

NetApp									
ONTAP Select 9.2 Maximum Configurations Guide									
4 Node Cluster (Single Node Cluster Use Node Scope)									
Category	Description	Scope	Code Enforced	Scalability Scope	Platform Agnostic	Cluster Maximum	Primary Platforms		
							ONTAP Select		
							Memory 16GB/node Platform Maximum	Memory 16GB/node Platform Maximum	Memory 16GB/node Platform Maximum
Supported Clustered Data ONTAP 9.5 Volumes ***							9	9.1	9.1
1	Core	Maximum number of nodes - NAS	N/A	N/A	N/A	4	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	N/A
3	Core	Maximum number of LIFs - NAS	N/A	N/A	N/A	512	256	256	512
4	Core	Maximum number of connections - NAS	N/A	N/A	N/A	N/A	10,000	10,000	100,000
5	Core	Maximum number of flexible volumes - NAS	N/A	N/A	N/A	2,000	200	200	200
5	Core	Maximum number of FlexGroups - NAS	N/A	N/A	N/A	0	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	1,200,000
7	NFS	Maximum number of export policies	N/A	N/A	N/A	4,000	1,000	1,000	1,000
8	NFS	Maximum number of export rules	N/A	N/A	N/A	70,000	N/A	N/A	N/A
9	NFS	Maximum NFSv4 access control entries	N/A	N/A	N/A	N/A	1,024	1,024	1,024
10	NFS	Maximum number of client objects	N/A	N/A	N/A	24,456	12,228	12,228	100,000
11	NFS	Maximum number of pNFS objects	N/A	N/A	N/A	1,048,576	524,288	524,288	1,024,000
12	WAFLB	Maximum size of a 64-bit aggregate	N/A	N/A	N/A	N/A	100TB	100TB	100TB
13	WAFLB	Maximum size of a 64-bit volume	N/A	N/A	N/A	N/A	60TB	60TB	60TB
14	WAFLB	Maximum file size in a 64-bit volume	N/A	N/A	N/A	N/A	16TB	16TB	16TB
15	WAFL	Maximum number of volume Snapshot™ copies	N/A	N/A	N/A	N/A	255	255	255
16	WAFL	Maximum character length for Snapshot copy names	N/A	N/A	N/A	N/A	255	255	255
17	WAFL	Maximum number of hard links	N/A	N/A	N/A	N/A	100,000	100,000	100,000
18	WAFL	Maximum number of inodes/files	N/A	N/A	N/A	N/A	2,000,000,000	2,000,000,000	2,000,000,000
19	WAFL	Maximum number of qtree	N/A	N/A	N/A	400,000	100,000	100,000	100,000
20	WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	8	8	8
21	Quality of Service	Maximum number of policy groups	N/A	N/A	N/A	12,000	3,500	3,500	3,500
22	Quality of Service	Maximum number of QoS user workloads	N/A	N/A	N/A	12,000	10,000	10,000	10,000
23	Quality of Service	Maximum number of nodes participating in QoS	N/A	N/A	N/A	4	N/A	N/A	N/A
24	Quality of Service	Maximum number of QoS autosave workloads	N/A	N/A	N/A	12,000	5,000	5,000	5,000
25	Quality of Service	Maximum number of QoS system workloads	N/A	N/A	N/A	5,000	10,000	10,000	10,000
26	SAN	Maximum number of nodes - SAN	N/A	N/A	N/A	4	N/A	N/A	N/A
27	SAN	Maximum number of storage virtual machines (SVMs) - SAN	N/A	N/A	N/A	500	128	128	128
28	SAN	Maximum number of flexible volumes - SAN	N/A	N/A	N/A	2,000	500	500	500
29	SAN	Maximum number of LUNs	N/A	N/A	N/A	8,192	512	512	512
30	SAN	Maximum number of LUN mappings	N/A	N/A	N/A	8,192	2,048	2,048	8,192
31	SAN	Maximum LUN size	N/A	N/A	N/A	N/A	16TB	16TB	16TB
32	SAN	Maximum FC queue depth available	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	SAN	Maximum ITtNs	N/A	N/A	N/A	8,192	N/A	N/A	N/A
34	SAN	Maximum number of LIFs - iSCSI	N/A	N/A	N/A	1,024	32	32	32
35	SAN	Maximum number of LIFs - FCP	N/A	N/A	N/A	N/A	32	32	32
36	SAN	Maximum number of groups	N/A	N/A	N/A	4,096	512	512	2,048
37	SAN	Maximum number of initiators	N/A	N/A	N/A	4,096	1,024	1,024	4,096
38	SAN	Maximum number of portals	N/A	N/A	N/A	4,096	512	512	2,048
39	SAN	Maximum number of iSCSI sessions	N/A	N/A	N/A	8,192	1,024	1,024	4,096
40	CIFS	Maximum number of connected shares	N/A	N/A	N/A	N/A	400,000	400,000	1,000,000
41	CIFS	Maximum number of regular shares (does not apply to dynamic shares created using the home directory feature)	N/A	N/A	N/A	40,000	N/A	N/A	N/A
42	CIFS	Maximum number of open files	N/A	N/A	N/A	N/A	65,536	65,000	65,000
43	CIFS	Maximum number of local users	N/A	N/A	N/A	1,000	N/A	N/A	N/A
44	CIFS	Maximum number of local groups	N/A	N/A	N/A	1,000	N/A	N/A	N/A
45	CIFS	Maximum number of local group members	N/A	N/A	N/A	20,000	10,000	10,000	320,000
46	Data Protection	Maximum number of NDMP sessions	N/A	N/A	N/A	N/A	20	20	36
47	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships	N/A	N/A	N/A	2,000	200	200	1
48	Data Protection	Maximum number of load sharing (LS) mirrors	N/A	N/A	N/A	2 for each NAS SVM	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)	N/A	N/A	N/A	N/A	100	100	100
50	Data Protection	Maximum fan-out from source for DP mirror	N/A	N/A	N/A	N/A	8	8	8
51	Data Protection	Maximum fan-out from source for LS mirror	N/A	N/A	N/A	2 for each NAS SVM	N/A	N/A	N/A
52	Data Protection	Maximum number of clusters that can be peered	N/A	N/A	N/A	255	N/A	N/A	N/A

