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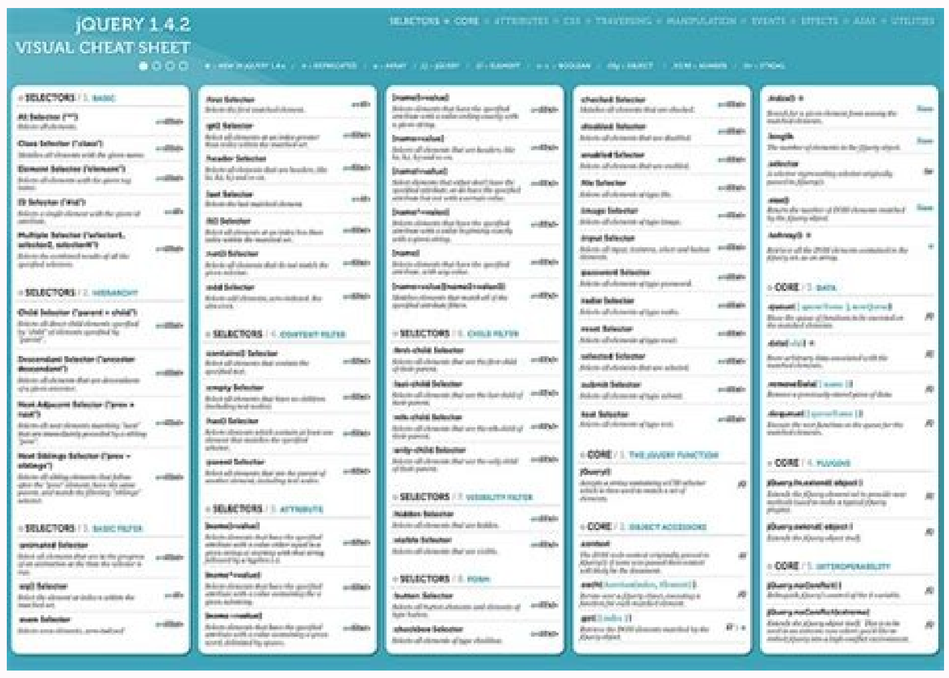
Netapp Cluster mode Commands cheat sheet



NetApp is popular for its cloud data storage and data management systems. As a Fortune 500 company since 2012, it has remained an important leader in cloud computing and storage devices. In 2020, NetApp was the leader in cost optimization and compute management in public clouds. ONTAP helps you manage clusters through commands, such as the ones found below. Common storage tasks like qtrees and volumes are discussed as well. However, these commands are found in many places across the web, and this cheat sheet only has some of the many NetApp commands. To learn about NetApp, our NetApp courses at QuickStart will guide you through every detail to ensure full competency. If you would like full access to over 900 self-paced IT certification training and courses, start your free trial with QuickStart today! Boot Menu 1) Normal Boot. 2) Boot without /etc/rc. 3) Change password. 4) Clean configuration and initialize all disks. 5) Maintenance mode boot. 6) Update flash from backup config. 7) Install new software first. 8) Reboot node. Selection (1-8)? • Normal Boot - continue with the normal boot operation • Boot without /etc/rc - boot with only default options and disable some services • Change Password - change the storage systems password • Clean configuration and initialize all disks - cleans all disks and reset the filer to factory default settings • Maintenance mode boot - file system operations are disabled with limited set of commands • Update flash from backup config - restore the configuration information if corrupted on the boot device • Install new software first - use this if the filer does not include support for the storage array • Reboot node - restart the filer startup modes • boot_ontap - boots the current Data ONTAP software release stored on the boot device • boot primary - boots the Data ONTAP release stored on the boot device as the primary kernel • boot_backup - boots the backup Data ONTAP release from the boot device • boot_diags - boots a Data ONTAP diagnostic kernel shutdown halt [-t] [-f] -t = shutdown after minutes specified -f = used with HA clustering, means that the partner filer does not take over restart reboot [-t] [-s] [-r] [-f] -t = reboot in specified minutes -s = clean reboot but also power cycle the filer (like pushing the off button) -r = bypasses the shutdown (not clean) and power cycles the filer -f = used with HA clustering and means that the partner filer does not take over System Privilege and System Shell Privilege priv set [-q] [admin | advanced] Note: by default, you are in administrative mode -q = quiet suppresses warning messages Access the systemshell ## First obtain the advanced privileges priv set advanced ## Then unlock and reset the diag users password useradmin diaguser unlock useradmin diaguser password ## Now you should be able to access the systemshell and use all the standard Unix ## commands systemshell login: diag password: ******** Licensing and Version licenses (commandline) ## display licenses license ## Adding a license license add ## Disabling a license license delete Data ONTAP version version [-b] -b = include name and version information for the primary, secondary and diagnostic kernels and the firmware Useful Commands read the messages file rdfile /etc/messages write to a file wrfile -a # Examples wrfile -a /etc/test1 This is line 6 # comment here wrfile -a /etc/test1 "This is line \"15\"." System Configuration General information sysconfig sysconfig -v sysconfig -a (detailed) Configuration errors sysconfig -c Display disk devices sysconfig -d sysconfig -A Display Raid group information sysconfig -V Display arregates and plexes sysconfig -r Display tape devices sysconfig -t Display tape libraries sysconfig -m Environment Information General information environment status Disk enclosures (shelves) environment shelf [adapter] environment shelf_power_status Chassis environment chassis list-sensors environment chassis Fans environment chassis CPU_Fans environment chassis Power environment chassis Temperature environment chassis [PS1|PS2] Fibre Channel Information Fibre Channel stats fcstat link_status fcstat fcal_stat fcstat device_map SAS Adapter and Expander Information Shelf information sasstat shelf sasstat shelf_short Expander information sasstat expander sasstat expander_map sasstat expander_phy_state Disk information sasstat dev_stats Adapter information sasstat adapter_state Statistical Information System stats show system