

NetApp® Solaris® Host Utilities 6.0 Quick Command Reference

Solaris Host Utilities and Host Commands		
<pre>sanlun lun show [-v] [-d <host_device_filename> all <controller/vserver_name> <controller/vserver_name>:<path_name>] sanlun lun show -wwpn sanlun lun show -p [-v] [all <controller/vserver_name> <controller/vserver_name>:<path_name>]</pre>		Displays information about LUNs mapped to this host. -p includes multipathing information.
<pre>sanlun fcp show adapter [-c [-v] [<adapter name> all]]</pre>		Displays information about the host HBA(s). sanlun fcp show adapter -c provides the igroup command to enter on the storage system.
(SPARC, x86) stmsboot -e		SPARC and x86/64 (Solaris 10 Update 4 and higher) Use to set up MPxIO and force a reboot.
/usr/sbin/stmsboot -D fp -e		Enable MPxIO for FCP
/usr/sbin/stmsboot -D fp -d		Disable MPxIO for FCP
/usr/sbin/stmsboot -D iscsi -e		Enable MPxIO for iSCSI
/usr/sbin/stmsboot -D iscsi -d		Disable MPxIO for iSCSI
<pre>(MPxIO) /usr/sbin/cfgadm -c configure cx (DMP) touch /reconfigure; /sbin/init 6 (DMP) /usr/sbin/devfsadm</pre>		(MPxIO) Discover the LUNs (x is HBA controller number for that LUN). (DMP) Discover LUNs using a reconfiguration reboot or devfsadm command.
format		Label the LUNs.
FC and Data ONTAP Commands		
vserver fcp initiator show	Cluster-Mode	Displays details of FC initiators.
vserver {fcp iscsi} show	Cluster-Mode	Displays current status of the Fibre Channel or iSCSI targets.
vserver iscsi connection show	Cluster-Mode	Displays details of iSCSI connections.
vserver {iscsi fcp} start -vserver name	Cluster-Mode	Starts the FC or iSCSI service on the specified Vserver.
vserver {iscsi fcp} stop -vserver name	Cluster-Mode	Stops the FC or iSCSI service on the specified Vserver.
system license show	Cluster-Mode	Verifies the FCP and iSCSI licenses are installed on the cluster.
vserver iscsi create -vserver name -status-admin up	Cluster-Mode	Enables iSCSI on the specified Vserver.
vserver fcp create -vserver name -status-admin up	Cluster-Mode	Enables FC on the specified Vserver.
fcp status	7-Mode	Displays status of FC service.
fcp start stop	7-Mode	Starts and stops the FC service.
<pre>fcp config [adapter [up down] [partner {adapter None } -partner] [mediatype { ptp auto loop }]]</pre>	7-Mode	Configures the FC target adapters. For NearStore family you must put the ports into loop mode.
fcp show cfmodes	7-Mode	Displays the storage system cfmodes.
fcp show adapter [-v] [adapter]	7-Mode	Displays target adapter information.
fcp show initiator [-v] [adapter]	7-Mode	Displays information about initiators connected.
<pre>igroup create { -f -i } [-t ostype] initiator_group [node ...]</pre>	7-Mode	Creates a new initiator group (“-f” for fc).
igroup show [-v] [initiator_group]	7-Mode	Displays the nodes in a given initiator group.
igroup add initiator_group node	7-Mode	Adds a node to a given initiator group.

igroup set <i>igroup_name</i> alua yes	7-Mode	Enables ALUA on an igroup.
lun setup	7-Mode	Interactive LUN creation.
lun create -s <i>size</i> [-t <i>type</i>] [-o noreserve] <i>lun_path</i>	7-Mode	LUN creation command (non-scripted).
lun create -b <i>snapshot-lun-path</i> <i>lun_path</i>	7-Mode	Creates (writable) LUN storage at this LUN path.
lun clone start <i>lun_clone_path</i>	7-Mode	Clones a LUN.
lun map <i>lun_path</i> <i>initiator_group</i> [<i>lun_id</i>]	7-Mode	Makes a LUN accessible to initiator(s) in the specified group, at the LUN ID specified.
lun show [-v -m -c] [all mapped offline online unmapped -g <i>initiator_group</i> <i>lun_path</i>]	7-Mode	Displays information about all/specified subset of LUN(s).
lun stats [-z -k] [<i>lun_path</i>]	7-Mode	Display or zero block-protocol access stats.
lun online offline <i>lun_path</i>	7-Mode	Enables, disables block-protocol access to a LUN.
