

NetApp Confidential - Internal Use Only												
ONTAP Select 9.4 Maximum Configurations Guide												
4 Node Cluster (Single Node Cluster Use Node Scope)												
Category	Description	Scope	Code Enforced	Scales by Scope	Platform Agnostic	Cluster Maximum	Primary Platforms		Primary Platforms		Primary Platforms	
							ONTAP Select		ONTAP Select Premium		ONTAP Select Premium	
							Memory 16GB/node	Platform Maximum	Memory 16GB/node	Platform Maximum	Memory 64GB/node	Platform Maximum
Supported Clustered Data ONTAP 9.4 Versions >=							9	9.1	9.1			
1	Core	Maximum number of nodes - NAS	N/A	N/A	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	512	N/A	N/A	N/A	N/A	N/A	
3	Core	Maximum number of LIFs - NAS	Node	N/A	Yes	512	256	256	256	256	512	
4	Core	Maximum number of connections - NAS	Node	Yes	N/A	N/A	10,000	10,000	10,000	10,000	10,000	
5	Core	Maximum number of flexible volumes - NAS	Node	Yes	N/A	2,000	500	500	500	500	500	
5	Core	Maximum number of FlexGroups - NAS	Node	N/A	N/A	0	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	1,048,576	524,288	524,288	1,200,000	524,288	1,200,000	
7	NFS	Maximum number of export policies	Node	No	N/A	4,000	1,000	1,000	1,000	1,000	1,000	
8	NFS	Maximum number of export rules	Node	N/A	N/A	70,000	N/A	N/A	N/A	N/A	N/A	
9	NFS	Maximum NFSv4 access control entries	Node	N/A	N/A	N/A	1,024	1,024	1,024	1,024	1,024	
10	NFS	Maximum number of client objects	Node	Yes	N/A	24,456	12,228	12,228	100,000	12,228	100,000	
11	NFS	Maximum number of pNFS objects	Node	Yes	N/A	1,048,576	524,288	524,288	1,024,000	524,288	1,024,000	
12	WAFL	Maximum size of a 64-bit aggregate	Node	N/A	N/A	N/A	100TB	100TB	100TB	100TB	100TB	
13	WAFL	Maximum size of a 64-bit volume	Node	N/A	N/A	N/A	60TB	60TB	60TB	60TB	60TB	
14	WAFL	Maximum file size in a 64-bit volume	Node	N/A	N/A	N/A	16TB	16TB	16TB	16TB	16TB	
15	WAFL	Maximum number of volume Snapshot™ copies	Node	Yes	N/A	N/A	255	255	255	255	255	
16	WAFL	Maximum character length for Snapshot copy names	Node	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
17	WAFL	Maximum number of hard links	Node	Yes	N/A	N/A	100,000	100,000	100,000	100,000	100,000	
18	WAFL	Maximum number of inodes/files	Node	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	
19	WAFL	Maximum number of qtrees	Node	No	N/A	400,000	4,995	4,995	4,995	4,995	4,995	
20	WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	Node	Yes	N/A	N/A	8	8	8	8	8	
21	Quality of Service	Maximum number of policy groups	Node	Yes	N/A	12,000	12,000	12,000	12,000	12,000	12,000	
22	Quality of Service	Maximum number of QoS user workloads	Node	Yes	N/A	40,000	12,000	12,000	40,000	12,000	40,000	
23	Quality of Service	Maximum number of nodes participating in QoS	Node	N/A	N/A	4	N/A	N/A	N/A	N/A	N/A	
24	Quality of Service	Maximum number of QoS autovolume workloads	Node	Yes	N/A	12,000	12,000	12,000	40,000	12,000	40,000	
25	Quality of Service	Maximum number of QoS system workloads	Node	Yes	N/A	5,000	5,000	5,000	5,000	5,000	5,000	
26	SAN	Maximum number of nodes - SAN	Node	N/A	N/A	4	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	500	N/A	N/A	N/A	N/A	N/A	
28	SAN	Maximum number of flexible volumes - SAN	Node	Yes	N/A	2,000	500	500	500	500	500	
29	SAN	Maximum number of LUNs	Node	No	N/A	8,192	2,048	2,048	2,048	2,048	2,048	
30	SAN	Maximum number of LUN mappings	Node	No	N/A	8,192	2,048	2,048	16,384	16,384	16,384	
31	SAN	Maximum LUN size	Node	N/A	N/A	N/A	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	N/A	N/A	N/A	
