American Megatrends

StorTrends®
iTX Software
CLI (Command Line Interface)
(Version 2.7)
User's Guide

Revision History

02/16/06	Created iTX 2.1 CLI document.
02/16/06	iSCSI Tape command added.
02/16/06	UPS driver config command added.
02/23/06	Synchronous replication commands added.
06/20/06	Volume and Snapshot commands updated.
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06/07/10	Removed the term apple
06/07/10	Corrected set -t nfs command.
06/07/10	Corrected set raid commands.
06/07/10	Added available cache options for create raid.
06/07/10	Since alarm and cache is supported for set raid; the 'not supported' was removed.
06/07/10	Osinfo commands removed.

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Chapter 1　　Overview of CLI

Preface

Our feature rich StorTrends® iTX comes with a built-in command line interface (CLI) that provides extensive options to monitor and control "managed objects". Wherever applicable, CLI follows industry standards and uses extensible 'tags' for new features and objects. The command line utility can be accessed through an in-band special console connected to the StorTrends® iTX system or out-of-band via a SSH or telnet client. It can also be used with scripting languages to automate a set of operations.

Overview of CLI

Our CLI supports commands in excess of 140 verbs and supports XML output format. The design is very similar to DMTF SMASH specifications and is being extended to fully comply with SMASH. Every managed element or object has a SMASH compliant <Target> addressing conforming to the server management instance addressing specification. The commands implemented are essentially "stateless" in nature. SMASH compliant <Verbs> is used to select the management actions, which are complemented by extensive <Option> attributes to control the behavior of the command. <Property> attributes can control the behavior of the output produced by the <Verb> along with various other mapping actions to the CIM schema.

The output produced can be controlled depending on the need, For example, in automation scripting. Output can also be made to be in the W3C standard compliant, self-descriptive XML format. The output format includes new tags pertinent to the object management. Inherent support for multi-lingual documents and Unicode data, along with content separation from presentation, aids in development of management applications that have their own data representation format. CLIs used for monitoring of performance parameters are dished out in XML tags that assist in graphing and charting, and can be right away imported by spreadsheet applications.

Accessing CLI

The CLI can be accessed either through an in-band console connected directly to the ITX box or through the out-of-band / remote CLP agents. It can also be accessed through a remote terminal emulation program using SSH or Telnet. Once connected, the administrator has to login to the system to perform the operations. In a typical console session, the user will be presented with a login screen such as:

```
login: cli <Enter>
password: ******* <Enter>
```

"cli" is the special user that has been provided with CLI access. The password is factory defaulted to "password". Once logged in, the system will present the user with a CLI shell as follows:

```
CLI>
```

The user can then enter the supported commands in any order. The supported commands are listed in the next section. To close the session, the user can type the command 'quit'. This will end the session.

Initial Setup

Network Configuration

Once the StorTrends® iTX is installed in a new system, please ensure that the initial network configuration is proper. The system factory defaults to DHCP setup. The configured network settings can be verified by the following CLI commands:

```
CLI> get    --type or -t port
            --name or -n NIC-1
            --info or -i
            network <Enter>

            Example: get -t port -n nic-1 -i network
```

This will display the NIC-1 network settings.

To configure static IP to this port:

```
CLI> set    --type or -t port
            --name or -n NIC-1
            --ip or -i 10.0.0.100
            --mask or -m 255.255.255.0
            --gate or -g 10.0.0.7 (optional)
            --pridns or -p 10.0.0.2 (optional)
            --secdns or -s 0.0.0.0 (optional)
            --dnssuff or -f ami.com (optional)
            network <Enter>

            Example: set -t port -n nic-1 -i 10.0.0.100 -g 10.0.0.7
            -p 10.0.0.2 -s 0.0.0.0 -f ami.com network
```

Here 10.0.0.100 is the static IP address, 255.255.255.0 is netmask and 10.0.0.7 is the network gateway.

Volume Configuration

Initial volume configuration can be done in three stages.

1. RAID Disk Creation

At the base level is the RAID CONTROLLER.

```
CLI> list    --type or –t controller
             raid <Enter>

             Example: list –t controller raid
```

This will list the available RAID controllers in the system. By default, Software MD will be shown as a RAID controller with controller number "0". If Hardware RAID controllers present, then they will take precedence over Software MD.

```
CLI> list    --type or –t PD
             --controllerno or –n 0
             raid <Enter>

             Example: list –t pd –n 0 raid
```

This will list the PD's that are available for configuration in controller number zero. PD's can be grouped through a RAID level to form a Logical disk – LD.

```
CLI>create   --type or –t LD
             --stripesize or –p 64
             --diskname or –d /dev/sda (use –d 1 or –d 2…15 on a 3U)
             --diskname or –d /dev/sdb
             --diskname or –d /dev/sdc
             --diskname or –d /dev/sdd
             --raidlevel or –r 0
             --controllerno or –n 0
             --cachemode or –m 3
             raid <Enter>

             Example: create –t ld –p 64 –d 1 –d 2 –r 1 –n 0 –m 2 raid
```

This will create a RAID 1 Logical Disk – LD with 64K-chunk size and two disks on a 3U.

```
             Example: create –t ld –p 64 –d /dev/sda –d /dev/sdb –d
             /dev/sdc –r 5 –n 0 –m 1 raid
```

This command will crate a RAID 5 Logical disk – LD with 64 k chunk size and three disks on a 1U box.

```
CLI> list    --type or –t LD
             raid <Enter>

             Example: list –t ld raid
```

This will list the available RAID LD's present in the system.

2. Container and Volume Configuration

Next step is the AMI DVM container creation. This can be done by the following commands:

```
CLI>create   --type or –t container
             --containername or –c container1
             --chunksize or –k 64
             --ldname or –l /dev/md0
             volume <Enter>

             Example: create –t container –c accounting –k 64 –l
             /dev/sdb volume (for a 3U)
```

This command creates a container named "accounting" from the LD /dev/sdb.

On a 1U, LDs are created with names of /dev/mdX, with X as 0, 1, and so on. Therefore the above operation would be accomplished by entering, for example:

```
             Example: create –t container –c marketing –k 64 –l
             /dev/md1 volume
```

The next step is the creation of volumes.

A NAS volume can be created by the following command:

```
CLI>create   --type or –t volume
             --containername or –c container1
             --volumename or –v nasvol0
             --volumesize or –z 1000 (in GB)
             --provisiontype or –p 0 (0 is thin-provisioned, 1 is exact)
             --volumetype or –e 0 (type 0 is ROW)
             --voldialect or –f 1 (dialect 1 is NAS, 0 is iSCSI)
             --chunksize or –k (8 or 64 for 8KB and 64KB chunk sized volume
                               respectively.)
             volume <Enter>

             Example: create –t volume –c container1 –v volume1 –z 1000 –p 0 –
             e 0 –f 1 –k 64 volume
```

This command creates volume "nasvol0" in container "container1" with size of 1000GB, that is thin-provisioned, Redirect-On-Write, and of NAS type with chunk size as 64KB.

Volume size should be in GBs and currently supported volume type is 0 – ROW.

Similarly a SAN volume can be created as follows:

```
CLI>create  --type or –t volume
            --containername or –c container1
            --volumename or –v sanvol0
            --volumesize or –z 1000
            --provisiontype or –p 0
            --volumetype or –e 0
            --voldialect or –f 0
            --chunksize or –k (8 or 64 for 8KB and 64KB chunk sized volume
                              respectively.)
            volume <Enter>

            Example: create –t volume –c container1 –v volume1 –z 1000 –p 0 –
            e 0 –f 1 –k 8 volume
```

This command creates volume "`sanvol0`" in container "`container1`" with size of 1000GB, that is thin-provisioned, Redirect-On-Write, and of SAN type with chunk size as 8KB.

3. Enabling Share or Target

To enable NAS share, use the following command syntax. Make sure the corresponding share protocol is enabled in the system.

First, create the directory in the path before creating a share for the path.

```
CLI>create  --path or –p container1_nasvol0/test
            dir<Enter>

            Example: create –p cont1_nasvol0/test dir
```

This command creates the subdirectory of "test" within the volume "nasvol0" in the container "cont1".

Then create the share using the following syntax.

```
CLI>add    --name or –n NASShare
           --path or –p container1_nasvol0/test
           --prototype or –s cifs
           --prototype or –s nfs
           share <Enter>

           Example: add –n nasshare –p cont1_nasvol0/test –s cifs –s
           nfs share
```

Note: The path specified should be of format:

            "ContainerName_VolumeName/directoryName".

To create a target, use the following commands.

```
CLI>add    --type or –t lun
           --volumename or –v sanvol0
           --containername or –c container1
           --targetname or –n sanvol0
           iscsi <Enter>

           Example: add –t lun –v sanvol0 –c cont1 –n sanvol0 iscsi
```

Then, to enable the target, use the syntax below:

```
CLI>enable  --type or -t tgt
            --targetname or -n sanvol0
            iscsi <Enter>

            Example: enable -t tgt -n sanvol0 iscsi
```

Next step is to activate a port for iSCSI traffic.

```
CLI>activate     --type or -t portal
            --ipaddress or -p 10.0.0.100
            --portaltag or -g 1 iscsi

            Example: activate -t portal -p 10.0.0.100 -g 2 iscsi
```

We recommend that you assign different portal tags to the two portals if they are on different subnets.

Chapter 2   Command Set

Command Set

The CLI design being similar to the DMTF SMASH specifications follows the standard to a great extent. The commands supported can be represented grammatically as follows:

`<verb> <option> … <property> <target>`

The CLI provides a wide range of command sets. These commands are grouped into modules for better understanding. Each command is non-interactive and state-less. The <options> are supported using switches. Our CLI accepts both short and long options for each switch to make it user-friendly. If there is any error in the parameters entered, the CLI will display the usage of that particular command.

