Cisco Catalyst SD-WAN Control Components Compatibility Matrix and Recommended Computing Resources

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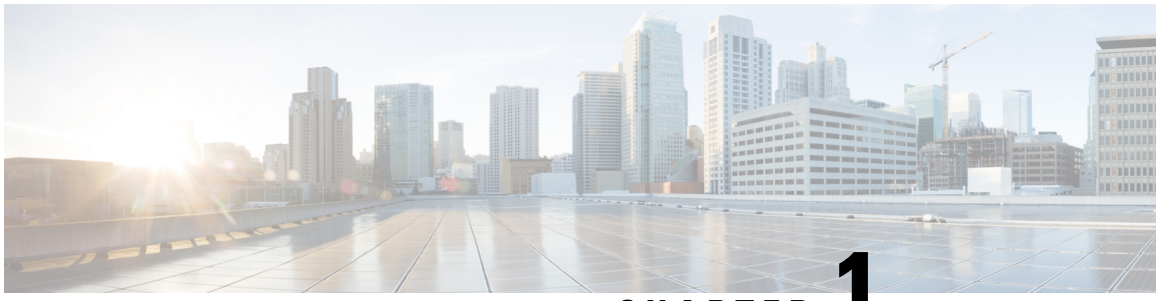
Compatibility Matrix



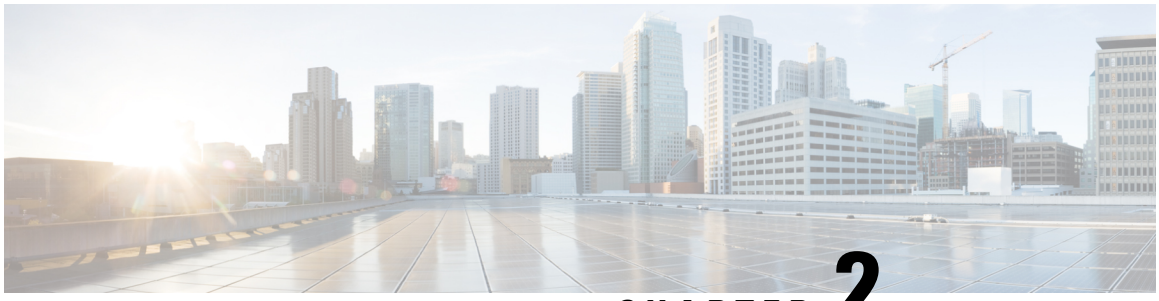
CHAPTER 1

Compatibility Matrix

This document accompanies the Cisco Catalyst SD-WAN release notes forCisco IOS XE Catalyst SD-WAN devices, Cisco vEdge devices, and Cisco Catalyst SD-WAN Controllers. This document provides detailed information for Cisco Catalyst SD-WAN Controller-device compatibility and Cisco Catalyst SD-WAN Controller server requirements.

For additional release information, see Cisco SD-WAN Release Notes.

Note If you have Cisco vEdge Hardware (vEdge 100M, vEdge100B, vEdge 100wm, vEdge 1000, or vEdge 2000) deployed in your Cisco SD-WAN fabric please refer to the respective release-specific topics in this document, before upgrading.



CHAPTER 2

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.12.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Compatibility Matrix for Cisco Catalyst SD-WAN Routing Platforms

Table 1: Cisco Catalyst SD-WAN Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.12.1	17.12.1a, 17.11.1a, 17.10.1a, 17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a

Table 2: Cisco Catalyst SD-WAN Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8200	Catalyst 8200L	Catalyst 8300/Catalyst 8500	Catalyst 8500L	Catalyst C8500-20X6C
20.12.1	17.12.1a, 17.11.1a, 17.10.1a, 17.9.4, 17.9.3a, 17.9.2a, , 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.12.1a, 17.11.1a, 17.10.1a, 17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.12.1a, 17.11.1a, 17.10.1a, 17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.12.1a,17.11.1a, 17.10.1a, 17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.12.1a, 17.11.1a and 17.10.1a

Table 3: Cisco Catalyst SD-WAN Compatibility Matrix for Virtual Platforms

Control Components	C8000v
20.12.1	17.12.1a, 17.11.1a, 17.10.1a, 17.9.4, 17.9.3, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a

Table 4: Cisco Catalyst SD-WAN Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.12.1	17.6.1a and later	17.6.1a and later	17.6.1a and later	17.7.1 and later	17.7.1 and later

Table 5: Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Control Components	Cisco vEdge 5000	Cisco vEdge Cloud
20.12.1	20.9.4, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.1, 20.6.1, 20.6.3, 20.6.4, and 20.6.5	20.9.4, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.1, 20.6.1, 20.6.3, 20.6.4, and 20.6.5

Table 6: Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	Cisco vEdge 2000
20.12.1	20.6.5.3, 20.6.5.2, 20.6.4.1, 20.6.3.3, 20.6.3.2, and 20.6.1.2	20.9.3.1, 20.6.5.3, 20.6.5.2, 20.6.4.1, 20.6.3.3, 20.6.3.2, and 20.6.1.2

Table 7: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.12.1	Cisco IOS XE Catalyst SD-WAN Releases 17.12.1a, 17.11.1a, 17.10.1a, 17.9.1a, 17.8.1, 17.7.1a, and 17.6.5. Cisco SD-WAN Releases (Viptela OS) 20.9.4, 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, and 20.6.1	Cisco IOS XE Catalyst SD-WAN Releases 17.12.1a, 17.11.1a, 17.10.1a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a. Cisco SD-WAN Releases (Viptela OS) 20.9.4, 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, and 20.6.1

Compatibility Matrix for Cisco Catalyst SD-WAN Control Components and Cisco NFVIS

Table 8: Compatibility Matrix for Cisco Catalyst SD-WAN Control Components, Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE

Control Components	Cisco Catalyst 8200 Series Edge uCPE	ENCS 5400
20.12.1	Cisco NFVIS Release 4.12.1, 4.11.1, 4.10.1, 4.9.1, 4.9.2, 4.9.3, 4.9.4, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.12.1, 4.11.1, 4.10.1, 4.9.1, 4.9.2, 4.9.3, 4.9.4, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Table 9: Cisco Catalyst SD-WAN Compatibility Matrix for Cisco NFVIS Platforms and Cisco Catalyst SD-WAN Control Components

Control Components	Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE
20.12.1	Cisco NFVIS Release 4.12.1

Table 10: Compatibility Matrix for Cisco Catalyst 8000V, Cisco Catalyst 8200 Series Edge uCPE and Cisco NFVIS Platforms

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Cisco Catalyst 8000V
Cisco NFVIS Release 4.12.1	17.12.1a, 17.11.1a, 17.10.1a, 17.9.4, 17.9.3a, 17.9.1a, 17.6.5, 17.6.3a, 17.6.2, and 17.6.1a

Table 11: Compatibility Matrix for Cisco ENCS 5400, Cisco Catalyst 8200 Series Edge uCPE and Cisco Catalyst 8000V

Cisco Catalyst 8000V	Catalyst 8200 Series Edge uCPE and Cisco ENCS 5400 and Cisco
17.12.1a	Cisco NFVIS Release 4.12.x

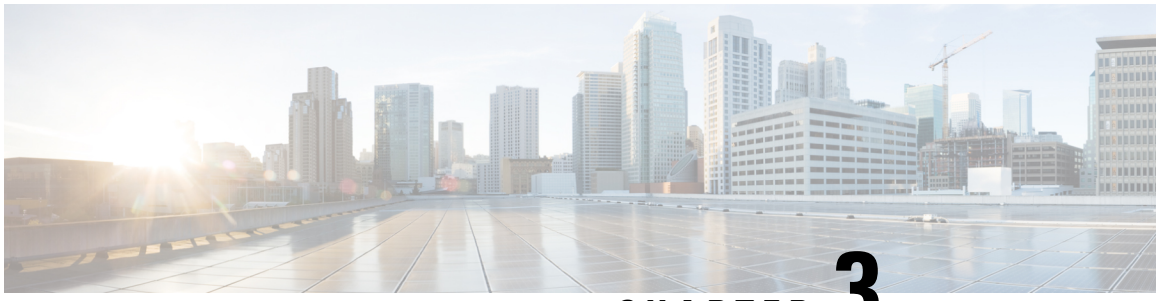
Compatibility Matrix for Cisco Catalyst SD-WAN Control Components and Cisco Cellular Gateways

Table 12: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.12.1	Cisco IOS XE Catalyst SD-WAN Release 17.6.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.6.1a. Cisco IOS CG Release 17.6.1 and later.

Note

- Starting from Cisco vManage Release 20.9.1, the Control componets software version must be the same or be higher that the WAN edge device software version. If the WAN edge device software version is higher than the Controller software version, policy download to the device fails.
- All device and control components combinations listed in this table have been validated. However, there are no software changes in this control components software release, which impact the device-to-control components backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco Catalyst SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.
- If your Cisco IOS XE Catalyst SD-WAN devices are running Cisco IOS XE Catalyst SD-WAN Release 16.12.x and 17.2.x and if you are looking to upgrade your Cisco Catalyst SD-WAN Manager to Cisco Catalyst SD-WAN Control Components Release 20.12.1, you need to upgrade your Cisco IOS XE Catalyst SD-WAN devices to Cisco IOS XE Catalyst SD-WAN Release 17.3.x.
- If your Cisco vEdge devices are running Cisco SD-WAN Release 20.1.x and if you are looking to upgrade your Cisco Catalyst SD-WAN Manager to Cisco Catalyst SD-WAN Control Components Release 20.12.1, you need to upgrade your Cisco vEdge devices to Cisco Catalyst SD-WAN Control Components Release 20.3.x.



CHAPTER 3

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.11.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 13: Cisco Catalyst SD-WANCompatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.11.1, 20.11.1.1, and 20.11.1.2	17.11.1a, 17.10.1a, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a

Table 14: Cisco Catalyst SD-WAN Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L	Catalyst C8500-20X6C
20.11.1, 20.11.1.1, and 20.11.1.2	17.11.1a, 17.10.1a, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.11.1a, 17.10.1a, 17.9.2a, 17.9.3a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.11.1a, 17.10.1a, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.11.1a, 17.10.1a, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.11.1a and 17.10.1a

Table 15: Cisco Catalyst SD-WAN Compatibility Matrix for Virtual Platforms

Control Components	C8000v
20.11.1, 20.11.1.1, and 20.11.1.2	17.11.1a, 17.10.1a, 17.9.3, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a

Table 16: Cisco Catalyst SD-WAN Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.11.1, 20.11.1.1, and 20.11.1.2	17.3.1 and later	17.6.1a and later	17.6.1a and later	17.7.1 and later	17.7.1 and later

Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Table 17: Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Control Components	Cisco vEdge 5000	Cisco vEdge Cloud
20.11.1, 20.11.1.1, and 20.11.1.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.5, 20.6.4, 20.6.3, 20.6.1, 20.7.1, 20.8.1, 20.9.1, 20.9.2 and 20.9.3	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.5, 20.6.4, 20.6.3, 20.6.1, 20.7.1, 20.8.1, 20.9.1, 20.9.2 and 20.9.3

Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Table 18: Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	Cisco vEdge 2000
20.11.1, 20.11.1.1, and 20.11.1.2	20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2 and 20.6.5.3	20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, 20.6.5.3, and 20.9.3.1

Table 19: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.11.1, 20.11.1.1, and 20.11.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.11.1a, 17.10.1a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.11.1a, 17.10.1a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco NFVIS

Table 20: Compatibility Matrix for Cisco SD-WAN Control Components, Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE

Control Components	ENCS 5400	Cisco Catalyst 8200 Series Edge uCPE
20.11.1, 20.11.1.1, and 20.11.1.2	Cisco NFVIS Release 4.11.1, 4.10.1, 4.9.1, 4.9.2, 4.9.3, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.11.1, 4.10.1, 4.9.1, 4.9.2, 4.9.3, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Table 21: Cisco Catalyst SD-WAN Compatibility Matrix for Cisco NFVIS Platforms and Cisco SD-WAN Control Components

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Control Components
Cisco NFVIS Release 4.11.1	20.11.1

Table 22: Compatibility Matrix for Cisco Catalyst 8000V, Cisco Catalyst 8200 Series Edge uCPE and Cisco NFVIS Platforms

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Cisco Catalyst 8000V
Cisco NFVIS Release 4.11.1	17.11.1a, 17.10.1a, 17.9.3a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2

Table 23: Compatibility Matrix for Cisco ENCS 5400, Cisco Catalyst 8200 Series Edge uCPE and Cisco Catalyst 8000V

Cisco Catalyst 8000V	Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE
17.11.1a	Cisco NFVIS Release 4.11.x

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Table 24: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.11.1, 20.11.1.1, and 20.11.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst D-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.

Note

- Starting from Cisco vManage Release 20.9.1, the Controller software version must be the same or be higher that the WAN edge device software version. If the WAN edge device software version is higher than the Controller software version, policy download to the device fails.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.

CHAPTER 4

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.10.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 25: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.10.1, 20.10.1.1, and 20.10.1.2	17.10.1a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a

Table 26: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L	Catalyst C8500-20X6C
20.10.1, 20.10.1.1, and 20.10.1.2	17.10.1a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.10.1a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.10.1a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.10.1a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a	17.10.1a

Table 27: Compatibility Matrix for Virtual Platforms

Control Components	C8000v
20.10.1, 20.10.1.1, and 20.10.1.2	17.10.1a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, and 17.6.1a

Table 28: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.10.1, 20.10.1.1, and 20.10.1.2	17.6.1a and later	17.6.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later

Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Table 29: Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Control Components	Cisco vEdge 5000	Cisco vEdge Cloud
20.10.1, 20.10.1.1, and 20.10.1.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.5, 20.6.4, 20.6.3, 20.6.1, 20.7.1, 20.8.1, 20.9.1, and 20.9.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.5, 20.6.4, 20.6.3, 20.6.1, 20.7.1, 20.8.1, 20.9.1, and 20.9.2

Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Table 30: Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	Cisco vEdge 2000
20.10.1, 20.10.1.1, and 20.10.1.2	20.6.1.2, 20.6.3.2, 20.6.3.3, and 20.6.4.1	20.6.1.2, 20.6.3.2, 20.6.3.3 and 20.6.4.1

Table 31: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.10.1, 20.10.1.1, and 20.10.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.10.1a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.10.1a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco NFVIS

Table 32: Compatibility Matrix for Cisco SD-WAN Control Components, Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE

Control Components	ENCS 5400	Cisco Catalyst 8200 Series Edge uCPE
20.10.1	Cisco NFVIS Release 4.10.1, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.10.1, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3
20.10.1.1	Cisco NFVIS Release 4.10.1, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.10.1, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3
20.10.1.2	Cisco NFVIS Release 4.10.1, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.10.1, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Table 33: Compatibility Matrix for Cisco NFVIS Platforms and Cisco SD-WAN Control Components

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Control Components
Cisco NFVIS Release 4.10.1	20.10.1

Table 34: Compatibility Matrix for Cisco Catalyst 8000V, Cisco Catalyst 8200 Series Edge uCPE and Cisco NFVIS Platforms

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Cisco Catalyst 8000V
Cisco NFVIS Release 4.10.1	17.10.a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2

Table 35: Compatibility Matrix for Cisco ENCS 5400, Cisco Catalyst 8200 Series Edge uCPE and Cisco Catalyst 8000V

Cisco Catalyst 8000V	Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE
17.10.1a	Cisco NFVIS Release 4.10.x

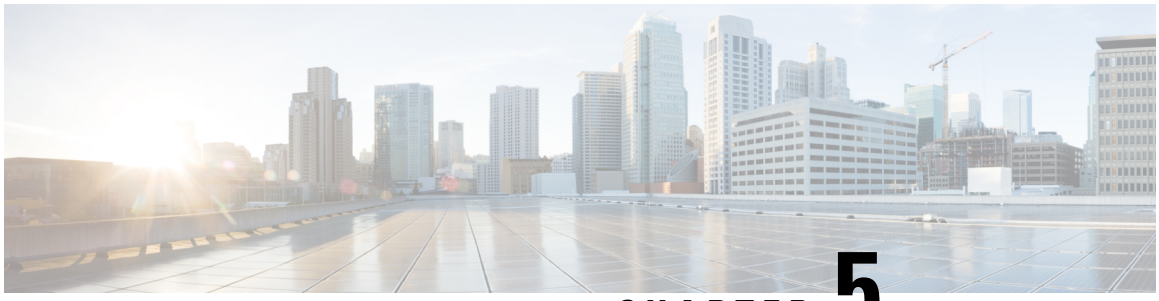
Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Table 36: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.10.1, 20.10.1.1, and 20.10.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.

Note

- Starting from Cisco vManage Release 20.9.1, the Controller software version must be the same or be higher that the WAN edge device software version. If the WAN edge device software version is higher than the Controller software version, policy download to the device fails.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.



CHAPTER 5

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.9.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 37: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.9.1	17.9.1a, 17.8.1a, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.3.5, 17.4.1a, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, and 17.2.1r
20.9.2	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.3.5, 17.4.1a, 17.3.6, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, and 17.2.1r
20.9.3, 20.9.3.1 and 20.9.3.2	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.3.5, 17.4.2, 17.4.1a, 17.3.6, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, and 17.2.1r
20.9.4 and 20.9.4.1	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.3.5, 17.4.2, 17.4.1a, 17.3.6, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, and 17.2.1r

Table 38: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.9.1	17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.5, 17.3.4a, 17.3.3, and 17.3.2	17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, and 17.5.1a
20.9.2	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 17.3.2	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, and 17.5.1a
20.9.3, 20.9.3.1 and 20.9.3.2	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 17.3.2	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, and 17.5.1a
20.9.4 and 20.9.4.1	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 17.3.2	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, and 17.5.1a

Table 39: Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	C8000v	ISRv (ENCS)	vEdge Cloud
20.9.1	17.3.5, 17.3.4a, and 17.3.3	17.9.1a, 17.8.1a, 17.7.2, 17.7.1a,17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.4a and 17.3.3 with NFVIS 4.9.1 FC3	20.3.3, 20.3.4, 20.3.5, 20.4.2, 20.5.1, 20.6.3, 20.6.2, 20.6.1, 20.7.1, 20.7.2, 20.8.1, and 20.9.1
20.9.2	17.3.6, 17.3.5, 17.3.4a, and 17.3.3	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2.	17.3.4a and 17.3.3 with NFVIS 4.9.2 FC5	20.3.6, 20.3.3, 20.3.4, 20.3.5, 20.4.2, 20.5.1, 20.6.3, 20.6.2, 20.6.1, 20.7.1, 20.7.2, 20.8.1, 20.9.1 and 20.9.2
20.9.3, 20.9.3.1 and 20.9.3.2	17.3.6, 17.3.5, 17.3.4a, and 17.3.3	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2.	17.3.4a and 17.3.3 with NFVIS 4.9.3 FC1	20.3.6, 20.3.3, 20.3.4, 20.3.5, 20.4.2, 20.5.1, 20.6.3, 20.6.2, 20.6.1, 20.7.1, 20.7.2, 20.8.1, 20.9.1, 20.9.2, and 20.9.3
20.9.4 and 20.9.4.1	17.3.7, 17.3.6, 17.3.5, 17.3.4a, and 17.3.3	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2.	17.3.4a and 17.3.3 with NFVIS 4.9.4 FC1	20.3.6, 20.3.3, 20.3.4, 20.3.5, 20.4.2, 20.5.1, 20.6.3, 20.6.2, 20.6.1, 20.7.1, 20.7.2, 20.8.1, 20.9.1, 20.9.2, 20.9.3 and 20.9.4

Compatibility Matrix for Cisco IOS XE Catalyst SD-WAN Release SD-WAN Control Components and Cisco NFVIS

Table 40: Compatibility Matrix for Cisco IOS XE Catalyst SD-WAN Release SD-WAN Control Components, Cisco ENCS 5400 and Cisco IOS XE Catalyst SD-WAN Release 8200 Series Edge uCPE

Control Components	ENCS 5400	Cisco IOS XE Catalyst SD-WAN Release 8200 Series Edge uCPE
20.9.1	Cisco NFVIS Release 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3
20.9.2	Cisco NFVIS Release 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Control Components	ENCS 5400	Cisco IOS XE Catalyst SD-WAN Release 8200 Series Edge uCPE
20.9.3	Cisco NFVIS Release 4.9.3, 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.9.3, 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3
20.9.3.1	Cisco NFVIS Release 4.9.3, 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.9.3, 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3
20.9.4 and 20.9.4.1	Cisco NFVIS Release 4.9.4, 4.9.3, 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.9.4, 4.9.3, 4.9.2, 4.9.1, 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Table 41: Compatibility Matrix for Cisco NFVIS Platforms and Cisco IOS XE Catalyst SD-WAN Release SD-WAN Control Components

