

ONTAP 9.3 Maximum Configurations Guide										8 Node Clusters												
Category	Description	Scope	Code Enforced	Scales by Scope	Platform Agnostic	Cluster Maximum	Primary Platforms															
							FAS2562		FAS2564		FAS8020		FAS8040		FAS8060		FAS8080		FAS8200		AFF A300	
							Memory 16GB/node	Platform Maximum	Memory 16GB/node	Platform Maximum	Memory 24GB/node	Platform Maximum	Memory 24GB/node	Platform Maximum	Memory 48GB/node	Platform Maximum	Memory 128GB/node	Platform Maximum	Memory 128GB/node	Platform Maximum	Memory 128GB/node	Platform Maximum
Supported Clustered DataONTAP 9.3.0 Systems v14																						
1	Core	Maximum number of nodes - NAS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
2	Core	Maximum number of storage virtual machines (SVMs) - NAS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	1,024	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
3	Core	Maximum number of LIFs - NAS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	2,048	256	256	256	512	512	512	512	512	512	512	512	512	512	512	512	
4	Core	Maximum number of connections - NAS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	N/A	10,000	10,000	10,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	
5	Core	Maximum number of flexible volumes - NAS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	8,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
6	Core	Maximum number of FlexGroups - NAS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	40	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
7	Core	Maximum number of lock manager locked objects (CIFS and NFS combined)	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	4,096,000	800,000	800,000	800,000	800,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	
8	NFS	Maximum number of export policies	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	12,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
9	NFS	Maximum number of export rules	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	70,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
10	NFS	Maximum NFSv4 access control entries	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	N/A	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	
11	NFS	Maximum number of client objects	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	N/A	10,000	10,000	10,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	
12	NFS	Maximum number of pNFS objects	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	4,096,000	524,288	524,288	524,288	524,288	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	1,024,000	
13	WAFL	Maximum size of a 64-bit aggregate	Aggregate: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	120TB	120TB	120TB	324TB	324TB	400TB	400TB	400TB	324TB	324TB	324TB	324TB	324TB	324TB	324TB	
14	WAFL	Maximum size of a 64-bit volume	Volume: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	60TB	60TB	60TB	70TB	100TB	100TB	100TB	100TB	100TB	100TB	100TB	100TB	100TB	100TB	100TB	
15	WAFL	Maximum file size in a 64-bit volume	File: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	
16	WAFL	Maximum number of volume Snapshot™ copies	Volume: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	
17	WAFL	Maximum character length for Snapshot copy names	Snapshot: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
18	WAFL	Maximum number of hard links	File: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	
19	WAFL	Maximum number of inodes/files	Volume: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	2,000,000,000	
20	WAFL	Maximum number of qfiles	Volume: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	800,000	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	4,995	
21	WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	Volume: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	
22	Quality of Service	Maximum number of policy groups	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	12,000	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
23	Quality of Service	Maximum number of QoS user workloads	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	12,000	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
24	Quality of Service	Maximum number of nodes participating in QoS	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
25	Quality of Service	Maximum number of QoS autotune workloads	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	12,000	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
26	Quality of Service	Maximum number of QoS system workloads	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	5,000	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
27	SAN	Maximum number of nodes - SAN	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
28	SAN	Maximum number of storage virtual machines (SVMs) - SAN	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	1,000	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	
29	SAN	Maximum number of flexible volumes - SAN	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	8,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
30	SAN	Maximum number of LUNs	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	98,304	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	
31	SAN	Maximum number of LUN mappings	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	98,304	2,048	2,048	2,048	2,048	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	
32	SAN	Maximum LUN size	LUN: N/A Node: N/A HA Pair: N/A Cluster: N/A	Yes N/A N/A N/A	N/A N/A N/A N/A	N/A	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	14TB	
33	SAN	Maximum FC queue depth available	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	N/A	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048	
34	SAN	Maximum ITNs	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	65,536	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	
35	SAN	Maximum number of LIFs - iSCSI	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	2,048	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
36	SAN	Maximum number of LIFs - FCP	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	4,096	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
37	SAN	Maximum number of groups	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	32,768	1,024	1,024	1,024	1,024	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	
38	SAN	Maximum number of initiators	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	32,768	1,024	1,024	1,024	1,024	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	
39	SAN	Maximum number of portsets	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	32,768	1,024	1,024	1,024	1,024	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	4,096	
40	SAN	Maximum number of SCSI sessions	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	65,536	2,048	2,048	2,048	2,048	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	8,192	
41	CIFS	Maximum number of connected shares	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	N/A	400,000	400,000	400,000	400,000	800,000	800,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
42	CIFS	Maximum number of regular shares (does not apply to dynamic shares created using the home directory feature)	Node: N/A HA Pair: N/A Cluster: N/A	N/A N/A N/A	N/A N/A N/A	N																

