

NetApp Confidential - Internal Use Only									
ONTAP 9.0 Maximum Configurations Guide									
ONTAP Select - 4 Node Cluster (Single Node Cluster Use Node Scope)									
Category	Description	Scope	Code Enforced	Scales by Scope	Platform Agnostic	Cluster Maximum	Primary Platforms		
							ONTAP Select	Memory 16GB/node	
						Platform Maximum			
						Supported ONTAP 9.0 Versions >>>	9		
1	Core	Maximum number of nodes - NAS	N/A	N/A	N/A	4	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		N/A	N/A	
2	Core	Maximum number of storage virtual machines (SVMs) - NAS	N/A	N/A	N/A	512	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		N/A	N/A	
3	Core	Maximum number of LIFs - NAS	N/A	N/A	N/A	512	256	256	
		Node	Yes	N/A	Yes		N/A	N/A	
		HA Pair	No	No	Yes		N/A	N/A	
		Cluster	No	Yes	N/A		N/A	N/A	
4	Core	Maximum number of connections - NAS	N/A	N/A	N/A	N/A	10,000	10,000	
		Node	Yes	N/A	No		N/A	N/A	
		HA Pair	No	No	No		N/A	N/A	
		Cluster	N/A	N/A	N/A		N/A	N/A	
5	Core	Maximum number of flexible volumes - NAS	N/A	N/A	N/A	2,000	500	1,000	
		Node	Yes	N/A	No		N/A	N/A	
		HA Pair	Yes	Yes	No		500	500	
		Cluster	Yes	Yes	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	1,048,576	524,288	524,288	
		Node	Yes	N/A	No		N/A	N/A	
		HA Pair	Yes	No	No		524,288	524,288	
		Cluster	Yes	No	N/A		N/A	N/A	
7	NFS	Maximum number of export policies	N/A	N/A	N/A	4,000	N/A	1,000	
		Node	No	N/A	Yes		N/A	2,000	
		HA Pair	No	Yes	Yes		N/A	N/A	
		Cluster	No	Yes	N/A		N/A	N/A	
8	NFS	Maximum number of export rules	N/A	N/A	N/A	70,000	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		N/A	N/A	
9	NFS	Maximum NFSv4 access control entries	N/A	N/A	N/A	N/A	N/A	1,024	
		Node	N/A	N/A	Yes		N/A	N/A	
		HA Pair	N/A	N/A	N/A		N/A	N/A	
		Cluster	N/A	N/A	N/A		N/A	N/A	
10	NFS	Maximum number of client objects	N/A	N/A	N/A	24,456	N/A	12,228	
		Node	Yes	No	No		12,228	12,228	
		HA Pair	Yes	No	No		N/A	N/A	
		Cluster	Yes	No	N/A		N/A	N/A	
11	NFS	Maximum number of NFS objects	N/A	N/A	N/A	1,048,576	N/A	524,288	
		Node	Yes	N/A	No		524,288	524,288	
		HA Pair	Yes	No	N/A		N/A	N/A	
		Cluster	Yes	No	N/A		N/A	N/A	
12	WAFLB	Maximum size of a 64-bit aggregate	Aggregate	Yes	N/A	No	N/A	100TB	
		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		N/A	N/A	
13	WAFL	Maximum size of a 64-bit volume	Volume	Yes	N/A	No	N/A	60TB	
		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		N/A	N/A	
14	WAFL	Maximum file size in a 64-bit volume	File	Yes	N/A	Yes	N/A	16TB	
		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		N/A	N/A	
15	WAFL	Maximum number of volume Snapshot™ copies	Volume	Yes	N/A	Yes	N/A	255	
		Node	Yes	Yes	N/A	No	80,000	80,000	
		HA Pair	Yes	Yes	No	No	100,000	100,000	
		Cluster	N/A	N/A	N/A		N/A	N/A	
16	WAFL	Maximum character length for Snapshot copy names	Snapshot	Yes	N/A	Yes	N/A	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		N/A	N/A	
17	WAFL	Maximum number of hard links	File	Yes	N/A	Yes	N/A	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		N/A	N/A	
18	WAFL	Maximum number of inodes/files	Volume	Yes	N/A	Yes	N/A	2,000,000,000	
		Node	No	N/A	Yes	No	50,000,000,000	50,000,000,000	
		HA Pair	No	No	No	No	50,000,000,000	50,000,000,000	
		Cluster	N/A	N/A	N/A		N/A	N/A	
19	WAFL	Maximum number of qtree	Volume	Yes	N/A	Yes	N/A	4,995	
		Node	No	N/A	Yes	No	100,000	100,000	
		HA Pair	No	No	Yes	No	200,000	200,000	
		Cluster	No	Yes	N/A		N/A	N/A	
20	WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	Node	N/A	N/A	Yes	N/A	N/A	
		Node	Yes	N/A	Yes	No	8	8	
		HA Pair	Yes	No	Yes	No	8	8	
		Cluster	N/A	N/A	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		3,500	3,500	
		HA Pair	Yes	No	Yes		3,500	3,500	
		Cluster	Yes	No	N/A		N/A	N/A	
22	Quality of Service	Maximum (QoS) number of storage objects (contained in QoS policy groups)	Policy Group	Yes	N/A	Yes	N/A	10,000	
		Node	Yes	N/A	Yes	No	10,000	10,000	
		HA Pair	Yes	No	Yes	No	10,000	10,000	
		Cluster	Yes	No	N/A		N/A	N/A	
23	Quality of Service	Maximum number of nodes participating in QoS	Node	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		N/A	N/A	
24	Quality of Service	Maximum number of QoS statistics workloads (user workloads)	Node	Yes	N/A	Yes	N/A	5,000	
		Node	Yes	N/A	Yes	No	5,000	5,000	
		HA Pair	Yes	No	Yes	No	N/A	N/A	
		Cluster	Yes	No	N/A		N/A	N/A	
25	Quality of Service	Maximum number of QoS statistics workloads (user, autovolume, and system workloads)	Node	Yes	N/A	Yes	N/A	10,000	