CLI also provides extensive online help. Each command supports a help option using '-h' or '--help' that will display the grammar of the command.

To get the main list of targets or modules present in CLI, the user should type the command "main" at the CLI prompt.

The following targets will get displayed:

```
****************************************************************
                       TARGET LIST
---------------------------------------------------------------
        1. ug                            2. ups
        3. dir                           4. srm
        5. dump                          6. raid
        7. ndmp                          8. alert
        9. iscsi                        10. share
       11. quota                        12. system
       13. volume                       14. domain
       15. health                       16. license
       17. network                      18. journal
       19. eventlog                     20. protocol
       21. firewall                     22. datetime
       23. timezone                     24. serverinfo
       25. sysupgrade                   26. syncreplica
       27. asyncreplica                 28. recoverywizard
       29. snapvalidation
For more information on the targets please use the following command

        show -t/--target <targetname>

Note : Targetnames are case insensitive

Example :
        show -t iscsi
****************************************************************
```

The show option can also be used to show commands based on **<verb>**, and to display the list of targets or verbs available.

For example: To find out how the show command works, type:

```
CLI>show –h <Enter>
```

This will display the many ways the show command can be used.

 (this is redundant)
For example: To display the available targets/verbs, the user has to enter:

```
CLI>show –d targets <Enter>
CLI>show –d verbs <Enter>
```

The show option can display the functions available for a target or even the functions available for a verb.

For example: To display the functions available for targets/verbs the user has to enter:

```
CLI>show –t <targetname> <Enter>
          Example: show –t ups

CLI>show –v <verbname> <Enter>
          Example: show –v list
```

Note: In the table below, though the <target> is given in the first column together with <verb>, it should actually be typed at the end of command, complying with SMASH specification. Again, the target is not case-sensitive.

Alert Configuration

These commands configure the way alerts are generated.

Command	Argument	Description
get alert	-t/--type snmp For example: get –t snmp alert	Gives the SNMP alert configuration.
get alert	-t/--type email For example: get –t email alert	Gives the Email alert configuration.
delete alert	-t/--type snmp -v/--value <destination> -x/--xml alert For example: delete -t snmp -v 10.0.3.155 -v 10.0.0.203 -x alert	Deletes the SNMP specified destination from the alert configuration.
delete alert	-t/--type email -v/--value <emailaddress> -x/--xml alert For example: delete -t email -v sam@yahoo.com -v yyy@ami.com -x alert	Deletes the specified email address from the alert configuration.
set alert	-t/--type snmp -e/--enable or -d/--disable -v/--value <alertmask:communityname:destination> -x/--xml For example: set –t snmp –e –v 1:public:10.10.10.5 -x alert	Configures SNMP alerts. Note: <alertmask:communityname:destination> For example: <1:public:10.0.0.79>
set alert	-t/--type email -e/--enable or -d/--disable -v/--value <alertmask:language:emailaddr> -s/--emailserver (IP address) -F <Fully Qualified Domain Name> -x/--xml For example: set -t email -e -v 1:1:sam@yahoo.com -s 10.0.0.79 -F ami.com -x alert	Configures Email alerts. <alertmask:language:emailaddr> <1:1:aaaa@ami.com> Language 0-Unknown 1-English 2-Japanese 3-Korean 4-Chinese Alert Mask: 1 - Information 2 - Warning 4 - Fatal Any combination of the three alert masks up to a maximum of seven levels.

Date/Time Configuration

These commands configure the time zone and date.

Command	Argument	Description
set timezone	-z/--zone <zone name> -x/--xml For example: set –z America/New_York timezone	Sets the time zone of StorTrends® iTX to given time zone.
get timezone	For example: get timezone	Shows the configured time zone.
set datetime	-n/--ntp <FQDN of NTP server or ipaddress>	Configures the NTP server to be used for time synchronization.
get timezone	-c/--count	Gets the number of time zones.
set datetime	-d/--date <date in MM/DD/YYYY> -t/--time <time in HH:MM:SS> -x/--xml For example: set –d 12/01/2006 –t 12:11:55 datetime	Sets the date and time to given values.
list timezone	For example: list timezone	Lists the time zones supported.
get datetime	For example: get datetime	Shows the date & time.

Domain Configuration

These commands configure the domain server to be used for authentication.

Command	Argument	Description
get domain	-t/--type {nis/ms} -x/--xml For example: get –t nis domain	Displays the domain information of either NIS or Microsoft (MS) domains.
set domain	-t/--type{ nis } -b/--broadcast {y/n} -d/--domain <domainname > -s/--server <server-1> -s/--server <server-2> -x/--xml For example: set -t nis -b n -d NISSERV -s 10.0.0.215 -s 10.0.0.25 -s 10.0.0.5 domain	Sets the NIS domain to given domain with broadcast mode OFF or ON. Servers can be added using the –s/--server switch. If broadcast is set to OFF, then no servers are needed.
set domain	-t/--type {ms} -m/--mtype {wg} -d/--domain< domainname> -x/--xml For example: set -t ms -m wg -d MYGROUP domain	Sets the Microsoft domain type to Workgroup.
set domain	-t/--type {ms} -m/--mtype {/nt/ads} -d/--domain< domainname> -D/--nbname<netbiosname> (optional) -i/--ip <serverip> -I/--secip<secondary serverip> (optional) -o/--orgname <orgName> (optional) -u/--user <Adminname > -p/--passwd <Adminpassword> -x/--xml For example: set –t ms –m ads –d domain1.com –D domain1 –I 10.10.220.1 –u Administrator –p password domain	Sets the Microsoft domain type to NT / ADS.

Event log Commands

These commands display or clear the event log.

Command	Argument	Description
get eventlog	-s/--section {v/s/o/h} -o/--offset <record-offset> -n/--recordcount <record-count> -i/--info -f/--fatal -w/--warning or -a – all eventlog -x/--xml For example: get –s vs –o 2 –n 20 –f –w eventlog	Lists event log content matching the given criteria. v-Volume s-System o-OS h-Health
get eventlog	-c/--count -s/--section {v/s/o/h} -i/--info -f/--fatal -w/--warning or -a/-- all eventlog -x/--xml For example: cli get -s vsoh -a -c eventlog	Gets the number of events reported.
clear eventlog		Clears the complete event log.

Firewall Configuration

These commands configure the network firewall options.

Command	Argument	Description
add firewall	-a/--allow or -b/--block -i/--ip <ipaddress> -m/--mask <netmask> -p/--proto {icmp} -x/--xml	Add allowed or blocked firewall rule with given parameters for the ICMP protocol.
add firewall	-a/--allow -b/--block -i/--ip <ipaddress> -m/--mask <netmask> -s/--sport <start-port> -e/--eport <end-port> -p/--proto {tcp/udp} For example: add –a –i 10.10.1.1 –s 1200 –e 5000 – p tcp firewall	Add allowed or blocked firewall rule with given parameters for TCP and UDP protocols.
edit firewall	-a/--allow or -b/--block -r/--rule<ruleno> -i/--ip <IP address> -m/--mask <net mask> -p/--proto { icmp} -x/--xml For example: edit -a -i 10.0.0.218 -r 1 -m 255.255.255.255 -p icmp -x firewall	Modifies specified allowed or blocked firewall rule with given rule number to the given values for ICMP.
delete firewall	-a/--allow or -b/--block -r/--num <rule number>(obtained when viewing the list of firewalls via the list command below) -x/--xml For example: delete -b -r 1 -x firewall	Deletes allowed or blocked firewall rule with given rule number.
edit firewall	-a/--allow or -b/--block -r/--rule<ruleno> -i/--ip <IP address> -m/--mask <net mask> -s/--sport <start port> -e/--eport <end port> -p/--proto {tcp/udp} -x/--xml For example: edit -a -i 10.0.0.218 -r 1 -m 255.255.255.255 -s 2000 -e 3000 -p udp -x firewall	Modifies specified allowed or blocked firewall rule with given rule number to the given values for TCP or UDP.
list firewall		Lists all the blocked and allowed firewall rules.
get firewall	-c/--count -x/--xml For example: get -c -x firewall	Retrieves the count of allowed or blocked firewall rules.

General Server Configuration

These commands retrieve the general server information, such as build version, build date and so on. It also allows configuration of a new server name.

Command	Argument	Description
get serverinfo	For example: get serverinfo	Displays the server information such as server name, build version, build date and so on.
set serverinfo	-n/--name <server name> -x/--xml For example: set –n newitx serverinfo	Configures the name of the server. The length of the servername should be less than 16 characters and the first character must be alphabetical.
set serverinfo	-p/--password –u/--user{root/cli} -x/--xml	System will prompt you to enter and confirm the new administrator (root/cli) password. Password length should be 32 or less characters.
create dump		Creates a dump of the running system that is useful for debugging. The file is placed in /usr/AmiNas.

Health Configuration

These commands get the health information

Command	Argument	Description
get health	-c/--enccount -x/--xml For example: get –c health	Gets the number of enclosures present in the system.
get health	-i/--info –n/--enclosure -x/--xml For example: get –i –n 0 health	Gets the health information regarding fan, voltage and temperatures for the given enclosure.
get health	-s/--encstatus –n/--enclosure (optional) -x/--xml For example: get –s health get –s –n 0 health	Gets the enclosure status for the given enclosure or for all the enclosures.
get health	-a/-- -x/--xml For example: get –x –a health	Gets the enclosure status for all the enclosures.

iSCSI Configuration

Note: **`Targetname input:`** Only the suffix portion of the **`targetname`** is required.
For example: "iqn.1991-10.com.ami:itx001a2b3c4d5e2006:test1" . The user needs to input only "test1".