Cisco ENCS 5400 and Cisco IOS XE Catalyst SD-WAN Release 8200 Series Edge uCPE	Control Components
Cisco NFVIS Release 4.9.1	20.9.3, 20.9.2, and 20.9.1
Cisco NFVIS Release 4.9.2	20.9.3 and 20.9.2
Cisco NFVIS Release 4.9.3	20.9.3 and 20.9.3.1
Cisco NFVIS Release 4.9.4	20.9.4 and 20.9.4.1

Table 42: Compatibility Matrix for Cisco NFVIS Platforms and Cisco IOS XE Catalyst SD-WAN Release 8000V

Cisco ENCS 5400 and Cisco IOS XE Catalyst SD-WAN Release 8200 Series Edge uCPE	Cisco IOS XE Catalyst SD-WAN Release 8000V
Cisco NFVIS Release 4.9.1	17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2
Cisco NFVIS Release 4.9.2	17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2
Cisco NFVIS Release 4.9.3	17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2
Cisco NFVIS Release 4.9.4	17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1a, 17.7.2, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2

Table 43: Compatibility Matrix for Cisco IOS XE Catalyst SD-WAN Release 8000V and Cisco ENCS 5400

Cisco IOS XE Catalyst SD-WAN Release 8000V	Cisco ENCS 5400
17.9.1a	Cisco NFVIS Release 4.9.x

Cisco IOS XE Catalyst SD-WAN Release 8000V	Cisco ENCS 5400
17.9.2a	Cisco NFVIS Release 4.9.x
17.9.3a	Cisco NFVIS Release 4.9.x
17.9.4	Cisco NFVIS Release 4.9.x

Compatibility Matrix for Cisco IOS XE Catalyst SD-WAN Release SD-WAN vEdge Platforms

Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Table 44: Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Control Components	vEdge 5000	vEdge Cloud
20.9.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.1, 20.8.1, and 20.9.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.1, 20.8.1, and 20.9.1
20.9.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.6, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.2, 20.7.1, 20.8.1, 20.9.1, and 20.9.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.6, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.2, 20.7.1, 20.8.1, 20.9.1, and 20.9.2
20.9.3, 20.9.3.1 and 20.9.3.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.6, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.2, 20.7.1, 20.8.1, 20.9.1, 20.9.2, and 20.9.3	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.6, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.2, 20.7.1, 20.8.1, 20.9.1, 20.9.2, and 20.9.3
20.9.4 and 20.9.4.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.6, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.2, 20.7.1, 20.8.1, 20.9.1, 20.9.2, 20.9.3, and 20.9.4	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.6, 20.4.1, 20.4.2, 20.5.1, 20.6.4, 20.6.3, 20.6.1, 20.7.2, 20.7.1, 20.8.1, 20.9.1, 20.9.2, 20.9.3, and 20.9.4

Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Table 45: Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	vEdge 2000
20.9.4.1	20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, and 20.6.5.3	20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, and 20.6.5.3

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	vEdge 2000
20.9.3.1	20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, and 20.6.5.3	20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, 20.6.5.3 and 20.9.3.1
20.9.3.2	20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, and 20.6.5.3	20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, and 20.6.5.3

Table 46: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.9.1	Cisco IOS XE Catalyst SD-WAN Release 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.9.2	Cisco IOS XE Catalyst SD-WAN Release 17.9.2a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.9.2a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.9.3, 20.9.3.1 and 20.9.3.2	Cisco IOS XE Catalyst SD-WAN Release 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.9.4 and 20.9.4.1	Cisco IOS XE Catalyst SD-WAN Release 17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.4, 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.9.4, 17.9.3a, 17.9.2a, 17.9.1a, 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.9.4, 20.9.3.1, 20.9.3, 20.9.2, 20.9.1, 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 47: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.9.1	17.3.1a and later	17.6.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later
20.9.2	17.3.1a and later	17.6.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later
20.9.3, 20.9.3.1, and 20.9.3.2	17.3.1a and later	17.6.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later
20.9.4 and 20.9.4.1	17.3.1a and later	17.6.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later

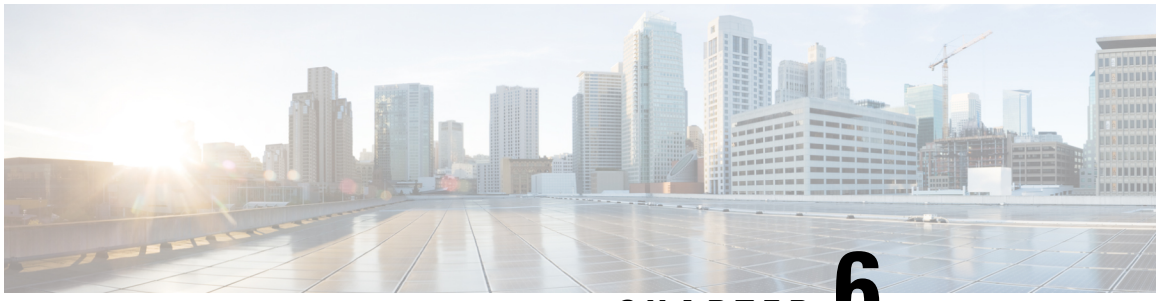
Compatibility Matrix for Cisco IOS XE Catalyst SD-WAN Release SD-WAN Control Components and Cisco Cellular Gateways

Table 48: Compatibility Matrix for Cisco IOS XE Catalyst SD-WAN Release SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.9.1	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.9.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.9.3, 20.9.3.1, and 20.9.3.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.9.4 and 20.9.4.1	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.

Note

- Starting from Cisco vManage Release 20.9.1, the Control components software version must be the same or be higher that the WAN edge device software version. If the WAN edge device software version is higher than the Control components software version, policy download to the device fails.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this control components software release, which impact the device-to-control components backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.



CHAPTER 6

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.8.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 49: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.8.1	17.8.1, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x

Table 50: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.8.1	17.8.1, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.8.1, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.8.1, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.8.1, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, and 17.5.1a

Table 51: Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.8.1	17.3.3, 17.3.4a, and 17.3.5	17.8.1, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.3 and 17.3.4 with NFVIS 4.7.1 FC4

Table 52: Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Control Components	vEdge
20.8.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.3, 20.6.1, 20.7.1, and 20.8.1.

Table 53: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.8.1	Cisco IOS XE Catalyst SD-WAN Release 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.8.1, 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.8.1, 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 54: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.8.1	17.3.1a and later	17.6.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco NFVIS

Table 55: Compatibility Matrix for Cisco SD-WAN Control Components, Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE

Control Components	ENCS 5400	Cisco Catalyst 8200 Series Edge uCPE
20.8.1	Cisco NFVIS Release 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.8.1, 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Table 56: Compatibility Matrix for Cisco NFVIS Platforms and Cisco SD-WAN Control Components

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Control Components
Cisco NFVIS Release 4.8.1	20.8.1

Table 57: Compatibility Matrix for Cisco NFVIS Platforms and Cisco Catalyst 8000V

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Cisco Catalyst 8000V
Cisco NFVIS Release 4.8.1	17.8.1, 17.7.2, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2

Table 58: Compatibility Matrix for Cisco Catalyst 8000V and Cisco ENCS 5400

Cisco Catalyst 8000V	Cisco ENCS 5400
17.8.1	Cisco NFVIS Release 4.8.x

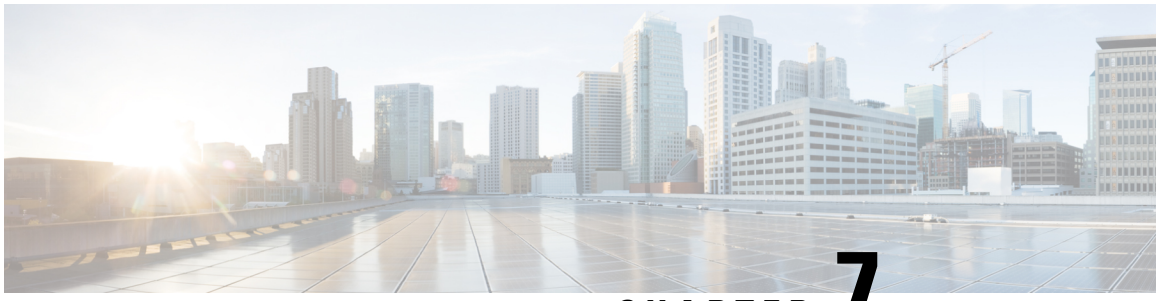
Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Table 59: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.8.1	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.

Note

- We recommend that the Control component software version matches or be higher than the WAN edge device software version.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.



CHAPTER 7

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.7.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 60: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.7.1	17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x
20.7.2	17.7.2, 17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x

Table 61: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.7.1	17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.7.1a, 17.6.2, 17.6.1a, and 17.5.1a

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.7.2	17.7.2, 17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.7.2, 17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.7.2, 17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.7.2, 17.7.1a, 17.6.2, 17.6.1a, and 17.5.1a

Table 62: Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.7.1	17.3.4a, and 17.3.3	17.7.1a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.3 and 17.3.4 with NFVIS 4.7.1 FC4
20.7.2	17.3.4a, 17.3.3, and 17.3.5	17.7.2, 17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.3 and 17.3.4 with NFVIS 4.7.1 FC4

Table 63: Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Control Components	vEdge
20.7.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.1, and 20.7.1
20.7.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.7.1, and 20.7.2

Table 64: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.7.1	Cisco IOS XE Catalyst SD-WAN Release 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.7.2	Cisco IOS XE Catalyst SD-WAN Release 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.7.1a, 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.7.2, 20.7.1.1,20.7.1, 20.6.5.2, 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 65: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.7.1	17.3.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later	17.7.1a and later
20.7.2	17.3.1a and later	17.6.1a and later	17.7.1a and later	17.7.1a and later	17.7.1a and later

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco NFVIS

Table 66: Compatibility Matrix for Cisco SD-WAN Control Components, Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE

Control Components	ENCS 5400	Cisco Catalyst 8200 Series Edge uCPE
20.7.1	Cisco NFVIS Release 4.7.1, 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.7.1, 4.6.1, 4.6.2, and 4.6.3

Table 67: Compatibility Matrix for Cisco NFVIS Platforms and Cisco SD-WAN Control Components

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Control Components
Cisco NFVIS Release 4.7.1	20.7.1

Table 68: Compatibility Matrix for Cisco NFVIS Platforms and Cisco Catalyst 8000V

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Cisco Catalyst 8000V
Cisco NFVIS Release 4.7.1	17.7.1a, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2

Table 69: Compatibility Matrix for Cisco Catalyst 8000V and Cisco ENCS 5400

Cisco Catalyst 8000V	Cisco ENCS 5400
17.7.1a	Cisco NFVIS Release 4.7.x

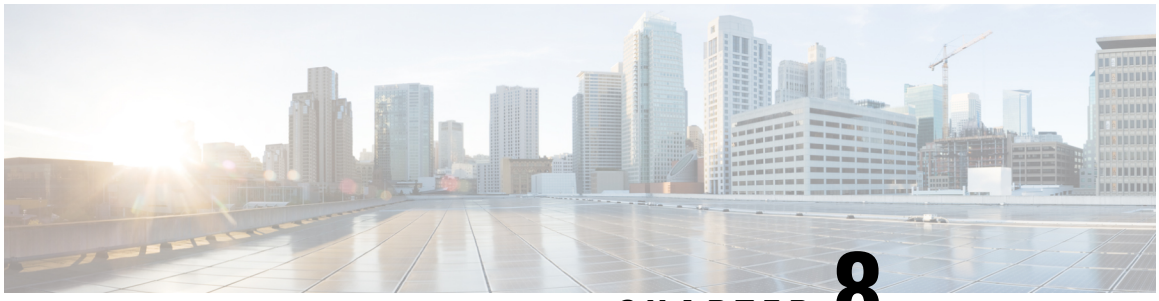
Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Table 70: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.7.1	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.7.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a.

Note

- We recommend that the Controller software version matches or be higher than the WAN edge device software version.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.



CHAPTER 8

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.6.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 71: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.6.1 and 20.6.1.2	17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x
20.6.2, 20.6.2.1, and 20.6.2.2	17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager only), 20.6.3.2, 20.6.3.3, and 20.6.3.4	17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x
20.6.4, 20.6.4.1, and 20.6.4.2	17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x

Table 72: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.6.1 and 20.6.1.2	17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, and 17.4.1a	17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, and 17.4.1a	17.6.1a and 17.5.1a
20.6.2, 20.6.2.1, and 20.6.2.2	17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.4a, 17.3.3, and 17.3.2	17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, and 17.4.1a	17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, and 17.4.1a	17.6.2, 17.6.1a, and 17.5.1a
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, and 17.4.1a	17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, and 17.4.1a	17.6.3a, 17.6.2, 17.6.1a, and 17.5.1a
20.6.4, 20.6.4.1, and 20.6.4.2	17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, 17.4.2, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2	17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, 17.3.5,17.3.4a, 17.3.3, and 17.3.2

Table 73: Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.6.1 and 20.6.1.2	17.3.4a, 17.3.3, and 16.12.5	17.6.1a, 17.5.1a, and 17.4.2	17.3.3, 17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.6.1 FC1
20.6.2, 20.6.2.1, and 20.6.2.2	17.3.4a, 17.3.3, and 16.12.5	17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.4a, 17.3.3, 17.3.2, 17.3.1a with NFVIS 4.6.1 FC1

Control Components	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.5 with NFVIS 4.6.2 FC2, 17.3.4a, and 17.3.3 with NFVIS 4.6.1 FC1
20.6.4, 20.6.4.1, and 20.6.4.2	17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.5 with NFVIS 4.6.3 FC3, 17.3.4a, 17.3.3, and 16.12.5
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.5 with NFVIS 4.6.3 FC3, 17.3.4a, 17.3.3, and 16.12.5

Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Table 74: Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Control Components	vEdge 5000	vEdge Cloud
20.6.1 and 20.6.1.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.4.1, 20.5.1, and 20.6.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.4.1, 20.5.1, and 20.6.1
20.6.2, 20.6.2.1, and 20.6.2.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.1, and 20.6.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.4.1, 20.4.2, 20.5.1, 20.6.1, and 20.6.2
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.6.2, and 20.6.3	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.6.2, and 20.6.3
20.6.4, 20.6.4.1, and 20.6.4.2	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.6.2, 20.6.3, and 20.6.4	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.6.2, 20.6.3, and 20.6.4
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.3.7.1, 20.3.7.2, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.6.2, 20.6.3, 20.6.4, and 20.6.5	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.4.1, 20.4.2, 20.5.1, 20.6.1, 20.6.2, 20.6.3, 20.6.4, and 20.6.5

Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Table 75: Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	vEdge 2000
20.6.1.2	20.6.1.2	20.6.1.2
20.6.3.2	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, and 20.6.3.2	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, and 20.6.3.2
20.6.3.3	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, and 20.6.3.3	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, and 20.6.3.3
20.6.3.4	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, and 20.6.3.3	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, and 20.6.3.3
20.6.4.1	20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3 and 20.6.4.1	20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3 and 20.6.4.1
20.6.4.2	20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3 and 20.6.4.1	20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3 and 20.6.4.1
20.6.5.2	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, and 20.6.5.2	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, and 20.6.5.2
20.6.5.3	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2 and 20.6.5.3	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2 and 20.6.5.3
20.6.5.4	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, 20.6.5.3, and 20.6.5.4	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, 20.6.5.3, and 20.6.5.4
20.6.5.5	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	20.3.7.2, 20.3.7.1, 20.4.2.3, 20.6.1.2, 20.6.3.2, 20.6.3.3, 20.6.4.1, 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5

Table 76: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.6.1 and 20.6.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.6.2, 20.6.2.1, and 20.6.2.2	Cisco IOS XE Catalyst SD-WAN Release 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	Cisco IOS XE Catalyst SD-WAN Release 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.6.4, 20.6.4.1, and 20.6.4.2	Cisco IOS XE Catalyst SD-WAN Release 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	Cisco IOS XE Catalyst SD-WAN Release 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.6.5, 17.6.4, 17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.6.5, 20.6.4.1, 20.6.4, 20.6.3.2, 20.6.3.1, 20.6.3, 20.6.2.2, 20.6.2.1, 20.6.2, 20.6.1.2, 20.6.1.1, 20.6.1, 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 77: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.6.1 and 20.6.1.2	17.3.1a and later	17.6.1a and later	17.6.1a and later	Not supported	Not supported
20.6.2, 20.6.2.1, and 20.6.2.2	17.3.1a and later	17.6.1a and later	17.6.1a and later	Not supported	Not supported

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	17.3.1a and later	17.6.1a and later	17.6.1a and later	Not supported	Not supported
20.6.4, 20.6.4.1, and 20.6.4.2	17.3.1a and later	17.6.1a and later	17.6.1a and later	Not supported	Not supported
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	17.3.1a and later	17.6.1a and later	17.6.1a and later	Not supported	Not supported

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco NFVIS

Table 78: Compatibility Matrix for Cisco SD-WAN Control Components, Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE

Control Components	ENCS 5400	Cisco Catalyst 8200 Series Edge uCPE
20.6.1 and 20.6.1.2	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3
20.6.2, 20.6.2.1, and 20.6.2.2	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3
20.6.4, 20.6.4.1, and 20.6.4.2	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3	Cisco NFVIS Release 4.6.1, 4.6.2, and 4.6.3

Table 79: Compatibility Matrix for Cisco NFVIS Platforms and Cisco SD-WAN Control Components

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Control Components
Cisco NFVIS Release 4.6.1	20.6.1
Cisco NFVIS Release 4.6.2	20.6.1 and 20.6.2
Cisco NFVIS Release 4.6.3	20.6.1, 20.6.2, and 20.6.3

Table 80: Compatibility Matrix for Cisco NFVIS Platforms and Cisco Catalyst 8000V

Cisco ENCS 5400 and Cisco Catalyst 8200 Series Edge uCPE	Cisco Catalyst 8000V
Cisco NFVIS Release 4.6.1	17.6.3a, 17.6.2, 17.6.1a, 17.5.1a, and 17.4.2

Table 81: Compatibility Matrix for Cisco Catalyst 8000V and Cisco ENCS 5400

Cisco Catalyst 8000V	Cisco ENCS 5400
17.6.1a	Cisco NFVIS Release 4.6.x

Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

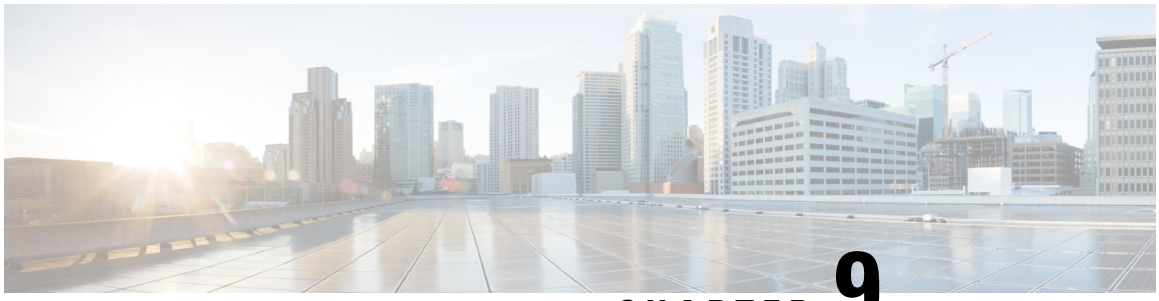
Table 82: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.6.1 and 20.6.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.6.2, 20.6.2.1, and 20.6.2.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.6.3, 20.6.3.1 (Cisco SD-WAN Manager), 20.6.3.2, 20.6.3.3, and 20.6.3.4	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.

Control Components	CG418-E	CG522-E
20.6.4, 20.6.4.1, and 20.6.4.2	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.
20.6.5, 20.6.5.1 (Cisco SD-WAN Manager), 20.6.5.2, 20.6.5.3, 20.6.5.4, and 20.6.5.5	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a. Cisco IOS CG Release 17.6.1 and later.

Note

- We recommend that the Controller software version matches or be higher than the WAN edge device software version.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.