		Node	Yes	N/A	Yes	No	10,000	10,000	
		HA Pair	Yes	No	Yes	No	10,000	10,000	
		Cluster	Yes	No	N/A		N/A	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		N/A	N/A	
		HA Pair	N/A	N/A	N/A		N/A	N/A	
		Cluster	No	N/A	N/A		N/A	N/A	
27	SAN	Maximum number of storage virtual machines (SVMs) - SAN	N/A	N/A	N/A	500	N/A	125	
		Node	No	N/A	No		N/A	250	
		HA Pair	No	Yes	No		N/A	N/A	
		Cluster	No	Yes	N/A		N/A	N/A	
28	SAN	Maximum number of flexible volumes - SAN	N/A	N/A	N/A	2,000	N/A	500	
		Node	Yes	N/A	No		1,000	1,000	
		HA Pair	Yes	Yes	No		N/A	N/A	
		Cluster	Yes	Yes	N/A		N/A	N/A	
29	SAN	Maximum number of LUNs	Volume	No	N/A	Yes	N/A	512	
		Node	No	N/A	No		2,048	2,048	
		HA Pair	No	Yes	No		4,096	4,096	
		Cluster	No	Yes	N/A		N/A	N/A	
30	SAN	Maximum number of LUN mappings	Node	No	N/A	No	N/A	2,048	
		Node	No	N/A	No		4,096	4,096	
		HA Pair	No	Yes	No		N/A	N/A	
		Cluster	No	Yes	N/A		N/A	N/A	
31	SAN	Maximum LUN size	LUN	No	N/A	Yes	N/A	16TB	
		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		N/A	N/A	
32	SAN	Maximum FC queue depth available	Node	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	N/A	N/A	N/A		N/A	N/A	
33	SAN	Maximum ITNs	Port	No	N/A	Yes	N/A	N/A	
		Node	No	N/A	No		N/A	N/A	
		HA Pair	No	Yes	No		N/A	N/A	
		Cluster	No	Yes	N/A		N/A	N/A	
34	SAN	Maximum number of LIFs - iSCSI	Portset	No	N/A	Yes	N/A	32	
		Portset	No	N/A	No		32	32	
		Node	No	N/A	No		256	256	
		HA Pair	No	Yes	No		512	512	
		Cluster	No	Yes	N/A		N/A	N/A	
35	SAN	Maximum number of LIFs - FCP	Portset	No	N/A	Yes	N/A	N/A	
		Portset	No	N/A	No		N/A	N/A	
		Node	No	N/A	No		N/A	N/A	
		HA Pair	No	Yes	No		N/A	N/A	
		Cluster	No	Yes	N/A		N/A	N/A	
36	SAN	Maximum number of groups	N/A	N/A	N/A	N/A	N/A	N/A	
		Node	N/A	N/A	N/A		4,096	4,096	
		HA Pair	No	No	Yes	No	1,024	1,024	
		Cluster	No	Yes	N/A		N/A	N/A	
37	SAN	Maximum number of initiators	igroup	No	N/A	Yes	N/A	256	
		Node	No	N/A	No		1,024	1,024	
		HA Pair	No	No	No		2,048	2,048	
		Cluster	No	Yes	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	N/A	N/A	N/A		N/A	N/A	
		HA Pair	No	N/A	No		512	512	
		Cluster	No	Yes	N/A		1,024	1,024	
39	SAN	Maximum number of iSCSI sessions	N/A	N/A	N/A	N/A	N/A	N/A	
		Node	No	N/A	No		N/A	N/A	
		HA Pair	No	No	Yes	No	2,048	2,048	
		Cluster	No	Yes	N/A		4,096	4,096	
40	CIFS	Maximum number of connected shares	N/A	N/A	N/A	N/A	N/A	N/A	
		Node	No	No	Yes		192,000	192,000	
		HA Pair	N/A	N/A	N/A		N/A	N/A	
		Cluster	N/A	N/A	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)	Node	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	No	N/A		N/A	N/A	
42	CIFS	Maximum number of open files	Connection	Yes	N/A	Yes	N/A	65,536	
		Node	No	No	Yes	No	700,000	700,000	
		HA Pair	No	No	Yes	No	700,000	700,000	
		Cluster	N/A	N/A	N/A		N/A	N/A	
43	CIFS	Maximum number of local users	Node	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	No	N/A		N/A	N/A	
44	CIFS	Maximum number of local groups	Node	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	No	N/A		N/A	N/A	
45	CIFS	Maximum number of local group members	Node	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	No	N/A		N/A	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		20	20	
		HA Pair	Yes	No	No		N/A	N/A	
		Cluster	No	N/A	N/A		N/A	N/A	
47	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships	Volume	No	N/A	Yes	ONTAP 9.0 > 3,000	1	
		Node	No	N/A	No		500	500	
		HA Pair	No	Yes	No		1,000	1,000	
		Cluster	No	No	N/A		N/A	N/A	
48	Data Protection	Maximum number of load sharing (LS) mirrors	Volume	No	N/A	N/A	2 for each NAS SVM	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		N/A	N/A	
49	Data Protection	Maximum number of concurrent SnapMirror® or SnapVault transfers (additional transfers can be scheduled but will be queued)	Node	Yes	N/A	No	N/A	100	
		Node	Yes	N/A	No		N/A	200	
		HA Pair	Yes	No	No		N/A	N/A	
		Cluster	Yes	No	N/A		N/A	N/A	
50	Data Protection	Maximum fan-out from source for DP mirror	Volume	No	N/A	N/A	N/A	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		N/A	N/A	
51	Data Protection	Maximum fan-out from source for LS mirror	Node	N/A	N/A	N/A	2 for each NAS SVM	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	N/A	N/A	N/A		N/A	N/A	
52	Data Protection	Maximum number of clusters that can be peered	Node	N/A	N/A	N/A	255	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		N/A		