Command	Argument	Description
get iscsi	-t/--type {tgtstatus} -n/--targetname <targetsuffix> For example: get –t tgtstatus –n target1 iscsi	Gives the status of the target as enabled or disabled.
get iscsi	-t/--type {tgtname}	Gets the iSCSI target name. This value is not configurable and is unique to the iTX device. For example: iqn.1991-10.com.ami:itx0030482c8d788a7e
activate iscsi	-t/--type {portal} -p/--ipaddress <Ipaddress of the target machine> -g/--portaltag <portal tag> For example: activate –t portal –p 10.15.1.1 –g 3 iscsi	Activates the specified iSCSI portal. You have to specify a portal tag at the time of activation of the portal.
deactivate iscsi	-t/--type {portal} -p/--ipaddress <ipaddress of the target machine>	Deactivates the specified iSCSI portal.
enable iscsi	-t /--type {tgt} -n/--targetname <target suffix>	Enables the specified target.
disable iscsi	-t/--type {tgt} -n/--targetname <target suffix> For example: cli disable –t tgt –n newtgt iscsi	Disables the specified target.
start iscsi		To start the iSCSI service.
stop iscsi	For example: stop iscsi	To stop the iSCSI service.
set iscsi	-t/--type {params} -o/--choiceno {0-12} -l/--value <value> For example: set –t params –o 1 –l 256 iscsi.	Sets specified iSCSI Login negotiation parameters. The possible values are: 1. FirstBurstLength (0-256 KB, default=256) 2. MaxBurstLength (must be less than #1, default=256) 3. MaxRecvDataSegmentLength (0-256KB, default=256) 4. MaxConnections (0-4, default=2) 5. DefaultTime2Retain (0-3600, default=20 sec) 6. DefaultTime2Wait (0-3600,default=2 sec) 7. InitialR2T (0-1, default=No,0) 8. MaxOutStandingR2T (1-8, default=1 sec) 9. ErrorRecoveryLevel (0-2, default=2) 10. ImmediateData (0-1, default=1,yes) 11. DataPduInOrder (0-1, default=1,yes) 12. DataSeqInOrd (0-1,default=1,yes)
get iscsi	-t/--type {lunwritecachemode} -v/--volumename <volume name> -c/--containername <containername>	Gets the Write Cache mode for the specified disk.
set iscsi	-t/ --type {lunwritecachemode} -v/--volumename <volume name>	Sets the Write Cache mode for the specified disk.

Command	Argument	Description
	-c/--containername <containername> -m/--mode {0/1/2} For example: set –t lunwritecachemode –v v1 –c c1 –m 0 iscsi	0 – Write through 1 – Write back
add iscsi	-t/--type {processor} -n/--targetname <target suffix>	Adds the processor to the specified target (used for backup).
remove iscsi	-t/--type {processor} -n/--targetname <target suffix>	Removes the processor from the specified target.
get iscsi	-t/--type {statistics} For example: get –t statistics iscsi	Gets the iSCSI statistics, for example, No. of iSCSI PDU sent and received, payload, and login/session failures.
get iscsi	-t/--type {portalstatus} -p/--ipaddress <ipaddress>	Gets the iSCSI Portal Status.
get iscsi	-t/--type {servicestatus}	Gets the iSCSI service status. (Active/Inactive)
add iscsi	-t/--type {lun} -v/--volumename <volume name> -c/--containername <container name> -n/--targetname <targetsuffix>	Adds the LUN to the specified target.
remove iscsi	-t/--type {lun} -v/--volumename <volume name> -c/--containername <container name> -n/--targetname <target suffix>	Removes the LUN from the specified target.
get iscsi	-t/--type {sessions} For example: get –t sessions iscsi	Gets the current sessions details including session id.
remove iscsi	-t/--type {session} -s/--sessionid <session id>	Terminates the session with the given ID. To avoid automatic reconnection by the initiator, you will need to change the security settings for that target prior to termination.
list iscsi	-t/--type {tgt}	Gets the List of Targets available.
list iscsi	-t/--type {lun} -n/--targetname <target suffix>	Gets the available LUNs in the given target.
get iscsi	-t/--type {tgtauthsettings} -n/--targetname <target suffix>	Gets the Authorization settings for the target.
set iscsi	-t/--type {peersecret} -i/--initiatorname < initiatorname. (Default : none)> -s/--peersecret For example: set –t peersecret –I iqn.1991-10.com.microsoft:newbox –s iscsi	Sets the peer secret for the initiator. You will be prompted to enter this twice.
set iscsi	-t/--type {tgtauthsettings} -n/--targetname <targetsuffix> -u/--username <user name 'none' for default > -r/--secretname <user password 'none' for default > -i/--initiatorname <initiator name – 'none' for default>	Sets the Authorization settings for the target. The secret name should be at least 12 characters in size This will give exclusive access to the LUN for the specified user and initiator for maximum security.
get iscsi	-t/--type {lun} -n/--targetname <target suffix> -v/--volumename<volumename> -c/--containername<containername> -i/--info	Gives the LUN's Information for the specified target.
get iscsi	-t/--type {tgtoptimizations} -n/--targetname <target name>	Gives the Target's Optimization settings (i.e. whether multiple initiator logins are supported).
set iscsi	-t/--type {tgtoptimizations} -n/--targetname <target suffix> -p/ --multiplesession {y/n} -g/--nopinterval < nop ping internal >	Sets the Target's Optimization settings to allow/disallow multiple initiators logging in to a target simultaneously.

Command	Argument	Description
	For example: set –t tgtoptimizations –n t1 –p y –g 10 iscsi	
enable iscsi	-t/--type { iSNSservice}	Enables the iSNS Service.
disable iscsi	-t/--type { iSNSservice}	Disables the iSNS Service.
get iscsi	-t/--type {iSNS}	Gives the iSNS server's information i.e. iSNS server IP, server status, command description, last status message.
set iscsi	-t/--type {iSNS} -e/--entityname <entity name> -a /--aliasname <alias name>	Sets the specified iSNS information.
enumerate iscsi	-t/--type {initiator} -n/--targetname <target suffix, 'none' for default>	Gets the iSCSI initiators from the iSNS server.
add iscsi	-t/--type {iSNSServer} -i/--ipaddress <ip address>	Adds a new iSNS server.
remove iscsi	-t/--type {iSNSServer} -p/--ipaddress <ip address>	Removes an existing iSNS server.
rescan iscsi	-t/--type {iSNS}	Rescan for targets and initiators.
update iscsi	-t/--type {noderegistrations}	Updates the nodes that are registered with all iSNS servers this iTX device is registered with.
reset iscsi		Resets the iSCSI statistics.
get iscsi	-t/--type {params} -o/--choice {0-12}	Gets values of the specified iSCSI login negotiation parameters.
set iscsi	-t/--tgtname	This resets the base iSCSI target name of the iTX box This operation should be done with utmost precaution and there should not be any replication pairs in the box. Logout of all existing iSCSI sessions before running this command

License configuration

These commands configure the License.

Command	Argument	Description
set license	-k/--key <key> -x/--xml	Sets the entered license key to file.
set license	-f/--file <filename with path> -x/--xml	Sets the license according to the license key given in file path.
get license	-s/--serviceKey -x/--xml	Gets the license service key necessary if you want to upgrade your iTX license.
get license	-l/--licenseInfo -x/--xml	Gets the current license information.

Network Controller Configuration

These commands configure the network ports. They can also be used to create virtual bonding network ports (teams) for high availability and/or load balancing.

Command	Argument	Description
get network	-t/--type {port} -c/--count -x/--xml For example: get –t port –c count network	Gets the number of ports.
get network	-t/--type {port / alias} -n/ --name <name of the adapter > -i/--info -x/--xml	Displays the given network port information.
set network	-t/--type {port} -n/--name <Name of the NIC> -d/--dhcp -x/--xml For example: set –t port –n nic-1 –d network	Configures the given network port to work with DHCP.
set network	-t/--type {port / alias} -n/--name <Name of the NIC> -i/--ip <IP Address> -m/--mask <net mask> -g/--gate <Gateway> (optional) -p/--pridns <Primary DNS> (optional) -s/--secdns <Secondary DNS>(optional) -f/--dnssuff <DNS suffix>(optional) -j/--mtu <size> (optional)	Configures the specified network port to work with the given STATIC IP configuration.
get network	-t/--type {adp} -c/--count -x/--xml	Displays the number of network adapters present.
list network	-t/--type {adp}	Displays the available network adapters and their status.
create network	-t/--type {team} -m/--mode {1/2/3} -p/--pri <primary NIC> -s/--sec <secondary NIC> -x/--xml Creates a team named Team-1, Team-2, and so on, depending on available NICs in system For example: create –t team –p nic-1 –s nic-2 –m 1 network	Creates a network team with the given mode. The supported modes are: 1 – Balance Round Robin 2 – 802.3 AD (with pre-configured switch) 3 – Balance TB
delete network	-t/--type {team} -n/--name <name of the Team> -x/--xml For example: delete –t team –n Team-1 network	Deletes the network team with the given name.
get network	-t/--type {team} -i/--info -n/--name <name of the Team> -x/--xml For example: get –t team –i –n Team-1 network	Displays the number of NICs present in the given team.
get network	-t/--type {team} -i/--info -n/--name <name of the Team> -x/--xml	Displays the given network team information.
list network	-t/--type {adp/port} -x/--xml	Displays various information for the available network ports including their status.
add network	-t/--type alias -n/--name <alias name>	Adding an alias adapter for a specific NIC port

Command	Argument	Description
	-p/--port <adapter name>	
remove network	-t/--type alias -n/--name <alias name>	Removing an alias adapter

NAS Quota Configuration

These commands configure quotas for the NAS volumes of your iTX box.