CHAPTER 9

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.5.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 83: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.5.1	17.5.1a, 17.4.1b, 17.4.1a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, and 16.12.x

Table 84: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.5.1	17.5.1a, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.5.1a, 17.4.1b, and 17.4.1a	17.5.1a, 17.4.1b, and 17.4.1a	17.5.1a

Table 85: Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.5.1	17.3.3, 17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, 16.12.5 and 16.12.4	17.5.1a, 17.4.1b, and 17.4.1a	17.3.3, 17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.5.1 FC2

Table 86: Compatibility Matrix for Cisco SD-WAN vEdge Platforms

Control Components	vEdge
20.5.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.4.1, and 20.5.1

Table 87: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.5.1	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a, 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.5.1.2, 20.5.1.1, 20.5.1, 20.4.2.3, 20.4.2.2, 20.4.2.1, 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 88: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.5.1	17.3.1a and later	Not supported	Not supported	Not supported	Not supported

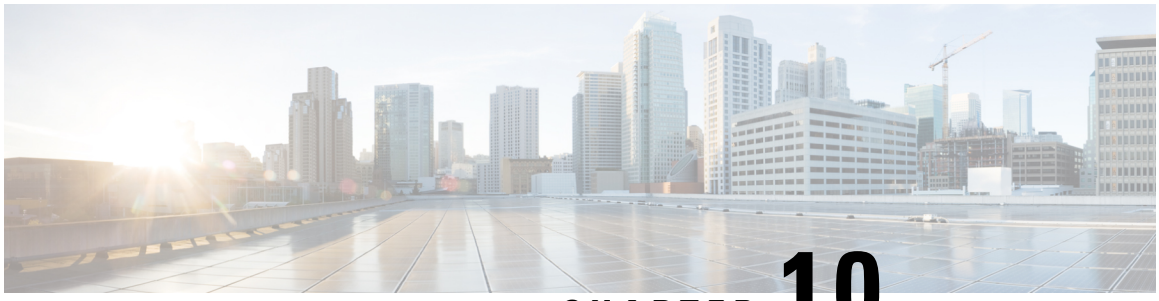
Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Table 89: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.5.1	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a.	Cisco IOS XE Catalyst SD-WAN Release 17.5.1a and Cisco IOS XE Catalyst SD-WAN Release 17.4.1a.

Note

- We recommend that the Controller software version matches or be higher than the WAN edge device software version.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.



CHAPTER 10

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.4.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 90: Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.4.1 and 20.4.1.2	17.4.1a, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
20.4.2 and 20.4.2.3	17.4.2, 17.4.1b, 17.4.1a, 17.3.3, 17.3.2, 17.3.1a, 17.2.2, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x

Table 91: Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L
20.4.1 and 20.4.1.2	17.4.1a and 17.3.2	17.4.1a	17.4.1a
20.4.2 and 20.4.2.3	17.4.2, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.4.2, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.4.2, 17.4.1b, and 17.4.1a

Table 92: Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.4.1 and 20.4.1.2	17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, and 16.12.x	17.4.1a	17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.4.1 FC2
20.4.2 and 20.4.2.3	17.3.3, 17.2.1v, and 16.12.5	17.4.2, 17.4.1b, and 17.4.1a	17.3.3, 17.3.4, 17.2.1r with NFVIS 4.4.2-FC2

Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Compatibility Matrix for Cisco vEdge 5000 and vEdge Cloud

Table 93: Compatibility Matrix for Cisco vEdge 5000 and vEdge Cloud

Control Components	Cisco vEdge 5000, Cisco vEdge Cloud
20.4.1 and 20.4.1.2	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, and 20.4.1
20.4.2 and 20.4.2.3	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.4.1, 20.4.1.1, 20.4.1.2, and 20.4.2

Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Table 94: Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	Cisco vEdge 2000
20.4.2.3	20.3.7.1, and 20.4.2.3	20.3.7.1, and 20.4.2.3

Table 95: Compatibility Matrix for ISR1100 Platforms

Control Components	ISR 1100-4G and ISR 1100-6G	ISR 1100X-4G and ISR 1100X-6G	ISR1100-4GLTENA, ISR1100-4GLTEGB
20.4.1 and 20.4.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.4.1b and 17.4.1a Cisco SD-WAN Release (Viptela OS) 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.4.1b and 17.4.1a Cisco SD-WAN Release (Viptela OS) 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.4.1b and 17.4.1a Cisco SD-WAN Release (Viptela OS) 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Control Components	ISR 1100-4G and ISR 1100-6G	ISR 1100X-4G and ISR 1100X-6G	ISR1100-4GLTENA, ISR1100-4GLTEGB
20.4.2 and 20.4.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 Cisco SD-WAN Release (Viptela OS) 20.4.2, 20.4.1.2, 20.3.7.1, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 96: Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.4.1 and 20.4.1.2	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.4.2 and 20.4.2.3	17.3.1a and later	Not supported	Not supported	Not supported	Not supported

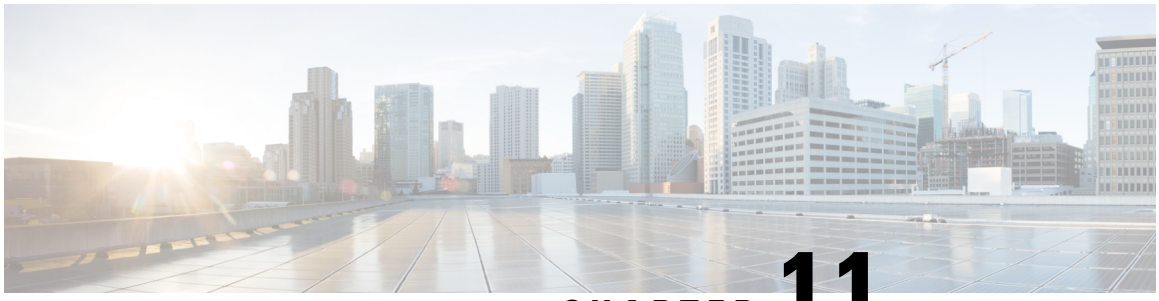
Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Table 97: Compatibility Matrix for Cisco SD-WAN Control Components and Cisco Cellular Gateways

Control Components	CG418-E	CG522-E
20.4.1 and 20.4.1.2	Cisco IOS XE Catalyst SD-WAN Release 17.4.1a	Cisco IOS XE Catalyst SD-WAN Release 17.4.1a
20.4.2 and 20.4.2.3	Cisco IOS XE Catalyst SD-WAN Release 17.4.1a	Cisco IOS XE Catalyst SD-WAN Release 17.4.1a

Note

- We recommend that the Controller software version matches or be higher than the WAN edge device software version.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.



CHAPTER 11

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN Control Components Release 20.3.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Table 98: Cisco Catalyst SD-WAN Compatibility Matrix for ISR1000, ISR4000 and ASR 1000 platforms

Control Components	ISR1000/ISR4000/ASR1000
20.3.1	17.3.1a, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
20.3.2 and 20.3.2.1	17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
20.3.3 and 20.3.3.1	17.3.3, 17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
20.3.4 and 20.3.4.2	17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
20.3.5	17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.1r, 16.12.x, and 16.10.x
20.3.6	17.3.6, 17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.1r, 16.12.x, and 16.10.x
20.3.7, 20.3.7.1, and 20.3.7.2	17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.1r, 16.12.x, and 16.10.x
20.3.8	17.3.8, 17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.1r, 16.12.x, and 16.10.x

Table 99: Cisco Catalyst SD-WAN Compatibility Matrix for Catalyst 8000 Series Platforms

Control Components	Catalyst 8300/Catalyst 8500
20.3.1	Not Supported
20.3.2 and 20.3.2.1	17.3.2
20.3.3 and 20.3.3.1	17.3.3 and 17.3.2
20.3.4 and 20.3.4.2	17.3.4a, 17.3.3 and 17.3.2
20.3.5	17.3.5, 17.3.4a, 17.3.3 and 17.3.2
20.3.6	17.3.6, 17.3.5, 17.3.4a, 17.3.3 and 17.3.2
20.3.7, 20.3.7.1, and 20.3.7.2	17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3 and 17.3.2
20.3.8	17.3.8, 17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3 and 17.3.2

Table 100: Cisco Catalyst SD-WAN Compatibility Matrix for Virtual Platforms

Control Components	CSR1000v	ISRv (ENCS/CSP)
20.3.1	17.3.1a, 17.2.1v, 17.2.1r, and 16.12.x	17.3.1a, 17.2.1r with NFVIS 4.2.1 FC3
20.3.2 and 20.3.2.1	17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, and 16.12.x	17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.2.1 FC3
20.3.3 and 20.3.3.1	17.3.3, 17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, and 16.12.x	17.3.3, 17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.2.1 FC3
20.3.4 and 20.3.4.2	17.3.4a, 17.3.3, 17.2.1v, and 16.12.5	17.3.4a, 17.3.3, 17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.2.1 FC3
20.3.5	17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.3.5, 17.3.4a, 17.3.3, 17.2.1r with NFVIS 4.2.1 FC3
20.3.6	17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.3.6, 17.3.5, 17.3.4a, 17.3.3, 17.2.1r with NFVIS 4.2.1 FC3
20.3.7, 20.3.7.1, and 20.3.7.2	17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, 17.2.1r with NFVIS 4.2.1 FC3
20.3.8	17.3.8, 17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, and 16.12.5	17.3.8, 17.3.7, 17.3.6, 17.3.5, 17.3.4a, 17.3.3, 17.2.1r with NFVIS 4.2.1 FC3

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco Catalyst SD-WAN vEdge Platforms

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Table 101: Cisco Catalyst SD-WAN Compatibility Matrix for Cisco vEdge 5000 and Cisco vEdge Cloud

Control Components	vEdge 5000	Cisco vEdge Cloud
20.3.1	18.3, 18.4, 19.2, 20.1, 20.1.12, and 20.3.1	18.3, 18.4, 19.2, 20.1, 20.1.12, and 20.3.1
20.3.2 and 20.3.2.1	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, and 20.3.2	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, and 20.3.2
20.3.3 and 20.3.3.1	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, and 20.3.3	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, and 20.3.3
20.3.4 and 20.3.4.2	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, and 20.3.4	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, and 20.3.4
20.3.5	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, and 20.3.5	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, and 20.3.5
20.3.6	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, and 20.3.6	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, and 20.3.6
20.3.7, 20.3.7.1, and 20.3.7.2	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.3.6, and 20.3.7	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.3.6, and 20.3.7
20.3.8	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.3.6, 20.3.7, and 20.3.8	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.3.3, 20.3.4, 20.3.5, 20.3.6, 20.3.7 and 20.3.8

Cisco Catalyst SD-WAN Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Table 102: Cisco Catalyst SD-WAN Compatibility Matrix for Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 1000, Cisco vEdge 100wm and Cisco vEdge 2000

Control Components	vEdge 100M, vEdge 100B, vEdge 100wm and vEdge 1000	Cisco vEdge-2000
20.3.7.1	20.3.7.1	20.3.7.1
20.3.7.2	20.3.7.2 and 20.3.7.1	20.3.7.2 and 20.3.7.1

Table 103: Cisco Catalyst SD-WAN Compatibility Matrix for ISR1100 Platforms

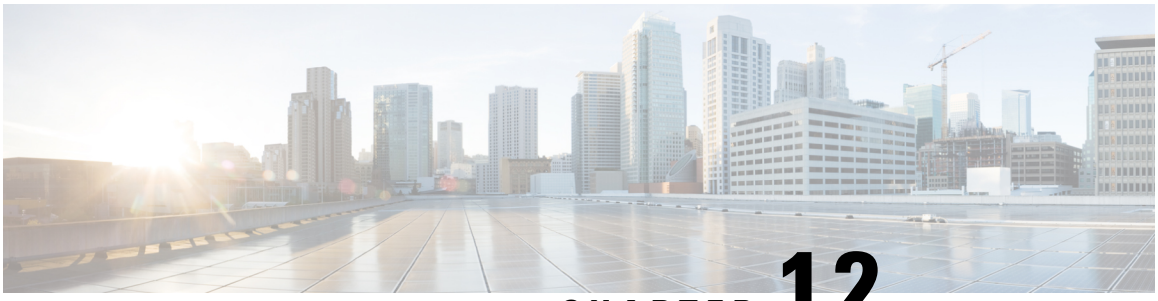
Control Components	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.3.1	Cisco SD-WAN Release (Viptela OS) 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.2 and 20.3.2.1	Cisco SD-WAN Release (Viptela OS) 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.3 and 20.3.3.1	Cisco SD-WAN Release (Viptela OS) 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.4 and 20.3.4.2	Cisco SD-WAN Release (Viptela OS) 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.5	Cisco SD-WAN Release (Viptela OS) 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.6	Cisco SD-WAN Release (Viptela OS) 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.7, 20.3.7.1, and 20.3.7.2	Cisco SD-WAN Release (Viptela OS) 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3
20.3.8	Cisco SD-WAN Release (Viptela OS) 20.3.8, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3	Cisco SD-WAN Release (Viptela OS) 20.3.8, 20.3.7, 20.3.6, 20.3.5, 20.3.4.2, 20.3.4, 20.3.3.1, 20.3.3, 20.3.2.1, 20.3.2, 20.3.1, 20.1.12, 20.1.3.1, 20.1.3, 20.1.2, 19.2.31, 19.2.4, and 19.2.3

Table 104: Cisco Catalyst SD-WAN Compatibility Matrix for IOT IR Platforms

Control Components	IR-1101-K9 and IR-1101-A-K9	ESR-6300-NCP-K9	IR1821-K9, IR1831-K9, IR1833-K9, IR1835-K9	IR8140H and IR8140H-P	IR8340-K9
20.3.1	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.2 and 20.3.2.1	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.3 and 20.3.3.1	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.4 and 20.3.4.2	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.5	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.6	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.7, 20.3.7.1, and 20.3.7.2	17.3.1a and later	Not supported	Not supported	Not supported	Not supported
20.3.8	17.3.1a and later	Not supported	Not supported	Not supported	Not supported

Note

- We recommend that the Control components software version matches or be higher than the WAN edge device software version.
- All device and control components combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. For more information see, Troubleshooting certificate expiry incident.



CHAPTER 12

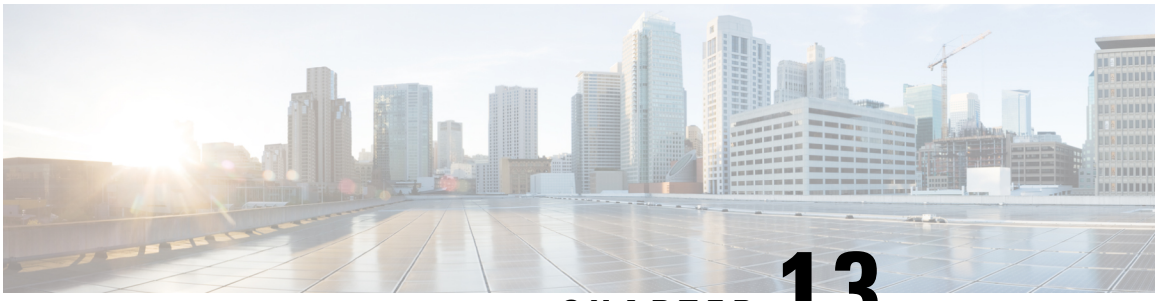
Compatibility Matrix for Cisco SD-WAN Release 20.1.x

Table 105: Compatibility Matrix for Cisco SD-WAN Release 20.1.x

Controllers	ISR1000/ISR4000/ASR1000	CSR1000v	ISRv (ENCS/CSP)	vEdge	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.1.1	17.2.1r, 16.12.x, 16.10.x, and 16.9.x	17.2.1r and 16.12.x	17.2.1r with NFVIS 4.1.2 FC2	18.3, 18.4, 19.2, and 20.1	20.1.1 & lower up to 19.2.099	20.1.1 & lower up to 19.2.1
20.1.1.1	17.2.1r, 16.12.x, 16.10.x, and 16.9.x	17.2.1v, 17.2.1r, and 16.12.x	17.2.1r with NFVIS 4.1.2.FC2	18.3, 18.4, 19.2, 20.1, and 20.1.1.1	20.1.1.1 & lower up to 19.2.099	20.1.1.1 & lower up to 19.2.1
20.1.12	17.2.1v, 17.2.1r, 16.12.x, 16.10.x, and 16.9.x	17.2.1v, 17.2.1r, and 16.12.x	17.2.1r with NFVIS 4.1.2 FC2	18.3, 18.4, 19.2, 20.1, 20.1.12	20.1.12 & lower up to 19.2.099	20.1.12 & lower up to 19.2.1
20.1.2	17.2.2, 17.2.1v, 17.2.1r, 16.12.x, 16.10.x, and 16.9.x	17.2.2, 17.2.1v, 17.2.1r, and 16.12.x	17.2.1r with NFVIS 4.1.2.FC2	18.3, 18.4, 19.2, 20.1, 20.1.12, and 20.1.2	20.1.2 & lower up to 19.2.099	20.1.2 & lower up to 19.2.1

Note

- We recommend that the Controller software version matches or be higher than the WAN edge device software version.
- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.
- The Cisco vEdge 100M, Cisco vEdge 100B, Cisco vEdge 100wm and Cisco vEdge 1000 devices are impacted by a certificate expiry incident. If your Cisco vEdge devices are running Cisco SD-WAN Releases 19.2.x or older releases, or 18.4.x or older releases, upgrade to Cisco SD-WAN Release 20.3.7.1 for a stable user experience. For more information on upgrading to Cisco SD-WAN Release 20.3.7.1 see, Perform the upgrade.



CHAPTER 13

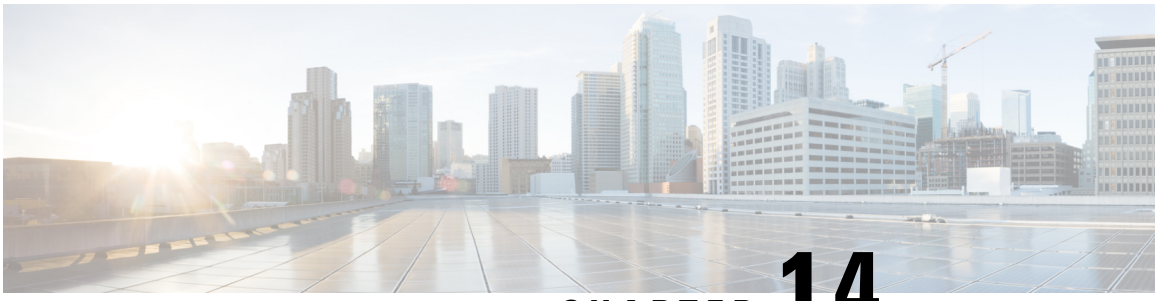
Compatibility Matrix for Cisco SD-WAN Release 19.2.x

Table 106: Compatibility Matrix for Cisco SD-WAN Release 19.2.x

Controllers	ISR1000/ISR4000/ASR1000	CSR1000v	ISRv (ENCS/CSP)	vEdge	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
19.2.099	16.12.1e and lower versions of 16.12,16.10.x, and 16.9.x	16.12.1e and lower versions of 16.12	16.12.1a with NFVIS 3.12.3FC4	18.4 and 19.2.099	19.2.099	Not Supported
19.2.1	16.12.2r and lower versions of 16.12, 16.10.x, and 16.9.x	16.12.2r and lower versions of 16.12	16.12.1a, 16.12.2r with NFVIS 3.12.3FC4	18.3, 18.4, 19.2.099, and 19.2.1	19.2.099 and 19.2.1	19.2.1
19.2.2	16.12.3 and lower versions of 16.12, 16.10.x, 16.9.x	16.12.3 and lower versions of 16.12	16.12.3 with NFVIS 3.12.3FC4	18.3, 18.4, 19.2.099, 19.2.1, and 19.2.2	19.2.099, 19.2.1, and 19.2.2	19.2.1 and 19.2.2
19.2.3	16.12.4 and lower versions of 16.12, 16.10.x, 16.9.x	16.12.4a and lower versions of 16.12	16.12.4 with NFVIS 3.12.3FC4	18.3, 18.4, 19.2.099, 19.2.1, 19.2.2, 19.2.3, and 19.2.31	19.2.099, 19.2.1, 19.2.2, 19.2.3, and 19.2.31	19.2.1, 19.2.2, 19.2.3, and 19.2.31
19.2.4	16.12.5 and lower versions of 16.12, 16.10.x, 16.9.x	16.12.5 and lower versions of 16.12	16.12.5 with NFVIS 4.2.1 FC3	18.3, 18.4, 19.2.099, 19.2.1, 19.2.2, 19.2.3, 19.2.31, and 19.2.4	19.2.099, 19.2.1, 19.2.2, 19.2.3, 19.2.31, and 19.2.4	19.2.1, 19.2.2, 19.2.3, 19.2.31, and 19.2.4

Note

- All device and controller combinations listed in this table have been validated. However, there are no software changes in this controller software release, which impact the device-to-controller backwards compatibility for previous releases that are not listed in the table.
- UCS-E Series using External Interfaces are supported from Cisco SD-WAN Release 19.2.1 and later releases.
- UCS-E Series using Internal Backplane Interfaces such as ucse x/y/0 and ucse x/y/1 have a limited feature support configurable using only Cisco SD-WAN Manager CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.