Notes		
- When setting up a LUN for FC access, space reservations are on by default at the LUN level. - To disable space reservation add the -o noreserve option to the lun create command. - Turn off scheduled snapshots: snap sched vol_name 0 0 0 or vol options vol_name nosnap on - When cloning a LUN make sure that the LUN is consistent, the file system cache has been cleared, and the application is in hot-backup mode for a DB or unmounted for other applications. - FilerView can be used for most of the above commands (http://filer.ip.address.xx/na_admin)		
iSCSI authentication (CHAP) management commands for 7-Mode		
iscsi security add -i <i>initiator</i> -s CHAP -p <i>inpassword</i> -n <i>iname</i> [-o <i>outpassword</i> -m <i>outname</i>]	Defines authentication method for specified initiator. For <i>initiator</i> , use node name in iqn format. Note that <i>iname</i> on storage system is set to outgoing user name on host. Use -o and -m for bidirectional CHAP.	
iscsi security default -s CHAP -p <i>inpassword</i> -n <i>iname</i> [-o <i>outpassword</i> -m <i>outname</i>]	Sets the default authentication method, user names, and passwords for all initiators not specifically configured.	
iSCSI authentication (CHAP) management commands for Cluster-Mode		
vserver iscsi security create -initiator <i>initiator</i> -auth-type CHAP -user-name <i>iname</i> -password <i>inpassword</i> [-outbound-user-name <i>outname</i> -outboundpassword <i>outpassword</i>]	Defines authentication method for specified initiator. For <i>initiator</i> , use the host's iSCSI node name in iqn or eui format. Note that <i>iname</i> on storage system is set to outgoing user name on host.	
vserver iscsi security show	Displays the current iSCSI authentication configuration.	
iSCSI target status, performance, and troubleshooting commands		
iscsi status	Displays current status of the iSCSI service.	
iscsi stats [-z]	Displays numbers of iSCSI PDUs and CDBs, and error statistics.	
ifstat [-z] -a <i>interface</i>	Displays device-level statistics for the specified network interface. Use -z to clear statistics. Use -a to display statistics for all interfaces.	
sysstat -i [<i>interval</i>]	Displays iSCSI performance statistics. <i>interval</i> is integer reporting interval in seconds; default is 15 seconds.	
lun stats [-z] [-o] [-a <i>lun_path</i>]	Displays block access statistics for the specified LUN. Use -z to clear statistics. Use -o for extended stats, -a to display stats for all LUNs.	
Logical interface (LIF) management commands for Cluster-Mode		
network interface create -vserver <i>name</i> -lif <i>lif_name</i> -role data -dataprotocol { iscsi fcp } -home-node <i>node</i> -home-port <i>port</i>	Creates a data LIF for either iSCSI or FC. Create a data LIF in each Vserver on each node to enable failover.	
Network interface show	Verifies status of LIFs.	
portset create -vserver <i>name</i> -portset <i>portset_name</i> -protocol mixed -port-name <i>lif</i> <i>list</i>	Creates a port set. Add the port set to an igroup to limit which LIFs can be used to access LUNs mapped to that igroup.	
LUN and igroup management commands for 7-Mode		
vol options <i>vol_name</i> nosnap on	Turns off scheduled snapshots for a volume containing LUNs.	
lun setup	Interactive LUN creation. Combines the lun create , igroup create , igroup add , and lun map command functions.	
lun create -s <i>size</i> [-t aix hpux image]	Manual LUN creation. Enter <i>size</i> as integer bytes with one of the	

netware linux solaris vld vmware windows] <i>lun_path</i>	following suffixes: m (megabytes), g (gigabytes), or t (terabytes).
igroup create -i [-t aix hpux default linux netware solaris vmware windows] <i>initiator_group [node...]</i>	Creates a new iSCSI initiator group. (Optional) specify the initiator node names (<i>node...</i>), or add them using the igroup add command.