Processor stats show processor Disk stats show disk Volume stats show volume LUN stats show lun Aggregate stats show aggregate FC stats show fcp iSCSI stats show iscsi CIFS stats show cifs Network stats show ifnet Storage Storage Commands Display storage show adapter storage show disk [-a|-x|-p|-T] storage show expander storage show fabric storage show fault storage show hub storage show initiators storage show mc storage show port storage show shelf storage show switch storage show tape [supported] storage show acp storage array show storage array show-ports storage array show-luns storage array show-config Enable storage enable adapter Disable storage disable adapter Rename switch storage rename Remove port storage array remove-port -p Load Balance storage load balance Power Cycle storage power_cycle shelf -h storage power_cycle shelf start -c storage power_cycle shelf completed Aggregates Aggregate States Online Read and write access to volumes is allowed Restricted Some operations, like parity reconstruction, are allowed, but data access is not allowed Offline No access to the aggregate is allowed Aggregate Status Values 32-bit This aggregate is a 32-bit aggregate 64-bit This aggregate is a 64-bit aggregate aggr This aggregate is capable of containing FlexVol volumes copying This aggregate is currently the target aggregate of an active copy operation degraded This aggregate contains at least one RAID group with single disk failure that is not being reconstructed double degraded This aggregate contains at least one RAID group with double disk failure that is not being reconstructed (RAID-DP aggregate only) foreign Disks that the aggregate contains were moved to the current storage system from another storage system growing Disks are in the process of being added to the aggregate initializing The aggregate is in the process of being initialized invalid The aggregate contains no volumes and none can be added. Usually, this happens only after an aborted "aggr copy" operation ironing A WAFL consistency check is being performed on the aggregate mirror degraded The aggregate is mirrored and one of its plexes is offline or resynchronizing mirrored The aggregate is mirrored needs check WAFL consistency check needs to be performed on the aggregate normal The aggregate is unmirrored and all of its RAID groups are functional out-of-date The aggregate is mirrored and needs to be resynchronized partial At least one disk was found for the aggregate, but two or more disks are missing raid0 The aggregate consists of RAID 0 (no parity) RAID groups raid4 The aggregate consists of RAID 4 RAID groups raid_dp The aggregate consists of RAID-DP RAID groups reconstruct At least one RAID group in the aggregate is being reconstructed redirect Aggregate reallocation or file reallocation with the "-p" option has been started on the aggregate, read performance will be degraded resyncing One of the mirror aggregates plexes is being resynchronized snapmirror The aggregate is a SnapMirror replica of another aggregate (traditional volumes only) trad The aggregate is a traditional volume and cannot contain FlexVol volumes. verifying A mirror operation is currently running on the aggregate wafl inconsistent The aggregate has been marked as corrupted; contact technical support Aggregate Commands Displaying aggr status aggr status -r aggr status [-v] Check you have spare disks aggr status -s Adding (creating) ## Syntax - if no option is specified then the defult is used aggr create [-f] [-m] [-n] [-t {raid0 |raid4 |raid_dp}] [-r raid_size] [-T disk_type] [-R rpm>] [-L] [-B {32|64}] ## create aggregate called newaggr that can have a maximum of 8 RAID groups aggr create newaggr -r 8 -d 8a.16 8a.17 8a.18 8a.19 ## create aggregated called newfastaggr using 20 x 15000rpm disks aggr create newfastaggr -R 15000 20 ## create aggrgate called newFCALaggr (note SAS and FC disks may bge used) aggr create newFCALaggr -T FCAL 15 Note: -f = overrides the default behavior that does not permit disks in a plex to belong to different disk pools -m = specifies the optional creation of a SyncMirror -n = displays the results of the command but does not execute it -r = maximum size (number of disks) of the RAID groups for this aggregate -T = disk type ATA, SATA, SAS, BSAS, FCAL or LUN -R = rpm which include 5400, 7200, 10000 and 15000 Remove(destroying) aggr offline aggr destroy Unremoving (undestroying) aggr undestroy Rename aggr rename Increase size ## Syntax aggr add [-f] [-n] [-g {raid_group_name | new |all}] ## add an additonal disk to aggregate pfvAggr, use "aggr status" to get