ONTAP 9.4 Maximum Configurations Guide

MetroCluster IP (2 Node Cluster Per Site, 2 Sites)

	Category	Description	Scope	Code Enforced	Scales by Scope	Platform Agnostic	Cluster Maximum	FAS9000 / AFF-A700 Memory 1TB/node Platform Maximum	AFF-A800 Memory 1TB/node Platform Maximum
						Supported Clustered Data ONTAP® 9.0 Versions >>>		9.4	9.4
1	Core	Maximum number of nodes - NAS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	2 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			
2	Core	Maximum number of storage virtual machines (SVMs) - NAS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	Per Platform HA Pair Maximum	32	32
			HA Pair	No	No	No		32	32
			Cluster	N/A	N/A	N/A		32	32
3	Core	Maximum number of LIFs - NAS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	Yes	Per Platform HA Pair Maximum	32	32
			HA Pair	No	No	Yes		64	64
			Cluster	N/A	N/A	N/A			
4	Core	Maximum number of connections - NAS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	N/A	50,000	50,000
			HA Pair	No	No	No		50,000	50,000
			Cluster	N/A	N/A	N/A			
5	Core	Maximum number of flexible volumes - NAS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	Per Platform HA Pair Maximum	250	250
			HA Pair	No	Yes	No		500	500
			Cluster	N/A	N/A	N/A			
5	Core	Maximum number of FlexGroups - NAS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	Per Platform HA Pair Maximum	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
6	Core	Maximum number of lock manager locked objects (CIFS and NFS combined)	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	No	Per Platform HA Pair Maximum	1,024,000	1,024,000
			HA Pair	Yes	No	No		1,024,000	1,024,000
			Cluster	N/A	N/A	N/A			
7	NFS	Maximum number of export policies	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	Yes	Per Platform HA Pair Maximum	500	500
			HA Pair	No	Yes	Yes		1,000	1,000
			Cluster	N/A	N/A	N/A			
8	NFS	Maximum number of export rules	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	Per Platform HA Pair Maximum	70,000	70,000
			HA Pair	N/A	N/A	N/A		70,000	70,000
			Cluster	N/A	N/A	N/A			
9	NFS	Maximum NFSv4 access control entries	ACL	Yes	N/A	Yes	N/A	1,024	1,024
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
10	NFS	Maximum number of client objects	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	No	Per Platform HA Pair Maximum	102,400	102,400
			HA Pair	Yes	No	No		102,400	102,400
			Cluster	N/A	N/A	N/A			
11	NFS	Maximum number of pNFS objects	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	No	Per Platform HA Pair Maximum	1,024,000	1,024,000
			HA Pair	Yes	No	No		1,024,000	1,024,000
			Cluster	N/A	N/A	N/A			
12	WAFL®	Maximum size of a 64-bit aggregate	Aggregate	Yes	N/A	No	N/A	400TiB	400TiB
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
13	WAFL	Maximum size of a 64-bit volume	Volume	Yes	N/A	No	N/A	100TiB	100TiB
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
14	WAFL	Maximum file size in a 64-bit volume	File	Yes	N/A	Yes	N/A	16TiB	16TiB
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
15	WAFL	Maximum number of volume Snapshot™ copies	Volume	No	N/A	Yes	N/A	255	255
			Node	No	N/A	No		63,750	63,750
			HA Pair	No	Yes	No		127,500	127,500
			Cluster	N/A	N/A	N/A			
16	WAFL	Maximum character length for Snapshot copy names	Snapshot	Yes	N/A	Yes	N/A	255	255
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
17	WAFL	Maximum number of hard links	File	No	N/A	Yes	N/A	100,000	100,000
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
18	WAFL	Maximum number of inodes/files	Volume	No	N/A	Yes	N/A	2,000,000,000	2,000,000,000
			Node	No	N/A	Yes		50,000,000,000	50,000,000,000
			HA Pair	No	No	Yes		50,000,000,000	50,000,000,000
			Cluster	N/A	N/A	N/A			
19	WAFL	Maximum number of qtrees	Volume	Yes	N/A	Yes	Per Platform HA Pair Maximum	4,995	4,995
			Node	No	N/A	Yes		15,000	15,000
			HA Pair	No	No	Yes		30,000	30,000
			Cluster	N/A	N/A	N/A			
20	WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	Yes	N/A	8	8
			HA Pair	No	No	Yes		8	8
			Cluster	N/A	N/A	N/A			
21	Quality of Service	Maximum number of policy groups	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	Yes	6,000	N/A	N/A
			HA Pair	Yes	No	Yes		N/A	N/A
			Cluster	Yes	No	N/A			
22	Quality of Service	Maximum (QoS) number of storage objects (contained in QoS policy groups)	Policy Group	Yes	N/A	Yes	20,000	N/A	N/A
			Node	Yes	N/A	Yes		20,000	20,000
			HA Pair	Yes	No	Yes		20,000	20,000
			Cluster	Yes	No	N/A		20000	20000
23	Quality of Service	Maximum number of nodes participating in QoS	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	4 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			
24	Quality of Service	Maximum number of QoS statistics workloads (user workloads)	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	Yes	6,000	6,000	6,000
			HA Pair	Yes	No	Yes		6,000	6,000
			Cluster	Yes	No	N/A		6,000	6,000
25	Quality of Service	Maximum number of QoS statistics workloads (user, autovolume, and system workloads)	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	Yes	2,500	N/A	N/A
			HA Pair	Yes	No	Yes		N/A	N/A
