Cisco SD-WAN Controller Compatibility Matrix and Server Recommendations

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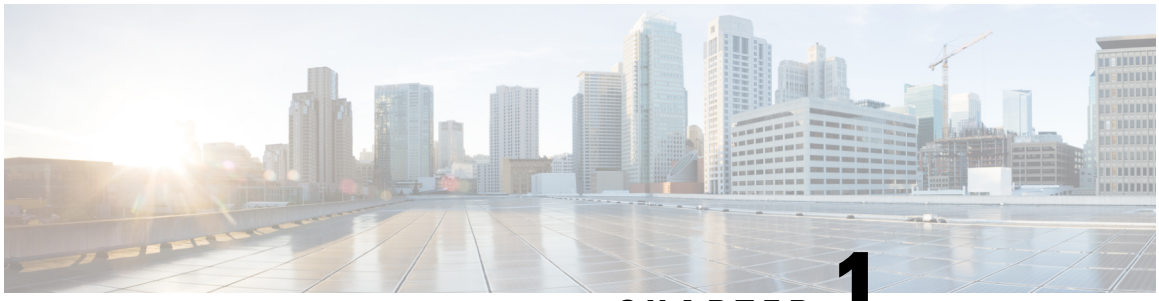


CHAPTER 1

Compatibility Matrix

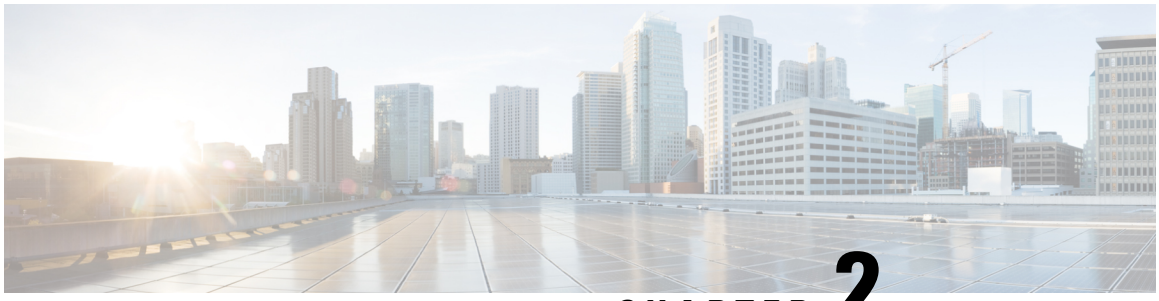
Note The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on standards documentation, or language that is used by a referenced third-party product.

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

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

Note

- 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 vManage CLI templates, starting from Cisco SD-WAN Release 20.1.1 and later releases.



CHAPTER 2

Compatibility Matrix for Cisco SD-WAN Release 20.7.x

Table 1: Compatibility Matrix for Cisco SD-WAN Release 20.7.x

Controllers	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

Table 2: Compatibility Matrix for Catalyst 8000 Series Platforms

Controllers	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

Table 3: Compatibility Matrix for Virtual Platforms

Controllers	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

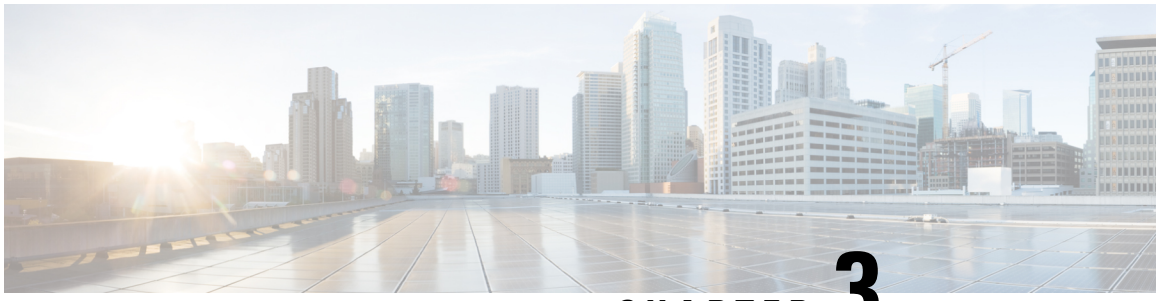
Table 4: Compatibility Matrix for Cisco SD-WAN vEdge Platforms

Controllers	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

Table 5: Compatibility Matrix for ISR1100 Platforms

Controllers	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.7.1	20.7.1 and lower up to 19.2.099	20.7.1 and lower up to 19.2.1

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.



CHAPTER 3

Compatibility Matrix for Cisco SD-WAN Release 20.6.x

Table 6: Compatibility Matrix for Cisco SD-WAN Release 20.6.x

Controllers	ISR1000/ISR4000/ASR1000
20.6.1	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
20.6.2	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 7: Compatibility Matrix for Catalyst 8000 Series Platforms

Controllers	Catalyst 8300/Catalyst 8500	Catalyst 8200	Catalyst 8500L	Catalyst 8200L
20.6.1	17.6.1a, 17.5.1a, 17.4.1b, 17.4.1a, 17.3.3, and 17.3.2	17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.6.1a and 17.5.1a
20.6.2	17.6.2, 17.6.1a, 17.5.1a, 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, 17.4.1b, and 17.4.1a	17.6.2, 17.6.1a, 17.5.1a, 17.4.1b, and 17.4.1a	17.6.2, 17.6.1a, and 17.5.1a

Table 8: Compatibility Matrix for Virtual Platforms

Controllers	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.6.1	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	17.3.4a, 17.3.3, and 16.12.5	17.6.2, 17.6.1a, 17.5.1a, and 17.4.2	17.3.4, 17.3.3, 17.3.2, 17.3.1a with NFVIS 4.6.1 FC1