HOW TO READ THE MAXIMUM VALUES TABLE

The feature or functional area of clustered Data ONTAP related to the maximum value

The level of scope in which the maximum value applies within the cluster

Applies to HA pair and cluster scope and indicates "yes" if the node maximum value doubles in failover (HA pair scope) or if the node limits scales by the maximum number of nodes in the cluster

Indicates which clustered Data ONTAP versions support the platform and maximum values indicated for the column

Platform maximum values listed by platform model

Clustered Data ONTAP 8.2, 8.2.1 Maximum Configurations Guide									
Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	Platform Maximum	Platform Maximum
								FA52220	FA52240
								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
		HA Pair	N/A	N/A	N/A	N/A		N/A	N/A
		Cluster	No	No	No	Yes		N/A	N/A

A generic description of the maximum value that, combined with each level of "scope," provides a complete context to the maximum value

Indicates if the maximum value is code enforced by clustered Data ONTAP

Indicates whether an equivalent or related maximum value is present in 7-Mode that should be considered when planning a transition to clustered Data ONTAP

The cluster maximum value for the indicated size of the cluster for this document (small - 4 nodes, medium - 8 nodes, or large - 24 nodes) that applies to both homogenous and heterogeneous clusters

Platform-specific maximum values as they relate to the scope column

HOW SCOPE APPLIES TO CLUSTER AND PLATFORM MAXIMUM VALUES

The HA pair, node, and any subnode row of scope, along with the code enforced, scales by scope, 7-Mode, and platform-agnostic columns in the same row, apply to the various platform maximum value column entries located to the right of the cluster column

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	Platform Maximum
								FA56080
								Platform Maximum
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	25	8,2,8,2,1
		Node	Yes	Yes	Yes	Yes		100
		HA Pair	Yes	Yes	Yes	Yes		200
		Cluster	Yes	Yes	No	Yes		N/A
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	25	8,2,8,2,1
		Node	No	No	Yes	Yes		25
		HA Pair	No	No	Yes	Yes		25
		Cluster	No	No	No	Yes		N/A

The cluster row of scope, along with the code enforced, scales by scope, 7-Mode, and platform-agnostic columns in the same row, only apply to the cluster maximum column

"N/A" in the cluster maximum column indicates that the maximum value is not a cluster resource, whereas any number that is specified in this field indicates that the maximums/objects are tracked as a cluster resource

UNDERSTANDING SCALES BY SCOPE FOR AN HA PAIR

YES: If the HA pair row Scales by Scope column is "yes," the platform maximum value entry for the HA pair row is double that of the node row, indicating that the node maximum value is doubled in failover

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	Platform Maximum
								FA56080
								Platform Maximum
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	2,400	8,2,8,2,1
		Node	Yes	Yes	Yes	Yes		100
		HA Pair	Yes	Yes	Yes	Yes		200
		Cluster	Yes	Yes	No	Yes		N/A
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	25	8,2,8,2,1
		Node	No	No	Yes	Yes		25
		HA Pair	No	No	Yes	Yes		25
		Cluster	No	No	No	Yes		N/A

NO: If the HA pair row Scales by Scope column is "no," the platform maximum value entry for the HA pair row is the same as that of the node row, indicating that the node maximum value is not doubled in failover

UNDERSTANDING SCALES BY SCOPE FOR A CLUSTER

YES: If the cluster row Scales by Scope column is "yes," the cluster maximum value entry scales in relation to the maximum number of nodes supported for the cluster

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	Platform Maximum
								FA56080
								Platform Maximum
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	2,400	8,2,8,2,1
		Node	Yes	Yes	Yes	Yes		100
		HA Pair	Yes	Yes	Yes	Yes		200
		Cluster	Yes	Yes	No	Yes		N/A
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	25	8,2,8,2,1
		Node	No	No	Yes	Yes		25
		HA Pair	No	No	Yes	Yes		25
		Cluster	No	No	No	Yes		N/A

NO: If the cluster row Scales by Scope column is "no," the cluster maximum value entry does not scale based on the maximum number of nodes supported for the 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=931268&contentId=125939)

<https://fieldportal.netapp.com/Core/DownloadDoc.aspx?documentId=931268&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

Author: Jay White | Published: June 26, 2015

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