



Recommended ESXi host and other ONTAP settings

NetApp Solutions

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Recommended ESXi host and other ONTAP settings

NetApp has developed a set of ESXi host multipathing and HBA timeout settings for proper behavior with ONTAP based on NetApp testing. These are easily set using ONTAP tools for VMware vSphere. From the Summary dashboard, click Edit Settings in the Host Systems portlet or right-click the host in vCenter, then navigate to ONTAP tools > Set Recommended Values. Here are the currently recommended host settings with the 9.8 release.

Host setting
NetApp recommended value
ESXi advanced configuration
VMFS3.HardwareAcceleratedLocking
Leave as set (VMware default is 1).
VMFS3.EnableBlockDelete
Leave as set (VMware default is 0, but this is not needed for VMFS6). For more information, see VMware KB article .
NFS Settings
Net.TcpipHeapSize
vSphere 6.0 or later, set to 32. All other NFS configurations, set to 30.
Net.TcpipHeapMax
Set to 1536 for vSphere 6.0 and later.
NFS.MaxVolumes
vSphere 6.0 or later, set to 256. All other NFS configurations, set to 64.
NFS41.MaxVolumes
vSphere 6.0 or later, set to 256.
NFS.MaxQueueDepth
vSphere 6.0 or later, set to 128.
NFS.HeartbeatMaxFailures
Set to 10 for all NFS configurations.
NFS.HeartbeatFrequency
Set to 12 for all NFS configurations.
NFS.HeartbeatTimeout
Set to 5 for all NFS configurations.
SunRPC.MaxConnPerIP

vSphere 7.0 or later, set to 128.
FC/FCoE Settings
Path selection policy
Set to RR (round robin) when FC paths with ALUA are used. Set to FIXED for all other configurations. Setting this value to RR helps provide load balancing across all active/optimized paths. The value FIXED is for older, non-ALUA configurations and helps prevent proxy I/O. In other words, it helps keep I/O from going to the other node of a high-availability (HA) pair in an environment that has Data ONTAP operating in 7-Mode.
Disk.QFullSampleSize
Set to 32 for all configurations. Setting this value helps prevent I/O errors.
Disk.QFullThreshold
Set to 8 for all configurations. Setting this value helps prevent I/O errors.
Emulex FC HBA timeouts
Use the default value.
QLogic FC HBA timeouts
Use the default value.
iSCSI Settings
Path selection policy
Set to RR (round robin) for all iSCSI paths. Setting this value to RR helps provide load balancing across all active/optimized paths.
Disk.QFullSampleSize
Set to 32 for all configurations. Setting this value helps prevent I/O errors.
Disk.QFullThreshold
Set to 8 for all configurations. Setting this value helps prevent I/O errors.

ONTAP tools also specify certain default settings when creating ONTAP FlexVol volumes and LUNs:

ONTAP tool
Default setting
Snapshot reserve (-percent-snapshot-space)
0
Fractional reserve (-fractional-reserve)
0
Access time update (-atime-update)
False
Minimum readahead (-min-readahead)
False

Scheduled Snapshot copies
None
Storage efficiency
Enabled
Volume guarantee
None (thin provisioned)
Volume Autosize
grow_shrink
LUN space reservation
Disabled
LUN space allocation
Enabled

Other host multipath configuration considerations

While not currently configured by available ONTAP tools, NetApp suggests considering these configuration options:

- In high-performance environments or when testing performance with a single LUN datastore, consider changing the load balance setting of the round-robin (VMW_PSP_RR) path selection policy (PSP) from the default IOPS setting of 1000 to a value of 1. See VMware KB [2069356](#) for more info.
- In vSphere 6.7 Update 1, VMware introduced a new latency load balance mechanism for the Round Robin PSP. The new option considers I/O bandwidth and path latency when selecting the optimal path for I/O. You might benefit from using it in environments with non-equivalent path connectivity, such as cases where there are more network hops on one path than another, or when using a NetApp All SAN Array system. See [Path Selection Plug-Ins and Policies](#) for more information.

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