group name aggr status pfvAggr -r aggr add pfvAggr -g rg0 -d v5.25 ## Add 4 300GB disk to aggregate aggr1 aggr add aggr1 4@300 offline aggr offline online aggr online restricted state aggr restrict Change an aggregate options ## to display the aggregates options aggr options ## change a aggregates raid group aggr options raidtype raid_dp ## change a aggregates raid size aggr options raidsize 4 show space usage aggr show_space Mirror aggr mirror Split mirror aggr split Copy from one agrregate to another ## Obtain the status aggr copy status ## Start a copy aggr copy start ## Abort a copy - obtain the operation number by using "aggr copy status" aggr copy abort ## Throttle the copy 10=full speed, 1=one-tenth full speed aggr copy throttle Scrubbing (parity) ## Media scrub status aggr media_scrub status aggr scrub status ## start a scrub operation aggr scrub start [aggrname | plexname | groupname] ## stop a scrub operation aggr scrub stop [aggrname | plexname | groupname] ## suspend a scrub operation aggr scrub suspend [aggrname | plexname | groupname] ## resume a scrub operation aggr scrub resume [aggrname | plexname | groupname] Note: Starts parity scrubbing on the named online aggregate. Parity scrubbing compares the data disks to the parity disk(s) in their RAID group, correcting the parity disk's contents as necessary. If no name is given, parity scrubbing is started on all online aggregates. If an aggregate name is given, scrubbing is started on all RAID groups contained in the aggregate. If a plex name is given, scrubbing is started on all RAID groups contained in the plex. Look at the following system options: raid.scrub.duration 360 raid.scrub.enable on raid.scrub.perf_impact low raid.scrub.schedule Verify (mirroring) ## verify status aggr verify status ## start a verify operation aggr verify start [aggrname] ## stop a verify operation aggr verify stop [aggrname] ## suspend a verify operation aggr verify suspend [aggrname] ## resume a verify operation aggr verify resume [aggrname] Note: Starts RAID mirror verification on the named online mirrored aggregate. If no name is given, then RAID mirror verification is started on all online mirrored aggregates. Verification compares the data in both plexes of a mirrored aggregate. In the default case, all blocks that differ are logged, but no changes are made. Media Scrub aggr media_scrub status Note: Prints the media scrubbing status of the named aggregate, plex or group. If no name is given, then status is printed for all RAID groups currently running a media scrub. The status includes a percent-complete and whether it is suspended. Look at the following system options: raid.media_scrub.enable on raid.media_scrub.rate 600 raid.media_scrub.spares.enable on Volumes Volume States Online Read and write access to this volume is allowed. Restricted Some operations, such as parity reconstruction, are allowed, but data access is not allowed. Offline No access to the volume is allowed. Volume Status Values access denied The origin system is not allowing access. (FlexCache volumes only.) active redirect The volume's containing aggregate is undergoing reallocation (with the -p option specified). Read performance may be reduced while the volume is in this state. connecting The caching system is trying to connect to the origin system. (FlexCache volumes only.) copying The volume is currently the target of an active vol copy or snapmirror operation. degraded The volume's containing aggregate contains at least one degraded RAID group that is not being reconstructed after single disk failure. double degraded The volume's containing aggregate contains at least one degraded RAID-DP group that is not being reconstructed after double disk failure. flex The volume is a FlexVol volume. flexcache The volume is a FlexCache volume. foreign Disks used by the volume's containing aggregate were moved to the current storage system from another storage system. growing Disks are being added to the volume's containing aggregate. initializing The volume's containing aggregate is being initialized. invalid The volume does not contain a valid file system. ironing A WAFL consistency check is being performed on the volume's containing aggregate. lang mismatch The language setting of the origin volume was changed since the caching volume was created. (FlexCache volumes only.) mirror degraded The volume's containing aggregate is mirrored and one of its plexes is offline or resynchronizing. mirrored The volume's containing aggregate is mirrored. needs check A WAFL consistency check needs to be performed on the volume's