igroup show [initiator_group]	Displays the initiator nodes in the specified initiator group. Omit <i>initiator_group</i> to see all igroups.
igroup add initiator_group node...	Adds initiator nodes to the specified igroup.
lun map lun_path initiator_group [lun_id]	Makes the specified LUN accessible to initiators in the specified igroup. Specify optional LUN ID, or take default of lowest available value.
lun show [-v -m -c] [all mapped offline online unmapped lun_path -g initiator_group]	Displays general (-v), mapping (-m), or clone (-c) information about the specified set of LUNs.
lun online offline lun_path...	Enables or disables block-protocol access to the specified LUNs.
lun destroy [-f] lun_path...	Destroys the specified LUNs and all their data. Use -f if LUN is in use.
LUN and igroup management commands for Cluster-Mode	
vserver setup	Interactive Vserver, volume, LUN, and igroup creation.
lun create -vserver name -volume vol_name -lun lun_name -size size -ostype type -space-reserve {enabled disabled}	Manual LUN creation. Enter <i>size</i> as an integer with one of the following suffixes: m (megabytes), g (gigabytes), or t (terabytes). Enter <i>type</i> as solaris .
igroup create -vserver name -igroup igroup_name -protocol {fc iscsi mixed} -ostype windows -initiator list [-portset portset name]	Manual initiator group creation. Specify the initiator WWPNs or iSCSI node name. Use the optional port set to limit which initiator ports access LUNs mapped to this igroup.
lun map -vserver name -volume vol_name -lun lun_name -igroup igroup_name [-lun-id integer]	Makes the specified LUN accessible to initiators in the specified igroup. Specify optional LUN ID, or take default of lowest available value.
lun igroup show [-vserver name] [-igroup igroup_name]	Displays the initiators in all igroups or in the specified initiator group or for the specified Vserver.
lun show [-instance] [parameters]	Lists LUNs. Use -instance to display more details. Add parameters to filter the list; run man lun show for available parameters.
lun modify -vserver name -volume vol_name -lun lun_name -state {online offline}	Enables or disables block-protocol access to the specified LUN.
lun delete -vserver name -volume vol_name -lun lun_name	Deletes the specified LUN and all its data.
General iSCSI notes	
The FilerView™ GUI can also be used for the above commands (http://stor_sys_ip_address/na_admin).	The iSCSI service on the storage system uses IP port 3260.
The format of an iSCSI node name is iqn.yyyy-mm.reverse_domain_name:anything and is automatically set on the storage system (target) and each host (initiator). It is recommended that you do not change the initiator node name.	
iSCSI host configuration commands – all commands require you to become superuser	
iscsiadm list initiator-node	Displays the iSCSI node name and settings of the initiator. It is recommended that you do <i>not</i> change the default name.
iscsiadm add discovery-address ip_address:3260	Configures the address of an iSCSI-enabled interface on the storage system. Configure any one iSCSI-enabled interface on each storage system. Note: Do not use iSNS discovery.
iscsiadm modify discovery --sendtargets enable	Enables dynamic target discovery. Issue after configuring the discovery address.
iscsiadm list discovery	Displays the target discovery status.
iscsiadm list target -v	Displays a list of iSCSI targets and the configured login parameters.
iscsiadm list target-param -v	Displays a list of iSCSI targets and the negotiated login parameters currently in use.
CHAP commands – all commands require you to become superuser	
iscsiadm modify initiator-node --CHAP-secret	Runs dialog to set secret for unidirectional CHAP. The value of the secret must be a string of 12 to 16 characters. The default CHAP username is the host iSCSI initiator node name.
iscsiadm modify target-param -B enable target	Enables bidirectional CHAP. Configure unidirectional CHAP first. Run each command in order shown. The <i>target</i> value is

<code>iscsiadm modify target-param --authentication CHAP target</code>	the target's iSCSI node name.
<code>iscsiadm modify target-param --CHAP-secret target</code>	
Accessing LUNs as disk devices – all commands require you to become superuser	
<code>devfsadm -i iscsi</code>	Discovers new LUNs and creates the iSCSI device links.