Command	Argument	Description
get quota	-t/--type {user } -p/--path <volume path> -n/--name <user name> -x/--xml For example: get –t user –p c0_nas0 –n user1 quota	Displays the quota configured for the given member.
set quota	-t/--type {user } -p/--path <volume path> -n/--name <user name> -q/--quotasize <size> -f/--filecount <file count> -x/--xml For example: set –t user –p c0_nas0 –n user1 –q 4000 –f 400 quota	Configures the quota size of given member. Size should be entered in KB.
list quota	-p/--path <volume path> -x/--xml	Displays the user quota configured for a given volume as specified in path.
get quota	-p/--path <volume path> -d/--default -x/--xml	Displays the default quota configured for the volume.
set quota	-p/--path <volume path> -q/--quotasize (KB) <quota size> -d/--default [y/n] -x/--xml	Sets the default quota limit which should be used for a volume.

NAS User / Group Configuration

These commands allow viewing and configuration of the NAS Users and groups accounts.

Note: Known Issue: As iTX software supports enabling of ADS and NIS simultaneously, the user/group list retrieved will be given for both instead of singly.

Command	Argument	Description
add ug	-t/--type {user} -u/--username <user name> -i/--id <userid (optional)> -p/--passwd <password(optional)> -f/--fullname <Full name> -x/--xml For example: add –t user –u user1 –p password –f "User 1" ug	Adds a user. If password is not entered in command line, it will be prompted for. Username is case-sensitive, must be alphanumeric, and 8 -32 characters .
add ug	-t/--type {group} -g/--groupname <group name> -i/--id <group id (optional)> -x/--xml	Adds a group. Group name is case-sensitive, must be alphanumeric, and 8 -32 characters.
delete ug	-t/--type {user} -u/--username <username> -x/--xml	Deletes the given user.
get ug	-t/--type {user/group} -s/--section {local/ads/nis/all} -c/--count -x/--xml For example: get -t user -i -u test1 ug	Displays the count of users / groups of specified type.
list ug	-t/--type {user/group} -s/--section (local/ads/nis/all) -x/--xml For example: list -t user -s all ug	Displays the specified list of users / groups and their info.
get ug	-t/--type {group} -i/--info -g/--groupname <groupname> -x/--xml For example: get –t group –I –g groupA ug	Displays the group info.
get ug	-t/--type {user} -i/--info -u/--username <username> -x/--xml	Displays the specified user's info.
set ug	-t/--type { user} -u/--username <username> -p/--passwd <password> -f/--fullname <fullname> -x/--xml For exmaple: set -t user -u test1 -p test1 -f test1 ug	Changes the user info to given values for password and/or full name.
list ug	-t/--type {group} -g/--groupname <groupname> -x/--xml	Displays the users present in a particular group.
delete ug	-t/--type {group} -g/--groupname <groupname> -x/--xml	Deletes the given group.
delete ug	-t/--type {group} -g/--groupname <groupname> -u/--username <username> -x/--xml For example: cli delete –t group –g groupA –u user1 ug	Deletes the given user from the specified group.

Command	Argument	Description
set ug	-t/--type {group} -g/--groupname <groupname> -u/--username <username> -x/--xml	Adds the given user to the specified group. Multiple users can be added using –u/--username switch. (maximum of 8 users at a time)

Protocol Configuration

These commands configure the various network protocols supported.

Command	Argument	Description
get protocol	-t/--type {cifs/nfs/http/snmp/nis/ads/https/ftp/upnp}	Gets the status of cifs, nfs, http, snmp, nis, or ads protocols.
set protocol	-t/--type {cifs/nfs/apple/http/snmp/nis/ads/https/ftp/upnp} -d/--disable or -e/--enable -x/--xml For example: set –t cifs –e protocol	Enables or Disables the specified protocol.
get protocol	-t /--type {snmp} -n/--communityname For example: get –t snmp –n protocol	Gets the community name for snmp.
get protocol	-t/--type {cifs} -w/--winserver	Gets the Wins server address.
set protocol	-t/--type {cifs} -s/--winsserver <winsserver name> -m/--mtype {wg/nt/ads} -w/--workgroup <workgroupname> -x/--xml	Sets the Wins server address.
set protocol	-t/--type {snmp} -n/--communityname <communityname>	Sets the snmp community name By default, the public community name is supported.
set protocol	-t/--type {nfs} -i/--ipaddress <ipaddress or "world" > -d/--disable or -e/--enable -x/--xml For example: set -t nfs -i 10.0.0.124 -i 10.0.0.123 -e -x protocol	Sets the nfs clients.
list protocol		Lists all the protocols and whether they are enabled or disabled.
get protocol	-t/--type {nfs} -c/--count	Gets the number of NFS clients that have access to NAS shares.

RAID & Disk Management Commands

These commands allow management of disks and RAID creation.
For Hardware RAID please enter the Slotindex (For example: 1, 2,3, and so on) instead of diskname (For example: /dev/sda, /dev/sdb) in the option for -d / --diskname <DiskInfo_OSName or slotindex>

Command	Argument	Description
get raid	-t/--type {pd/ld/controller} -c/--count	Displays the number of disks, logical drives and controllers respectively.
get raid	-t/--type {controller} -a/--alarm -n <controllerno>	Displays the alarm mode and battery status of controllers respectively.
list raid	-t/--type {pd/ld/controller}	Displays the list of logical drives and controllers respectively.
list raid	-t/--type {pd/enclosure} -n <controllerno>	Displays the list of physical drives and enclosures for controller respectively.
list raid	-t/--type {spare}	Displays the list of spare disks.
get raid	-t/--type {pd} -i/--info -n/--controllerno <controller number> -d / --diskname <Diskname or slotindex>	Displays the information about specified disk.
get raid	-t/--type {pd} -d/--diskname <diskname or slotindex> -n <ControllerNo> -m/--cachemode For example: get –t pd –d 1 –n 0 –m raid	Gets the physical disk cache mode.
get raid	-t/--type {ld} -l/--ldname < Logical_Osname> -m/ --cachemode	Gets the logical drive cache setting.
rebuild raid	-d/--diskname <diskname or slotindex> -l/–ldname <ldname>	Rebuilds a logical drive with the specified disk drive.
create raid	-t/--type {ld} -s/ --disksize <disksize optional in GB> -p/--stripesize <stripe size 64 KB> -d / --diskname <diskname or slotindex> -a/--sparediskname <sparediskname> (optional) -e/--distspare <distributedspare> (optional) -r / --raidlevel <raid level(0/1/3/5/6/10/1N/10N/50/60) > -m/--cachemode <cachemode> -b/--subdisk <subdiskcount> -n/--controllerno <controllerno> For example: cli create -t ld -p 64 -d 1:5 -d 1:6 -r 0 -m WriteThrough:ReadAhead:Cached -n 0 raid	Creates a logical drive. -s/ --disksize – only supported for 3U For LSI RAID Controller - Cache Modes Format - writecache:readcache:cachemode writecache values - WriteThrough / WriteBack / ForceWriteBack readcache values - ReadAheadNone / ReadAhead / ReadAdaptive cachemode values - Direct / Cached -p/ --stripesize – only 64 kb supported for 3U Minimum LD size: 10 GB
delete raid	-t/--type {ld} -l / --ldname <drivename> For example: delete –t ld –l /dev/md1 raid (1U) For example: delete –t ld –l /dev/sdb raid (3U)	Deletes specified logical drive.

Command	Argument	Description
expand raid	-t/--type {ld} -l/ -- ldname <ldname > -d/ --diskname <diskname or slotindex(optional)> -s/--disksize <disksize in GB> -b/--subdisk <subdiskcount (Required only for RAID10N and RAID50)> -e/--distspare -n/--controllerno <controllerno (Required only for LSI RAID controller) For example: expand -t ld -l /dev/sdb -d 2 -s 20 raid	Expands the logical drive to specified disksize using specified disk.
transform raid	-t/--type {ld} -l / --ldname <ldname> -d / --diskname <diskname or slotindex > -r/ --raidlevel <raid level (0/1/3/5/6/10/1N/10N/50/60)> -s/--size <size (optional)> (enter ss for same size) -b/--subdisk <subdiskcount (Required only for RAID10N and RAID50)> -e/--distspare -n/--controllerno <controllerno (Required only for LSI RAID controller) For example: transform -t ld -l /dev/md0 -r 5 -d /dev/sda -d /dev/sdb raid	Transforms a logical drive.
blink raid	-t/--type {ld/pd} -d / --diskname<diskname or slotindex> -n/--controllerno <controllerno> For example: blink –t pd –l /dev/sda –n 0 raid	Blinks a disk (not supported on a 1U yet).
blink raid	-t/--type {ld/pd} -l / --ldname <ldname>	Blinks a logical drive (not supported on a 1U yet).

set raid	-t/--type {pd}
	-d / --diskname<diskname or slotindex>
	-m / --cachemode
	< diskcache mode>
	-n/--controllerno <controllerno>
	Cache Modes - pd
	  0 - None 1 - Read 2 - Read-Write
	  3 - Read-Ahead 4 - Read-Ahead-Write
	For example: set –t pd –d 2 –m 1 –n 0 raid
		Sets the cache mode for disk (HW RAID only).
		