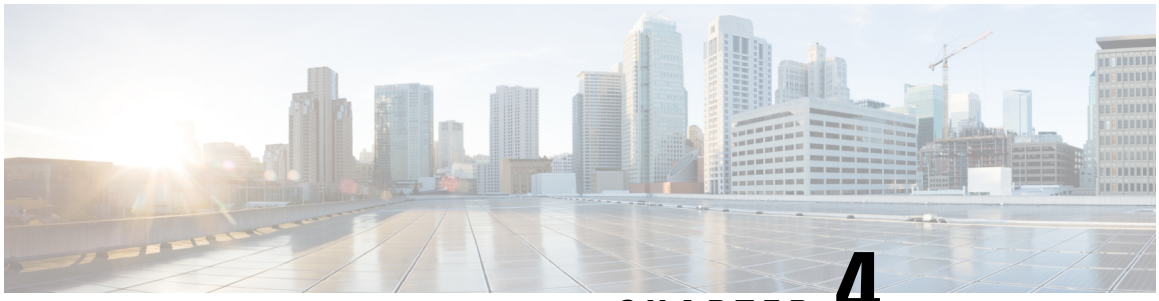
Table 9: Compatibility Matrix for Cisco SD-WAN vEdge Platforms

Controllers	vEdge
20.6.1	19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.4.1, and 20.5.1
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, and 20.6.1

Table 10: Compatibility Matrix for ISR1100 Platforms

Controllers	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.6.1	20.6.1 & lower up to 19.2.099	20.6.1 & lower up to 19.2.1
20.6.2	20.6.2 & lower up to 19.2.099	20.6.2 & lower up to 19.2.1

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.



CHAPTER 4

Compatibility Matrix for Cisco SD-WAN Release 20.5.x

Table 11: Compatibility Matrix for Cisco SD-WAN Release 20.5.x

Controllers	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 12: Compatibility Matrix for Catalyst 8000 Series Platforms

Controllers	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 13: Compatibility Matrix for Virtual Platforms

Controllers	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

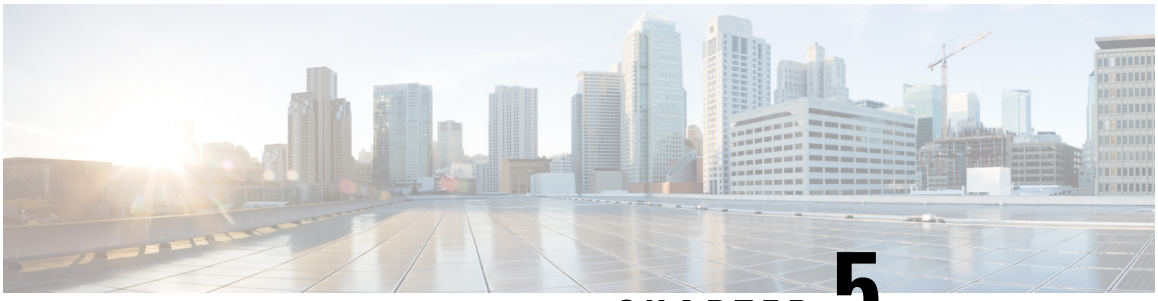
Table 14: Compatibility Matrix for Cisco SD-WAN vEdge Platforms

Controllers	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 15: Compatibility Matrix for ISR1100 Platforms

Controllers	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.5.1	20.5.1 & lower up to 19.2.099	20.5.1 & lower up to 19.2.1

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.



CHAPTER 5

Compatibility Matrix for Cisco SD-WAN Release 20.4.x

Table 16: Compatibility Matrix for Cisco SD-WAN Release 20.4.x

Controllers	ISR1000/ISR4000/ASR1000
20.4.1	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
20.4.1.2	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
20.4.2	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 17: Compatibility Matrix for Catalyst 8000 Series Platforms

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

Table 18: Compatibility Matrix for Virtual Platforms

Controllers	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.4.1	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
20.4.1.2	17.3.3, 17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, and 16.12.x	17.4.1b, 17.4.1a, and 17.3.3	17.3.3, 17.3.2, 17.3.1a, 17.2.1r with NFVIS 4.4.1 FC2

Controllers	CSR1000v	C8000v	ISRv (ENCS/CSP)
20.4.2	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

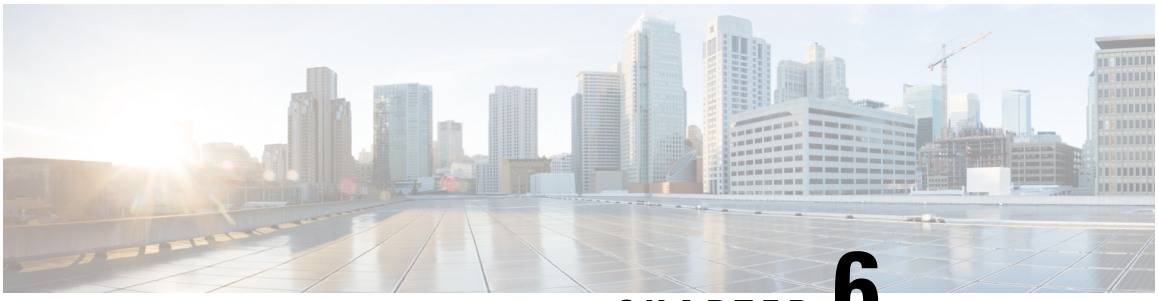
Table 19: Compatibility Matrix for Cisco SD-WAN vEdge Platforms

Controllers	vEdge
20.4.1	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, and 20.4.1
20.4.1.2	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, 20.4.1, 20.4.1.1, and 20.4.1.2
20.4.2	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

Table 20: Compatibility Matrix for ISR1100 Platforms

Controllers	ISR 1100-4G and ISR 1100-6G	ISR 1100X-4G and ISR 1100X-6G	ISR1100-4GLTENA, ISR1100-4GLTEGB
20.4.1	17.4.1b and 17.4.1a 20.4.1 & lower up to 19.2.099	17.4.1b and 17.4.1a 20.4.1 & lower up to 19.2.099	17.4.1b and 17.4.1a 20.4.1 & lower up to 19.2.1
20.4.1.2	17.4.1b, 17.4.1a, and 17.3.3 20.4.1.2 & lower up to 19.2.099	17.4.1b, 17.4.1a, and 17.3.3 20.4.1.2 & lower up to 19.2.099	17.4.1b, 17.4.1a, and 17.3.3 20.4.1.2 & lower up to 19.2.1
20.4.2	17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 20.4.2 & lower up to 19.2.099	17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 20.4.2 & lower up to 19.2.099	17.4.2, 17.4.1b, 17.4.1a, and 17.3.3 20.4.2 & lower up to 19.2.1

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.