<code>/opt/NTAP/SANToolkit/bin/sanlun lun show all</code>	Lists available LUNs as seen by the sanlun utility.
<code>iscsiadm list target -S</code>	Lists LUNs discovered on each target during enumeration.
<code>format</code>	Partitions and formats LUNs.
Solaris and Veritas commands (see the man pages for more information)	
<code>devfsadm</code>	Administration command for /dev entries
<code>luxadm probe/display</code>	Get information on disks (probe) or multipathing (display) .
<code>metadb</code>	Set up database (-a -c 3 -f /dev/dsk/name) or get status (-i)
<code>metainit</code>	Create a Solaris volume.
<code>diskset</code>	Create a Solaris Volume Manager disk set.
<code>metastat</code>	Get status of your Solaris volumes.
<code>vxdiskadm</code>	VxVM utility for managing disks/LUNs.
<code>vxdisk list/scandisks</code> <code>vxdisk path 4.1 (mel) (MP2 only)</code>	VxVM utility for listing disks (list) and checking the status of disks (scandisks), or multipathing (path).
<code>vxldg list/init name namedisk01=c#t#d#</code> <code>namedisk02=c#t#d#</code>	VxVM disk group utility for listing disk groups and status as well adding disks to a given disk group.
<code>vxassist -g tester make testervol1 10m</code> <code>layout=stripe</code>	VxVM assistant that creates volumes from a given disk group. Options include size (10m) and layout (stripe).
<code>vxctl init/enable/disable</code>	VxVM daemon command (initialize, enable, disable).
<code>vxdisksetup -l c#t#d# ((online) initializing))</code>	VxVM utility that initializes (puts under VxVM Control) a disk.
<code>vxprint -g dg -ht</code>	VxVM utility that provides status of a given disk group and its associated mirrors (plexes).
<code>vxresize</code>	VxVM utility to resize a given volume.
<code>vxdkmpadm</code>	VxVM utility that administers Dynamic Multipathing (DMP).
<code>vxdkmpadm listenclosure all</code> <code>vxdkmsadm listenclosure</code> <code>dkmpnodename=enclos_name</code>	VxVM command that lists enclosures and storage arrays. Each storage system is listed by modelname.
<code>makefs -F vxfs /dev/vx/rdisk/vg/xxx</code>	Solaris command to create a File System on a VxVM volume.
<code>mpathadm list lu</code>	Solaris command to view paths.
<code>fsck -F vxfs</code>	Solaris utility that checks and repairs a given file system.
<code>fstyp (-v)</code>	Solaris utility that determines and displays the file system type.
<code>vxdkmpadm stat restore</code> <code>vxdkmpadm stop restore</code> <code>vxdkmpadm start restore policy=check_all</code> <code>interval=60</code>	Veritas commands that set the DMP daemon to optimal values for failover. See the Release Notes for information on how to ensure the settings persist across reboots.
Emulex commands (see the man pages for more information)	
<code>emlxadm</code>	Used to manage the firmware on the HBA. Is not specific to a multipathing solution.
iSCSI service management commands	
<code>iscsi start stop</code>	Starts or stops the iSCSI service.
<code>iscsi nodename [new_nodename]</code>	Displays or sets the iSCSI target node name.
<code>iscsi alias [-c new_alias]</code>	Displays, sets, or clears an alias for the iSCSI target node name.
<code>iscsi initiator show</code>	Displays information about initiators connected to target. (Data ONTAP® 7.1 & later)
<code>ifconfig [-a interface]</code>	Displays or configures network parameters for the specified interface. Use -a to display all network interfaces.