		For LSI RAID Controller - Cache Modes Format - writecache:readcache:cachemode
		
		writecache values - WriteThrough / WriteBack / ForceWriteBack
		
		readcache values - ReadAheadNone / ReadAhead / ReadAdaptive
		
		cachemode values - Direct / Cached

set raid	-t/--type {pd} -d / --diskname<diskname or slotindex> -g/--makegood -n/--controllerno <controllerno> -x/--xml For example: set -t pd -d 1:2 -g -n 0 raid	

set raid	-t/--type {controller}
	-n/--controllerno<controller no>
	-a / --alarmmode <alarm mode>
	Alarm Modes - controller
	   0 - NP 1 - Enable 2 - Disable
	   3 - Mute 4 - UnMute
		Sets the alarm mode for controller

set raid	-t/--type {ld}	Set the cache mode for LD

Command	Argument	Description

	-l / --ldname <ldname>
	-m/--cachemode <cache mode>
	Cache Modes - ld
	   0 - None 1 - Read
	   2 - Write 3 - Read-Write	

rescan raid	-n/--controllerno <controller number>	Initiates rescanning of the storage bus connected to the controller.
remove raid	-t/--type {spare} -d / --diskname <diskname or slotindex> -l/ --ldname <ldname> (for dedicated spare) -n/--controllerno <controllerno> For example: remove -t spare -d 3 -n 0 raid remove -t spare -l /dev/md0 -d /dev/sdb raid	Removes a drive assigned as a spare disk or dedicated disk.
add raid	-t/--type {spare} -d / --diskname or slotindex or enclosurenumber:slotindex- l/--ldname <ldname>(for dedicated spare) -n/--controllerno <controllerno> For example: add -t spare -d 1:4 -n 0 raid	Adds the given drive as a global or dedicated hot spare.
upgrade raid	-t/--type {controller} -n/--controllerno <controller number> -o /--code <code> -l/ --length <length>	Upgrades the firmware for controller.
upgrade raid	-t/--type {pd} -d / --diskname <diskname or slotindex> -n/--controllerno <controller number> -o /--code <code> -l/ --length <length>	Upgrades the firmware for a physical disk.

Share, Directory & ACL Configuration

These commands work on NAS shares and directory.

Command	Argument	Description
create dir	-p/--path <directory path> -x/--xml For example: create –p c0_nas0/new dir	Creates a subdirectory with the given complete path.
list dir	-p/--path <directory path> -x/--xml	Displays all directories in the volume.
delete dir	-p/--path <directory path> -f/--force (optional) -x/--xml	Deletes a subdirectory with the given complete path. The complete path should also include the volume path exported by the system. The subdirectory should be empty before deletion. Note: the parent directory cannot be deleted For example: c0_nas0
list share		Displays all shares and details of each.
get share	-t/--type {share} -c/--count -x/--xml	Gets the number of shares.
get share	-t/--type {share} -i/--info -p/--path < path of the share > -x/--xml	Gets the share information according to the path given.
get share	-t/--type {acl} -p/--path < path of the share > -x/--xml	Gets the acl permissions of a share.
add share	-n/--name <name of the share > -p/--path <path to be added> - s/--prototype {cifs/nfs/upnp/apple/http/ftp} -x/--xml For example: add –n share0 –p c0_nas0/new –s cifs –s ftp share	Adds specified share to the system. Note: Please make sure a directory with the same path is made before creating a share
delete share	-t/--type {share} -n/--name <name of the share > -x/--xml For example: delete -t share –n share1 share	Deletes a share from the system.
delete share	-t/--type {acl} -p <directory path> -u/--username <username> or -g/--groupname <groupname> -x/--xml For example: delete -t acl -p c0_v0/test1 -u test1 share	Deletes a acl share from the system.
set share	-t/--type {acl} -x/--xml -p/--path <directory path> -m/--mode <USERNAME:MODE{user/group}:PERMISSIONS:INHERITANCE:ALLOW:LEVEL> -e/--enable or -d/--disable -v/--voltype (0 for NT 1 for posix) -i/--inherited (0 to not inherit 1 otherwise)share For example: set -t acl -p Cont0_Volume0/dir1 -m user1:user:agf:3:1:0 -m user2:user:agh:5:0:0 -m group1:group:gd:3:1:1 -e -v 1 -i 0 share	Sets the acl permission of the share (maximum of 4 ACL permissions can be entered at a time. And 237 acl permissions maximum per share). The -e/-d option is to enable or disable ACL recursively for the root folder and sub folders ALLOW FOR NT 0 - Allow ACE 1 - Deny ACE

		LEVEL FOR NT
		  0 - Apply to all levels 1 – Apply
		  to first level
		
		PERMISSIONS FOR POSIX
		 0 - Read Write 1 - Read Only
		 2 - Deny
		
		PERMISSIONS FOR NT : The 14
		bits in following order
		 A - Traverse Folder / Execute file
		 B - List Folder / Read Data
		 C - Read Attributes
		 D - Read Extended Attributes
		 E - Create files/ Write Data
		 F - Create folders / Append Data
		 G - Write Attributes
		 H - Write Extended Attributes
		 I - Delete Subfolders and files
		 J - Delete
		 K - Read Permissions
		 L - Change Permissions
		 m - Take Ownership
		
		INHERITANCE FOR NT
		 0 - No inheritance
		 1 - this folder sub folders and files
		 2 - this folder and sub folders
		 3 - this folder and files
		 4 - subfolders and files only
		 5 - subfolders only
		 6 - files only

set share	-t/--type {share} -n/--name <name of the share> -p/--path <path of the share> -s/--prototype <cifs/nfs/upnp/apple/http/ftp> -x/--xml For example: set -t share -n test1 -p Container0_Volume0/dir1 -s cifs -s http -s upnp share	Sets a share properties.

System Control Configuration

These commands configure the System controls.

Command	Argument	Description
shutdown system	For example: shutdown system	Shuts the system down.
get system	For example: cli get -x system	Gets the auto shutdown information.
set system	-f/--fansensors <on/off> -t/--tempsensors <on/off> -x/--xml	Sets the fan sensors or temperature sensors on or off for autoshutdown (only temperature supported at this release).
reboot system		Reboots the system.

Volume and Snapshot Commands

These commands manage the way Containers, Volumes and Snapshots are created, or expanded. While some of these commands are specific to either NAS or iSCSI volumes, most will work in both types of volumes.

Command	Argument	Description
create volume	-t/--type {container} -c/--containername<containername> -k/--chunksize< {64} in KB> -l/--ldname<logical device name> ..... For example: create –t container –c c0 –k 64 –l /dev/md2 volume (1U) For example: create –t container –c c0 –k 64 –l /dev/sdb volume (3U)	Creates a container. Note: The chunk size should be 64K The device name should be in the form /dev/mdx or /dev/sdx where x can be 0,1,2,3…
create volume	-t/--type { volume } -c/--containername <containername> -v/--volumename <volumename> -z/--volumesize <volumesize in GB> -k/-- <chunksize {64 or 8} in KB }><volumesize> -p/--provisiontype< provisiontype {0/1/2} > -e/--volumetype <volumetype {0} > -f/--voldialect <volumedialect {0/1} > For example: create -t volume -c Cont0 -v AutoNas -k 64 -z 20 -e 0 -p 2 -f 1 volume	Creates a Volume. Note: 1)volumetype ([0]-ROW 2) voldialect ([[0]-ISCSI [1]-NAS) 3)provisiontype ([0]-Thin [1]-Exact 2 – Auto(Nas Only) As a best practice measure, it is recommended that 20% of container capacity be reserved (left free) for snapshots.
create volume	-t/--type {snap} -c/--containername <containername> -v/--volumename <volumename> -s/--snapname <snapname> For example: create –t snap –c c0 –v v0 –s snap00 volume	Creates a read-only Snapshot. Note: A total of 254 read-only Snapshot can be created per volume. And the total number of snapshots (read-only + writable) is 992 per iTX device.
create volume	-t/--type {snap} -c/--containername <containername> -v/--volumename <volumename> -s/--snapname <snapname> -w/--writablesnapname<writablesnapname > For example: create –t snap –c c0 –v v0 –s snap00 –w wsnap00 volume	Creates a writable Snapshot over a read-only snapshot. Note: A total of 254 writable Snapshot can be created per volume. But the total number of snapshots (read-only + writable) should be 992 per iTX device.
create volume	-t/--type { snap } -c/--containername <containername> -v/--volumename <volumename> -s/--snapname <snapname> -R/--remotesnap	Creates a snapshot on the local target as well as the remote target if the volume is replication enabled. If only –R is given, only the remote snapshot is created. If only –L is

Command	Argument	Description
	-L/--localsnap	used, then only the local snapshot will be created. By default, without the switches –L and –R, it will create the local snapshot only.
delete volume	-t/--type {container} -c/--containername<containername> -f/--force (optional) -r/--recursive (optional)	Deletes the container. -r/ option deletes all volumes within the container recursively.
delete volume	-t/--type {volume} -c/ --containername <containername> -v/ --volumename <volumename> -f/--force (optional)	Deletes the specified Volume.
delete volume	-t/--type {snap} -c/ --containername <containername> -v/ --volumename <volumename> -s/ --snapname <snapname> -f/--force (optional)	Deletes the specified Snapshot.
delete volume	-t/--type {snap} -c/ --containername <containername> -v/ --volumename <volumename> -s/ --snapname <snapname> -L/--localsnap -R/--remotesnap -f/--force (optional) For example: delete –t snap –c c0 –v v0 –s snap00 –L –R –f volume	Deletes the Snapshot on the local target as well as the remote target if the volume is replication enabled. If –R is given, only the remote snapshot is deleted. If –L is used, only the local snapshot will be deleted. By default, without the switches –L and –R, it will delete the local snapshot.
delete volume	-t/--type {volume} -c/ --containername <containername> -a/--all -f/--force (optional)	Deletes all the volumes within that container.
delete volume	-t/--type {snap} -c/ --containername <containername> -v/ --volumename <volumename> -a/--all -f/--force (optional)	Deletes all Snapshots for that volume.
expand volume	-t/--type {container} -c/--containername <containername> -l/--ldname<logical device name> For example: expand –t container –c c0 –l /dev/sdc volume	Expands Container by adding the specified LD to it. Logical Device name eg;/dev/md0 Use:–l option
expand volume	-t/--type {volume} -c/--containername <containername> -v/--volumename <volumename> -z/-- capacity new volume size (in GB) For example: expand –t volume –c c0 –v v0 –z 300 volume	Expands Volume.
list volume	-t/--type {container/volume/snap } For example: list –t snap volume	List all the Containers, Volumes, or Snapshots in system.
list volume	-t/--type {volume} -c/--containername <containername>	List the details for all the Volumes in specified container.
list volume	-t/--type { snap} -c/--containername <containername> -v/--volumename <volumename>	List the details about SnapShots in specified volume and container.
get volume	-t/--type {container } -i/ --info -c /--containername <containername>	Gets the information about the specified Container.
get volume	-t/--type {volume} -i/--info	Gets the information about the specified Volume.