CHAPTER 6

Compatibility Matrix for Cisco SD-WAN Release 20.3.x

Table 21: Compatibility Matrix for Cisco SD-WAN Release 20.3.x

Controllers	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	17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
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	17.3.3, 17.3.2, 17.3.1a, 17.2.1v, 17.2.1r, 16.12.x, and 16.10.x
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	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

Table 22: Compatibility Matrix for Catalyst 8000 Series Platforms

Controllers	Catalyst 8300/Catalyst 8500
20.3.1	Not Supported
20.3.2	17.3.2
20.3.2.1	17.3.2
20.3.3	17.3.3 and 17.3.2
20.3.3.1	17.3.3 and 17.3.2
20.3.4	17.3.4a, 17.3.3 and 17.3.2

Table 23: Compatibility Matrix for Virtual Platforms

Controllers	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	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
20.3.2.1	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	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
20.3.3.1	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	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

Table 24: Compatibility Matrix for Cisco SD-WAN vEdge Platforms

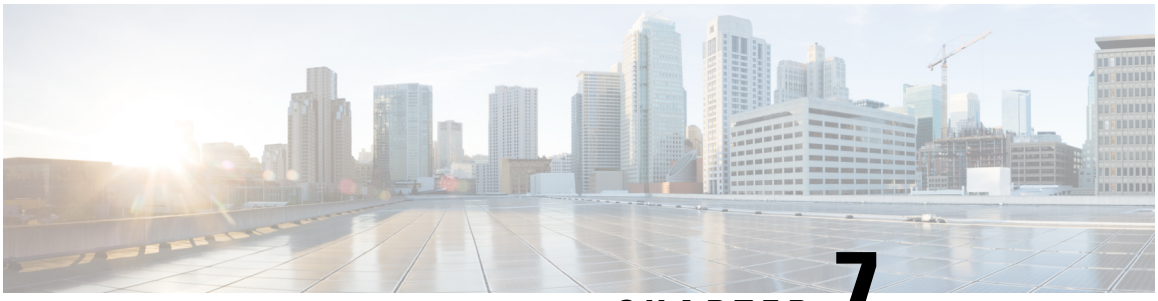
Controllers	vEdge
20.3.1	18.3, 18.4, 19.2, 20.1, 20.1.12, and 20.3.1
20.3.2	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, and 20.3.2
20.3.2.1	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, and 20.3.2
20.3.3	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, and 20.3.3
20.3.3.1	18.3, 18.4, 19.2, 20.1, 20.1.12, 20.3.1, 20.3.2, and 20.3.3
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

Table 25: Compatibility Matrix for ISR1100 Platforms

Controllers	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.3.1	20.3.1 & lower up to 19.2.099	20.3.1 & lower up to 19.2.1
20.3.2	20.3.2 & lower up to 19.2.099	20.3.2 & lower up to 19.2.1
20.3.2.1	20.3.2 & lower up to 19.2.099	20.3.2 & lower up to 19.2.1
20.3.3	20.3.3 & lower up to 19.2.099	20.3.3 & lower up to 19.2.1

Controllers	ISR 1100-4G and ISR 1100-6G	ISR1100 - 4GLTENA, ISR1100 - 4GLTEGB
20.3.3.1	20.3.3 & lower up to 19.2.099	20.3.3 & lower up to 19.2.1
20.3.4	20.3.4 & lower up to 19.2.099	20.3.4 & lower up to 19.2.1

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.



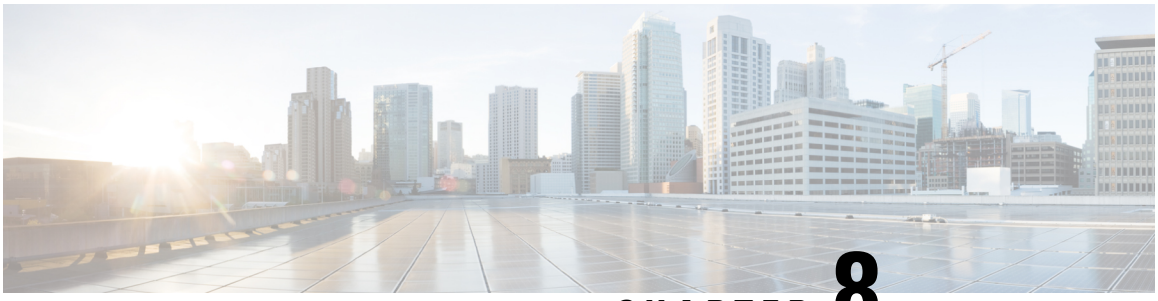
CHAPTER 7

Compatibility Matrix for Cisco SD-WAN Release 20.1.x

Table 26: 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 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.



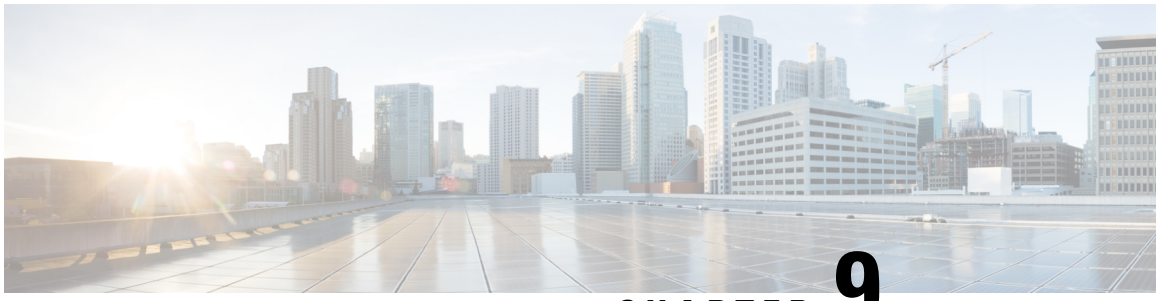
CHAPTER 8

Compatibility Matrix for Cisco SD-WAN Release 19.2.x

Table 27: 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.