Commands specific to Data ONTAP 7.0.x	
<code>iscsi config [adapter [up down]]</code>	Configures the iSCSI target adapter up or down. Leave off up or down to

	display configurable information. Omit <i>adapter</i> to display all.
iscsi show adapter [<i>adapter...</i>]	Displays target adapter information for specified logical adapters.
iscsi show initiator [<i>adapter...</i>]	Displays information about initiators connected to specified adapters.
iswt interface show [- a <i>interface ...</i>]	Shows Show ISWT driver use of network interface.
iswt session show [- v] [<i>session_num</i>]	Show status of one session, or for all connections associated with a specified logical adapter if no session number is specified.
iswt interface enable {- a <i>interface...</i> }	Enables use of specified network interfaces by iswt. Use - a to enable all. NetApp recommends against enabling e0 for iSCSI traffic.
iswt interface disable [- f] {- a <i>interface...</i> }	Disables use of specified network interfaces by iswt . Use - a to disable all. Use - f to force termination of current sessions.
iSCSI software target and session management commands	
iscsi interface enable {- a <i>interface...</i> }	Enables use of specified network interfaces for iSCSI traffic. Use - a to enable all. Only gigabit Ethernet interfaces are recommended for iSCSI.
iscsi interface disable [- f] {- a <i>interface...</i> }	Disables use of specified network interfaces for iSCSI traffic. Use - a to disable all. Use - f to force termination of current sessions.
Commands specific to Data ONTAP 7.1 and later	
iscsi interface show [- a <i>interface ...</i>]	Shows which network interfaces are enabled for iSCSI traffic.
iscsi session show [- v] [<i>session_num</i>]	Shows status of one session or connection, or for all if no session number (and connection number for connection show) is specified.
iscsi connection show [- v] [<i>sess conn</i>]	
iscsi tpgroup create [- f] [- t <i>tpgtag</i>] <i>tpgroup_name</i> [<i>interface ...</i>]	Creates user-defined target portal group for multi-connection sessions. All session connections must use interfaces in the same target portal group.
Troubleshooting	
ping <i>storage_system_IP_address</i> (from host console) ping <i>host_IP_address</i> (from storage system console)	Verifies basic network connectivity between storage system and host.
license (from storage system console)	Verifies that iSCSI is licensed on the storage system.
ifconfig -a (from storage system console and host console)	Verifies that network parameters are compatible on host and storage system. Check duplex and jumbo frame (mtu) settings.
If using jumbo frames, verify that jumbo frames are configured on all switches between the host and storage system.	
If using CHAP, verify correct user names and passwords. The incoming values on the host are the outgoing values on the storage system. The outgoing values on the storage system are the incoming values on the host. For bidirectional, incoming and outgoing passwords must be different.	
Check the log file on the storage system (/etc/messages) for error messages.	
Check the log file on the host (/var/adm/messages) for error messages.	
Follow the Solaris iSCSI troubleshooting procedures in chapter 15 of the <i>Solaris System Administration Guide: Devices and File Systems</i> . Also check the troubleshooting section in the <i>Solaris Host Utilities 6.0 Installation and Setup Guide</i> .	
Search the NetApp Service and Support Knowledgebase at https://now.netapp.com/eservice/SupportHome.jsp for information about the problem.	
Is FC licensed and enabled? (fc status , fc config) Can the storage system see the host HBAs? (fc show initiator)	
Is the HBA set up correctly? (sanlun fcp show adapter -v , fcinfo hba-port , luxadm probe , luxadm display -v device_name)	
Do you have the recommended system setup? (OS cat /etc/release), patch, driver, and firmware levels)	
Are the LUN(s) mapped, online, and in a good state? (storage system: lun show -v mapped , host: sanlun lun show -p)	
Can the switch see the storage system and the host? Check cables for a bad cable by checking LEDs on HBAs, and switches.	
(MPxIO) Is the Sun Volume Manager (SVM) set up correctly (if you are using it)? (metastat -a) Are you using the correct FCode? (seli)	
(MPxIO) Is multipathing working? (luxadm display ; to view paths: mpathadm list lu) On Sparc systems, has MPxIO been enabled? (stmsboot -e)	
(MPxIO) Was ALUA enabled on the storage system before you mapped the LUNs to igroups? (igroup show -v , sanlun show -p)	
(DMP) Is Veritas installed and operational? Is the Veritas volume manager set up correctly (if you are using it)? (vxdisk list)	
Performance issues? Check LUN queues and HBA queues. Use diagnostic scripts to get information to review/send to support.	
Useful Resources	
NetApp Support Site (http://support.netapp.com)	Key NetApp resource for support, documentation, software, and more
Interoperability Matrix (support.netapp.com/matrix/mtx/login.do/)	Contains the latest list of NetApp supported hardware and software