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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	FA S3160
Supported Data ONTAP® Versions >>>								8.2, 8.2.1	8.2, 8.2.1	8.2, 8.2.1
Core	Maximum number of nodes - NAS	N/A	N/A	N/A	N/A	N/A	4	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	No	N/A	No	Yes		N/A	N/A	N/A

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

Category	Description	Scope	Code Enforced	Scales by Scope	7-Mode	Platform Agnostic	Cluster Maximum	FA S6080
Supported Data ONTAP® Versions >>>								Platform Maximum
		N/A	N/A	N/A	N/A	N/A	8.2, 8.2.1	N/A
WAFL	Maximum number of FlexCache® volumes	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	Node	No	N/A	Yes	Yes	25	N/A
		HA Pair	No	No	Yes	Yes	25	N/A
		Cluster	No	No	No	Yes	25	N/A

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

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
		N/A	N/A	N/A	N/A	N/A	8.2, 8.2.1	N/A
WAFL	Maximum number of FlexCache® volumes	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	Node	No	N/A	Yes	Yes	25	N/A
		HA Pair	No	No	Yes	Yes	25	N/A
		Cluster	No	No	No	Yes	25	N/A

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

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
		N/A	N/A	N/A	N/A	N/A	8.2, 8.2.1	N/A
WAFL	Maximum number of FlexCache® volumes	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	Node	No	N/A	Yes	Yes	25	N/A
		HA Pair	No	No	Yes	Yes	25	N/A
		Cluster	No	No	No	Yes	25	N/A

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

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.