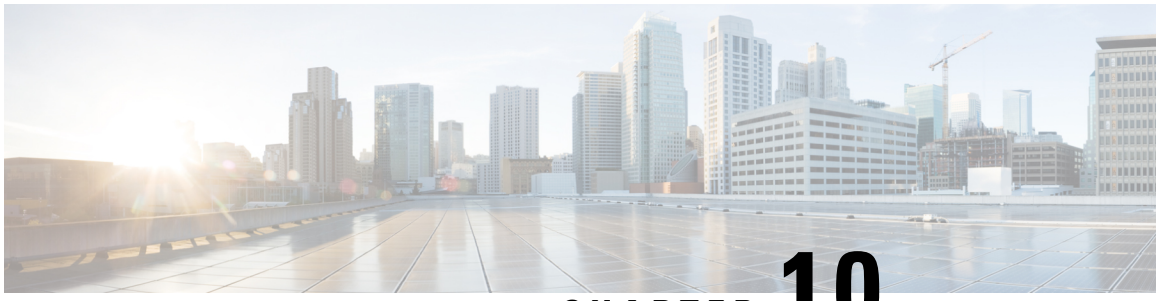


CHAPTER 9

Compatibility Matrix for Cisco SD-WAN Release 18.4.x

Table 28: 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

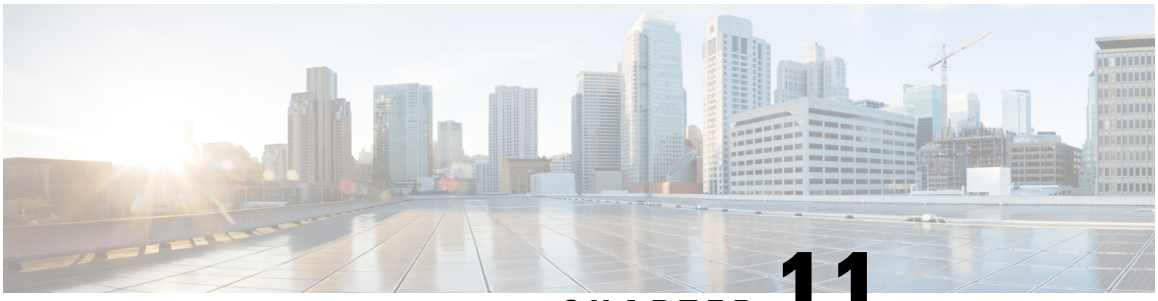


CHAPTER 10

Hypervisor Compatibility Matrix for vManage, vSmart, vBond and vEdgeCloud

Table 29: Hypervisor Compatibility Matrix for vManage, vSmart, vBond and vEdgeCloud

Controller Version	vEdgeCloud-Device Version	vManage/vSmart/vBond-Hypervisor Version		vEdgeCloud-Hypervisor Version		
		ESXi	KVM	ESXi	KVM	NFVIS
18.4	18.4	6.0/6.5	2.11.1	6.5/6.7	RHEL 7.5/7.7	NA
19.2	19.2	6.0/6.5	2.11.1	6.5/6.7	RHEL 7.5/7.7	3.12.3 FC4
20.1	20.1	6.0/6.5	2.11.1	6.5/6.7	RHEL 7.5/7.7	4.1.2 FC2
20.3	20.3	6.0/6.5	2.11.1	6.5/6.7	RHEL 7.5/7.7	4.2.1 FC3
20.4	20.4	6.5/6.7	2.11.x	6.5/6.7	RHEL 7.5/7.7	4.4.1 FC2
20.5	20.5	6.5/6.7	2.11.x	6.5/6.7	RHEL 7.5/7.7	4.5.1 FC2
20.6	20.6	6.5/6.7/7.0	2.11.x	6.5/6.7/7.0	RHEL 7.5/7.7	4.5.1 FC2



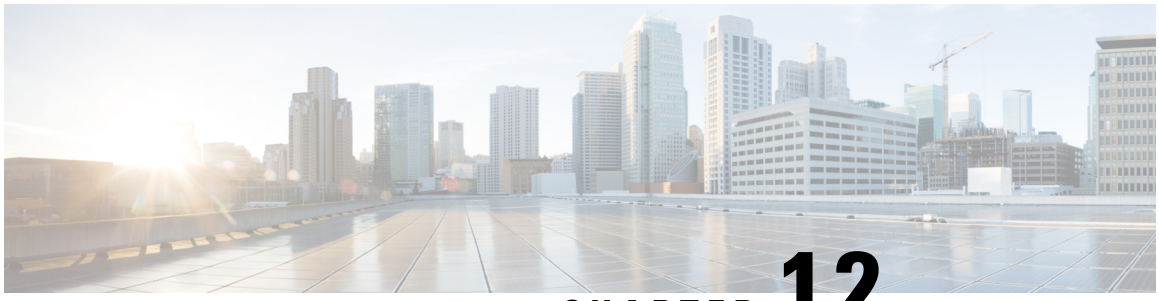
CHAPTER 11

Hypervisor Compatibility Matrix for CSR1000v, ISRv and C8000v

Table 30: Hypervisor Compatibility Matrix for CSR1000v, ISRv and C8000v

Controller Version	CSR1000v/ISRv/C8000v-Device version	CSR1000v/ISRv/C8000v-Hypervisor Version		
		ESXi	KVM	NFVIS
19.2	16.12	6.5	RHEL 7.5	3.12.3 FC4
20.1	17.2	6.5	RHEL 7.5	4.1.2 FC2
20.3	17.3	6.5/6.7	RHEL 7.5/7.7	4.2.1 FC3
20.4	17.4	6.5/6.7	RHEL 7.5/7.7	4.4.1 FC2
20.5	17.5	6.5/6.7	RHEL 7.5/7.7	4.5.1 FC2
20.6	17.6	6.5/6.7/7.0	RHEL 7.5/7.7	4.6.1 FC1

Note Beginning with Cisco IOS XE Release 17.4.1a, the Cisco Catalyst 8000V is a newly supported virtual router platform replacing the Cisco CSR1000V and Cisco ISRv. Installing the Cisco Catalyst 8000V in a Cisco SD-WAN environment requires Cisco vManage Release 20.4.1 or later. Note that begininng with Cisco IOS XE Release 17.4.1a, there are no installable images for Cisco CSR1000V or Cisco ISRv.