Command	Argument	Description
	-c/ --containername <containername> -v/--volumename <volumename>	
get volume	-t/--type {snap} -c/--containername <containername> -v/--volumename <volumename> -u/--schedule	Gets the snapshot schedule settings for the specified volume.
get volume	-t/--type { snap} -i/--info -c/--containername <containername> -v/--volumename <volumename> -s/--snapname <snapname> For example: get –t snap –i –c c0 –v v0 –s snap00 volume	Gets the information about the specified Snapshot.
get volume	-t/--type {container} -n /-- count	Gets the number of containers in system.
activate volume	-t/--snap {snap} -c/--containername <containername> -v/--volumename <volumename> -s/--snapname <snapname> -w/--writeable(optional) For example: activate -t snap -c Cont0 -v Volume0 -s Volume0WriteableSnap0 -w volume	Activates writeable Snapshot.
deactivate volume	-t/--snap {snap} -c/--containername<containername> -v/--volumename <volumename> -s/ --snapname <snapname>	Deactivates the Snapshot.
rollback volume	-t/--snap {snap} -c/--containername<containername> -v/--volumename <volumename> -s/--snapname <snapname>	Rolls back the Snapshot. Requires disconnecting and stopping of all I/Os.
freeze volume	-t/--type {container/volume/snap}	Freezes the UVM Container/volume/snap. Note: Yet to be implemented.
set volume	-t/--type {snap} -u/--schedule -c/--containername<containername> -v/--volumename <volumename> -s/-schedulesnap <scheduleduration:maxsnapshots> -d/--description <description> -n/--backtargetname <backuptargetname > -p/--scheduleType 0-Windows,1-Local [default:Windows] volume For example: set -t snap -c Cont0 -v Volume0ISCSILUN0 -s 5:10 -s 60:20 -d testing -n backuptest -p 0 volume	Set the Snapshot Schedule. Note: maximum number of read only snapshots (read-only + writable) is 254 per volume for a total of 992 per system.

UPS Configuration

These commands configure the UPS for power management.

Command	Argument	Description
get UPS	-i/--info -x/--xml	Displays the existing UPS configuration.
get UPS	-i/--info -m/--monitor -x/--xml	Display the monitoring configuration for the configured UPS devices.
set UPS	-d/--disable -x/--xml	Disables automatic shutdown.
set UPS	-e/--enable or -d/--disable -b/--battery <min battery value> -t/--timeout <mins> -m/--mode {1} -x/--xml For example: set –e –b 10 –t 3 –m 1 ups	Sets the UPS configuration to given values. The enable mode is to denote the shutdown option. Timeout should be given in minutes. Battery is the minimum battery value below which the shutdown is triggered Mode checks whether it set to master or slave. Note: Minimum Battery value should be between 0 and 100 % Timeout value should be between 0 and 1000 minutes
set UPS	-e/--enable or d/--disable -b/--battery <min battery value> -t/--timeout <mins> -m/--mode {2} -i/--masterip <{HostName/Master Ip> -x/--xml For example: set -e -b 35 -t 300 -m 2 -i 10.0.0.218 ups	Sets the UPS configuration to given values. The battery value indicates the minimum battery value at which the alert has to be generated. Timeout should be given in minutes. Mode is set to slave and the masterip is IP Address of the master. Note: Minimum Battery value should be between 0 and 100 Timeout value should be between 0 and 1000
config UPS	-i/--info -x/--xml	Displays currently configured driver for UPS monitoring.
config UPS	-l/--list -x/--xml	Displays list of available drivers.
config UPS	-d/--driver <num> -p/--port <value> -x/--xml For example: config –d 2 –p 1 ups	Sets driver to use with UPS monitoring. Driver number is from list obtained from –list command. Port value: 1 – COM1 2 – COM2 u - USB

Synchronous replication

These commands configure synchronous replication and High Availability using Windows DSM (iTX 2.7v 2.x).

Command	Argument	Description

create syncreplica	–l/--local < cont_vol_name>
	-r/--remote < cont_vol_name>
	-p/--priority <resync priority>
	-i/--localhost <primary's IP address>
	-m/--remotehost <rem host name>
	-d/--mode [sync | ha]
	Example: replication in local volumes
	   create -l c0_v0 -r c1_v1 -p 50 -i 172.16.70.70 -d sync -m local syncreplica
	
	Example: HA in remote volumes
	   create -l c0_v0 -r c1_v1 -p 50 -i 172.16.70.70 -m 172.16.70.102 –d ha syncreplica
		Creates a replication pair. Both the primary and secondary volumes should be present before this operation.
		For local volume copy, please enter remote host as "local". All other parameters remain same. Default resync priority is zero.
		Specify sync for –d/--mode option to create a synchronous replication pair; specify ha for –d/--mode option to create an high-availability pair.
		NOTE: management target name for SR is the name of the virtual target, as opposed to mtarget in earlier versions (2.5/2.6).

update syncreplica	–l/--local < cont_vol_name> -p/--priority <resync priority> -m/--remotehost <rem host name> -x/--xmlflag <xml flag> For example: update -l c0_v0 -p 50 -m 172.16.70.102 -x syncreplica	Updates the given parameters of the volpair in DDF and in module.
get syncreplica	-l/--local <local-primary cont_vol_name> For example: get –l c0_v0 syncreplica	Displays the replication details as available from DDF as well as runtime.
list syncreplica	-c/--container <container name> For example: list –c c0 syncreplica	Lists available replication pairs in the given container.
delete syncreplica	-l/--local < cont_vol_name > -f/--force (optional)	Deletes the given synchronous replication pair. Note : Use --force to clean up non-operational pair locally.
split syncreplica	-l/--local <local-primary cont_vol_name>	Temporarily stops replication of the replication pair. But at a later time, the replication can be joined to replicate from the place where it stopped.
join syncreplica	-l/--local <cont_vol_name>	Manually joins or resync the replication on the given consistency group that was split earlier. Also, this command should be used to initiate a failback resync.
perform syncreplica	-t/--type {failover} -l/--local <cont_vol_name>	Initiates failover on the given consistency group. This command has to be given in the secondary target. All further I/Os will be fielded by the secondary from now on.
perform syncreplica	-t/--type {failback} -l/--local <cont_vol_name> For example: perform –t failback –l c0_v0 syncreplica	This will reinstate the initial primary to start fielding I/Os after a successful failback. Resync has to be completed before activating the failback.

High Availability (iTX27 v3.x and up)
These commands configure High Availability which is OS Agnostic

Command	Argument	Description
syncparams syncreplica	-r/--remoteip < remote ipaddress > -x/--xmlflag For example: syncparams -r 172.16.70.148 syncreplica	Syncparams is used to sync the iscsi base target names/date and time between local and remote machines before creating an HA pair. This command has to be executed in the Primary machine before creating the first RG between two iTX machine.
managerg syncreplica	-t/--type <action{create/delete/get/editalias/ removealias/addalias/changeowner/forcetakeover}> -n/--rgname <resource group name> -a/--alias <Alias> -r/--remoteip <remote ipaddress> -v/--vipaddress <Virtual iapddress> -l/--local <localipaddress> -f/--force -x/--xmlflag For example: managerg -t create -n rg0 -a Alias-1 -a Alias-2 -r 172.16.70.146 -l 172.16.70.176 syncreplica managerg -t get syncreplica managerg -t delete -n rg0 syncreplica managerg -t editalias -n rg0 -v 172.16.70.10 -a Alias-1 syncreplica managerg -t addalias -n rg0 -a Alias-2 syncreplica managerg -t removealias -n rg0 -a Alias-2 syncreplica managerg -t changeowner -n rg0 syncreplica managerg -t forcetakeover -n rg0 syncreplica	Managerg command is used to manage and configure Resource Group. Action denotes the operation to be perfomed on the RG This command is also used to add/remove/edit virtual IP configured for a specific RG. Note: Atleast one VIP should be present for an RG. This command is also used the change the original ownership of an RG. --forcetakeover option can be used to takeover the RG forcefully if the RG is in an inconsistent state but this may result in data corruption. --force option is used to delete an non operational RG forcefully if remote is dead.
create syncreplica	–l/--local < cont_vol_name> -r/--remote < cont_vol_name> -p/--priority <resync priority> -i/--localhost <primary's IP address> -m/--remotehost <rem host name> -d/--mode [hanodsm] -g/--rgname <resource group name> Example: HA NO DSM replication in remote volumes create -l c0_v0 -r c1_v1 -p 50 -i 172.16.70.70 -d hanodsm -m 172.16.70.1 02 -t iqn.1991- 10.com.ami:itx00c09f2164459104:virtual -g rg0 syncreplica	Creates a replication pair. Both the primary and secondary volumes should be present before this operation. Default resync priority is 25. Specify sync for –d/--mode option to create a synchronous replication pair; specify hanodsm for –d/--mode option to create an high-availability pair.
update syncreplica	–l/--local < cont_vol_name> -p/--priority <resync priority> -m/--remotehost <rem host name>	Updates the given parameters of the volpair in DDF and in module.