containing aggregate. out-of-date The volume's containing aggregate is mirrored and needs to be resynchronized. partial At least one disk was found for the volume's containing aggregate, but two or more disks are missing. raid0 The volume's containing aggregate consists of RAID0 (no parity) groups (array LUNs only). raid4 The volume's containing aggregate consists of RAID4 groups. raid_dp The volume's containing aggregate consists of RAID-DP groups. reconstruct At least one RAID group in the volume's containing aggregate is being reconstructed. redirect The volume's containing aggregate is undergoing aggregate reallocation or file reallocation with the -p option. Read performance to volumes in the aggregate might be degraded. rem vol changed The origin volume was deleted and re-created with the same name. Re-create the FlexCache volume to reenable the FlexCache relationship. (FlexCache volumes only.) rem vol unavail The origin volume is offline or has been deleted. (FlexCache volumes only.) remote nvram err The origin system is experiencing problems with its NVRAM. (FlexCache volumes only.) resyncing One of the plexes of the volume's containing mirrored aggregate is being resynchronized. snapmirrored The volume is in a SnapMirror relationship with another volume. trad The volume is a traditional volume. unrecoverable The volume is a FlexVol volume that has been marked unrecoverable; contact technical support. unsup remote vol The origin system is running a version of Data ONTAP the does not support FlexCache volumes or is not compatible with the version running on the caching system. (FlexCache volumes only.) verifying RAID mirror verification is running on the volume's containing aggregate. wafl inconsistent The volume or its containing aggregate has been marked corrupted; contact technical support . General Volume Operations (Traditional and FlexVol) Displaying vol status vol status -v (verbose) vol status -l (display language) Remove (destroying) vol offline vol destroy Rename vol rename online vol online offline vol offline restrict vol restrict decompress vol decompress status vol decompress start vol decompress stop Mirroring vol mirror volname [-n][-v victim_volname][-f][-d] Note: Mirrors the currently-unmirrored traditional volume volname, either with the specified set of disks or with the contents of another unmirrored traditional volume victim_volname, which will be destroyed in the process. The vol mirror command fails if either the chosen volname or victim_volname are flexible volumes. Flexible volumes require that any operations having directly to do with their containing aggregates be handled via the new aggr command suite. Change language vol lang Change maximum number of files ## Display maximum number of files maxfiles ## Change maximum number of files maxfiles Change root volume vol options root Media Scrub vol media_scrub status [volname|plexname|groupname -s disk-name][-v] Note: Prints the media scrubbing status of the named aggregate, volume, plex, or group. If no name is given, then status is printed for all RAID groups currently running a media scrub. The status includes a percent-complete and whether it is suspended. Look at the following system options: raid.media_scrub.enable on raid.media_scrub.rate 600 raid.media_scrub.spares.enable on FlexVol Volume Operations (only) Adding (creating) ## Syntax vol create vol_name [-l language_code] [-s {volume|file|none}] size{k|m|g|t} ## Create a 200MB volume using the english character set vol create newvol -l en aggr1 200M ## Create 50GB flexvol volume vol create vol1 aggr0 50g additional disks ## add an additional disk to aggregate flexvol1, use "aggr status" to get group name aggr status flexvol1 -r aggr add flexvol1 -g rg0 -d v5.25 Resizing vol size [+|-] n{k|m|g|t} ## Increase flexvol1 volume by 100MB vol size flexvol1 + 100m Automatically resizing vol autosize vol_name [-m size {k|m|g|t}] [-I size {k|m|g|t}] on ## automatically grow by 10MB increaments to max of 500MB vol autosize flexvol1 -m 500m -I 10m on Determine free space and Inodes df -Ah df -I Determine size vol size automatic free space preservation vol options try_first [volume_grow|snap_delete] Note: If you specify volume_grow, Data ONTAP attempts to increase the volume's size before deleting any Snapshot copies. Data ONTAP increases the volume size based on specifications you provided using the vol autosize command. If you specify snap_delete, Data ONTAP attempts to create more free space by deleting Snapshot copies, before increasing the size of the volume. Data ONTAP deletes Snapshot copies based