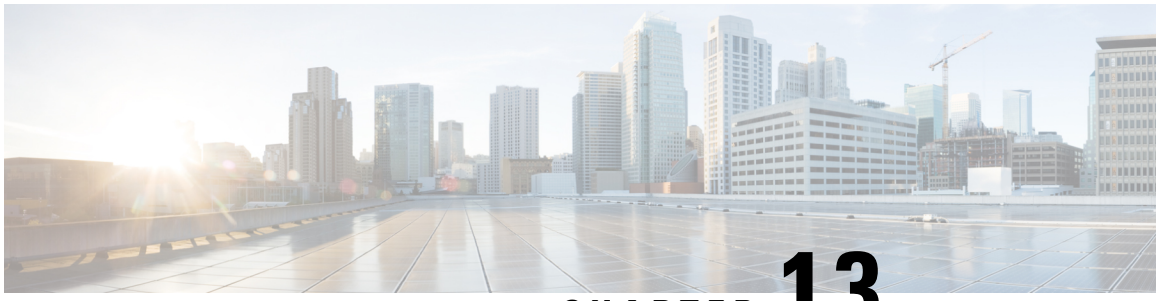
CHAPTER 12

Server Recommendations

This topic provides the hardware recommendations for the Cisco vBond Orchestrator server, vEdge Cloud router server, Cisco vManage server, and Cisco vSmart Controller server. The resources required to run the Cisco vBond Orchestrator, Cisco vSmart Controller, and Cisco vManage 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.

Warning Cisco SD-WAN controllers (Cisco vManage server, Cisco vBond Orchestrator, and Cisco vSmart Controller) have not been qualified for hyperconverged infrastructure.

Note Cisco vManage server, Cisco vBond Orchestrator, and Cisco vSmart Controller have been tested on Intel server platforms.



CHAPTER 13

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.

Cisco vManage Single Tenant

- The system that you select to run Cisco vManage 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 vManage when the overlay has fewer than 250 devices.
- An oversubscription of 2:1 on vCPU to pCPU (physical CPU) is supported for vSmart and vBond 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 vManage cluster communication.
- Co-hosting of Cisco vManage instances on single server is not supported. However, Cisco vManage can be co-hosted with vSmart and vBond instances on same server.
- If DPI 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 DPI is disabled
    - Depending on network sensitivity and deployment type, we recommend using a cluster of three Cisco vManage instances if you want to configure intra-cluster high availability.

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

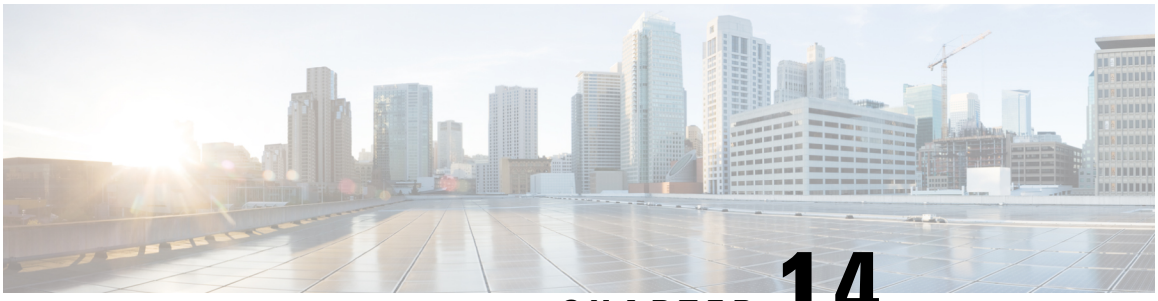
Cisco vBond Orchestrator Single Tenant

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

Cisco vSmart Controller Single Tenant

- 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.

For information about latency requirements, see vManage Cluster Creation and Troubleshooting White Paper.



CHAPTER 14

Cloud Controllers Instance Types for Cisco SD-WAN Controllers Release 20.7.x

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 31: 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
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled			

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
<250	One Node Medium vManage	50 GB/Day	30 Days
250-500	One Node Large vManage (All Services)	50 GB/Day	30 Days
500-2000	Three Node Large vManage Cluster	100 GB/Day	14 Days

Table 32: Number of Cisco vBond Orchestrators and Cisco vSmart Controllers required for Respective Device Ranges

Devices	Number of Cisco vBond Orchestrators required	Number of Cisco vSmart Controllers required
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled		
<250	2	2
250-1000	2	2
1000-1500	2	2
1500-2000	6	4
2000-5000	6	6
5000-7000	8	8
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled		
<250	2	2
250-500	2	2
500-2000	6	4

Note The required number of vCPUs and RAM for Cisco vBond Orchestrators and Cisco vSmart Controllers, is determined by the Cloud Ops and is provisioned accordingly.

Multitenant

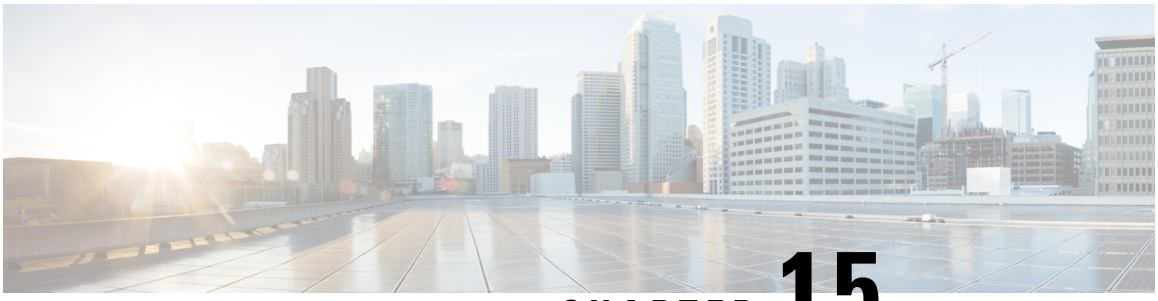
The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controllers are as follows:

Table 33: 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 vBond Orchestrators and Cisco vSmart Controllers, is determined by the Cloud Ops and is provisioned accordingly.



