the various cloud onramp for colocation size categories:

Note The cloud onramp for colocation size must be determined before orchestration when ordering the devices such as, CSP devices, and Cisco Catalyst 9500-40X and Cisco Catalyst 9500-48Y4C switches.

- Depending on the number of connections that are required for public clouds and the number of customers trying to reach these clouds, decide the number of required service chains.
- Depending on the policies that must be enforced, decide the number of VMs required in each service chain.
- From the preceding two criteria, you can determine on an average the throughput that is required per service chain.

In a single Cisco SD-WAN Cloud onRamp for Colocation Solution solution deployment, you can deploy four CSP systems in a cluster.