			Cluster	Yes	No	N/A			
26	SAN	Maximum number of nodes - SAN	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	2 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			
27	SAN	Maximum number of storage virtual machines (SVMs) - SAN	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	Yes	Per Platform HA Pair Maximum	32	32
			HA Pair	No	Yes	Yes		32	32
			Cluster	N/A	N/A	N/A			
28	SAN	Maximum number of flexible volumes - SAN	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	No	Per Platform HA Pair Maximum	250	250
			HA Pair	Yes	Yes	No		500	500
			Cluster	N/A	N/A	N/A			
29	SAN	Maximum number of LUNs	Volume	No	N/A	Yes	Per Platform HA Pair Maximum	512	512
			Node	No	N/A	No		2,048	2,048
			HA Pair	No	Yes	No		4,096	4,096
			Cluster	N/A	N/A	N/A			
30	SAN	Maximum number of LUN mappings	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	Per Platform HA Pair Maximum	2,048	2,048
			HA Pair	No	Yes	No		4,096	4,096
			Cluster	N/A	N/A	N/A			
31	SAN	Maximum LUN size	LUN	No	N/A	Yes	N/A	16TiB	16TiB
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
32	SAN	Maximum FC queue depth available	Port	No	N/A	Yes	N/A	2,048	2,048
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
33	SAN	Maximum ITNs	Port	No	N/A	Yes	Per Platform HA Pair Maximum	512	512
			Node	No	N/A	No		8,192	8,192
			HA Pair	No	Yes	No		16,384	16,384
			Cluster	N/A	N/A	N/A			
34	SAN	Maximum number of LIFS - iSCSI	Portset	No	N/A	Yes	Per Platform HA Pair Maximum	32	32
			Port	No	N/A	No		32	32
			Node	No	N/A	No		64	64
			HA Pair	No	Yes	No		64	64
			Cluster	N/A	N/A	N/A			
35	SAN	Maximum number of LIFS - FCP	Portset	No	N/A	Yes	Per Platform HA Pair Maximum	32	32
			Port	No	N/A	No		32	32
			Node	No	N/A	No		64	64
			HA Pair	No	Yes	No		64	64
			Cluster	N/A	N/A	N/A			
36	SAN	Maximum number of igroups	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	Per Platform HA Pair Maximum	4,096	4,096
			HA Pair	No	Yes	No		8,192	8,192
			Cluster	N/A	N/A	N/A			
37	SAN	Maximum number of initiators	igroup	No	N/A	Yes	Per Platform HA Pair Maximum	256	256
			Node	No	N/A	No		4,096	4,096
			HA Pair	No	Yes	No		8,192	8,192
			Cluster	N/A	N/A	N/A			
38	SAN	Maximum number of portsets	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	Per Platform HA Pair Maximum	4,096	4,096
			HA Pair	No	Yes	No		8,192	8,192
			Cluster	N/A	N/A	N/A			
39	SAN	Maximum number of iSCSI sessions	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	No	Per Platform HA Pair Maximum	8,192	8,192
			HA Pair	No	Yes	No		16,384	16,384
			Cluster	N/A	N/A	N/A			
40	CIFS	Maximum number of connected shares	N/A	N/A	N/A	N/A		N/A	N/A
			Node	No	N/A	Yes	N/A	192,000	192,000
			HA Pair	No	No	Yes		192,000	192,000
			Cluster	N/A	N/A	N/A			
41	CIFS	Maximum number of regular shares (does not apply to dynamic shares created using the home directory feature)	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	N/A	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	No	N/A			
42	CIFS	Maximum number of open files	Connection	Yes	N/A	Yes	N/A	65,536	65,536
			Node	No	N/A	Yes		700,000	700,000
			HA Pair	No	No	Yes		700,000	700,000
			Cluster	N/A	N/A	N/A			
43	CIFS	Maximum number of local users	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	500 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	No	N/A			
44	CIFS	Maximum number of local groups	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	500 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	No	N/A			
45	CIFS	Maximum number of local group members	N/A	N/A	N/A	N/A		N/A	N/A
			Node	N/A	N/A	N/A	10000 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	No	N/A			
46	Data Protection	Maximum number of NDMP sessions	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	No	N/A	36	36
			HA Pair	Yes	No	No		36	36
			Cluster	N/A	N/A	N/A			
47	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships	Volume	Yes	N/A	Yes	Per Platform HA Pair Maximum	1	1
			Node	No	N/A	No		250	250
			HA Pair	No	Yes	No		500	500
			Cluster	N/A	N/A	N/A			
48	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships for FabricPool	Volume	N/A	N/A	N/A	N/A	N/A	N/A
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			
49	Data Protection	Maximum number of load sharing (LS) mirrors	Volume	N/A	N/A	N/A	2 for each NAS SVM	N/A	N/A
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			
50	Data Protection	Maximum number of concurrent SnapMirror® or SnapVault transfers (additional transfers can be scheduled but will be queued)	N/A	N/A	N/A	N/A		N/A	N/A
			Node	Yes	N/A	No	N/A	100	100
			HA Pair	Yes	No	No		200	200
			Cluster	Yes	No	N/A			
51	Data Protection	Maximum fan-out from source for DP mirror	Volume	No	N/A	Yes	N/A	8	8
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	N/A	N/A	N/A			
52	Data Protection	Maximum fan-out from source for LS mirror	N/A	N/A	N/A	N/A	2 for each NAS SVM	N/A	N/A
			Node	N/A	N/A	N/A		N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			
53	Data Protection	Maximum number of clusters that can be peered	Node	N/A	N/A	N/A	8 (per site)	N/A	N/A
			HA Pair	N/A	N/A	N/A		N/A	N/A
			Cluster	No	N/A	N/A			