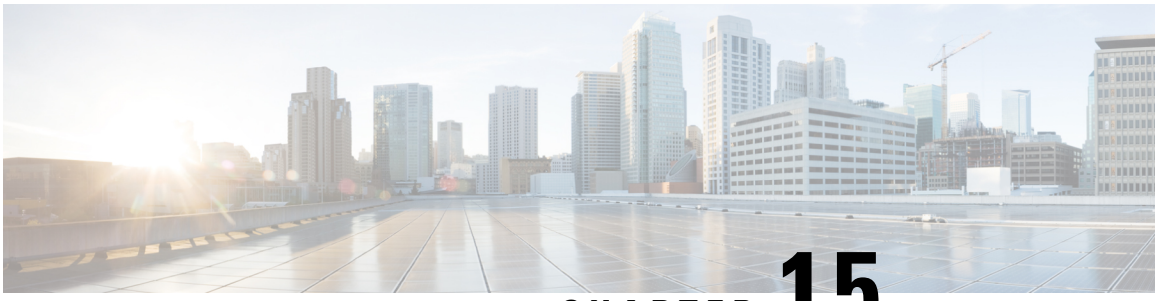


CHAPTER 14

Compatibility Matrix for Cisco SD-WAN Release 18.4.x

Table 107: Compatibility Matrix for Cisco SD-WAN Release 18.4.x

Controllers	ISR1000/ISR4000/ASR1000	vEdge
18.4.4	16.10.4 and lower versions of 16.10.x and 16.9.x	17.2.8 or higher up to 18.4.4
18.4.5	16.10.5 and lower versions of 16.10.x and 16.9.x	17.2.8 or higher up to 18.4.5
18.4.6	16.10.6 and lower versions of 16.10.x and 16.9.x	17.2.8 or higher up to 18.4.6



CHAPTER 15

Hypervisor Compatibility Matrix for Cisco Catalyst SD-WAN Control Components and vEdgeCloud

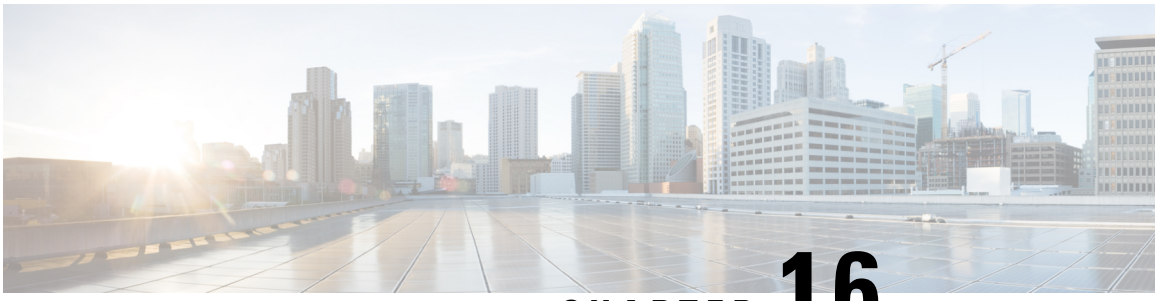
Table 108: Hypervisor Compatibility Matrix for Cisco SD-WAN Control Components

Control Component Version	vEdgeCloud-Device Version	Cisco SD-WAN Control Components- Hypervisor Version	
		ESXi	KVM
20.6	20.6	6.5/6.7/7.0	Ubuntu 20.04
20.7	20.7	6.5/6.7/7.0	Ubuntu 20.04
20.8	20.8	6.5/6.7/7.0	Ubuntu 20.04
20.9	20.9	6.5/6.7/7.0	Ubuntu 20.04
20.10	20.10	6.5/6.7/7.0	Ubuntu 20.04
20.11	20.11	6.5/6.7/7.0	Ubuntu 20.04
20.12	20.12	6.5/6.7/7.0	Ubuntu 20.04

Table 109: Hypervisor Compatibility Matrix for vEdgeCloud

Control Component Version	vEdgeCloud-Device Version	vEdgeCloud-Hypervisor Version		
		ESXi	KVM	NFVIS
20.6	20.6	6.5/6.7/7.0	RHEL 7.5/7.7	4.5.1 FC2
20.7	20.7	6.7/7.0	RHEL 7.5/7.7	4.5.1 FC2
20.8	20.8	6.7/7.0	RHEL7.5/7.7	4.5.1 FC2
20.9	20.9	6.7/7.0	RHEL7.5/7.7	4.5.1 FC2
20.10	20.10	NA	NA	NA

Control Component Version	vEdgeCloud-Device Version	vEdgeCloud-Hypervisor Version		
		ESXi	KVM	NFVIS
20.11	20.11	NA	NA	NA
20.12	20.12	NA	NA	NA



CHAPTER 16

Hypervisor Compatibility Matrix for Cloud Routers

Table 110: Hypervisor Compatibility Matrix for CSR1000v, ISRv and C8000v

Control Component Version	CSR1000v/ISRv/C8000v-Device version	CSR1000v/ISRv/C8000v-Hypervisor Version		
		ESXi	KVM	NFVIS
20.6	17.6	6.5/6.7/7.0	RHEL 7.5/7.7	4.6.1 FC1
20.7	17.7	6.7/7.0	RHEL 7.7/8.4, Openstack RH-OSP 16.1, and Openstack CVIM 4.2	4.7.1 FC4
20.8	17.8	6.7/7.0	RHEL 7.7/8.4, Openstack RH-OSP 16.1, and Openstack CVIM 4.2	4.8.1 FC4
20.9	17.9	6.7/7.0	RHEL 7.7/8.4, Openstack RH-OSP 16.1, and Openstack CVIM 4.2	4.9.1 FC3
20.10	17.10	6.7/7.0	RHEL 7.7/8.4, Openstack RH-OSP 16.1, and Openstack CVIM 4.2	4.10.1 FC3
20.11	17.11	6.7/7.0	RHEL 7.7/8.4, Openstack RH-OSP 16.1, and Openstack CVIM 4.2	4.11.1 FC1
20.12	17.12	6.7/7.0	RHEL 7.7/8.4, Openstack RH-OSP 16.1, and Openstack CVIM 4.2	4.12.1 FC1

Note Starting from Cisco IOS XE Catalyst SD-WAN Release 17.4.1a, the Cisco Catalyst 8000V is newly endorsed virtual router platform, supplanting the Cisco CSR1000V and Cisco ISRv. To integrate the Cisco Catalyst 8000V into a Cisco Catalyst SD-WAN setup, you must have Cisco vManage Release 20.4.1 or a more recent version. It's important to note that as of Cisco IOS XE Catalyst SD-WAN Release 17.4.1a, there are no longer any installable images available for Cisco CSR1000V or Cisco ISRv.

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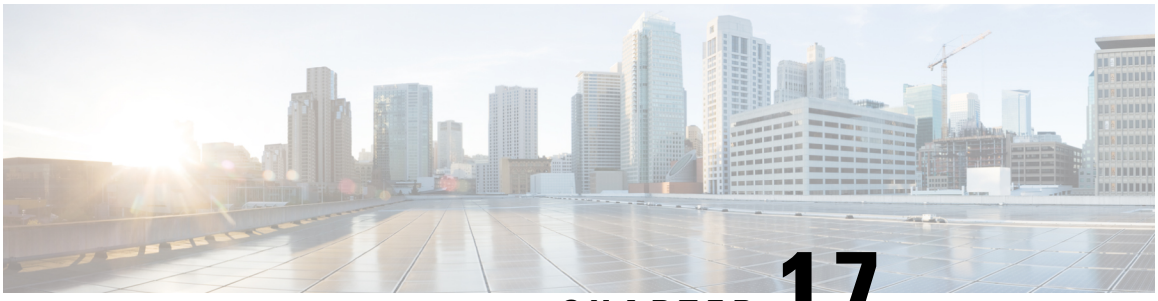
PART II

Recommended Computing Resources

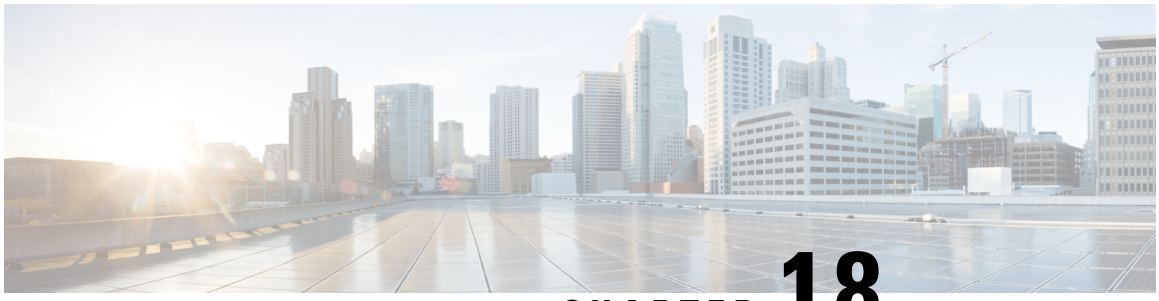


CHAPTER 17

Recommended Computing Resources

This topic provides the hardware recommendations for the Cisco Catalyst SD-WAN Validator server, vEdge Cloud router server, Cisco SD-WAN Manager server, and Cisco Catalyst SD-WAN Controller server. The resources required to run the Cisco Catalyst SD-WAN Validator, Cisco Catalyst SD-WAN Controller, and Cisco SD-WAN Manager server on the VMware vSphere ESXi or the Kernel-based Virtual Machine (KVM) server vary depending on the number of devices you deploy in the overlay network.

Note Cisco SD-WAN Manager server, Cisco Catalyst SD-WAN Validator, and Cisco Catalyst SD-WAN Controller have been tested on Intel server platforms.



CHAPTER 18

Points to Consider

Note

- We perform scale testing with server configuration detailed in this document. You must deploy servers that fulfil the technical parameters requirements which are specified in this document. You can choose to use servers from third party vendors, which are technically equivalent to the specifications detailed in this document. However, third party servers are not qualified by Cisco. In the event of any issue, Cisco TAC can triage but Cisco will not take liability for issues arising from hardware belonging to a third party vendor.
- The performance factor varies based on your network design and configuration. Consult your Cisco Accounts team for any design-related questions.
- Cisco Catalyst SD-WAN supports the following Elastic Block Store (EBS) volume types:
  - General Purpose SSD (gp2)
  - EBS volume type (gp3) by Amazon Web Services (AWS)
  - The IOPS (Input/Output Operations Per Second) for EBS volume types is generally dictated by the cloud provider. We recommend you select the appropriate EBS volume type that aligns with the performance requirements of your Cisco Catalyst SD-WAN deployment.

Cisco Catalyst SD-WAN Manager Single Tenant

- The system that you select to run Cisco SD-WAN Manager must satisfy the storage throughput requirement to match the above performance results.
- We recommend that you use Raid 0 for best performance, since application redundancy is built into the solution
- An oversubscription of 2:1 on vCPU to pCPU (physical CPU) can be supported on Cisco SD-WAN Manager when the overlay has fewer than 250 devices.
- An oversubscription of 2:1 on vCPU to pCPU (physical CPU) is supported for Cisco SD-WAN Controller and Cisco SD-WAN Validator in all of the above deployments.
- We recommend that you use a 10-Gbps interface for production.
- For 3-node and 6-node clusters, we recommend that you use three network interfaces —one for tunnel, one for management, and one for the Cisco SD-WAN Manager cluster communication.

- Co-hosting of Cisco SD-WAN Manager instances on single server is not supported. However, Cisco SD-WAN Manager can be co-hosted with Cisco SD-WAN Controller and Cisco SD-WAN Validator instances on same server.
- If SAIE is enabled:
  - Beyond 50 GB per day up to 100 GB per day, the configuration needs a 3-node cluster. For more that 100 GB per day, configure a 6-node cluster (all sizes are per-day sizes).
- If SAIE is disabled
  - Depending on network sensitivity and deployment type, we recommend using a cluster of three Cisco SD-WAN Manager instances if you want to configure intra-cluster high availability.

Note

- The use of encrypted hard drives is not supported for on-premises deployments of Cisco Catalyst SD-WAN due to the potential impact on software performance.
- Starting from Cisco vManage Release 20.9.1, **DPI** and **Aggregated DPI** are called as **SAIE** and **Aggregated SAIE** respectively.
- Starting from Cisco vManage Release 20.6.1, you can disable Aggregated DPI statistics collection, in Cisco SD-WAN Manager select **Administration** > **Settings** > **Statistics Setting** . Click **Edit**. Scroll to find Aggregated DPI and choose **Disable All**.
- To disable DPI statistics collection, in Cisco SD-WAN Manager select **Administration** > **Settings** > **Statistics Setting** . Click **Edit**. Scroll to find DPI and choose **Disable All**.

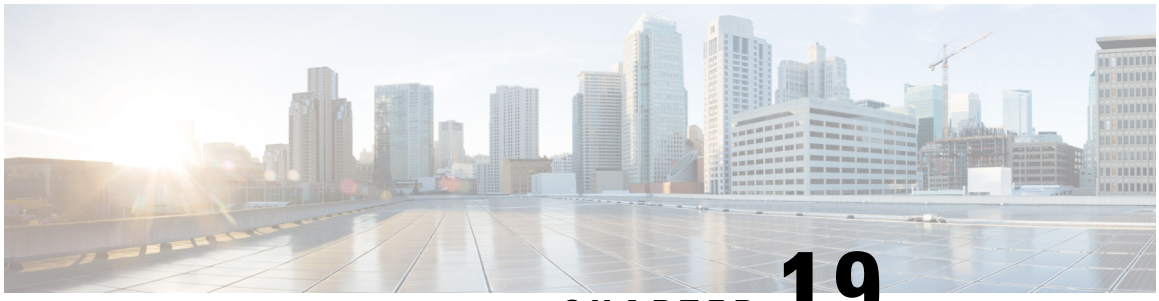
Cisco Catalyst SD-WAN Validator Single Tenant

- The OS volume must be on a solid-state drive (SSD).
- The maximum number of DTLS session supported is 4000 per Cisco SD-WAN Validator.

Cisco Catalyst SD-WAN Controller Single Tenant

- The OS volume must be on a solid-state drive (SSD).

For information about latency requirements, see Cisco SD-WAN Manager Cluster Creation and Troubleshooting White Paper.



CHAPTER 19

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.12.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Single Tenant (ST)

The supported instance specifications for the Cisco Catalyst SD-WAN Manager, Cisco Catalyst SD-WAN Validator, and Cisco Catalyst SD-WAN Controller are as follows:

Note
- The controller and the device software versions should be the same, to achieve the following scale.

Table 111: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Small	16 vCPUs	32 GB RAM	500 GB	Standard_F16s_v2	c5.4xlarge
Medium	32 vCPUs	64 GB RAM	1 TB	Standard_F32s_v2	c5.9xlarge

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Large	32 vCPUs	128 GB RAM	5 TB	Standard_D32ds_v5	c5.18xlarge

* vCPU, RAM, and Storage Size numbers are on per Cisco Catalyst SD-WAN Manager basis. The Storage Size numbers can be sized up to 10 TB for on-prem and customer cloud hosted.

Table 112: Instance Types with Number of Devices, Nodes and Deployment Models

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Disabled							
<250	One Node Small Cisco Cisco SD-WAN Manager	NA	NA	NA	Yes	Yes	Yes
250-1000	One Node Medium Cisco SD-WAN Manager	NA	NA	NA	Yes	Yes	Yes
1000-1500	One Node Large Cisco SD-WAN Manager	NA	NA	NA	Yes	Yes	Yes
1500-2000	Three Node Medium Cisco SD-WAN Manager Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes
2000-5000	Three Node Large Cisco SD-WAN Manager Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
5000-12500	Six Node Large Cisco SD-WAN Manager Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats and AppServer	NA	NA	NA	Yes	Yes	Yes
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Enabled							
<250	One Node Medium Cisco SD-WAN Manager	25 GB/Day	20 Days	25 GB/Day	Yes	NA	NA
<250	One Node Large Cisco SD-WAN Manager	50 GB/Day	30 Days	50 GB/Day	NA	Yes	Yes
250-1000	One Node Large Cisco SD-WAN Manager	50 GB/Day	30 Days	50 GB/Day	Yes	Yes	Yes
1000-4000	Three Node Large Cisco SD-WAN Manager Cluster (All Services)	100 GB/Day	14 Days	300 GB/Day	Yes	Yes	Yes

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
4000-7000	Six Node Large Cisco SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	2 TB/Day*	Yes	Yes	Yes
7000-12500	Six Node Large Cisco SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	1 TB/Day*	Yes	Yes	Yes

*For a larger dataset per day, run Stats on all the servers.

Table 113: Supported Scale on Cisco HyperFlex (HX), SAIE Disabled

Devices	Nodes and Deployment Models with Instance Types
0-2000	Three Node Medium Cisco SD-WAN Manager Cluster
2000-5000	Three Node Large Cisco SD-WAN Manager Cluster

To achieve scale beyond the numbers mentioned in the tables above, deploy multiple overlays.

Note

- The number of days the data can be stored in Cisco Catalyst SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco Catalyst SD-WAN Manager disk size:
- Formula to calculate the Cisco Catalyst SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco Catalyst SD-WAN Manager disk size is 1.5 Terabytes.
- Formula to calculate the Cisco Catalyst SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco Catalyst SD-WAN Manager disk size is 3.5 Terabytes.

Note Maximum tested disk size for On-prem is 10 TB per instance.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated SAIE size. The aggregated SAIE size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated SAIE also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the SAIE and aggregated SAIE index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated SAIE value,

1. From the Cisco SD-WAN Manager menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated SAIE** size to the desired value based on your SAIE traffic, the default disk size allocation is 5 GB.

Note When SAIE is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the Cisco SD-WAN Manager menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your SAIE traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 114: Cisco Catalyst SD-WAN Validator Recommended Computing Resources

Devices	Number of Cisco SD-WAN Validators	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2	c5.large
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
4000-8000	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
8000-12500	6	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge

Table 115: Cisco Catalyst SD-WAN Controller Recommended Computing Resources

Devices	Number of Cisco SD-WAN Controllers	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<250	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
250-1000	2	4	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_D4ds_v5	c5.2xlarge

Devices	Number of Cisco SD-WAN Controllers	vCPU	RAM	OS Volume	vNICs	Azure	AWS
1000-2500	2	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2	c5.2xlarge
2500-5000	4	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
5000-7500	6	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
7500-10000	8	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
10000-12500	10	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge

Note

- The tested and recommended limit of supported Cisco Catalyst SD-WAN Validator instances in a single Cisco Catalyst SD-WAN overlay are eight, similarly the maximum number of tested Cisco SD-WAN Controller instances is twelve.
- The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validator and Cisco Catalyst SD-WAN Controller devices for Cisco Cloud Hosted overlays are determined by the Cisco Cloud Ops and provisioned accordingly.
- The number of Cisco Catalyst SD-WAN Controller and Cisco Catalyst SD-WAN Validator instances recommended in the table above assumes a deployment with Cisco Catalyst SD-WAN controllers in two locations (i.e. data centers) designed for redundancy – with half the controllers in one data center and half the controllers in another data center. In other words, the table above already considers the 1:1 redundancy in the number of Cisco Catalyst SD-WAN Controller and Cisco Catalyst SD-WAN Validator instances recommended to be deployed across the two data centers – without considering any Cisco Catalyst SD-WAN Controller group/affinity configuration.

  If you are deploying Cisco Catalyst SD-WAN Controller and Cisco Catalyst SD-WAN Validator instances with a different set of assumptions, for example, across three data centers, or if you are using Cisco Catalyst SD-WAN Controller controller groups/affinity within your deployment, refer to the Points to Consider chapter for additional guidance.

Table 116: Testbed Specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, and PS.
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note

- Any UCS Platform (Fifth generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco Catalyst SD-WAN Controllers with similar scale numbers mentioned in this document.
- The CPU specifications are not tied to any brand, both AMD and Intel brands with specifications above are supported.

Table 117: Testbed Specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node

Hardware SKU	Specifications
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Note

- The tested replication factor is three.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant (MT)

The supported instance specifications for the Cisco Catalyst SD-WAN Manager, Cisco Catalyst SD-WAN Validator, and Cisco Catalyst SD-WAN Controller are as follows:

Table 118: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs	RAM	Storage Size	Azure	AWS
Large	32 vCPUs*	128 GB RAM	5 TB	Standard_F64s_v2	c5.18xlarge

* requires 64 vCPU for multi-tenant deployment in the Cisco Catalyst SD-WAN Manager Specifications table for deploying beyond 2500 devices.

Table 119: Cisco Catalyst SD-WAN Manager Specifications

Max Tenants (T) and Devices (D)	Nodes and Deployment Models with Instances Type	Data Processing Factor	Number of Days the Data Can be Stored	Cisco Cloud	On-Prem (UCS)	Customer Cloud
75(T) and 2500(D)*	Three Node Large Cisco SD-WAN Manager	100 GB/Day	14 Days	Yes	Yes	Yes

Max Tenants (T) and Devices (D)	Nodes and Deployment Models with Instances Type	Data Processing Factor	Number of Days the Data Can be Stored	Cisco Cloud	On-Prem (UCS)	Customer Cloud
150(T) and 7500(D)*	Six Node Large Cisco SD-WAN Manager (64 vCPUs required)	100 GB/Day	14 Days	No	Yes	Yes

Note * indicates that a pair of Cisco SD-WAN Controllers supports 24 tenants and 1000 devices across all the tenants.

