

ONTAP 9.4 Maximum Configurations Guide															
MetroCluster (4 Node Cluster Per Site NAS, 4 Node Cluster Per Site SAN, 2 Sites)															
Category	Description	Scope	Code Enforced	Scales by Scope	Platform Agnostic	Cluster Maximum	Supported Cluster Data ONTAP 9.4 Versions >=								
							FAS8200 Memory 24GB/node Platform Maximum	FAS8400 Memory 32GB/node Platform Maximum	FAS8600 Memory 64GB/node Platform Maximum	FAS8800 Memory 142GB/node Platform Maximum	FAS 8200 AFF A300 Memory 512GB/node Platform Maximum	FAS9800 Memory 512GB/node Platform Maximum			
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	N/A	N/A	N/A	N/A
2	Core	Maximum number of storage virtual machines (SVMs) - NAS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Core	Maximum number of LIFs - NAS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Core	Maximum number of connections - NAS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Core	Maximum number of flexible volumes - NAS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Core	Maximum number of FlexGroups - NAS	N/A	N/A	N/A	N/A	N/A	N/A	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)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	NFS	Maximum number of export policies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	NFS	Maximum number of export rules	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	NFS	Maximum number of client objects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	NFS	Maximum number of pNFS objects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	WAFL®	Maximum size of a 64-bit aggregate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	WAFL	Maximum size of a 64-bit volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	WAFL	Maximum file size in a 64-bit volume	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	WAFL	Maximum number of volume Snapshot™ copies	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	WAFL	Maximum character length for Snapshot copy names	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	WAFL	Maximum number of hard links	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	WAFL	Maximum number of inodes/files	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	WAFL	Maximum number of qtrees	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Quality of Service	Maximum number of QoS user workloads	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Quality of Service	Maximum number of nodes participating in QoS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Quality of Service	Maximum number of QoS autovolume workloads	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25	Quality of Service	Maximum number of QoS system workloads	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27	SAN	Maximum number of storage virtual machines (SVMs) - SAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	SAN	Maximum number of flexible volumes - SAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	SAN	Maximum number of LUNs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	SAN	Maximum number of LUN mappings	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	SAN	Maximum LUN size	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	SAN	Maximum FC queue depth available	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	SAN	Maximum iTTLs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
34	SAN	Maximum number of LIFs - iSCSI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35	SAN	Maximum number of LIFs - FCP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	SAN	Maximum number of groups	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
37	SAN	Maximum number of initiators	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
38	SAN	Maximum number of portsets	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
39	SAN	Maximum number of iSCSI sessions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40	CIFS	Maximum number of connected shares	N/A	N/A	N/A	N/A	N/A	N/A	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)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
42	CIFS	Maximum number of open files	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43	CIFS	Maximum number of local users	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
44	CIFS	Maximum number of local groups	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
45	CIFS	Maximum number of local group members	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A
47	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships for FabricPool	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48	Data Protection	Maximum number of data protection (DP) mirrors and/or SnapVault® relationships for FabricPool	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
49	Data Protection	Maximum number of local shading (LS) mirrors	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
51	Data Protection	Maximum fan-out from source for DP mirror	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
52	Data Protection	Maximum fan-out from source for LS mirror	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
53	Data Protection	Maximum number of clusters that can be peered	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

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	<table border="1"> <thead> <tr> <th>Platform Model</th> <th>Platform Maximum</th> </tr> </thead> <tbody> <tr> <td>FA52220</td> <td>8.2, 8.2.1</td> </tr> <tr> <td>FA52240</td> <td>8.2, 8.2.1</td> </tr> <tr> <td>FA53160</td> <td>8.2, 8.2.1</td> </tr> <tr> <td>FA53170</td> <td>8.2, 8.2.1</td> </tr> <tr> <td>FA53210</td> <td>8.2, 8.2.1</td> </tr> <tr> <td>FA53240</td> <td>8.2, 8.2.1</td> </tr> </tbody> </table>	Platform Model	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
		Platform Model	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																					
N/A	N/A	N/A	N/A	N/A	N/A																	

Supported Data ONTAP Versions >>>

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	Platform Maximum						
		N/A	N/A	N/A	N/A	N/A	25	Supported Data ONTAP Versions 9.2, 9.2.1 <table border="1"> <thead> <tr> <th>Platform Model</th> <th>Platform Maximum</th> </tr> </thead> <tbody> <tr> <td>FA56000</td> <td>100</td> </tr> <tr> <td>FA56000</td> <td>200</td> </tr> </tbody> </table>	Platform Model	Platform Maximum	FA56000	100	FA56000	200
Platform Model	Platform Maximum													
FA56000	100													
FA56000	200													
WAFL	Maximum number of FlexCache® volumes	Node	Yes	N/A	Yes	Yes	25	100						
		HA Pair	Yes	N/A	Yes	Yes	25	200						
		Cluster	Yes	Yes	Yes	Yes	25	200						
		Node	No	N/A	No	N/A	25	100						
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	Node	No	N/A	Yes	Yes	25	25						
		HA Pair	No	No	Yes	Yes	25	25						
		Cluster	No	No	No	Yes	25	25						

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

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
								8.2, 8.2.1
WAFL	Maximum number of FlexCache® volumes	N/A	N/A	N/A	N/A	N/A	2,400	100
		Node	Yes	Yes	Yes	Yes	2,400	200
		HA Pair	Yes	Yes	No	Yes		
		Cluster	Yes	Yes	No	Yes		
		Node	N/A	N/A	N/A	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	25
		Node	Yes	Yes	Yes	Yes	25	25
		HA Pair	No	No	No	Yes		
		Cluster	No	No	No	Yes		

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
		N/A	N/A	N/A	N/A	Supported Data ONTAP 8 Versions (3)		8.2, 8.2.1
WAFL	Maximum number of FlexCache® volumes	Node	Yes	N/A	Yes	Yes	2,400	N/A
		HA Pair	Yes	N/A	Yes	Yes		100
		Cluster	Yes	Yes	Yes	Yes		200
WAFL	Maximum number of concurrent DataMotion™ for Volumes (vol move) operations	Node	N/A	N/A	N/A	N/A	25	N/A
		HA Pair	N/A	Yes	Yes	Yes		25
		Cluster	No	No	Yes	Yes		25

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

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