33	SAN	Maximum ITBs	Node	No	N/A	8,192	N/A	N/A	N/A	N/A	N/A	
34	SAN	Maximum number of LIFs - iSCSI	Node	No	N/A	1,024	32	32	32	32	32	
35	SAN	Maximum number of LIFs - FC	Node	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
36	SAN	Maximum number of groups	Node	N/A	N/A	4,096	512	512	2,048	512	2,048	
37	SAN	Maximum number of initiators	Node	No	N/A	4,096	2,048	2,048	2,048	2,048	2,048	
38	SAN	Maximum number of portsets	Node	No	N/A	4,096	512	512	2,048	512	2,048	
39	SAN	Maximum number of iSCSI sessions	Node	No	N/A	8,192	2,048	2,048	4,096	2,048	8,192	
40	CIFS	Maximum number of connected shares	Node	N/A	N/A	N/A	400,000	400,000	1,000,000	400,000	1,000,000	
41	CIFS	Maximum number of regular shares (does not apply to dynamic shares created using the home directory feature)	Node	N/A	N/A	40,000	N/A	N/A	N/A	N/A	N/A	
42	CIFS	Maximum number of open files	Node	Yes	N/A	N/A	60,000	60,000	300,000	60,000	300,000	
43	CIFS	Maximum number of local users	Node	N/A	N/A	1,000	N/A	N/A	N/A	N/A	N/A	
44	CIFS	Maximum number of local groups	Node	N/A	N/A	1,000	N/A	N/A	N/A	N/A	N/A	
45	CIFS	Maximum number of local group members	Node	N/A	N/A	20,000	30,000	30,000	640,000	30,000	640,000	
46	Data Protection	Maximum number of NDMP sessions	Node	N/A	N/A	N/A	20	20	30	20	30	
47	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships	Node	Yes	N/A	<DOT 9.0 = 3,000	500	500	500	500	500	
48	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships for FabricPool	Node	No	N/A	<DOT 9.0 = 32	1	1	1	1	1	
49	Data Protection	Maximum number of load sharing (LS) mirrors	Node	No	N/A	2 for each NAS SVM	N/A	N/A	N/A	N/A	N/A	
50	Data Protection	Maximum number of concurrent SnapMirror® or SnapVault transfers (additional transfers can be scheduled but will be queued)	Node	Yes	N/A	N/A	100	100	100	100	100	
51	Data Protection	Maximum fan-out from source for DP mirror	Node	No	N/A	N/A	1	1	1	1	1	
52	Data Protection	Maximum fan-out from source for LS mirror	Node	No	N/A	2 for each NAS SVM	N/A	N/A	N/A	N/A	N/A	
53	Data Protection	Maximum number of clusters that can be peered	Node	N/A	N/A	255	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	Platform Maximum
Core	Maximum number of nodes - NAS	N/A	N/A	N/A	N/A	N/A	4	Platform Maximum
		Node	N/A	N/A	N/A	N/A		Platform Maximum
		HA Pair	N/A	N/A	N/A	N/A		Platform Maximum
		Cluster	No	No	No	Yes		Platform Maximum

Platform Maximum Values:

Platform	Platform Maximum
FA52220	8,2,8,2,1
FA52240	8,2,8,2,1
FA53160	8,2,8,2,1
FA53170	8,2,8,2,1
FA53210	8,2,8,2,1
FA53240	8,2,8,2,1

Annotations:

- 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
- 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

Annotations:

- 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
- 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

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

UNDERSTANDING SCALES BY SCOPE FOR AN HA PAIR

Annotations:

- 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
- 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

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

UNDERSTANDING SCALES BY SCOPE FOR A CLUSTER

Annotations:

- 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
- 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

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

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

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