Table 120: Cisco Catalyst SD-WAN Validator Recommended Computing Resources

Devices	Number of Cisco Catalyst SD-WAN Validator	vCPU	RAM	OS Volume	vNICs	AWS	Azure
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	c5.large	Standard_F2s_v2
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2
4000-7500	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2

Table 121: Cisco Catalyst SD-WAN Controller Recommended Computing Resources

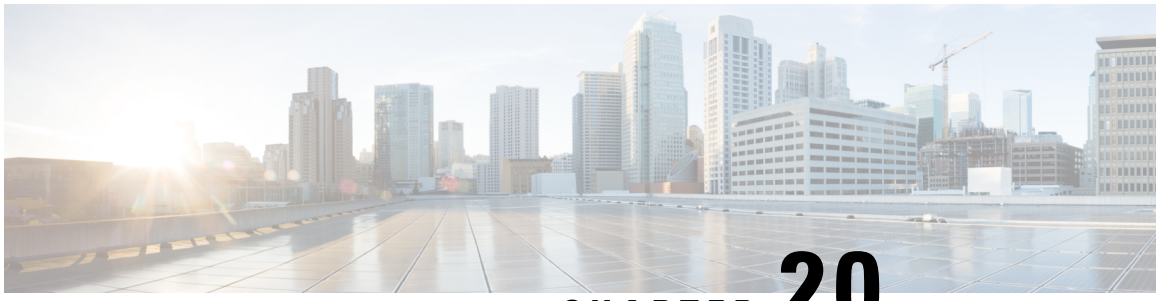
Devices	vCPU	RAM	OS Volume	vNICs	AWS	Azure
< 250	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2
250-2500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2
2500-5000	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2
5000-7500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2

Table 122: Cisco Catalyst SD-WAN Validator and Cisco Catalyst SD-WAN Controller Specifications

Devices	Number of Cisco Catalyst SD-WAN Validator Required	Number of Cisco Catalyst SD-WAN Controller Required
75 Tenants or 2500 Devices	2	A pair for every 24 tenants
150 Tenants or 7500 Devices	2 (additional 2 if deployment goes beyond 4000 devices)	A pair for every 24 tenants

Note

- A pair of Cisco Catalyst SD-WAN Controller supports 24 tenants and 1000 devices across all the tenants. For example, 24 tenants require 2 Cisco Catalyst SD-WAN Controllers, 50 tenants require 6 Cisco Catalyst SD-WAN Controllers, and 150 tenants require 14 Cisco Catalyst SD-WAN Controllers.
- The SAIE numbers are for the entire multi-tenant (cluster) deployment and there is no per tenant SAIE limitation.
- If SAIE is enabled, we recommend that the aggregated SAIE data (across all Cisco Catalyst SD-WAN Manager nodes and all tenants in the multitenant system) does not exceed 350 GB per day. If the SAIE data exceeds 350 GB per day, increase the Hard Disk capacity of each Cisco Catalyst SD-WAN Manager node up to 10 TB.
- A pair of Cisco Catalyst SD-WAN Controllers supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco Catalyst SD-WAN Validator instances in a single Cisco Catalyst SD-WAN Manager overlay is eight.



CHAPTER 20

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.11.x

Single Tenant (ST)

The supported instance specifications for the Cisco vManage, Cisco vBond Orchestrators, and Cisco vSmart Controllers are as follows:

Note The controller and the device software versions should be the same, to achieve the following scale.

Table 123: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Small	16 vCPUs	32 GB RAM	500 GB	Standard_F16s_v2	c5.4xlarge
Medium	32 vCPUs	64 GB RAM	1 TB	Standard_F32s_v2	c5.9xlarge
Large	32 vCPUs	128 GB RAM	5 TB	Standard_D32ds_v5	c5.18xlarge

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers can be sized up to 10 TB for on-prem and customer cloud hosted.

Table 124: Instance Types with Number of Devices, Nodes and Deployment Models

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled							
<250	One Node Small Cisco vManage	NA	NA	NA	Yes	Yes	Yes
250-1000	One Node Medium vManage	NA	NA	NA	Yes	Yes	Yes
1000-1500	One Node Large vManage	NA	NA	NA	Yes	Yes	Yes
1500-2000	Three Node Medium vManage Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes
2000-5000	Three Node Large vManage Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes
5000-10000	Six Node Large vManage Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats and AppServer	NA	NA	NA	Yes	Yes	Yes
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled							
<250	One Node Medium vManage	25 GB/Day	20 Days	25 GB/Day	Yes	NA	NA

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
<250	One Node Large vManage	50 GB/Day	30 Days	50 GB/Day	NA	Yes	Yes
250-1000	One Node Large vManage	50 GB/Day	30 Days	50 GB/Day	Yes	Yes	Yes
1000-4000	Three Node Large vManage Cluster (All Services)	100 GB/Day	14 Days	300 GB/Day	Yes	Yes	Yes
4000-7000	Six Node Large vManage Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	2 TB/Day*	Yes	Yes	Yes
7000-10000	Six Node Large vManage Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	1 TB/Day*	Yes	Yes	Yes

*For a larger dataset per day, run Stats on all the servers.

Table 125: Supported Scale on Cisco HyperFlex (HX), SAIE Disabled

Devices	Nodes and Deployment Models with Instance Types
0-2000	Three Node Medium Cisco vManage Cluster
2000-5000	Three Node Large Cisco vManage Cluster

To achieve scale beyond the numbers mentioned in the tables above, deploy multiple overlays.

Note

- The number of days the data can be stored in Cisco SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco SD-WAN Manager disk size:
- Formula to calculate the Cisco SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 1.5 Terabytes.
- Formula to calculate the Cisco SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 3.5 Terabytes.

Note Maximum tested disk size for On-prem is 10 TB per instance.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated SAIE size. The aggregated SAIE size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated SAIE also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the SAIE and aggregated SAIE index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated SAIE value,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated SAIE** size to the desired value based on your SAIE traffic, the default disk size allocation is 5 GB.

Note When SAIE is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your SAIE traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 126: Cisco vBond Orchestrators Recommended Computing Resources

Devices	Number of Cisco vBond	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2	c5.large
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
4000-8000	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
8000-10000	6	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge

Table 127: Cisco vSmart Controllers Recommended Computing Resources

Devices	Number of Cisco vSmart	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<250	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
250-1000	2	4	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_D4ds_v5	c5.2xlarge
1000-2500	2	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2	c5.2xlarge
2500-5000	4	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
5000-7500	6	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
7500-10000	8	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge

Note

- The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay are eight, similarly the maximum number of tested vSmart instances is twelve.
- The required number of vCPUs and RAM for Cisco vBond Orchestrators and Cisco vSmart Controllers for Cisco Cloud Hosted overlays are determined by the Cisco Cloud Ops and provisioned accordingly.
- The number of Cisco vSmart and Cisco vBond instances recommended in the table above assumes a deployment with Cisco SD-WAN controllers in two locations (i.e. data centers) designed for redundancy – with half the controllers in one data center and half the controllers in another data center. In other words, the table above already considers the 1:1 redundancy in the number of Cisco vSmart and Cisco vBond instances recommended to be deployed across the two data centers – without considering any Cisco vSmart controller group/affinity configuration.

  If you are deploying Cisco vSmart and Cisco vBond instances with a different set of assumptions, for example, across three data centers, or if you are using Cisco vSmart controller groups/affinity within your deployment, refer to the Points to Consider chapter for additional guidance.

Table 128: Testbed Specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, and PS.
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note

- Any UCS Platform (Fifth generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco SD-WAN Controllers with similar scale numbers mentioned in this document.
- The CPU specifications are not tied to any brand, both AMD and Intel brands with specifications above are supported.

Table 129: Testbed Specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz

Hardware SKU	Specifications
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Note

- The tested replication factor is three.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant (MT)

The supported instance specifications for the Cisco vManage, Cisco vBond Orchestrators, and Cisco vSmart Controllers are as follows:

Table 130: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs	RAM	Storage Size	Azure	AWS
Large	32 vCPUs*	128 GB RAM	5 TB	Standard_F64s_v2	c5.18xlarge

* requires 64 vCPU for multi-tenant deployment in the Cisco vManage Specifications table for deploying beyond 2500 devices.

Table 131: Cisco vManage Specifications

Max Tenants (T) and Devices (D)	Nodes and Deployment Models with Instances Type	Data Processing Factor	Number of Days the Data Can be Stored	Cisco Cloud	On-Prem (UCS)	Customer Cloud
75(T) and 2500(D)*	Three Node Large vManage	100 GB/Day	14 Days	Yes	Yes	Yes
150(T) and 7500(D)*	Six Node Large vManage (64 vCPUs required)	100 GB/Day	14 Days	No	Yes	Yes

Note * indicates that a pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all the tenants.

Table 132: Cisco vBond Orchestrators Recommended Computing Resources

Devices	Number of Cisco vBond	vCPU	RAM	OS Volume	vNICs	AWS	Azure
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	c5.large	Standard_F2s_v2
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2
4000-7500	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2

Table 133: Cisco vSmart Controllers Recommended Computing Resources

Devices	vCPU	RAM	OS Volume	vNICs	AWS	Azure
< 250	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2
250-2500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2
2500-5000	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2

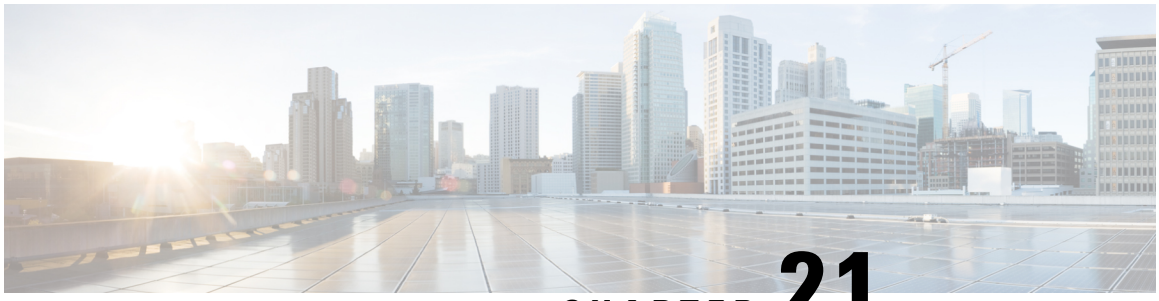
Devices	vCPU	RAM	OS Volume	vNICs	AWS	Azure
5000-7500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2

Table 134: Cisco vBond and vSmart Specifications

Devices	Number of Cisco vBond Orchestrators Required	Number of Cisco vSmart Controllers Required
75 Tenants or 2500 Devices	2	A pair for every 24 tenants
150 Tenants or 7500 Devices	2 (additional 2 if deployment goes beyond 4000 devices)	A pair for every 24 tenants

Note

- A pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all the tenants. For example, 24 tenants require 2 vSmart Controllers, 50 tenants require 6 vSmart Controllers, and 150 tenants require 14 vSmart Controllers.
- The SAIE numbers are for the entire multi-tenant (cluster) deployment and there is no per tenant SAIE limitation.
- If SAIE is enabled, we recommend that the aggregated SAIE data (across all Cisco vManage nodes and all tenants in the multitenant system) does not exceed 350 GB per day. If the SAIE data exceeds 350 GB per day, increase the Hard Disk capacity of each Cisco vManage node up to 10 TB.
- A pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay is eight.



CHAPTER 21

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.10.x

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Single Tenant (ST)

The supported instance specifications for the Cisco vManage, Cisco vBond Orchestrators, and Cisco vSmart Controllers are as follows:

Note The controller and the device software versions should be the same, to achieve the following scale.

Table 135: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Small	16 vCPUs	32 GB RAM	500 GB	Standard_F16s_v2	c5.4xlarge
Medium	32 vCPUs	64 GB RAM	1 TB	Standard_F32s_v2	c5.9xlarge

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Large	32 vCPUs	128 GB RAM	5 TB	Standard_D32ds_v5	c5.18xlarge

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers can be sized up to 10 TB for on-prem and customer cloud hosted.

Table 136: Instance Types with Number of Devices, Nodes and Deployment Models

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled							
<250	One Node Small Cisco vManage	NA	NA	NA	Yes	Yes	Yes
250-1000	One Node Medium vManage	NA	NA	NA	Yes	Yes	Yes
1000-1500	One Node Large vManage	NA	NA	NA	Yes	Yes	Yes
1500-2000	Three Node Medium vManage Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes
2000-5000	Three Node Large vManage Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
5000-10000	Six Node Large vManage Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats and AppServer	NA	NA	NA	Yes	Yes	Yes
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled							
<250	One Node Medium vManage	25 GB/Day	20 Days	25 GB/Day	Yes	NA	NA
<250	One Node Large vManage	50 GB/Day	30 Days	50 GB/Day	NA	Yes	Yes
250-1000	One Node Large vManage	50 GB/Day	30 Days	50 GB/Day	Yes	Yes	Yes
1000-4000	Three Node Large vManage Cluster (All Services)	100 GB/Day	14 Days	300 GB/Day	Yes	Yes	Yes
4000-7000	Six Node Large vManage Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	2 TB/Day*	Yes	Yes	Yes

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
7000-10000	Six Node Large vManage Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	1 TB/Day*	Yes	Yes	Yes

*For a larger dataset per day, run Stats on all the servers.

Table 137: Supported Scale on Cisco HyperFlex (HX), SAIE Disabled

Devices	Nodes and Deployment Models with Instance Types
0-2000	Three Node Medium Cisco vManage Cluster
2000-5000	Three Node Large Cisco vManage Cluster

To achieve scale beyond the numbers mentioned in the tables above, deploy multiple overlays.

Note

- The number of days the data can be stored in Cisco SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco SD-WAN Manager disk size:
- Formula to calculate the Cisco SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 1.5 Terabytes.
- Formula to calculate the Cisco SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 3.5 Terabytes.

Note Maximum tested disk size for On-prem is 10 TB per instance.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated SAIE size. The aggregated SAIE size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated SAIE also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the SAIE and aggregated SAIE index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated SAIE value,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated SAIE** size to the desired value based on your SAIE traffic, the default disk size allocation is 5 GB.

Note When SAIE is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your SAIE traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 138: Cisco vBond Orchestrators Recommended Computing Resources

Devices	Number of Cisco vBond	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2	c5.large
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge

Devices	Number of Cisco vBond	vCPU	RAM	OS Volume	vNICs	Azure	AWS
4000-8000	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
8000-10000	6	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge

Table 139: Cisco vSmart Controllers Recommended Computing Resources

Devices	Number of Cisco vSmart	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<250	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
250-1000	2	4	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_D4ds_v5	c5.2xlarge
1000-2500	2	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2	c5.2xlarge
2500-5000	4	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
5000-7500	6	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge

Devices	Number of Cisco vSmart	vCPU	RAM	OS Volume	vNICs	Azure	AWS
7500-10000	8	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge

Note

- The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay are eight, similarly the maximum number of tested vSmart instances is twelve.
- The required number of vCPUs and RAM for Cisco vBond Orchestrators and Cisco vSmart Controllers for Cisco Cloud Hosted overlays are determined by the Cisco Cloud Ops and provisioned accordingly.
- The number of Cisco vSmart and Cisco vBond instances recommended in the table above assumes a deployment with Cisco SD-WAN controllers in two locations (i.e. data centers) designed for redundancy – with half the controllers in one data center and half the controllers in another data center. In other words, the table above already considers the 1:1 redundancy in the number of Cisco vSmart and Cisco vBond instances recommended to be deployed across the two data centers – without considering any Cisco vSmart controller group/affinity configuration.

  If you are deploying Cisco vSmart and Cisco vBond instances with a different set of assumptions, for example, across three data centers, or if you are using Cisco vSmart controller groups/affinity within your deployment, refer to the Points to Consider chapter for additional guidance.

Table 140: Testbed Specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, and PS.
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note

- Any UCS Platform (Fifth generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco SD-WAN Controllers with similar scale numbers mentioned in this document.
- The CPU specifications are not tied to any brand, both AMD and Intel brands with specifications above are supported.

Table 141: Testbed Specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Note

- The tested replication factor is three.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant (MT)

The supported instance specifications for the Cisco vManage, Cisco vBond Orchestrators, and Cisco vSmart Controllers are as follows:

Table 142: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs	RAM	Storage Size	Azure	AWS
Large	32 vCPUs*	128 GB RAM	5 TB	Standard_F64s_v2	c5.18xlarge

* requires 64 vCPU for multi-tenant deployment in the Cisco vManage Specifications table for deploying beyond 2500 devices.

Table 143: Cisco vManage Specifications

Max Tenants (T) and Devices (D)	Nodes and Deployment Models with Instances Type	Data Processing Factor	Number of Days the Data Can be Stored	Cisco Cloud	On-Prem (UCS)	Customer Cloud
75(T) and 2500(D)*	Three Node Large vManage	100 GB/Day	14 Days	Yes	Yes	Yes

Max Tenants (T) and Devices (D)	Nodes and Deployment Models with Instances Type	Data Processing Factor	Number of Days the Data Can be Stored	Cisco Cloud	On-Prem (UCS)	Customer Cloud
150(T) and 7500(D)*	Six Node Large vManage (64 vCPUs required)	100 GB/Day	14 Days	No	Yes	Yes

Note * indicates that a pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all the tenants.

Table 144: Cisco vBond Orchestrators Recommended Computing Resources

Devices	Number of Cisco vBond	vCPU	RAM	OS Volume	vNICs	AWS	Azure
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	c5.large	Standard_F2s_v2
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2
4000-7500	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2

Table 145: Cisco vSmart Controllers Recommended Computing Resources

Devices	vCPU	RAM	OS Volume	vNICs	AWS	Azure
< 250	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge	Standard_F4s_v2

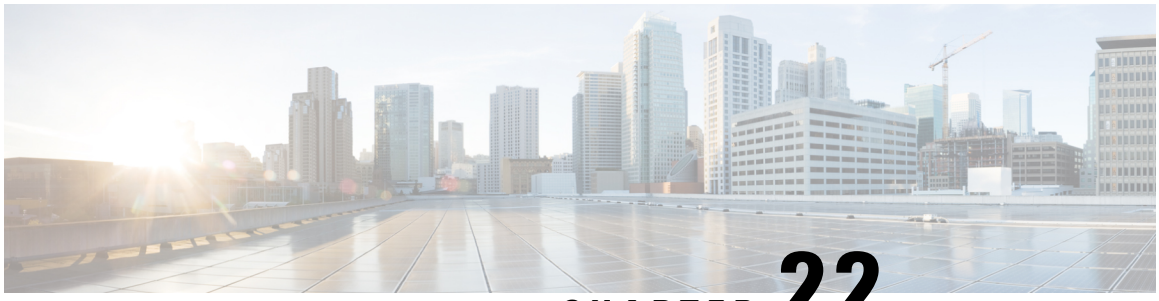
Devices	vCPU	RAM	OS Volume	vNICs	AWS	Azure
250-2500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2
2500-5000	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2
5000-7500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge	Standard_F8_v2

Table 146: Cisco vBond and vSmart Specifications

Devices	Number of Cisco vBond Orchestrators Required	Number of Cisco vSmart Controllers Required
75 Tenants or 2500 Devices	2	A pair for every 24 tenants
150 Tenants or 7500 Devices	2 (additional 2 if deployment goes beyond 4000 devices)	A pair for every 24 tenants

Note

- A pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all the tenants. For example, 24 tenants require 2 vSmart Controllers, 50 tenants require 6 vSmart Controllers, and 150 tenants require 14 vSmart Controllers.
- The SAIE numbers are for the entire multi-tenant (cluster) deployment and there is no per tenant SAIE limitation.
- If SAIE is enabled, we recommend that the aggregated SAIE data (across all Cisco vManage nodes and all tenants in the multitenant system) does not exceed 350 GB per day. If the SAIE data exceeds 350 GB per day, increase the Hard Disk capacity of each Cisco vManage node up to 10 TB.
- A pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay is eight.



CHAPTER 22

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.9.x

Single Tenant (ST)

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

The supported instance specifications for the Cisco SD-WAN Manager, Cisco SD-WAN Validator, and Cisco SD-WAN Controller are as follows:

Note The control components and the device software versions should be the same, to achieve the following scale.