HOW TO READ THE MAXIMUM VALUES TABLE

Clustered Data ONTAP 8.2, 8.2.1 Maximum Configurations Guide									
Small-Sized Clusters (4 nodes)									
Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	FA S2220	FA S2240
Supported Data ONTAP® Versions >>>								FA S3160	FA S3170
								FA S3210	FA S3240
								Platform Maximum	Platform Maximum
Core	Maximum number of nodes - NAS	N/A	N/A	N/A	N/A	N/A	4	8.2, 8.2.1	8.2, 8.2.1
		Node	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Cluster	No	N/A	No	Yes	N/A	N/A	N/A

HOW SCOPE APPLIES TO CLUSTER AND PLATFORM MAXIMUM VALUES

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	FA S6080
Supported Data ONTAP® Versions >>>								Platform Maximum
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	N/A	8.2, 8.2.1
		Node	Yes	N/A	Yes	Yes	100	N/A
		HA Pair	Yes	Yes	Yes	Yes	200	N/A
		Cluster	Yes	Yes	No	Yes	N/A	N/A
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	25	N/A
		Node	No	N/A	Yes	Yes	25	N/A
		HA Pair	No	N/A	Yes	Yes	25	N/A
		Cluster	No	No	No	Yes	25	N/A

UNDERSTANDING SCALES BY SCOPE FOR AN HA PAIR

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	FA S6080
Supported Data ONTAP® Versions >>>								Platform Maximum
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	N/A	8.2, 8.2.1
		Node	Yes	N/A	Yes	Yes	100	N/A
		HA Pair	Yes	Yes	Yes	Yes	200	N/A
		Cluster	Yes	Yes	No	Yes	N/A	N/A
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	25	N/A
		Node	No	N/A	Yes	Yes	25	N/A
		HA Pair	No	N/A	Yes	Yes	25	N/A
		Cluster	No	No	No	Yes	25	N/A

UNDERSTANDING SCALES BY SCOPE FOR A CLUSTER

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	FA S6080
Supported Data ONTAP® Versions >>>								Platform Maximum
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	2,400	N/A
		Node	Yes	N/A	Yes	Yes	100	N/A
		HA Pair	Yes	Yes	Yes	Yes	200	N/A
		Cluster	Yes	Yes	No	Yes	N/A	N/A
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	25	N/A
		Node	No	N/A	Yes	Yes	25	N/A
		HA Pair	No	N/A	Yes	Yes	25	N/A
		Cluster	No	No	No	Yes	25	N/A

NOTES AND CAVEATS

Maximum values in this document represent the maximum 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.

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.

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.

ONTAP Platform Mixing Rules
https://library.netapp.com/ecm/ecm_get_file/ECMP1644424

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 ONTAP maximum values information into additional feature and functional areas. Additionally, existing maximum values will be revised and expanded.

