

ONTAP 9.2 Maximum Configurations Guide												
24 Node Clusters												
Category	Description	Scope	Code Enforced	Scales by Scope	Platform Agnostic	Cluster Maximum	Supported Clustered Data ONTAP 9.2 versions					
							FAS8020 Memory 24GB/node	FAS8040 Memory 32GB/node	FAS8060 Memory 64GB/node	FAS8080 Memory 128GB/node	FAS9000 / AFF A700 Memory 512GB/node	AFF A700s Memory 512GB/node
							Platform Maximum	Platform Maximum	Platform Maximum	Platform Maximum	Platform Maximum	Platform Maximum
1	Core	Maximum number of nodes - NAS	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2	Core	Maximum number of storage virtual machines (SVMs) - NAS	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
3	Core	Maximum number of LIFs - NAS	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
4	Core	Maximum number of connections - NAS	Node	Yes	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
5	Core	Maximum number of flexible volumes - NAS	Node	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			HA Pair	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
5	Core	Maximum number of FlexGroups - NAS	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
6	Core	Maximum number of lock manager locked objects (CIFS and NFS combined)	Node	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			HA Pair	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
7	NFS	Maximum number of export policies	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8	NFS	Maximum number of export rules	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
9	NFS	Maximum NFSv4 access control entries	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
10	NFS	Maximum number of client objects	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
11	NFS	Maximum number of pNFS objects	Node	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			HA Pair	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	Yes	N/A	N/A	N/A	N/A	N/A	N/A		
12	WAFL®	Maximum size of a 64-bit aggregate	Aggregate	Yes	N/A	N/A	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
13	WAFL	Maximum size of a 64-bit volume	Volume	Yes	N/A	N/A	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A
			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	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
16	WAFL	Maximum character length for Snapshot copy names	Snapshot	N/A	N/A	N/A	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
17	WAFL	Maximum number of hard links	File	Yes	N/A	Yes	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
18	WAFL	Maximum number of inodes/files	Volume	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
19	WAFL	Maximum number of qtree	Volume	N/A	N/A	N/A	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
20	WAFL	Maximum number of concurrent DataLock™ for Volumes (vol) mode operations	Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Volume	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
21	Quality of Service	Maximum number of policy groups	Policy Group	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
22	Quality of Service	Maximum number of QoS user workloads	Policy Group	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
23	Quality of Service	Maximum number of nodes participating in QoS	Policy Group	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
24	Quality of Service	Maximum number of QoS autovolume workloads	Policy Group	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
25	Quality of Service	Maximum number of QoS system workloads	Policy Group	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
			Node	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
26	SAN	Maximum number of nodes - SAN	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
27	SAN	Maximum number of storage virtual machines (SVMs) - SAN	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
28	SAN	Maximum number of flexible volumes - SAN	Node	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
			HA Pair	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Cluster	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
			Volume	Yes	N/A	Yes	N/A	N/A	N/A	N/A		
29	SAN	Maximum number of LUNs	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
30	SAN	Maximum number of LUN mappings	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
31	SAN	Maximum LUN size	LUN	N/A	N/A	N/A	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
32	SAN	Maximum FC queue depth available	Port	N/A	N/A	N/A	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	N/A		
			HA Pair	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Cluster	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
33	SAN	Maximum iTns	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
34	SAN	Maximum number of LIFs - iSCSI	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
35	SAN	Maximum number of LIFs - FCP	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
36	SAN	Maximum number of iGroups	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
37	SAN	Maximum number of initiators	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
38	SAN	Maximum number of portsets	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
39	SAN	Maximum number of iSCSI sessions	Node	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
40	CIFS	Maximum number of SMB sessions	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	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	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
42	CIFS	Maximum number of open files	Node	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Volume	N/A	N/A	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	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	N/A	N/A	N/A	N/A	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
Core	Maximum number of nodes - NAS	N/A	N/A	N/A	N/A	N/A	4	Platform Maximum	Platform Maximum
		Node	N/A	N/A	N/A	N/A	4	Platform Maximum	Platform Maximum
		HA Pair	N/A	N/A	N/A	N/A	4	Platform Maximum	Platform Maximum
		Cluster	No	N/A	No	Yes	4	Platform Maximum	Platform Maximum

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	200	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	200	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	200	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.