Table 147: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Small	16 vCPUs	32 GB RAM	500 GB	Standard_F16s_v2	c5.4xlarge
Medium	32 vCPUs	64 GB RAM	1 TB	Standard_F32s_v2	c5.9xlarge

Instance Type	Specifications (Approximation)			Qualified Instance Type	
	vCPUs*	RAM*	Storage Size*	Azure	AWS
Large	32 vCPUs	128 GB RAM	5 TB	Standard_D32ds_v5	c5.18xlarge

* vCPU, RAM, and Storage Size numbers are on per Cisco SD-WAN Manager basis. The Storage Size numbers can be sized up to 10 TB for on-prem and customer cloud hosted.

Table 148: Instance Types with Number of Devices, Nodes and Deployment Models

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Disabled							
<250	One Node Small Cisco SD-WAN Manager	NA	NA	NA	Yes	Yes	Yes
250-1000	One Node Medium Cisco SD-WAN Manager	NA	NA	NA	Yes	Yes	Yes
1000-1500	One Node Large Cisco SD-WAN Manager	NA	NA	NA	Yes	Yes	Yes
1500-2000	Three Node Medium Cisco SD-WAN Manager Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes
2000-5000	Three Node Large Cisco SD-WAN Manager Cluster (All Services)	NA	NA	NA	Yes	Yes	Yes

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
5000-10000	Six Node Cisco SD-WAN Manager Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats and AppServer	NA	NA	NA	Yes	Yes	Yes
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Enabled							
<250	One Node Medium Cisco SD-WAN Manager	25 GB/Day	20 Days	25 GB/Day	Yes	NA	NA
<250	One Node Large Cisco SD-WAN Manager	50 GB/Day	30 Days	50 GB/Day	NA	Yes	Yes
250-1000	One Node Large Cisco SD-WAN Manager	50 GB/Day	30 Days	50 GB/Day	Yes	Yes	Yes
1000-4000	Three Node Large Cisco SD-WAN Manager Cluster (All Services)	100 GB/Day	14 Days	300 GB/Day	Yes	Yes	Yes

Devices	Nodes and Deployment Models with Instance Type	Data Processing Factor	Number of days the data can be stored	Max Daily Processing Volume	Cisco Cloud	On-Prem (UCS)	Customer Cloud
4000-7000	Six Node Cisco SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	2 TB/Day*	Yes	Yes	Yes
7000-10000	Six Node Cisco SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server, stats, and AppServer	100 GB/Day	14 Days	1 TB/Day*	Yes	Yes	Yes

*For a larger dataset per day, run Stats on all the servers.

Table 149: Supported Scale on Cisco HyperFlex (HX), SAIE Disabled

Devices	Nodes and Deployment Models with Instance Types
0-2000	Three Node Medium Cisco SD-WAN Manager Cluster
2000-5000	Three Node Large Cisco SD-WAN Manager Cluster

To achieve scale beyond the numbers mentioned in the tables above, deploy multiple overlays.

Note

- The number of days the data can be stored in Cisco SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco SD-WAN Manager disk size:
- Formula to calculate the Cisco SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 1.5 Terabytes.
- Formula to calculate the Cisco SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 3.5 Terabytes.

Note Maximum tested disk size for On-prem is 10 TB per instance.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated SAIE size. The aggregated SAIE size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated SAIE also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the SAIE and aggregated SAIE index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated SAIE value,

1. From the Cisco SD-WAN Manager menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated SAIE** size to the desired value based on your SAIE traffic, the default disk size allocation is 5 GB.

Note When SAIE is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the Cisco SD-WAN Manager menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your SAIE traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 150: Cisco SD-WAN Validator Recommended Computing Resources

Devices	Number of Cisco SD-WAN Validator	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2	c5.large
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
4000-8000	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
8000-10000	6	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge

Table 151: Cisco SD-WAN Controller Recommended Computing Resources

Devices	Number of Cisco vSmart	vCPU	RAM	OS Volume	vNICs	Azure	AWS
<250	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2	c5.xlarge
250-1000	2	4	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_D4ds_v5	c5.2xlarge

Devices	Number of Cisco vSmart	vCPU	RAM	OS Volume	vNICs	Azure	AWS
1000-2500	2	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2	c5.2xlarge
2500-5000	4	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
5000-7500	6	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge
7500-10000	8	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F8_v2	c5.2xlarge

Note

- The tested and recommended limit of supported Cisco SD-WAN Validator instances in a single Cisco Catalyst SD-WAN overlay are eight, similarly the maximum number of tested Cisco SD-WAN Controller instances is twelve.
- The required number of vCPUs and RAM for Cisco SD-WAN Validator and Cisco SD-WAN Controller for Cisco Cloud Hosted overlays are determined by the Cisco Cloud Ops and provisioned accordingly.
- The number of Cisco SD-WAN Controller and Cisco SD-WAN Validator instances recommended in the table above assumes a deployment with Cisco SD-WAN Control Components in two locations (i.e. data centers) designed for redundancy – with half the controllers in one data center and half the controllers in another data center. In other words, the table above already considers the 1:1 redundancy in the number of Cisco SD-WAN Controller and Cisco SD-WAN Validator instances recommended to be deployed across the two data centers – without considering any Cisco SD-WAN Controller group/affinity configuration.

  If you are deploying Cisco SD-WAN Controller and Cisco SD-WAN Validator instances with a different set of assumptions, for example, across three data centers, or if you are using Cisco SD-WAN Controller groups/affinity within your deployment, refer to the Points to Consider chapter for additional guidance.

Table 152: Testbed Specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, and PS.
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note

- Any UCS Platform (Fifth generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco SD-WAN Control Components with similar scale numbers mentioned in this document.
- The CPU specifications are not tied to any brand, both AMD and Intel brands with specifications above are supported.

Table 153: Testbed Specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Note

- The tested replication factor is three.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant (MT)

The supported instance specifications for the Cisco SD-WAN Manager, Cisco SD-WAN Validator, and Cisco SD-WAN Controller are as follows:

Table 154: Instance Type Definitions

Instance Type	Specifications (Approximation)			Qualified Instance Type
	vCPUs	RAM	Storage Size	AWS
Large	32 vCPUs*	128 GB RAM	5 TB	c5.18xlarge

* requires 64 vCPU for multi-tenant deployment in the Cisco SD-WAN Manager Specifications table for deploying beyond 2500 devices.

Table 155: Cisco SD-WAN Manager Specifications

Max Tenants (T) and Devices (D)	Nodes and Deployment Models with Instances Type	Data Processing Factor	Number of Days the Data Can be Stored	Cisco Cloud	On-Prem (UCS)	Customer Cloud
75(T) and 2500(D)*	Three Node Large Cisco SD-WAN Manager	100 GB/Day	14 Days	Yes	Yes	Yes
150(T) and 7500(D)*	Six Node Large Cisco SD-WAN Manager (64 vCPUs required)	100 GB/Day	14 Days	No	Yes	Yes

Note * indicates that a pair of Cisco SD-WAN Controller supports 24 tenants and 1000 devices across all the tenants.

Table 156: Cisco SD-WAN Validator Recommended Computing Resources

Devices	Number of Cisco SD-WAN Validator	vCPU	RAM	OS Volume	vNICs	AWS
<1000	2	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	c5.large

Devices	Number of Cisco SD-WAN Validator	vCPU	RAM	OS Volume	vNICs	AWS
1000-4000	2	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge
4000-7500	4	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge

Table 157: Cisco SD-WAN Controller Recommended Computing Resources

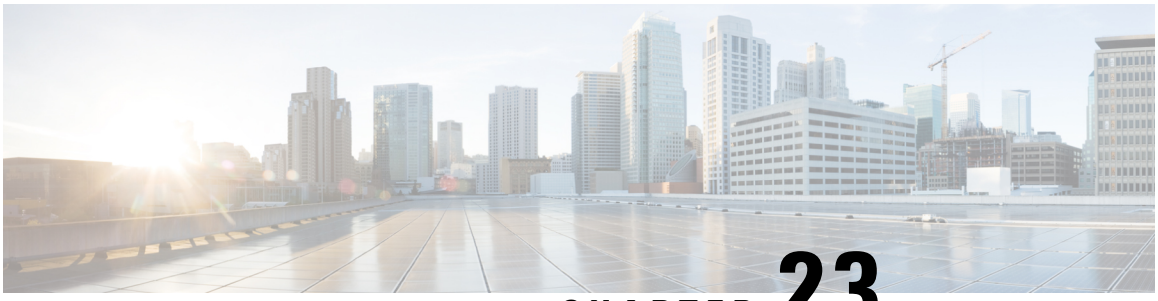
Devices	vCPU	RAM	OS Volume	vNICs	AWS
< 250	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	c5.xlarge
250-2500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge
2500-5000	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge
5000-7500	8	16 GB	10 GB	2 (one for tunnel interface, one for management)	c5.2xlarge

Table 158: Cisco SD-WAN Validator and Cisco SD-WAN Controller Specifications

Devices	Number of Cisco SD-WAN Validator Required	Number of Cisco SD-WAN Controller Required
75 Tenants or 2500 Devices	2	A pair for every 24 tenants
150 Tenants or 7500 Devices	2 (additional 2 if deployment goes beyond 4000 devices)	A pair for every 24 tenants

Note

- A pair of Cisco SD-WAN Controller supports 24 tenants and 1000 devices across all the tenants. For example, 24 tenants require 2 Cisco SD-WAN Controller, 50 tenants require 6 Cisco SD-WAN Controller, and 150 tenants require 14 Cisco SD-WAN Controller.
- The SAIE numbers are for the entire multi-tenant (cluster) deployment and there is no per tenant SAIE limitation.
- If SAIE is enabled, we recommend that the aggregated SAIE data (across all Cisco SD-WAN Manager nodes and all tenants in the multitenant system) does not exceed 350 GB per day. If the SAIE data exceeds 350 GB per day, increase the Hard Disk capacity of each Cisco SD-WAN Manager node up to 10 TB.
- A pair of Cisco SD-WAN Controller supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco SD-WAN Validator instances in a single Cisco Catalyst SD-WAN overlay is eight.



CHAPTER 23

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.8.x (Cisco Hosted Cloud Deployment)

Starting from Cisco SD-WAN Manager Release 20.6.x, new cloud controller instances are introduced. There are three types of these instances- Small, Medium, and Large, based on computing resources. The following table shows the specifications associated with each instance type.

Instance Type	Specifications (Approximation)		
	vCPUs	RAM	Storage Size
Small	16 vCPUs	32 GB RAM	500 GB
Medium	32 vCPUs	64 GB RAM	1 TB
Large	32 vCPUs	128 GB RAM	5 TB

Table 159: Instance Types With Number of Devices and Nodes and Deployment Models

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled			
<250	One Node Small vManage	NA	NA
250-1000	One Node Medium vManage	NA	NA
1000-1500	One Node Large vManage	NA	NA
1500-2000	Three Node Medium vManage Cluster	NA	NA
2000-5000	Three Node Large vManage Cluster	NA	NA
5000-7000	Six Node Large vManage Cluster	NA	NA

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled			
<250	One Node Medium vManage	25 GB/Day	20 Days
250-1000	One Node Large vManage (All Services)	50 GB/Day	30 Days
1000-2000	Three Node Large vManage Cluster	100 GB/Day	14 Days
2000-7000	Six Node Large vManage Cluster	100 GB/Day	14 Days

Note The number of days the data can be stored in Cisco SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco SD-WAN Manager disk size:

Formula to calculate the Cisco SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 1.5 Terabytes.

Formula to calculate the Cisco SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 3.5 Terabytes.

Table 160: Number of Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers Required for Respective Device Ranges

Devices	Number of Cisco Catalyst SD-WAN Validators required	Number of Cisco Catalyst SD-WAN Controllers required
<250	2	2
250-1000	2	2
1000-1500	2	2
1500-2000	4	4
2000-5000	6	6
5000-7000	8	8

Note The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers, is determined by the Cloud Ops and is provisioned accordingly.

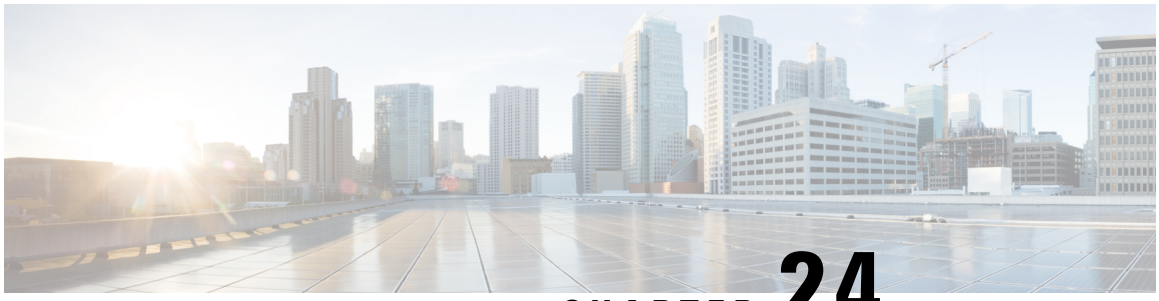
Multitenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controllers are as follows:

Table 161: Hardware Specifications to Support 50 Tenants and 1000 Devices

Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	Cloud hosted	Cloud hosted	Cloud hosted
Number of Instances	3 instances	2 instances	6 instances
Instance Type	Large	NA	NA

Note The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers, is determined by the Cloud Ops and is provisioned accordingly.



CHAPTER 24

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.8.x (Customer Cloud Hosted on Azure Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller for Azure are as follows:

Note The controller and the device version should be the same, to achieve the below scale.

Table 162: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled						
<250	Disabled	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	Standard_F16s_v2
250-1000	Disabled	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	Standard_F32s_v2
1000-1500	Disabled	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	Standard_F64s_v2
1500-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	Standard_F32s_v2
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	Standard_F64s_v2

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
5000-7000	Disabled	Six Node vManage Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats, and AppServer	32 vCPUs	128 GB RAM	1 TB	Standard_F64s_v2
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled						
<500	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB RAM	10 TB	Standard_F64s_v2
500-2000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	Standard_F64s_v2
2000-7000	2.0 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	10 TB	Standard_F64s_v2

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note In Cisco vManage Release 20.5.1 and earlier releases, You can modify the **DPI** size to the desired value to achieve the above mentioned storage size numbers.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated DPI size. The aggregated DPI size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated DPI also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the DPI and aggregated DPI index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated DPI value,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated DPI** size to the desired value based on your DPI traffic, the default disk size allocation is 5 GB.

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

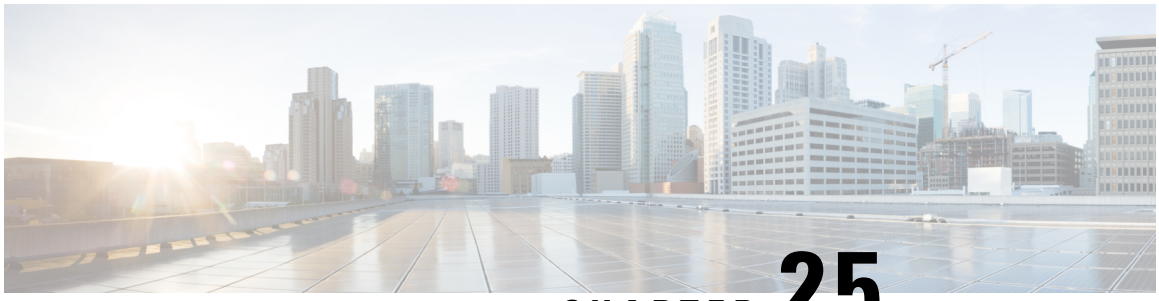
1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 163: Cisco Catalyst SD-WAN Validator Recommended Computing Resources

Devices	vCPUs	RAM	OS Volume	vNICs	Azure Instance Sizing
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
1001 -1500	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2

Table 164: Cisco Catalyst SD-WAN Controller Recommended Computing Resources

Devices	vCPUs	RAM	OS Volume	vNICs	Azure Instance Sizing
1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2
1001 -1500	8	16 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2



CHAPTER 25

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.8.x (On-Prem Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Note The controller and the device version should be the same, to achieve the below scale.

Table 165: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
On-Prem						
SD-WAN Application Intelligence Engine (SAIE) Disabled						
<250	Disabled	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	UCS
250-1000	Disabled	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
1000-1500	Disabled	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
1500-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
5000-7000	Disabled	Six Node vManage Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	1 TB	UCS
0-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	HX
SD-WAN Application Intelligence Engine (SAIE) Enabled						
<500	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
500-2000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
2000-7000	2.0 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	10 TB	UCS

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note In Cisco vManage Release 20.5.1 and earlier releases, You can modify the **DPI** size to the desired value to achieve the above mentioned storage size numbers.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated DPI size. The aggregated DPI size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated DPI also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the DPI and aggregated DPI index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated DPI value,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated DPI** size to the desired value based on your DPI traffic, the default disk size allocation is 5 GB.

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 166: Cisco Catalyst SD-WAN Validator Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
1001 or more	4	8 GB	10 GB	2 (one for tunnel interface, one for management)

Note The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay is eight.

Table 167: Cisco Catalyst SD-WAN Controller Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs

1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	2 (one for tunnel interface, one for management)

Testbed Specifications

Table 168: Testbed specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, PS
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note Any UCS Platform (Fifth generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco SD-WAN Controllers with similar scale numbers mentioned in this document.

Drive specifications:

- Interface Speed— 12.0 Gbit per second
- Read speed (64KB) —1800 MB per second
- Write speed (64KB)—850 MB per second

Note

- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like SAIE.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing speed.

Table 169: Testbed specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Drive specifications:

- The tested replication factor is 3.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controllers are as follows:

Table 170: Hardware Specifications to Support 50 Tenants and 1000 Devices

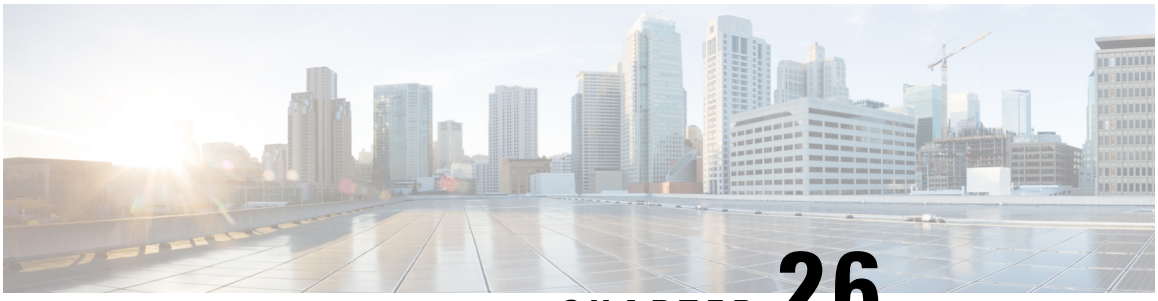
Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	3 Compute+Data nodes	2 instances	2 instances per 24 tenants To support 50 tenants and 1000 devices across all tenants, deploy 6 Cisco vSmart Controller instances.
CPU **DRAM** **Hard Disk**	32 vCPU 128 GB Minimum: 1 TB; Recommended: 10 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

Table 171: Hardware Specifications to Support 100 Tenants and 5000 Devices

Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	6 nodes: 3 Compute+Data nodes and 3 Data nodes	2 instances	2 instances per 24 tenants To support 100 tenants and 5000 devices across all tenants, deploy 10 Cisco vSmart Controllers.
CPU **DRAM** **Hard Disk**	64 vCPU 128 GB Minimum: 2 TB; Recommended: 10 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

Note

- If DPI is enabled, we recommend that the aggregated DPI data (across all Cisco vManage nodes and all tenants in the multitenant system) does not exceed 350 GB per day. If the DPI data exceeds 350 GB per day, increase the Hard Disk capacity of each Cisco vManage node up to 10 TB.
- A pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay is eight.



CHAPTER 26

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.7.x (Cisco Hosted Cloud Deployment)

Starting from Cisco SD-WAN Manager Release 20.6.x, new cloud controller instances are introduced. There are three types of these instances- Small, Medium, and Large, based on computing resources. The following table shows the specifications associated with each instance type.

Instance Type	Specifications (Approximation)		
	vCPUs	RAM	Storage Size
Small	16 vCPUs	32 GB RAM	500 GB
Medium	32 vCPUs	64 GB RAM	1 TB
Large	32 vCPUs	128 GB RAM	5 TB

Table 172: Instance Types With Number of Devices and Nodes and Deployment Models

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled			
<250	One Node Small vManage	NA	NA
250-1000	One Node Medium vManage	NA	NA
1000-1500	One Node Large vManage	NA	NA
1500-2000	Three Node Medium vManage Cluster	NA	NA
2000-5000	Three Node Large vManage Cluster	NA	NA
5000-7000	Six Node Large vManage Cluster	NA	NA

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled			
<250	One Node Medium vManage	25 GB/Day	20 Days
250-1000	One Node Large vManage (All Services)	50 GB/Day	30 Days
1000-2000	Three Node Large vManage Cluster	100 GB/Day	14 Days
2000-7000	Six Node Large vManage Cluster	100 GB/Day	14 Days

Note The number of days the data can be stored in Cisco SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco SD-WAN Manager disk size:

Formula to calculate the Cisco SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 1.5 Terabytes.