on the specifications you provided using the snap autodelete command. display a FlexVol volume's containing aggregate vol container Cloning vol clone create clone_vol [-s none|file|volume] -b parent_vol [parent_snap] vol clone split start vol clone split stop vol clone split estimate vol clone split status Note: The vol clone create command creates a flexible volume named clone_vol on the local filer that is a clone of a "backing" flexible volume named par_ent_vol. A clone is a volume that is a writable snapshot of another volume. Initially, the clone and its parent share the same storage; more storage space is consumed only as one volume or the other changes. Copying vol copy start [-S|-s snapshot] vol copy status vol copy abort vol copy throttle ## Example - Copies the nightly snapshot named nightly.1 on volume vol0 on the local filer to the volume vol0 on remote ## filer named toaster1. vol copy start -s nightly.1 vol0 toaster1:vol0 Note: Copies all data, including snapshots, from one volume to another. If the -S flag is used, the command copies all snapshots in the source volume to the destination volume. To specify a particular snapshot to copy, use the -s flag followed by the name of the snapshot. If neither the -S nor -s flag is used in the command, the filer automatically creates a distinctively-named snapshot at the time the vol copy start command is executed and copies only that snapshot to the destination volume. The source and destination volumes must either both be traditional volumes or both be flexible volumes. The vol copy command will abort if an attempt is made to copy between different volume types. The source and destination volumes can be on the same filer or on different filers. If the source or destination volume is on a filer other than the one on which the vol copy start command was entered, specify the volume name in the filer_name:volume_name format. Traditional Volume Operations (only) adding (creating) vol|aggr create vol_name -v [-l language_code] [-f] [-m] [-n] [-v] [-t {raid4|raid_dp}] [-r raidsize] [-T disk-type] -R rpm] [-L] disk-list ## create traditional volume using aggr command aggr create tradvol1 -l en -t raid4 -d v5.26 v5.27 ## create traditional volume using vol command vol create tradvol1 -l en -t raid4 -d v5.26 v5.27 ## Create traditional volume using 20 disks, each RAID group can have 10 disks vol create vol1 -r 10 20 additional disks vol add volname[-f][-n][-g]{ ndisks[@size]|-d } ## add another disk to the already existing traditional volume vol add tradvol1 -d v5.28 splitting aggr split Scrubing (parity) ## The more new "aggr scrub " command is preferred vol scrub status [volname|plexname|groupname][-v] vol scrub start [volname|plexname|groupname][-v] vol scrub stop [volname|plexname|groupname][-v] vol scrub suspend [volname|plexname|groupname][-v] vol scrub resume [volname|plexname|groupname][-v] Note: Print the status of parity scrubbing on the named traditional volume, plex or RAID group. If no name is provided, the status is given on all RAID groups currently undergoing parity scrubbing. The status includes a percent-complete as well as the scrub's suspended status (if any). Verify (mirroring) ## The more new "aggr verify" command is preferred ## verify status vol verify status ## start a verify operation vol verify start [aggrname] ## stop a verify operation vol verify stop [aggrname] ## suspend a verify operation vol verify suspend [aggrname] ## resume a verify operation vol verify resume [aggrname] Note: Starts RAID mirror verification on the named online mirrored aggregate. If no name is given, then RAID mirror verification is started on all online mirrored aggregates. Verification compares the data in both plexes of a mirrored aggregate. In the default case, all blocks that differ are logged, but no changes are made. FlexClone Volumes FlexClone Commands Display vol status vol status -v df -Lh adding (create) ## Syntax vol clone create clone_name [-s {volume|file|none}] -b parent_name [parent_snap] ## create a flexclone called flexclone1 from the parent flexvol1 vol clone create flexclone1 -b flexvol1 Removing (destroy) vol offline vol destroy splitting ## Determine the free space required to perform the split vol clone split estimate ## Double check you have the space df -Ah ## Perform the split vol clone split start ## Check up on its status vol colne split status ## Stop the split vol clone split stop log file /etc/log/clone The clone log file records the following information: • Cloning operation ID • The name of the volume in which the cloning operation was performed • Start time of the cloning operation • End time of the cloning operation • Parent file/LUN and clone file/LUN names • Parent file/LUN ID • Status of the clone operation: successful, unsuccessful, or stopped and some other details QTrees QTree Commands Display qtree status [-i] [-v] Note: The -i option includes the qtree ID number in the display. The -v option includes the owning vFiler unit, if the MultiStore license is enabled. adding (create) ## Syntax - by default wafl.default_qtree_mode option is used qtree create path [-m mode] ## create a news qtree in the /vol/users volume using 770 as permissions qtree create /vol/users/news -m 770 Remove rm -Rf Rename mv convert a directory into a qtree directory ## Move the directory to a different directory mv /n/joel/vol1/dir1 /n/joel/vol1/olddir ## Create the qtree qtree create /n/joel/vol1/dir1 ## Move the contents of the old directory back into the new QTree mv /n/joel/vol1/olddir/* /n/joel/vol1/dir1 ## Remove the old directory name rmdir /n/joel/vol1/olddir stats qtree stats [-z] [vol_name] Note: -z = zero stats Change the security style ## Syntax qtree security path {unix | ntfs | mixed} ## Change the security style of /vol/users/docs to mixed qtree security /vol/users/docs mixed File Access using HTTP HTTP Options enable options httpd.enable on disable options httpd.enable off Enabling or disabling the bypassing of HTTP traverse checking options httpd.bypass_traverse_checking on options httpd.bypass_traverse_checking off Note: this is similar to the FTP version root directory options httpd.rootdir /vol0/home/users/pages Host access options httpd.access host=Host1 AND if=e3 options httpd.admin.access host!=Host1 HTTP Commands Log files /etc/log/httpd.log # use the below to change the logfile format options httpd.log.format alt1 Note: use rdfile to view redirects redirect /cgi-bin/* pass rule pass /image-bin/* fail rule fail /usr/forbidden/* mime types /etc/httpd.mimetypes Note: use rdfile and wrfile to edit interface firewall ifconfig f0 untrusted stats httpstat [-dersta] # reset the stats httpstat -z[derta] Network Interfaces Display ifconfig -a ifconfig IP address ifconfig e0 ifconfig e0a # Remove a IP Address ifconfig e3 0 subnet mask ifconfig e0a netmask broadcast ifconfig e0a broadcast media type ifconfig e0a mediatype 100tx-fd maximum transmission unit (MTU) ifconfig e8 mtusize 9000 Flow control ifconfig # example ifconfig e8 flowcontrol none Note: value is the flow control type. You can specify the following values for the flowcontrol option: none - No flow control receive - Able to receive flow control frames send - Able to send flow control frames full - Able to send and receive flow control frames The default flowcontrol type is full. trusted ifconfig e8 untrusted Note: You can specify whether a network interface is trustworthy or untrustworthy. When you specify an interface as untrusted (untrustworthy), any packets received on the interface are likely to be dropped. HA Pair ifconfig e8 partner ## You must enable takeover on interface failures by entering the following commands: options cf.takeover.on_network_interface_failure enable ifconfig interface_name {nfo|-nfo} nfo — Enables negotiated failover -nfo — Disables negotiated failover Note: In an HA pair, you can assign a partner IP address to a network interface. The network interface takes over this IP address when a failover occurs Alias # Create alias ifconfig e0 alias 192.0.2.30 # Remove alias ifconfig e0 -alias 192.0.2.30 Block/Unblock protocols # Block options interface.blocked.cifs e9 options interface.blocked.cifs e0a,e0b # Unblock options interface.blocked.cifs "" Stats ifstat netstat Note: there are many options to both these commands so I will leave to the man pages bring up/down an interface ifconfig up ifconfig down Routing default route # using wrfile and rdfile edit the /etc/rc file with the below route add default 192.168.0.254 1 # the full /etc/rc file will look like something below hostname netapp1 ifconfig e0 192.168.0.10 netmask 255.255.255.0 mediatype 100tx-fd route add default 192.168.0.254 1 routed on enable/disable fast path options ip.fastpath.enable {on|off} Note: on — Enables fast path off — Disables fast path enable/disable routing daemon routed {on|off} Note: on — Turns on the routed daemon off — Turns off the routed daemon Display routing table netstat -rn route -s routed status Add to routing table route add 192.168.0.15 gateway.com 1 NetApp Training We hope you found this NetApp Clustered ONTAP CLI commands cheat sheet useful. 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