CHAPTER 15

Server Recommendations (Azure) for Cisco vManage Release 20.7.x

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 34: Cisco vManage Server Recommendations

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_D16s_v2
250-1000	Disabled	One Node vManage (All Services)	32 vCPUs	64 GB RAM	1 TB	Standard_E32s_v3
1000-1500	Disabled	One Node vManage (All Services)	32 vCPUs	128 GB RAM	1 TB	Standard_E64s_v3
1500-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	Standard_E32s_v3
2000-5000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	128 GB RAM	1 TB	Standard_E64s_v3
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_E64s_v3

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
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.

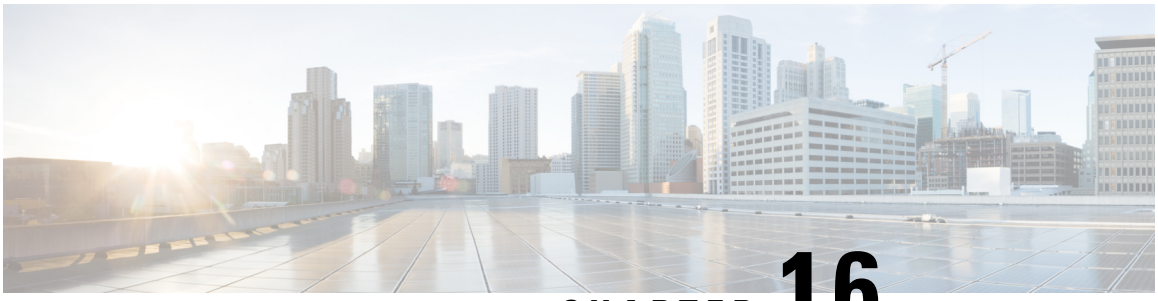
To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Table 35: Cisco vBond Orchestrator Server Recommendations

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 36: Cisco vSmart Controller Server Recommendations

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 16

Server Recommendations (On-Prem) for Cisco vManage Release 20.7.x

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 37: Cisco vManage Server Recommendations

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
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
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.

Table 38: Cisco vBond Orchestrator Server Recommendations 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 39: Cisco vSmart ControllerServer Recommendations 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 40: 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 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 41: 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 42: Hardware Specifications to Support 50 Tenants and 1000 Devices

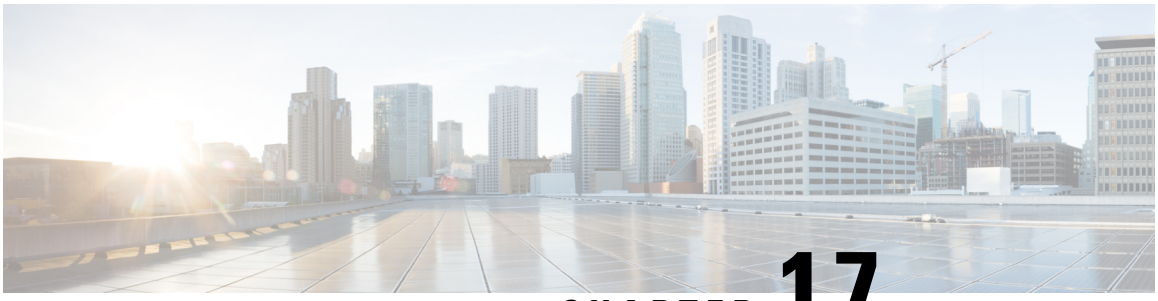
Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	3 Compute+Data nodes	2 instances	2 instances per 24 tenants To support 50 tenants and 1000 devices across all tenants, deploy 6 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 43: 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 17

Cloud Controllers Instance Types for Cisco SD-WAN Controllers Release 20.6.x

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 44: 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
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled			

Devices	Nodes and deployment models with instance type	Data processing factor	Number of days the data can be stored
<250	One Node Medium vManage	50 GB/Day	30 Days
250-500	One Node Large vManage (All Services)	50 GB/Day	30 Days
500-2000	Three Node Large vManage Cluster	100 GB/Day	14 Days

Table 45: Number of Cisco vBond Orchestrators and Cisco vSmart Controllers required for Respective Device Ranges

Devices	Number of Cisco vBond Orchestrators required	Number of Cisco vSmart Controllers required
Cisco SD-WAN Application Intelligence Engine (SAIE) Disabled		
<250	2	2
250-1000	2	2
1000-1500	2	2
1500-2000	6	4
2000-5000	6	6
5000-7000	8	8
Cisco SD-WAN Application Intelligence Engine (SAIE) Enabled		
<250	2	2
250-500	2	2
500-2000	6	4

Note The required number of vCPUs and RAM for Cisco vBond Orchestrators and Cisco vSmart Controllers, is determined by the Cloud Ops and is provisioned accordingly.