Formula to calculate the Cisco SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 3.5 Terabytes.

Table 173: Number of Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers Required for Respective Device Ranges

Devices	Number of Cisco Catalyst SD-WAN Validators required	Number of Cisco Catalyst SD-WAN Controllers required
<250	2	2
250-1000	2	2
1000-1500	2	2
1500-2000	4	4
2000-5000	6	6
5000-7000	8	8

Note The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers, is determined by the Cloud Ops and is provisioned accordingly.

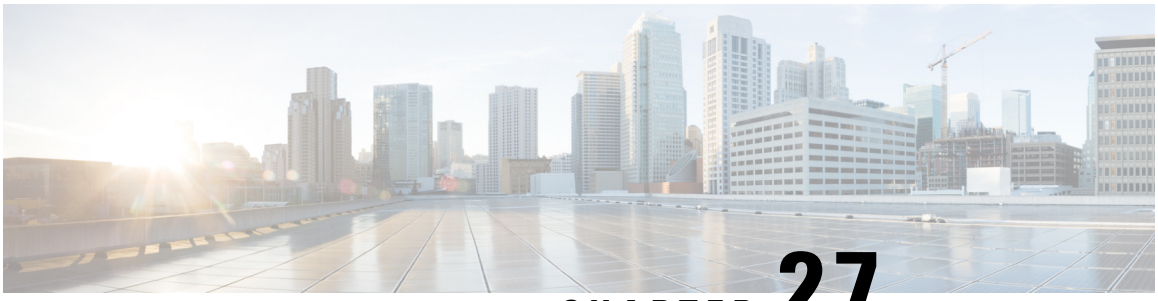
Multitenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controllers are as follows:

Table 174: Hardware Specifications to Support 50 Tenants and 1000 Devices

Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	Cloud hosted	Cloud hosted	Cloud hosted
Number of Instances	3 instances	2 instances	6 instances
Instance Type	Large	NA	NA

Note The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers, is determined by the Cloud Ops and is provisioned accordingly.



CHAPTER 27

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.7.x (Customer Cloud Hosted on Azure Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller for Azure are as follows:

Note The controller and the device version should be the same, to achieve the below scale.

Table 175: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled						
<250	Disabled	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	[illegible]
250-1000	Disabled	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	[illegible]
1000-1500	Disabled	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	[illegible]
1500-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	[illegible]
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	[illegible]

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
5000-7000	Disabled	Six Node vManage Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats, and AppServer	32 vCPUs	128 GB RAM	1 TB	[illegible]
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled						
<500	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB RAM	10 TB	[illegible]
500-2000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	[illegible]
2000-7000	2.0 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	10 TB	[illegible]

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note In Cisco vManage Release 20.5.1 and earlier releases, You can modify the **DPI** size to the desired value to achieve the above mentioned storage size numbers.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated DPI size. The aggregated DPI size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated DPI also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the DPI and aggregated DPI index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated DPI value,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated DPI** size to the desired value based on your DPI traffic, the default disk size allocation is 5 GB.

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

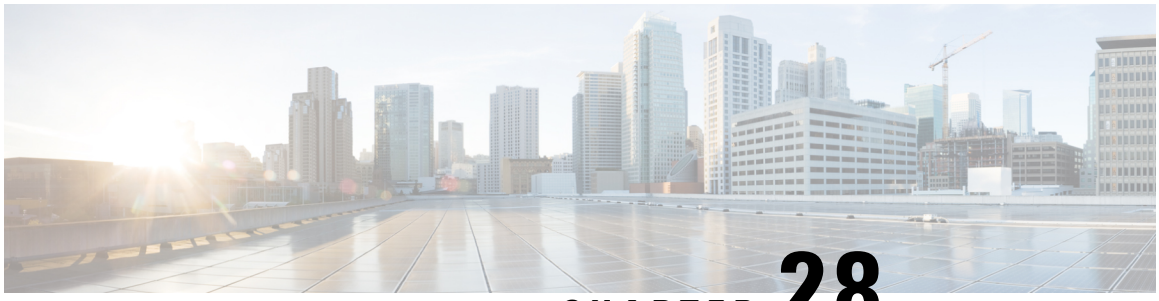
1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 176: Cisco Catalyst SD-WAN Validator Recommended Computing Resources

Devices	vCPUs	RAM	OS Volume	vNICs	Azure Instance Sizing
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
1001 -1500	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2

Table 177: Cisco Catalyst SD-WAN Controller Recommended Computing Resources

Devices	vCPUs	RAM	OS Volume	vNICs	Azure Instance Sizing
1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2
1001 -1500	8	16 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2



CHAPTER 28

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.7.x (On-Prem Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Note The controller and the device version should be the same, to achieve the below scale.

Table 178: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
On-Prem						
SD-WAN Application Intelligence Engine (SAIE) Disabled						
<250	Disabled	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	UCS
250-1000	Disabled	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
1000-1500	Disabled	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
1500-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
5000-7000	Disabled	Six Node vManage Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	1 TB	UCS
0-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	HX
SD-WAN Application Intelligence Engine (SAIE) Enabled						
<500	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
500-2000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
2000-7000	2.0 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	10 TB	UCS

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note In Cisco vManage Release 20.5.1 and earlier releases, You can modify the **DPI** size to the desired value to achieve the above mentioned storage size numbers.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated DPI size. The aggregated DPI size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated DPI also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the DPI and aggregated DPI index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated DPI value,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated DPI** size to the desired value based on your DPI traffic, the default disk size allocation is 5 GB.

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 179: Cisco Catalyst SD-WAN Validator Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
1001 or more	4	8 GB	10 GB	2 (one for tunnel interface, one for management)

Note The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay is eight.

Table 180: Cisco Catalyst SD-WAN Controller Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs

1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	2 (one for tunnel interface, one for management)

Testbed Specifications

Table 181: Testbed specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, PS
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note Any UCS Platform (Fifth generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco SD-WAN Controllers with similar scale numbers mentioned in this document.

Drive specifications:

- Interface Speed— 12.0 Gbit per second
- Read speed (64KB) —1800 MB per second
- Write speed (64KB)—850 MB per second

Note

- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like SAIE.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing speed.

Table 182: Testbed specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Drive specifications:

- The tested replication factor is 3.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controllers are as follows:

Table 183: Hardware Specifications to Support 50 Tenants and 1000 Devices

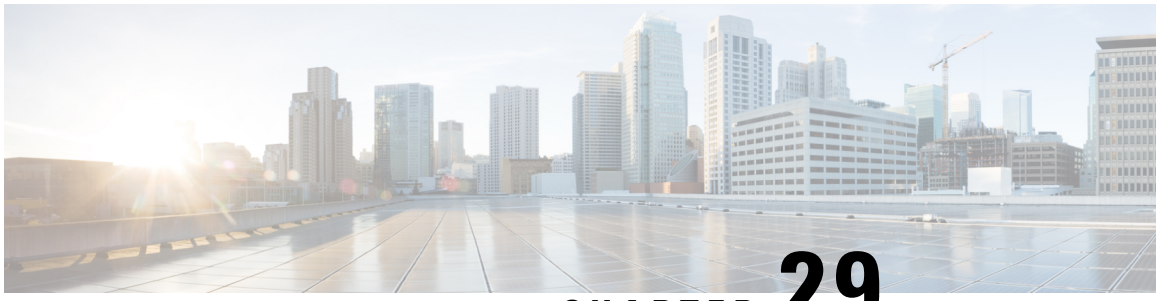
Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	3 Compute+Data nodes	2 instances	2 instances per 24 tenants To support 50 tenants and 1000 devices across all tenants, deploy 6 Cisco vSmart Controller instances.
CPU **DRAM** **Hard Disk**	32 vCPU 128 GB Minimum: 1 TB; Recommended: 10 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

Table 184: Hardware Specifications to Support 100 Tenants and 5000 Devices

Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	6 nodes: 3 Compute+Data nodes and 3 Data nodes	2 instances	2 instances per 24 tenants To support 100 tenants and 5000 devices across all tenants, deploy 10 Cisco vSmart Controllers.
CPU **DRAM** **Hard Disk**	64 vCPU 128 GB Minimum: 2 TB; Recommended: 10 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

Note

- If DPI is enabled, we recommend that the aggregated DPI data (across all Cisco vManage nodes and all tenants in the multitenant system) does not exceed 350 GB per day. If the DPI data exceeds 350 GB per day, increase the Hard Disk capacity of each Cisco vManage node up to 10 TB.
- A pair of Cisco vSmart Controllers supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco vBond Orchestrator instances in a single Cisco SD-WAN overlay is eight.



CHAPTER 29

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.6.x (Cisco Hosted Cloud Deployment)

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Starting from Cisco vManage Release 20.6.x, new cloud controller instances are introduced. There are three types of these instances- Small, Medium, and Large, based on computing resources. The following table shows the specifications associated with each instance type.

Instance Type	Specifications (Approximation)		
	vCPUs	RAM	Storage Size
Small	16 vCPUs	32 GB RAM	500 GB
Medium	32 vCPUs	64 GB RAM	1 TB
Large	32 vCPUs	128 GB RAM	5 TB

Table 185: Instance Types With Number of Devices and Nodes and Deployment Models

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Disabled			
<250	One Node Small Cisco SD-WAN Manager	NA	NA

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
250-1000	One Node Medium Cisco SD-WAN Manager	NA	NA
1000-1500	One Node Large Cisco SD-WAN Manager	NA	NA
1500-2000	Three Node Medium Cisco SD-WAN Manager Cluster	NA	NA
2000-5000	Three Node Large Cisco SD-WAN Manager Cluster	NA	NA
5000-7000	Six Node Large Cisco SD-WAN Manager Cluster	NA	NA
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Enabled			
<250	One Node Medium Cisco SD-WAN Manager	25 GB/Day	20 Days
250-1000	One Node Large Cisco SD-WAN Manager (All Services)	50 GB/Day	30 Days
1000-2000	Three Node Large Cisco SD-WAN Manager Cluster	100 GB/Day	14 Days
2000-7000	Six Node Large Cisco SD-WAN Manager Cluster	100 GB/Day	14 Days

Note The number of days the data can be stored in Cisco SD-WAN Manager, depends on per-day processing volume of the device nodes. To store the data for a longer time or to accommodate the increase in per-day processing volume, use the following formulas to calculate the required Cisco SD-WAN Manager disk size:

Formula to calculate the Cisco SD-WAN Manager disk size required for single node deployment: (Data per day × number of days) + 500 GB buffer. For example, if the data per day is 100 Gigabytes and the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 1.5 Terabytes.

Formula to calculate the Cisco SD-WAN Manager disk size required for cluster deployment: (Data per day × number of days × 3) + 500 GB buffer. For example, if the data per day is 100 Gigabytes, the number of days the data must be stored is 10, then the required Cisco SD-WAN Manager disk size is 3.5 Terabytes.

Table 186: Number of Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers Required for Respective Device Ranges

Devices	Number of Cisco Catalyst SD-WAN Validators required	Number of Cisco Catalyst SD-WAN Controllers required
<250	2	2
250-1000	2	2
1000-1500	2	2
1500-2000	4	4
2000-5000	6	6
5000-7000	8	8

Note The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers, is determined by the Cloud Ops and is provisioned accordingly.

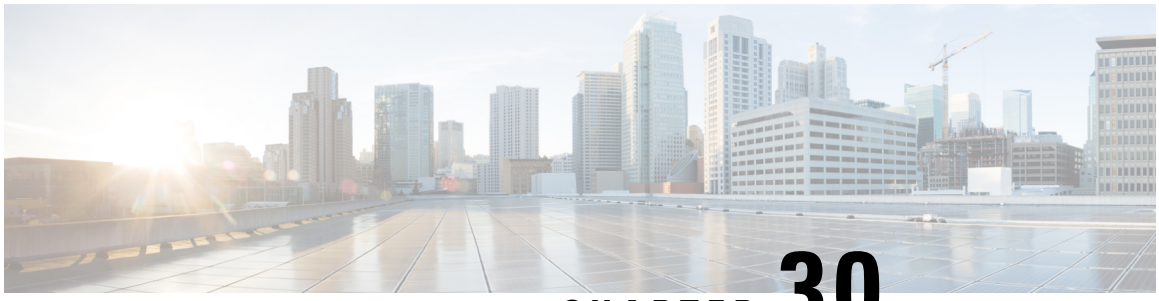
Multitenant

The supported hardware specifications for the Cisco Catalyst SD-WAN Validator, Cisco SD-WAN Manager, and the Cisco Catalyst SD-WAN Controller are as follows:

Table 187: Hardware Specifications to Support 50 Tenants and 1000 Devices

Server	Cisco SD-WAN Manager	Cisco Catalyst SD-WAN Validator	Cisco SD-WAN Controller
Deployment Model	Cloud hosted	Cloud hosted	Cloud hosted
Number of Instances	3 instances	2 instances	6 instances
Instance Type	Large	NA	NA

Note The required number of vCPUs and RAM for Cisco Catalyst SD-WAN Validators and Cisco Catalyst SD-WAN Controllers, is determined by the Cloud Ops and is provisioned accordingly.



CHAPTER 30

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.6.x (Customer Cloud Hosted on Azure Deployment)

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Single Tenant

The supported hardware specifications for the Cisco SD-WAN Validator, Cisco SD-WAN Manager, and the Cisco SD-WAN Controller for Azure are as follows:

Note The controller and the device version should be the same, to achieve the below scale.

Table 188: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Disabled						

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
<250	Disabled	One Node Cisco SD-WAN Manager (All Services)	16 vCPUs	32 GB RAM	500 GB	[illegible]
250-1000	Disabled	One Node Cisco SD-WAN Manager (All Services)	32 vCPUs	64 GB RAM	1 TB	[illegible]
1000-1500	Disabled	One Node Cisco SD-WAN Manager (All Services)	32 vCPUs	128 GB RAM	1 TB	[illegible]
1500-2000	Disabled	Three Node Cisco SD-WAN Manager Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	[illegible]
2000-5000	Disabled	Three Node Cisco SD-WAN Manager Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	[illegible]
5000-7000`	Disabled	Six Node Cisco SD-WAN Manager Cluster (3 Nodes with ConfigDB) and all nodes messaging server, stats, and AppServer	32 vCPUs	128 GB RAM	1 TB	[illegible]
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled						
<500	50 GB/Day	One Node Cisco SD-WAN Manager (All Services)	32 vCPUs	128 GB RAM	10 TB	[illegible]
500-2000	100 GB/Day	Three Node Cisco SD-WAN Manager Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	[illegible]
2000-7000	2.0 TB/Day**	Six Node Cisco SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	10 TB	[illegible]

* vCPU, RAM, and Storage Size numbers are on per Cisco SD-WAN Manager basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note In Cisco vManage Release 20.5.1 and earlier releases, You can modify the **DPI** size to the desired value to achieve the above mentioned storage size numbers.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated DPI size. The aggregated DPI size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated DPI also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the DPI and aggregated DPI index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated DPI value,

1. From the Cisco SD-WAN Manager menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated DPI** size to the desired value based on your DPI traffic, the default disk size allocation is 5 GB.

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

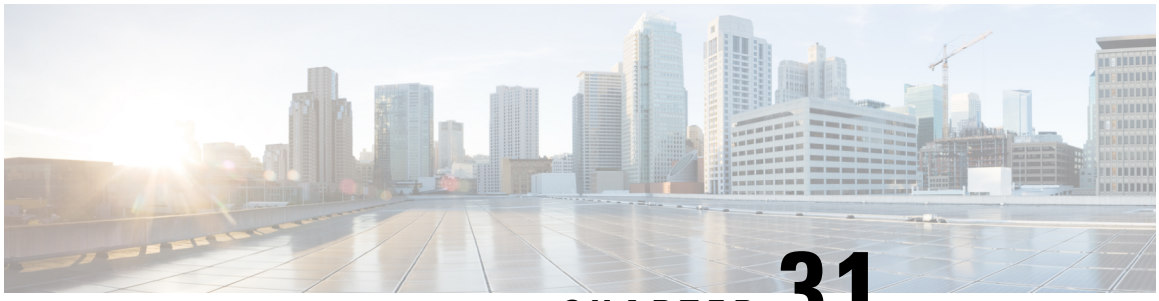
1. From the Cisco SD-WAN Manager menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 189: Cisco Catalyst SD-WAN Validator Recommended Computing Resources

Devices	vCPUs	RAM	OS Volume	vNICs	Azure Instance Sizing
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
1001 -1500	4	8 GB	10 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2

Table 190: Cisco Catalyst SD-WAN Controller Recommended Computing Resources

Devices	vCPUs	RAM	OS Volume	vNICs	Azure Instance Sizing
1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F2s_v2
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F4s_v2
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2
1001 -1500	8	16 GB	16 GB	2 (one for tunnel interface, one for management)	Standard_F8s_v2



CHAPTER 31

Recommended Computing Resources for Cisco Catalyst SD-WAN Control Components Release 20.6.x (On-Prem Deployment)

Note To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, and **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

Single Tenant

The supported hardware specifications for the Cisco SD-WAN Validator, Cisco SD-WAN Manager, and the Cisco SD-WAN Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Note The controller and the device version should be the same, to achieve the below scale.

Table 191: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
On-Prem						

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Disabled						
<250	Disabled	One Node Cisco Catalyst SD-WAN Manager (All Services)	16 vCPUs	32 GB RAM	500 GB	UCS
250-1000	Disabled	One Node Cisco Catalyst SD-WAN Manager (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
1000-1500	Disabled	One Node Cisco Catalyst SD-WAN Manager (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
1500-2000	Disabled	Three Node Cisco Catalyst SD-WAN Manager Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
2000-5000	Disabled	Three Node Cisco Catalyst SD-WAN Manager Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
5000-7000	Disabled	Six Node Cisco Catalyst SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	1 TB	UCS
0-2000	Disabled	Three Node Cisco Catalyst SD-WAN Manager Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX
2000-5000	Disabled	Three Node Cisco Catalyst SD-WAN Manager Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	HX
Cisco Catalyst SD-WAN Application Intelligence Engine (SAIE) Enabled						
<500	50 GB/Day	One Node Cisco Catalyst SD-WAN Manager (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
500-2000	100 GB/Day	Three Node Cisco Catalyst SD-WAN Manager Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
2000-7000	2.0 TB/Day**	Six Node Cisco Catalyst SD-WAN Manager Cluster (3 Node with ConfigDB) and all nodes messaging server,Stats, and AppServer	32 vCPUs	128 GB RAM	10 TB	UCS

* vCPU, RAM, and Storage Size numbers are on per Cisco Catalyst SD-WAN Manager basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note In Cisco vManage Release 20.5.1 and earlier releases, You can modify the **DPI** size to the desired value to achieve the above mentioned storage size numbers.

Note Starting from Cisco vManage Release 20.6.1, you can achieve the above mentioned storage size numbers by modifying the aggregated DPI size. The aggregated DPI size is unidimensional and varies when the deployment includes edge devices that run on a mix of releases (Cisco SD-WAN Release 20.6.x and earlier releases). The aggregated DPI also varies when on-demand troubleshooting is enabled for the devices.

Ensure that both the DPI and aggregated DPI index sizes are configured to enable on-demand troubleshooting.

To modify the aggregated DPI value,

1. From the **Cisco Catalyst SD-WAN Manager** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Database Configuration**.
3. Modify the **Aggregated DPI** size to the desired value based on your DPI traffic, the default disk size allocation is 5 GB.

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the **Cisco Catalyst SD-WAN Manager** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

Table 192: Cisco Catalyst SD-WAN Validator Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
1001 or more	4	8 GB	10 GB	2 (one for tunnel interface, one for management)

Note The tested and recommended limit of supported Cisco SD-WAN Validator instances in a single Cisco Catalyst SD-WAN overlay is eight.

Table 193: Cisco Catalyst SD-WAN Controller Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	2 (one for tunnel interface, one for management)

Testbed Specifications

Table 194: Testbed specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, PS
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Note Any UCS Platform (Fifth Generation and above) with the same or higher hardware specifications mentioned in the above table supports Cisco SD-WAN Control Components with similar scale numbers mentioned in this document.

Drive specifications:

- Interface Speed— 12.0 Gbit per second
- Read speed (64KB) —1800 MB per second
- Write speed (64KB)—850 MB per second

Note

- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like SAIE.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing speed.