Command	Argument	Description
	-g/--rgname <rgname> -x/--xmlflag <xml flag> For example: update -l c0_v0 -p 50 -m 172.16.70.102 -x syncreplica update -l c0_v0 -g rg0 syncreplica	Update command is used to move a replication volume pair from Resource group to another. -g stands for the destination rg name.
get syncreplica	-l/--local <local-primary cont_vol_name> -r/--rginfo -o/--owner For example: get –l c0_v0 syncreplica get -r syncreplica get -o syncreplica	Displays information about Resource Group. This command can be used both in Primary & Secondary storage systems. It Displays the replication details as available from DDF as well as runtime.
list syncreplica	-c/--container <container name> -r/--group For example: list –c c0 syncreplica list -r syncreplica	Lists available replication pairs in the given container. It can be used to display the details about the resource group configured in the system and the corresponding replication pairs.
delete syncreplica	-l/--local < cont_vol_name > -f/--force (optional) For Example: delete -l c0_v0 syncreplica delete -l c0_v0 -f syncreplica delete -l c0_v0 -l c1_v2 -l c1_v2 -f syncreplica	Deletes the given synchronous replication pair. Note: Use --force to clean up non-operational pair locally. Multiple pairs (up to 64) can be deleted at the same time by using -l repeatedly.
split syncreplica	-l/--local <local-primary cont_vol_name> -g/--rgname <resource group name> For Example: split -l c0_v0 syncreplica split -g rg0 syncreplica	Temporarily stops replication of the replication pair. But at a later time, the replication can be joined to replicate from the place where it stopped. This command can used to stop all the replication pairs part of the RG
join syncreplica	-l/--local <cont_vol_name> -g/--rgname <resource group name> For Example: join -l c0_v0 syncreplica join -g rg0 syncreplica	Manually joins or resync the replication on the given consistency group that was split earlier. Also, this command should be used to initiate a failback resync. This can be used to rejoin all the volume replication pairs part of the RG by specigying the RG name.
convert syncreplica	convert -c/--container <container_name> -v/--volume <volume_name> -g/--rg <resource_group> For Example: convert -c c0 -v v0 -g rg0 syncreplica	This command is used to convert a synchronous replication pair to operate in a High Availability mode.

Asynchronous Replication

These commands configure asynchronous replication.

Command	Argument	Description

create asyncreplica	-t/--type <sar/jar/hasar>
	-n/--name <snap assisted replication name>
	-f/--volumedialect
	-a/--primarycontainer <primary contName>
	-l/--primaryvolume <primary volName>
	-i/--primaryip <primary host IP address>
	-s/--secondarycontainer <secondary contName>
	-r/--secondaryvolume <secondary volName>
	-m/--secondaryip <secondary host IP>
	-k/--hasecondaryip <HA secondary host IP> (Only for HA-DR)
	-z/--secsnapcount <secondary snap count>
	-c/--compression <zlib compression level>(optional)
	-e/--encryption (optional)
	-b/--dedup (optional)
	-w/--wds <bandwidth in mbps> (optional)
	-u/--utilization <bandwidth utilization in percentage>(optional only if wds enabled)
	
	Example: Single volume in CG
	     create -t sar -n name -f 1 -a c0 -l v0 -i 172.16.70.70 -s c1 -r v1 -m 172.16.70.153 -c 6 -z 10 -e asyncreplica
	
	Example: Multiple volumes in CG
	     create –t sar –n name -f 0 –a c0 -l v0 -l v1 -l v2 -i 172.16.70.70 –s c1 -r v0 –r v1 -r v2 -m 172.16.70.153 -153 -c 6 -z 10 -e asyncreplica
		Creates a asynchronous replication pair. Both the primary and secondary volumes should be present before this operation.
		
		Note:
		1) Volume Dialect
		[0] - ISCSI
		[1] – NAS
		
		2) Compression Type
		[0] – No compression
		[1 - 9] – levels
		
		3) secsnapcount can take values between 1 to 1022
		
		4) WDS mode is used only in Snap Assisted Replication and HA-DR
		
		5) This command can be issued only in the storage system that will be the Primary.
		
		6) HA-DR (hasar) option can be used only after HA is established across all volumes of the DAR (DR) group.
		
		7) The HA secondary host IP is the WAN IP of the HA pair which can be reached from the SAR (DR) secondary system.

delete asyncreplica	-n/--name <asynchronous replication name>
	-c/--containername <container name>
	-d/--index <system assigned name>
	-f/--force(optional)
	
	Example:
	    delete -n name -c c0 -d 1 asyncreplica
	    delete -n name -c c0 –d 1 -f asyncreplica
		Deletes the asynchronous replication pair
		
		-f/--force flag is optional and is used where asynchronous replication has to be deleted forcefully
		
		This command can be issued only in the storage system that will be the Primary.

get asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> (optional) -s/--compressionstats (optional) Example: get -n name -c c0 -d 1 asyncreplica	Displays the asynchronous replication details. This command can be issued on both Primary and Secondary storage systems.
list asyncreplica	-c/--containername <container name>	Lists available asynchronous replication pairs in the given

Command	Argument	Description
	Example: list -c c0 asyncreplica	container. This command can be issued on both Primary and Secondary storage systems.
list asyncreplica	-c/--containername <container name> -n/--name <asynchronous replication name> Example: list -n name -c c0 asyncreplica	Lists all the common snapshots (of all volumes) in the asynchronous replication pairs in the given container. This command can be issued on both Primary and Secondary storage systems.

pause asyncreplica	-n/--name <asynchronous replication name>
	-c/--containername <container name>
	-d/--index <system assigned name>
	
	Example:
	pause -n name -c c0 –d 1 asyncreplica
		Pauses the Asynchronous replication until it is resumed by resume cli.
		
		This command can be issued in a primary.
		
		This command can be issued only when the Asynchronous replication has one of the following status
		    1. Paused
		    2. Idle
		    3. Active
		    4. Undefined
		
		For all other status, this command would return error.

resume asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> Example: resume -n name -c c0 –d 1 asyncreplica	Resumes the Asynchronous replication that was paused before. This command can be issued in a primary. This command can be issued only when the Asynchronous replication has one of the following status 1. Paused For all other status, this command would return error.
failover asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> Example: failover -n name -c c0 –d 1 asyncreplica	Fails over the Asynchronous replication to the secondary. This command can be issued only in the secondary.
failbackjoin asyncreplica	-n/--name <asynchronous name> -c/--containername <container name> -d/--index <system assigned name> Example: failbackjoin -n name -c c0 –d 1 asyncreplica	Prepares the original primary of the Asynchronous replication for failback. This command can be issued only in the primary.
failback asyncreplica	-n/--name <asynchronous replication name>	Fails back the Asynchronous

Command	Argument	Description
	-c/--containername <container name> -d/--index <system assigned name> Example: failback -n name -c c0 –d 1 asyncreplica	replication to the original primary. This command can be issued only in the original primary acting as a secondary.
rollbackjoin asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -s/--snapgrouptnum <t number> -d/--index <system assigned name> Example: rollback -n name -c c0 –s 30 –d 1 asyncreplica	If the status is FAILED_DUE_TO_ROLLBACK after a Rollback on Primary, the replication will continue after issuing this command on the primary to make the secondary ready for resuming replication. This command can be issued in a primary.
rollback asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -s/--snapgrouptnum <t number> -d/--index <system assigned name> Example: rollback -n name -c c0 –s 30 –d 1 asyncreplica	Rolls back all the volumes of the Asynchronous replication to a particular set of snapshots. This command can be issued in a primary and/or secondary.
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -i/--primaryip <primary host IP address> -m/--secondaryip <secondary host IP> -k/--hasecondaryip <HA secondary host IP> -t/--primarymgmttgt <primary management target name> -z/--secsnapcount <secondary snap count> -u/--secondarymgmttgt <secondary management target name> -g/--wds <wds {0/1}> -w/--bwutilization <bandwidth utilization in percentage> -b/--bandwidth <bandwidth in mbps> -f/--dedupe <deduplication {0/1}> -y/--encryption <encryption {0/1}> -o/--compression <compression level {0..9}> Example: update -n myname -d 1 -c Cont0 -o 2 –I 172.16.70.89 -m 172.16.70.90 -u iqn.1991-10.com.ami:itx00c09f2164459105:mtarget -t iqn.1991-10.com.ami:itx00c09f2164459108:mtarget -z 10 asyncreplica	Update 'priority', 'compression', 'primaryip, 'secondaryip', 'hasecondaryip' "primarymgmttgt", "secondarymgmttgt" fields. Note: 1) Compression type [0] - NO compression [1-9] – Compression Levels This command can be issued in a primary.
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -f/--dedupe <deduplication {0/1}> Example: update -n myname -d 1 -c Cont0 -f 1 asyncreplica	Update 'deduplication' field alone. This command can be issued in a primary.