Multitenant

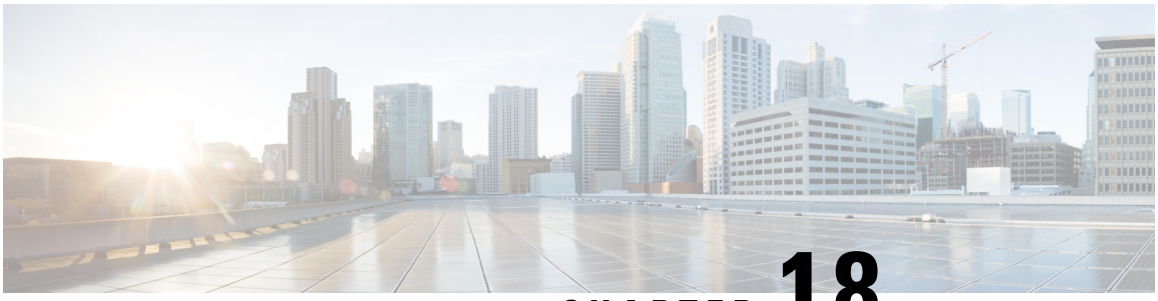
The supported hardware specifications for the Cisco vBond Orchestrator, Cisco vManage, and the Cisco vSmart Controllers are as follows:

Table 46: 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 vBond Orchestrators and Cisco vSmart Controllers, is determined by the Cloud Ops and is provisioned accordingly.



CHAPTER 18

Server Recommendations (Azure) for Cisco vManage Release 20.6.x

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 47: Cisco vManage Server Recommendations

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]
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]

Devices	Aggregated Statistics from Edge Devices	Nodes and Deployment Models	vCPUs *	RAM*	Storage Size*	Azure Instance Sizing
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.

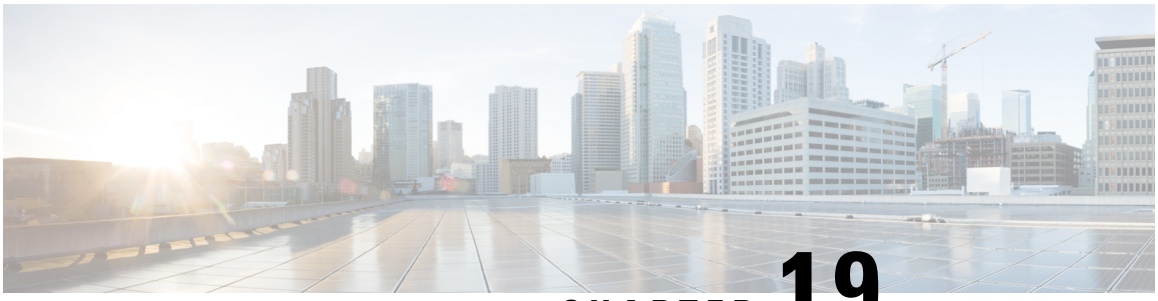
To achieve scale beyond the above mentioned numbers, deploy multiple overlays.

Table 48: Cisco vBond Orchestrator Server Recommendations

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 49: Cisco vSmart Controller Server Recommendations

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 19

Server Recommendations (On-Prem) for Cisco vManage Release 20.6.x

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 50: Cisco vManage Server Recommendations

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
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
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.

Table 51: Cisco vBond Orchestrator Server Recommendations 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 52: Cisco vSmart ControllerServer Recommendations 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 53: 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 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 54: 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 55: Hardware Specifications to Support 50 Tenants and 1000 Devices

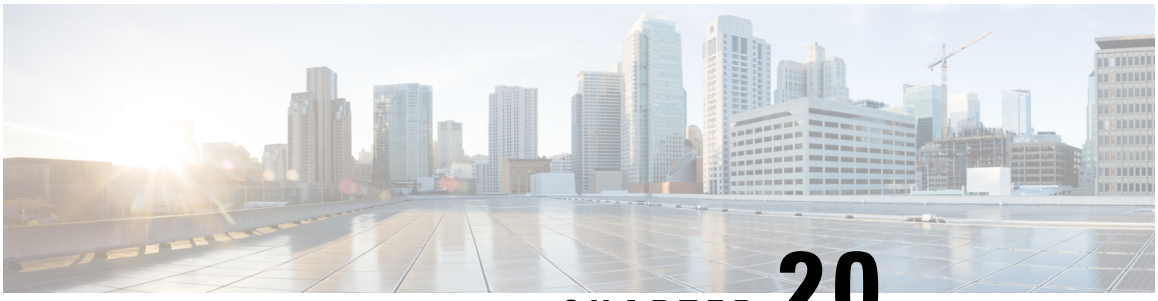
Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart Controller
Deployment Model	On-premises Cluster	On-premises deployment	On-premises deployment
Number of Instances	3 Compute+Data nodes	2 instances	2 instances per 24 tenants To support 50 tenants and 1000 devices across all tenants, deploy 6 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 56: 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 20

Server Recommendations (On-Prem) for Cisco vManage Release 20.5.x

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 57: Cisco vManage Server Recommendations

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
0-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX

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	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 58: Cisco vBond Orchestrator Server Recommendations 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 59: Cisco vSmart ControllerServer Recommendations 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 60: 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 61: 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

Hardware SKU	Specifications
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.

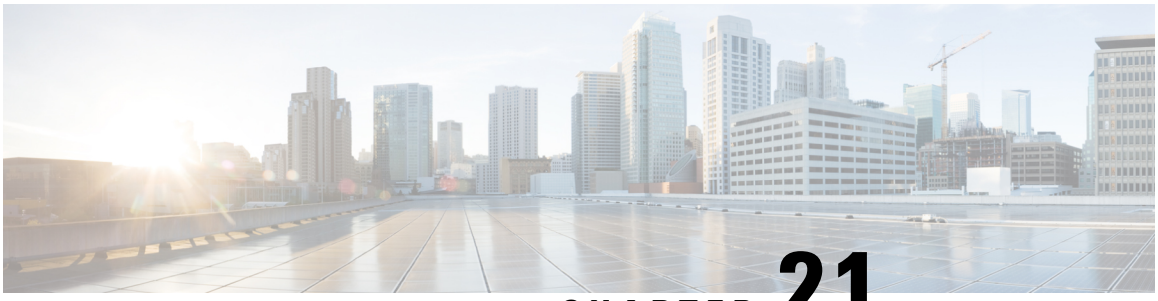
Multitenant

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

Table 62: On-prem Deployment

Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart 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 21

Server Recommendations (On-Prem) for Cisco vManage Release 20.4.x

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 63: Cisco vManage Server Recommendations

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
0-2000	Disabled	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX

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	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 64: Cisco vBond Orchestrator Server Recommendations 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 65: Cisco vSmart ControllerServer Recommendations 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 66: 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 67: 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.