Table 195: Testbed specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Drive specifications:

- The tested replication factor is 3.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

Multitenant

The supported hardware specifications for the Cisco SD-WAN Validator, Cisco SD-WAN Manager, and the Cisco SD-WAN Controller are as follows:

Table 196: Hardware Specifications to Support 50 Tenants and 1000 Devices

Server	Cisco SD-WAN Manager	Cisco SD-WAN Validator	Cisco SD-WAN Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	3 Compute+Data nodes	2 instances	2 instances per 24 tenants To support 50 tenants and 1000 devices across all tenants, deploy 6 Cisco vSmart Controller instances.
CPU **DRAM** **Hard Disk**	32 vCPU 128 GB Minimum: 1 TB; Recommended: 10 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

Table 197: Hardware Specifications to Support 100 Tenants and 5000 Devices

Server	Cisco SD-WAN Manager	Cisco SD-WAN Validator	Cisco SD-WAN Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	6 nodes: 3 Compute+Data nodes and 3 Data nodes	2 instances	2 instances per 24 tenants To support 100 tenants and 5000 devices across all tenants, deploy 10 Cisco vSmart Controllers.
CPU **DRAM** **Hard Disk**	64 vCPU 128 GB Minimum: 2 TB; Recommended: 10 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

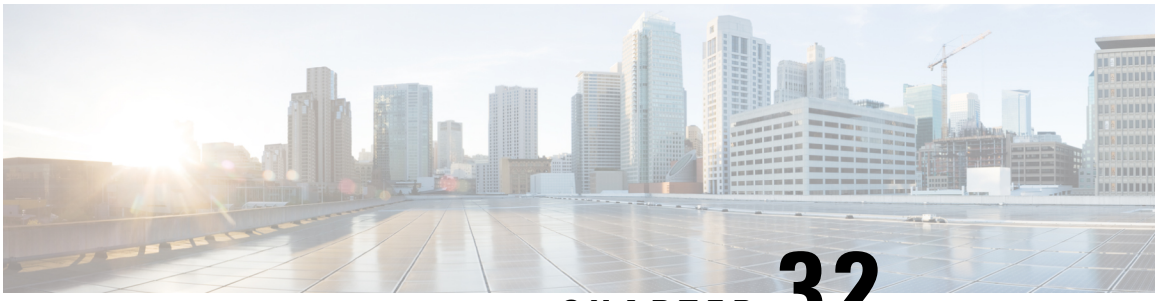
Table 198: Hardware Specifications to Support 150 Tenants and 7500 Devices

Server	Cisco SD-WAN Manager	Cisco SD-WAN Validator	Cisco SD-WAN Controller

Deployment Model	On-premises cluster	On-premises deployment	On-premises deployment
Number of Instances	6 nodes: 3 Compute+Data nodes and 3 Data nodes	4 instances	2 instances per 24 tenants/1000 devices To support 150 tenants and 7500 devices across all tenants, deploy 16 Cisco SD-WAN Controller.
CPU	64 vCPU	4 vCPU	8 vCPU
DRAM	128 GB	4 GB	16 GB
Hard Disk	Minimum: 2 TB; Recommended: 10 TB	10 GB	10 GB
Bandwidth	1 Gbps	10 Mbps	100 Mbps

Note

- A deployment with up to 150 tenants and 7500 devices across tenants is supported from Cisco IOS XE Catalyst SD-WAN Release 17.6.3a, Cisco SD-WAN Release 20.6.3, and Cisco vManage Release 20.6.3.
- If DPI is enabled, we recommend that the aggregated DPI data (across all Cisco Catalyst SD-WAN Manager nodes and all tenants in the multitenant system) does not exceed 350 GB per day.
- A pair of Cisco SD-WAN Controller supports 24 tenants and 1000 devices across all tenants.
- A tenant can add a maximum of 1000 devices.
- The tested and recommended limit of supported Cisco SD-WAN Validator instances in a single Cisco Catalyst SD-WAN overlay is eight.



CHAPTER 32

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.5.x (On-Prem Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Table 199: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
On-Prem						
DPI Disabled						
<250	Disabled	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	UCS
250-1000	Disabled	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
1000-1500	Disabled	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
1500-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
0-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	HX
DPI Enabled						
<250	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
250-1000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
1000-2000	1.2 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB, AppServer), 3 Nodes (Stats, AppServer) all nodes messaging server	32 vCPUs	128 GB RAM	10 TB	UCS
2000-5000	1.8 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB), All Nodes messaging server, Stats, AppServer	32 vCPUs	128 GB RAM	10 TB	UCS

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Table 200: Cisco Catalyst SD-WAN Validator Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
1001 or more	4	8 GB	10 GB	2 (one for tunnel interface, one for management)

Table 201: Cisco Catalyst SD-WAN Controller Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs

1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	2 (one for tunnel interface, one for management)

Testbed Specifications

Table 202: Testbed specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, PS
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Drive specifications:

- Interface Speed— 12.0 Gbit per second
- Read speed (64KB) —1800 MB per second
- Write speed (64KB)—850 MB per second

Note

- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like DPI.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing speed.

Table 203: Testbed specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node

Hardware SKU	Specifications
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Drive specifications:

- The tested replication factor is 3.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

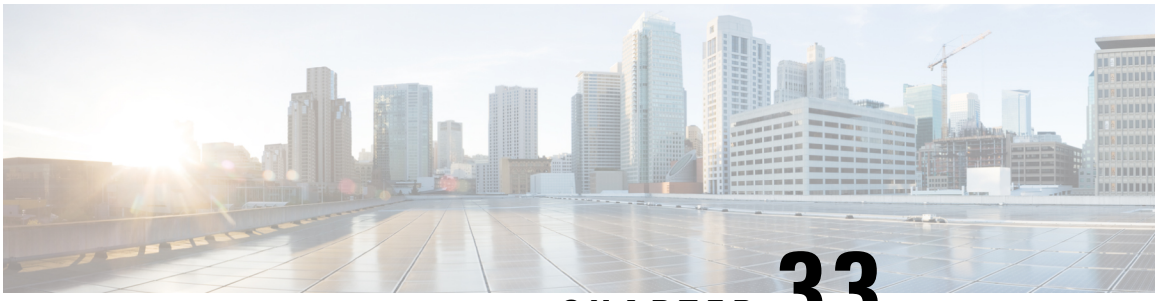
Multitenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Table 204: On-prem Deployment

Server	Cisco SD-WAN Manager	Cisco Catalyst SD-WAN Validator	Cisco Catalyst SD-WAN Controller
Deployment Model	Cluster	N/A	Non-containerized
Number of Instances	3	2	2 per 24 tenants
CPU **DRAM** **Hard Disk**	32 vCPU 128 GB 1 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 16 GB
NMS Service Distribution	Some services run on all three Cisco vManage instances in the cluster, while some services run on only one of the three instances in the cluster. Therefore, the CPU load may vary among the instances.	N/A	N/A

Note If DPI is enabled, we recommend that the aggregated DPI data across all Cisco vManage instances and all tenants in the multi-tenant system not exceed 350 GB per day.



CHAPTER 33

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.4.x (On-Prem Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Table 205: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
On-Prem						
DPI Disabled						
<250	N/A	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	UCS
250-1000	N/A	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
1000-1500	N/A	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
1500-2000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
2000-5000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
0-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	HX
DPI Enabled						
<250	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
250-1000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	10 TB	UCS
1000-2000	1.2 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB, AppServer), 3 Nodes (Stats, AppServer) all nodes messaging server	32 vCPUs	128 GB RAM	10 TB	UCS
1000-4000	1.8 TB/Day**	Six Node vManage Cluster (3 Node with ConfigDB), All Nodes messaging server, Stats, AppServer	32 vCPUs	128 GB RAM	10 TB	UCS

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

** For a larger dataset per day and a larger number of device support, have Stats running on all servers.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Note If DPI is enabled, we recommend to have Stats Service running on all Cisco vManage nodes, to achieve a larger dataset and better performance.

Table 206: Cisco Catalyst SD-WAN Validator Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
1001 or more	4	8 GB	10 GB	2 (one for tunnel interface, one for management)

Table 207: Cisco Catalyst SD-WAN Controller Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	2 (one for tunnel interface, one for management)

Testbed Specifications

Table 208: Testbed specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, PS
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Drive specifications:

- Interface Speed— 12.0 Gbit per second
- Read speed (64KB) —1800 MB per second
- Write speed (64KB)—850 MB per second

Note

- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like DPI.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing speed.

Table 209: Testbed specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Drive specifications:

- The tested replication factor is 3.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.

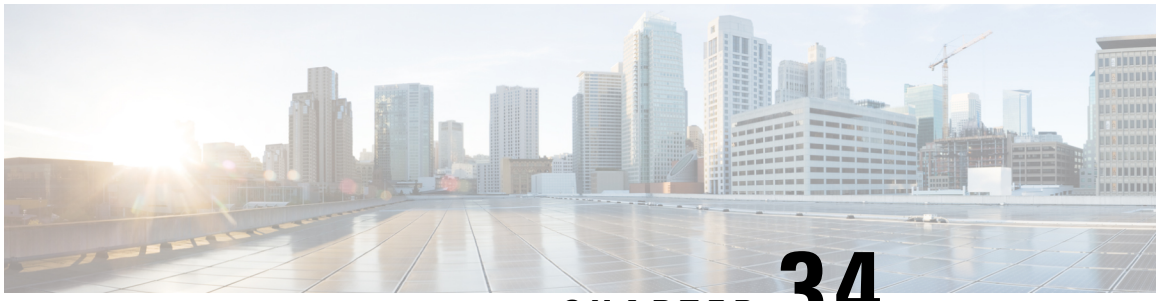
Multitenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Table 210: On-prem Deployment

Server	Cisco SD-WAN Manager	Cisco Catalyst SD-WAN Validator	Cisco Catalyst SD-WAN Controller
Deployment Model	Cluster	N/A	Non-containerized
Number of Instances	3	2	2 per 24 tenants
CPU **DRAM** **Hard Disk**	32 vCPU 72 GB 1 TB	4 vCPU 4 GB 10 GB	8 vCPU 16 GB 16 GB
NMS Service Distribution	Some services run on all three Cisco vManage instances in the cluster, while some services run on only one of the three instances in the cluster. Therefore, the CPU load may vary among the instances.	N/A	N/A

Note If DPI is enabled, we recommend that the aggregated DPI data across all Cisco vManage instances and all tenants in the multi-tenant system not exceed 350 GB per day.



CHAPTER 34

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.3.x (On-Prem Deployment)

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Table 211: Cisco SD-WAN Manager Recommended Computing Resources

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
On-Prem						
DPI Disabled						
<250	N/A	One Node vManage (All Services)	16 vCPUs	32 GB RAM	500 GB	UCS
250-1000	N/A	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
1000-1500	N/A	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS
1500-2000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	UCS
2000-5000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	UCS

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Deployment Type
0-2000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX
2000-5000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	HX
DPI Enabled						
<250	50 GB/Day	One Node vManage (All Services)	32 vCPUs	128 GB	10 TB	UCS
250-1000	100 GB/Day	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB	10 TB	UCS
1000-2000	1.2 TB/Day	Six Node vManage Cluster (3 Node with ConfigDB, AppServer), 3 Nodes (Stats, AppServer) all nodes messaging server	32 vCPUs	128 GB	10 TB	UCS

Note When DPI is enabled, you must set the Statistics Collection timer to 30 minutes or higher.

To set the Statistics Collection timer,

1. From the **Cisco vManage** menu, choose **Administration** > **Settings**.
2. Click **Edit** next to **Statistics Configuration**.
3. Modify the **Collection Interval** minutes to the desired value based on your DPI traffic, the default collection interval is 30 minutes.
4. Click **Save**.

* vCPU, RAM, and Storage Size numbers are on per Cisco vManage basis. The Storage Size numbers are the maximum tested values by Cisco, you can allocate smaller storage sizes.

To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Table 212: Cisco Catalyst SD-WAN Validator Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	2 (one for tunnel interface, one for management)

1001 or more	4	8 GB	10 GB	2 (one for tunnel interface, one for management)

Table 213: Cisco Catalyst SD-WAN Controller Recommended Computing Resources for HX/UCS

Devices	vCPUs	RAM	OS Volume	vNICs
1-50	2	4 GB	16 GB	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	2 (one for tunnel interface, one for management)

Testbed Specifications

Table 214: Testbed specifications for UCS Platforms

Hardware SKU	Specifications
UCSC-C240-M5SX	UCS C240 M5 24 SFF + 2 rear drives without CPU, memory cards, hard disk, PCIe, PS
UCS-MR-X16G1RT-H	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v
UCS-CPU-I6248R	Intel 6248R 3GHz/205W 24C/35.75MB DDR4 2933MHz
UCS-SD16T123X-EP	1.6TB 2.5in Enterprise Performance 12G SAS SSD (3X endurance)

Drive specifications:

- Interface Speed— 12.0 Gbit per second
- Read speed (64KB) —1800 MB per second
- Write speed (64KB)—850 MB per second

Note

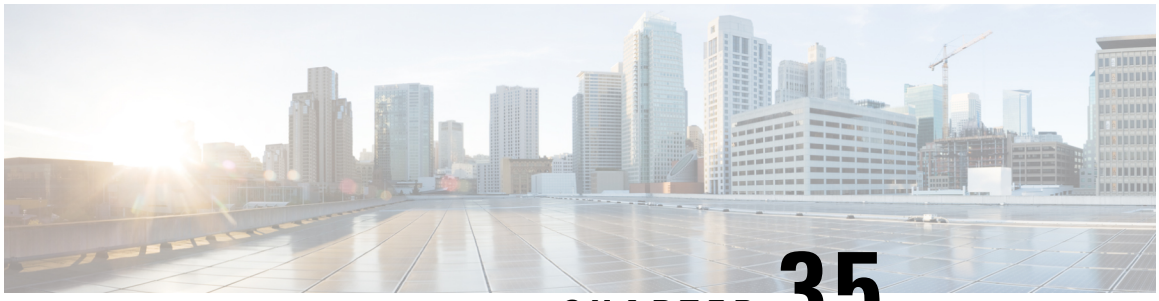
- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like DPI.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing speed.

Table 215: Testbed specifications for HX Platforms

Hardware SKU	Specifications
HXAF240-M5SX	Cisco HyperFlex HX240c M5 All Flash Node
HX-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v
HX-CPU-I6248	Intel 6248 2.5GHz/150W 20C/24.75MB 3DX DDR4 2933 MHz
HX-SD38T61X-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD
HX-NVMEXPB-I375	375GB 2.5 inch Intel Optane NVMe Extreme Performance SSD

Drive specifications:

- The tested replication factor is 3.
- The default compression on the HX system is applicable to all cases. This compression is automatically determined by the system and cannot be configured.



CHAPTER 35

Recommended Computing Resources for Cisco SD-WAN Controller Release 20.1.x and earlier releases

Single Tenant

The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controller are as follows:

Note For cloud deployments, the Cisco operation teams actively monitor the customer deployment and add resource in collaboration with the customer. This topic does not include recommendations for Cisco cloud deployments.

Table 216: Cisco SD-WAN Manager Computing Resources

Devices	vCPUs	RAM	OS Volume	Storage Size	Bandwidth	vNICs
1-250	16	32 GB	25 GB for Cisco vManage Release 20.3.1 and later, or 20 GB for earlier Cisco SD-WAN Manager releases	500 GB, 1500 IOPS	25 Mbps	3 (one for tunnel interface, one for management, one for the Cisco SD-WAN Manager cluster message bus)
251-1000	32	64 GB	25 GB for Cisco vManage Release 20.3.1 and later, or 20 GB for earlier Cisco SD-WAN Manager releases	1 TB, 3072 IOPS	100 Mbps	3 (one for tunnel interface, one for management, one for the Cisco SD-WAN Manager cluster message bus)
1001 -1500	32	64 GB	25 GB for Cisco vManage Release 20.3.1 and later, or 20 GB for earlier Cisco SD-WAN Manager releases	1 TB, 3072 IOPS	150 Mbps	3 (one for tunnel interface, one for management, one for the Cisco SD-WAN Manager cluster message bus)

Points to consider:

- The system selected to run Cisco vManage must satisfy the storage throughput requirement.
- The operating system and the database volumes must be on a drive that supports Transactions per second (TPS) throughput based on the above-mentioned vCPU values.
- Don't oversubscribe vCPU and memory. However, an oversubscription of 2:1 on vCPU to pCPU (physical CPU) can be supported when your overlay has fewer than 250 devices.
- We recommend a 10-Gbps interface for production.
- We recommend three network interfaces —one for tunnel, one for management, and one for the Cisco vManage cluster message bus.
- With hyperthreading enabled on CPU, an oversubscription of 4:1 on pCPUs to total number of threads is supported for fewer than 250 devices. For example, a Cisco UCS-C220-M4S server with two sockets, each with eight cores for a total of 16 physical cores can have hyperthreading enabled. Each processor has 16 logical CPUs for a total of 32 logical CPUs on both logical and physical processors (cores).
- If your overlay network has few devices, but if they generate large amounts of DPI or cflowd data, we recommend that you use the server recommendations given for 251-1000 devices or for 1001 or more devices.
- If DPI is enabled:

Note To disable DPI statistics collection, in Cisco vManage select **Administration** > **Settings** > **Statistics Setting** . Click **Edit**. Scroll to find DPI and choose **Disable All**.

  - In a three node Cisco SD-WAN Manager cluster, we recommend that each Cisco SD-WAN Manager have a minimum of 32 vCPUs, 64 GB of memory, and a 1 TB disk, and that aggregated DPI data across all Cisco SD-WAN Manager instances not exceed 100 GB per day.
  - In a six node Cisco SD-WAN Manager cluster, we recommend that each Cisco SD-WAN Manager have a minimum of 32 vCPUs, 64 GB of memory, and a 1 TB disk, and that aggregated DPI data across all Cisco SD-WAN Manager instances not exceed 750 GB per day.

- If DPI is disabled:
  - For a deployment of fewer than 1,500 nodes, a single Cisco SD-WAN Manager is required, although we recommend a cluster of three Cisco SD-WAN Manager instances for high availability. For a deployment of between 1,500 nodes and 4,499 nodes, a cluster of three Cisco SD-WAN Manager instances are required. Each Cisco SD-WAN Manager instance requires a minimum of 32 vCPUs, 64 GB of memory, and a 1 TB disk.

Table 217: Cisco Catalyst SD-WAN Validator Computing Resources

Devices	vCPUs	RAM	OS Volume	Bandwidth	vNICs
1-50	2	4 GB	10 GB	1 Mbps	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 Mbps	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	5 Mbps	2 (one for tunnel interface, one for management)

1001 or more	4	8 GB	10 GB	10 Mbps	2 (one for tunnel interface, one for management)

Table 218: Cisco Catalyst SD-WAN Controller Computing Resources

Devices	vCPUs	RAM	OS Volume	Bandwidth	vNICs
1-50	2	4 GB	16 GB	2 Mbps	2 (one for tunnel interface, one for management)
51-250	4	8 GB	16 GB	5 Mbps	2 (one for tunnel interface, one for management)
251-1000	4	16 GB	16 GB	7 Mbps	2 (one for tunnel interface, one for management)
1001 or more	8	16 GB	16 GB	10 Mbps	2 (one for tunnel interface, one for management)

Points to Consider:

- The OS volume must be on a solid-state drive (SSD).
- If more than 1001 devices are present, the deployment of devices should not exceed 1500 OMP sessions per Cisco vSmart Controller.

PART III

Related Documents

CHAPTER 36

Related Documents

For information about Cisco vEdge Cloud Routers, refer to Cisco vEdge Cloud Data Sheet

For more Cisco IOS XE SD-WAN and Cisco SD-WAN release information, see:

- Release Notes for Cisco IOS XE SD-WAN Devices, Cisco IOS XE Release 17.7.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 20.7.x
- Release Notes for Cisco SD-WAN Controllers, Cisco SD-WAN Release 20.7.x
- Release Notes for Cisco IOS XE SD-WAN Devices, Cisco IOS XE Release 17.6.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 20.6.x
- Release Notes for Cisco SD-WAN Controllers, Cisco SD-WAN Release 20.6.x
- Release Notes for Cisco IOS XE SD-WAN Devices, Cisco IOS XE Release 17.5.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 20.5.x
- Release Notes for Cisco SD-WAN Controllers, Cisco SD-WAN Release 20.5.x
- Release Notes for Cisco IOS XE SD-WAN Devices, Cisco IOS XE Release Bengaluru 17.4.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 20.4.x
- Release Notes for Cisco IOS XE SD-WAN Devices, Cisco IOS XE Release Amsterdam 17.3.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 20.3.x
- Release Notes for Cisco IOS XE SD-WAN Devices, Cisco IOS XE Release Amsterdam 17.2.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 20.1.x
- Release Notes for Cisco IOS XE SD-WAN Release 16.12.x
- Release Notes for Cisco vEdge Devices, Cisco SD-WAN Release 19.2.x
- Release Notes for Cisco IOS XE SD-WAN Release 16.10.x and Cisco SD-WAN Release 18.4.x