

FC management commands	
fcpx status	Displays the status of the fc service on the storage system.
fcpx start stop	Starts or stops the fc service on the storage system.
fcpx config [<i>adapter</i> [up down] [partner { <i>adapter</i> None}] [-partner] [mediatype { ptp auto loop }] [speed { 1 2 4 auto }]]	Configures the Fibre Channel target adapters on the storage system. Not all versions of Data ONTAP® support 4-gigabyte speed. Enter fcpx config with no arguments to display adapter information.
fcpx show adapter [-v] [<i>adapter</i>]	Displays information about target adapters on the storage system.
fcpx show cfmodes	Displays the cfmodes of a storage system active/active configuration.
fcpx show initiator [-v] [<i>adapter</i>]	Displays information about initiators connected to the storage system.
license [add code]	Displays or adds license codes on the storage system. Use to verify that the Fibre Channel protocol is licensed.
FC target status, performance, and troubleshooting commands	
fcpx status	Displays the status of the fc service on the storage system.
sysstat -f	Displays aggregated storage system performance statistics for FC.
fcpx stats [-z] [<i>adapter</i>]	Displays statistics for the specified FC target adapter. Use -z to clear statistics.
fcpx stats -i interval [-c count] [-a <i>adapter</i>]	Displays FC performance statistics over a specified interval. <i>interval</i> is integer reporting interval in seconds. Specify <i>adapter</i> , or use -a to display statistics for all FC target adapters.
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.
lun config_check [-S] [-s -v]	Performs several checks on the lun/igroup/fcpx configuration of the storage system. Requires Data ONTAP 7.1 or later.
LUN and igroup management commands	
lun setup	Interactive LUN creation. Combines the lun create , igroup create , igroup add , and lun map command functions.
lun create -s size -t linux lun_path	Manual LUN creation. Enter <i>size</i> as integer bytes with one of the following suffixes: m (megabytes), g (gigabytes), or t (terabytes).
igroup create -f -t linux initiator_group [<i>WWPN...</i>]	Creates a new FC initiator group. Optionally specify the initiator worldwide port names (<i>WWPN...</i>), or add them using the igroup add command.
igroup show [<i>initiator_group</i>]	Displays the initiator nodes in the specified initiator group. Omit <i>initiator_group</i> to see all igroups.
igroup add initiator_group WWPN...	Adds initiator worldwide port names (<i>WWPN</i>) 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 <i>lun_path</i> -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] <i>lun_path...</i>	Destroys the specified LUNs and all their data. Use -f if LUN is in use.
General FC notes	
The FilerView® GUI can also be used for the above commands (http://stor_sys_ip_address/na_admin).	
FC host configuration files	
/etc/modprobe.conf	Contains HBA driver parameter settings.
/etc/fstab	Lists file systems on FC LUNs to mount.
/etc/multipath.conf	Lists local disks to exclude (blacklist) from multipathing and sets specific device parameters for NetApp storage systems.
QLogic® HBA commands	
scli -i	Lists HBA attributes, including <i>WWPN</i> .
scli -C wwpn	Lists all attributes for the specified <i>wwpn</i> , including firmware and driver versions.
Emulex® HBA commands	
/usr/sbin/hbanyware/hbacmd ListHBAs	Lists HBA attributes, including <i>WWPN</i> .
/usr/sbin/hbanyware/hbacmd HBAAttrib wwpn	Lists all attributes for the specified <i>wwpn</i> , including firmware and driver versions.

Multipathing (dm-multipath) commands	
<code>/etc/init.d/multipathd start</code>	Manually start the multipathing service on the Linux host.
<code>chkconfig --add multipathd</code> <code>chkconfig multipathd on</code>	Configure the multipath service to start automatically.
<code>multipath -ll</code>	Display the multipathing configuration.
<code>multipath -v2</code>	Creates the initial multipath configuration.
<code>multipath -f <device_map></code>	Removes an existing LUN from the multipath configuration.
Accessing LUNs as Linux disk devices	
<code>ql-dynamic-tgt-lun-disc.sh -s -r</code>	Re-scan QLogic HBAs to discover LUNs added and removed using the QLogic re-scan script.
<code>lun_scan all</code>	Re-scan Emulex HBAs to discover new LUNs and targets using the Emulex re-scan script.
<code>sanlun lun show all</code>	Lists available LUNs as seen by the sanlun script.
<code>sanlun lun show -p all</code>	Provides multipath information, for both native dm-multipath and Veritas Storage Foundation dynamic multipathing solutions.
<code>sanlun fcp show adapter -c all</code>	Generate igroup create commands that you can run on the storage system to create an initiator group for this host.
<code>ls -lh /dev/mapper/</code>	List multipath devices generated for LUNs when using dm-multipath.
<code>fdisk device</code>	Partition the LUN. <i>device</i> is the /dev/sdx name for the LUN. At least one partition is required if not using dm-multipath.
<code>mkfs -V -t ext3 device</code>	Create an ext3 file system on the partition or multipath <i>device</i> . For dm-multipath, create the file system on the /dev/mapper/ <i>device</i> .
<code>e2label device label</code>	Create a persistent label for the file system. <i>device</i> is the partition, <i>label</i> is a unique string (maximum 16 characters). Not needed when using dm-multipath.
<code>mount -a</code>	Mounts all file systems listed in /etc/fstab.
<code>df</code>	Lists all mounted file systems.
Troubleshooting	
<code>sanlun lun show all</code>	Verify that LUNs are visible to the host.
<code>sanlun lun show -p all</code>	Verify the multipath information.
<code>sanlun fcp show adapter -v all</code>	Verify that host's HBA worldwide port names.
<code>license</code> (from storage system console)	Verify that FC is licensed on the storage system.
<code>lsmod grep qla</code> <code>lsmod grep lpfc</code>	Verify that the QLogic or Emulex driver is loaded on the host.
<code>lsmod grep dm</code>	Verify that the dm-multipath driver is loaded on the host.
Verifying the driver settings: For QLogic HBA driver: Check the values in /sys/module/qla2xxx or /sys/module/qla2xxx/parameters/. For Emulex HBA driver: Check the values in /sys/class/scsi_host/host<adapter_number>.	
Check the log file on the storage system (/etc/messages) for error messages.	
Search the NetApp Service and Support Knowledgebase at https://now.netapp.com/eservice/SupportHome.jsp for information about the problem.	
Before contacting NetApp Global Services with a problem, run the /opt/netapp/santools/linux_info and /opt/netapp/santools/filer_info scripts on the host to collect information to help diagnose the problem. Also run the appropriate script for your Fibre Channel switches.	
Resources	
http://now.netapp.com	All NetApp documentation and software downloads.
http://now.netapp.com/NOW/knowledge/docs/san/fcp_iscsi_config/fcp_support.shtml	FC support matrix.