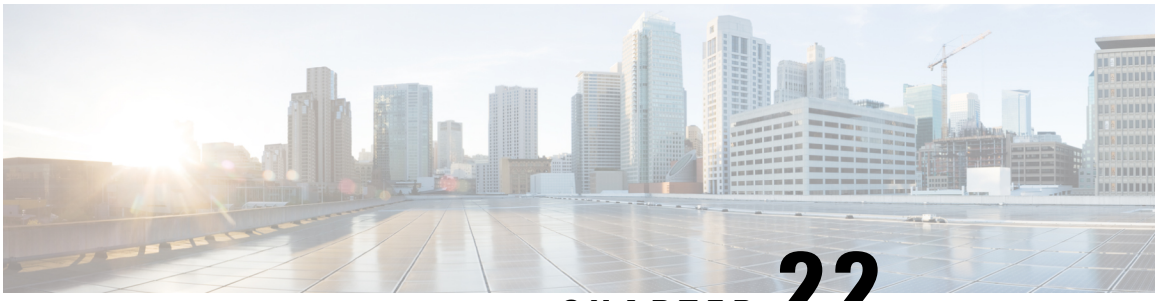
Multitenant

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

Table 68: On-prem Deployment

Server	Cisco vManage	Cisco vBond Orchestrator	Cisco vSmart 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 22

Server Recommendations (On-Prem) for Cisco vManage Release 20.3.x

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 69: Cisco vManage Server Recommendations

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
0-2000	N/A	Three Node vManage Cluster (All Services)	32 vCPUs	64 GB RAM	1 TB	HX

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

* 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 70: Cisco vBond Orchestrator Server Recommendations 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 71: Cisco vSmart Controller Server Recommendations 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 72: 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

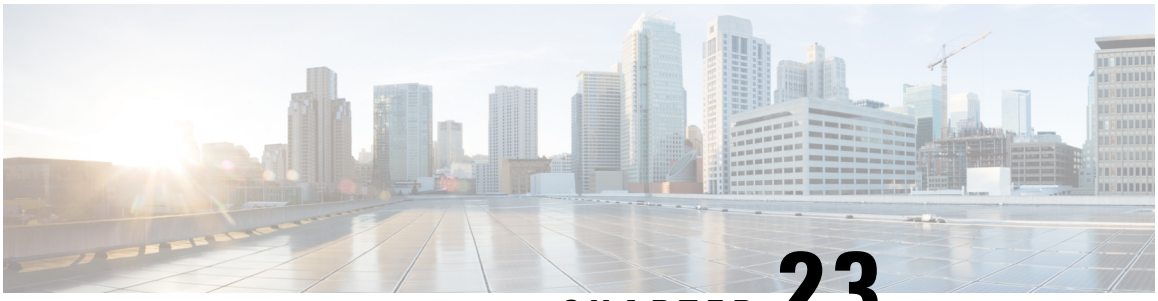
- The recommended numbers are based on the test setup specifications. Systems below these requirements may have challenges processing high volume of statistics data like DPI.
- Tested with 10 TB Volume (8 X 1.6 TB SSD Drives Raid 0).
- Default hyperthreading is enabled.
- Slower disks can impact processing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

Table 73: 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 23

Server Recommendations for Cisco vManage 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 74: Cisco vManage Server Recommendations

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 vManage releases	500 GB, 1500 IOPS	25 Mbps	3 (one for tunnel interface, one for management, one for the Cisco vManage 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 vManage releases	1 TB, 3072 IOPS	100 Mbps	3 (one for tunnel interface, one for management, one for the Cisco vManage 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 vManage releases	1 TB, 3072 IOPS	150 Mbps	3 (one for tunnel interface, one for management, one for the Cisco vManage 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 vManage cluster, we recommend that each Cisco vManage have a minimum of 32 vCPUs, 64 GB of memory, and a 1 TB disk, and that aggregated DPI data across all Cisco vManage instances not exceed 100 GB per day.
  - In a six node Cisco vManage cluster, we recommend that each Cisco vManage have a minimum of 32 vCPUs, 64 GB of memory, and a 1 TB disk, and that aggregated DPI data across all Cisco vManage instances not exceed 750 GB per day.

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

Table 75: Cisco vBond Orchestrator Server Recommendations

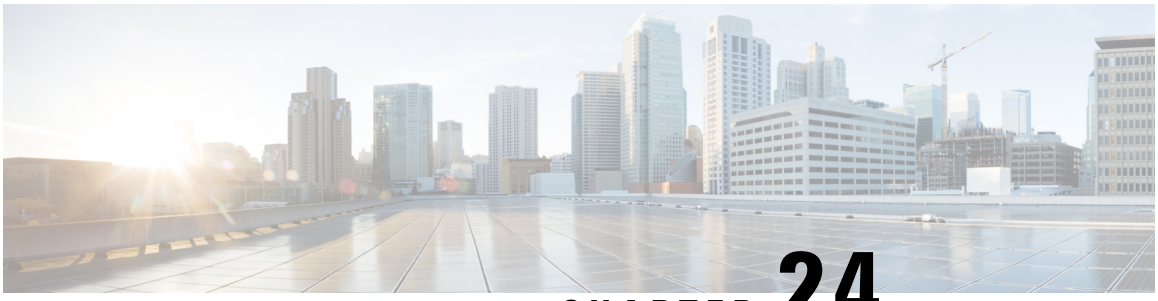
Devices	vCPUs	RAM	OS Volume	Bandwidth	vNICs
1-50	2	4 GB	10 GB	1 Mbps	2 (one for tunnel interface, one for management)
51-250	2	4 GB	10 GB	2 Mbps	2 (one for tunnel interface, one for management)
251-1000	2	4 GB	10 GB	5 Mbps	2 (one for tunnel interface, one for management)
1001 or more	4	8 GB	10 GB	10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

Table 76: Cisco vSmart ControllerServer Recommendations

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.



CHAPTER 24

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 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