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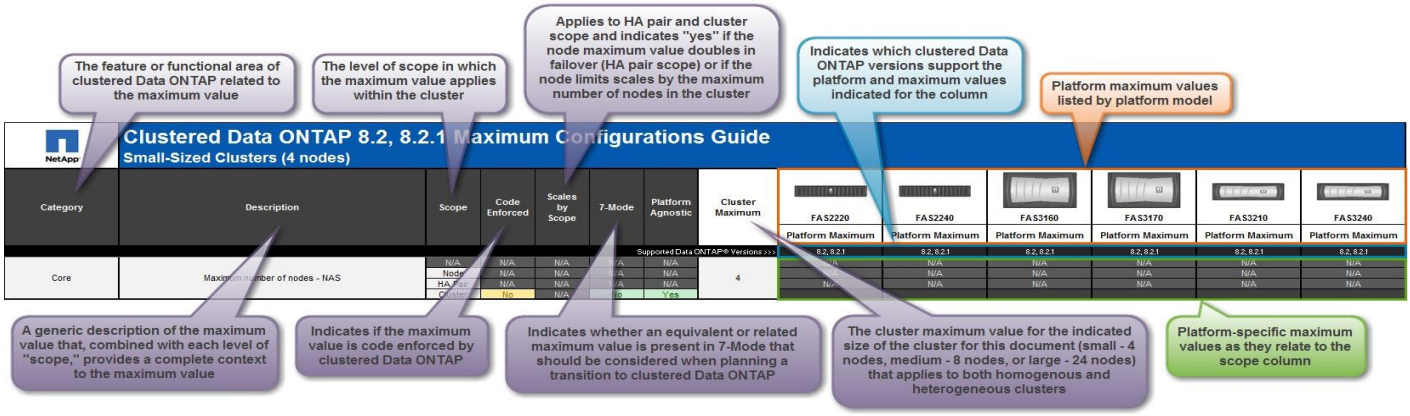
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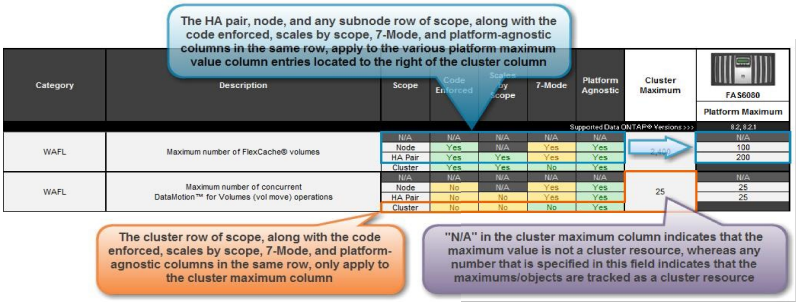
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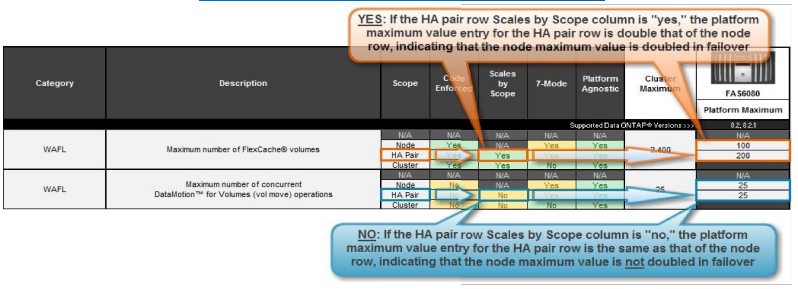
HOW TO READ THE MAXIMUM VALUES TABLE



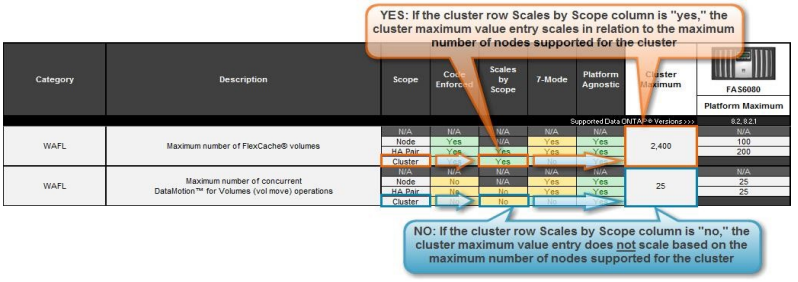
HOW SCOPE APPLIES TO CLUSTER AND PLATFORM MAXIMUM VALUES



UNDERSTANDING SCALES BY SCOPE FOR AN HA PAIR



UNDERSTANDING SCALES BY SCOPE FOR A CLUSTER



NOTES AND CAVEATS

Maximum values in this document represent the maximum value supported by NetApp in any configuration.

Consult additional technical documentation (technical reports and more) for operational guidance, best practices, and recommendations for specific application or performance-sensitive environments.

The primary resource affected by maximum values is system memory. As a result, all sizing and design considerations around maximum values must consider overall impact to available system memory.

Special attention must be paid to maximum values that are not code enforced, because in many cases there is no warning that a maximum value will be or has been exceeded.

Special consideration must be given to maximum values that have related or equivalent maximum values in 7-Mode, because the context of how the maximum values apply may have changed, or the maximum values may be lower (or higher) than it was in 7-Mode. For example, 7-Mode uses qtree policies, whereas clustered Data ONTAP uses both qtree policies and rules; although they are named the same in both ONTAP versions, the specific implementation is different.

For node maximum values that do not scale across HA failover (HA pair and node maximum values are the same), NetApp recommends operating at half of the defined maximum value (not required) on a per-node basis to make sure that maximum values are not exceeded in failover. It is possible to operate at any distribution between the two nodes in the HA pair, so long as in failover the remaining node does not exceed the defined maximum value.

Clustered Data ONTAP platform mixing rules (link below) take precedence in all cases. Each sized cluster now includes "primary platforms" and "mixable platforms" entries that define which platforms are able to be mixed together based on the defined platform mixing rules. When mixing platforms across different-sized clusters, the cluster maximum values for the specific size of cluster apply, while the individual subnode, node, and HA pair maximum values continue to apply based on the platform model being used.

Clustered Data ONTAP Platform Mixing Rules
https://fieldportal.netapp.com/Core/DownloadDoc.aspx?documentID=93126&contentID=125939

The maximum values listed in this document are valid only through the expiration date that is listed to the right of the main title bar. After expiration, visit the NetApp Field Portal to obtain the latest version of the maximum configurations document.

Future releases of this document will expand clustered Data ONTAP maximum values information into additional feature and functional areas. Additionally, existing maximum values will be revised and expanded.



Clustered Data ONTAP 8.3.x Maximum Configurations: Release 3.0

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