Command	Argument	Description
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -z/--secsnapcount <secondary snap count> Example: update -n myname -d 1 -c Cont0 -z 200 asyncreplica	Update 'secondary snap count' field alone. secsnapcount takes value between 1-1022 This command can be issued in a primary.
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -w/--bwutilization <bandwidth utilization in percentage>	Update 'bandwidth utilization' field alone. This command can be issued in a primary.
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -b/--bandwidth <bandwidth in mbps>	Update 'bandwidth' field alone. This command can be issued in a primary.
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -o/--compression {0-9}	Update 'compression' field alone. Note: 1) Compression type [0] - NO compression [1-9] – Compression Levels This command can be issued in a primary.
update asyncreplica	-n/--name <asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -i/--primaryip <primary host IP address>	Update 'primaryip' field alone. This command can be issued in a primary.
update asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -m/--secondaryip <secondary host IP>	Update 'secondaryip' field alone. This command can be issued in a primary.
update asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -k/--hasecondaryip <secondary host IP>	Update 'hasecondaryip' field alone. This command can be issued in a primary of a HA-DR setup.
update asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -t/--primarymgmttgt <primary management target name>	Update 'primarymgmttgt' field alone. This command can be issued in a primary.
update asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -u/--secondarymgmttgt <secondary management target name>	Update 'secondarymgmttgt' field alone. This command can be issued in a primary.
add asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name>	Add periodicity information for a particular Asynchronous

Command	Argument	Description
	-s/-- schedule> -d/--index <system assigned name> Example: add -n myname -c Cont0 -s "0-24 0-7" -d 1 asyncreplica add -n myname -c Cont0 -s "* 0-7" -d 1 asyncreplica add -n myname -c Cont0 -s "0-24 *" -d 1 asyncreplica add -n myname -c Cont0 -s "* *" -d 1 asyncreplica	Replication. Note : 1) The periodicity can be of one of the following a."<start time>-<end time> <start_day>-<end day>" b."<start time > <start_day>-<end day>" c."<start time>-<end time> <start_day>" d."<start time> <start_day>" e." * *" f." * <start_day>-<end day>" g."<start time>-<end time> *" 2) The 'start time' and 'end time' can take values from 0-24 representing the hour of the day only. 3) The 'start day' and 'end day' can take values from 0-7 representing the day of the week only. 4) '*' indicates all hours of the day or all days of the week based on its position. Note: The end_time and end_day are not included. Meaning 15-16 means 1500-1559 Hours and 0-2 means Monday and Tuesday 5) A Maximum of 8 periodicity information is allowed for Asynchronous Replication pair 6) This command can be issued in a primary.
remove asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name> -s/-- schedule> -d/--index <system assigned name> Example: remove -n myname -c Cont0 -s "0-24 0-7" -d 1 asyncreplica remove -n myname -c Cont0 -s "* 0-7" -d 1 asyncreplica remove -n myname -c Cont0 -s "0-24 *" -d 1 asyncreplica remove -n myname -c Cont0 -s "* *" -d 1 asyncreplica	Remove periodicity information for a particular Asynchronous Replication. Note: 1) The periodicity format should be same as above. 2) This command can be issued in a primary.
set asyncreplica	-t/--type snap -c/--containername <containername>	Sets the snapshot schedule for a CG.

Command	Argument	Description
	-n/--cgname <cgname> -s/--schedulesnap <scheduleduration:maxsnapshots> -d/--description <description> -b/--backuptargetname <backuptargetname> -p/--scheduleType <0-Windows,1-Local> Example: set -t snap -c Cont0 -n mysar0 -s 5:10 -s 60:20 -d testing -b backuptest -p 0 asyncreplica	
enable asyncreplica	-t hasar -n/--name < asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -i/--ip <other HA system IP>	Enables HA-DR with the HA pair system. IP addres should be the WAN IP of HA pair that can be reached from DR. This command can be issued in a primary of a HA-DR setup. Should be used when HA was setup on an existing SAR group.
update asyncreplica	-n/--name < asynchronous replication name> -c/--containername <container name> -d/--index <system assigned name> -i/--ip <other HA system IP>	Removes the HA- DR setup on the given IP. It must be the IP of the HA pair. The HA pairing should be removed after executing this command. This command can be issued in a primary of a HA-DR setup.

Journal Volume Management

These commands configure a journal and journal file.

create journal	-t/--type journal -j/--journalname <journalname> -l/--ldname <ldname> Example: create -t journal -j jour0 -l /dev/sdb journal	Creates journal. Minimum LD size for journal creation is 10GB
create journal	-t/--type journalfile -j/--journalname <journalname> -f/--journalfilename <journalfilename> Example create -t journalfile -j jour0 -f jf0 -z 10 -c cont1 -v v1 -v v2 journal	Creates journal file. 1)Minimum LD size for journal creation is 10GB
delete journal	-t/--type journal -j/--journalname <journalname> Example: delete -t journal -j jour0 journal	Deletes journal
delete journal	-t/--type journalfile -c/--containername <containername> -f/--journalfilename <journalfilename> Example: delete -t journalfile -c cont0 -f jf0 journal	Deletes journal file
get journal	-t/--type journal -j/--journalname <journalname Example: get -t journal -j Jour0 journal	Gets journal information
get journal	-t/--type journalfile -c/--containername <containername> -f/--journalfilename <journalfilename> Example: get -t journalfile -c Cont0 -f jf0 journal	Gets journal file information
get journal	-t/--type journalfile -c/--containername <containername> -v/--volumename <volumename> Example: get -t journalfile -c Cont0 -v vol0 -v vol1 -v vol2 journal	Gets journal file name for a specific volume.
get journal	-t/ --type snaptable -c/--containername <containername> -f/--journal/CG name <journal/CG name> Example:	Gets information for a specific journal file snapshot.

	get -t snaptable -c c0 -f cg0 -n 10 journal	
list journal	-t/ --type journal	List journal information.
list journal	-t/ --type journalfile -c/--containername \<containername	List journal file information.
list journal	-t/ --type snaptable -c/--containername \<containername> -f/--journal/CG name \<journal/CG name> Example: list -t snaptable -c containername -f cg0 journal	List information for a specific journal file snapshot.
creategroup journal	-t/--type snap -s \<contname:volumename:snapname> -j \<contname:journalfilename> -d \<volume_dialect> Example: creategroup -t snap -s c0:v0:Vsv0xxxxxxxxxxxxxxSchdL1RT -s c0:v1:VsvixxxxxxxxxxxxxxSchdL1RT -j c0:jf0 -j c0:jf1 -d 0 journal	Creates group snapshot and post event to journal
creategroup journal	-t/--type snap -w \<contname:volumename:snapname:writsnapname> -d \<volume_dialect> Example: creategroup -t snap -w c0:v0:Vsv0xxxxxxxxxxxxxxSchdL1RT1:Vsv0xxx xxxxxxxxxxxSchdL1WT1 -w c0:v1:VsvixxxxxxxxxxxxxxSchdL1RT1:Vsvixxxx xxxxxxxxxxSchdL1WT1 -d 0 journal	Creates group writeable snapshot and post event to journal
expand journal	-t/--type journal -j/--journalname \<journalname> -l/--ldname \<ldname> Example: expand -t journal -j jour0 -l /dev/sdc journal	Expands journal. 1) Minimum LD size for journal expansion is 10GB
set journal	-t/--type snap -c/--containername \<containername> -j/--jfname \<jfname> -s/--schedulesnap \<scheduleduration:maxsnapshots> -d/--description \<description> -b/--backuptargetname \<backuptargetname> -p/--scheduleType \<0-Windows,1-Local> Example: set -t snap -c Cont0 -j mysar0 -s 5:10 -s 60:20 -d testing -b backuptest -p 0 journal	Sets uniform scheduler settings in journal file volumes.

Continuous Data Protection

These commands are to view cdp for journal file.

rollback cdp	-c/--container \<containername> -f/--journalfile \<jfname> Example: rollback -c c0 -f jf0 cdp	Performs rollback on journal file.
review cdp	-c/--container \<containername> -f/--journalfile \<jfname> -s/--basesnap \<t-number> -t/--deltatime \<deltat from basesnap> -i/--deltaio \<delta IO from deltat> -e/--eventindex \<deltaevt from basesnap> Example: review -c c0 -f jf0 -s 1 -t 10 -i 54 cdp review -c c2 -f jf1 -s 1 -e 15 cdp	Performs CDP Review operation for journal file. 1) -t and -i options ignored if -e is specified 2) Delta time and IO must not be specified for event review
delete cdp	-c/--container \<containername> -f/--journalfile \<jfname> Example: delete -c c0 -f jf0 cdp	Delete a currently existing CDP session.
get cdp	-t review -c/--container \<containername> -f/--journalfile \<jfname> Example: get -t review -c c0 -f jf0 cdp	Gets CDP Review Progress operation for journal file.

Recovery Wizard

These commands are used as part of recovery wizard.

get recoverywizard	-c/--container \<container name>
	-v/--volume\<volumename>
	-x/--xml (optional)
	-n/--tnum \<writable snapshot number> (optional)
	
	Example:
	  get -c c0 -v vol1 recoverywizard
	  get -c c0 -v vol1 -v vol2 -v vol3 -n 1 -x
	  recoverywizard
		Get recoverywizard lists the snaps that have common 't' number across the given set of volume(s).

review
recoverywizard
	-c/--container \<container name>
	-v/--volume\<volumename>
	-s/--snap\<snapname>
	-x/--xml (optional)
	
	Example:
	  review -c c0 -v vol1 -s snapv1T1 recoverywizard
	  review -c c0 -v vol1 -v vol2 -v vol3 -s snap4v1T2
	  –s snap5v2T2 -s snap6v3T2 recoverywizard
		Review recoverywizard activates a set of snaps that have common 't' number across the given set of volume(s), adds them to a LUN and enables them as a target to which an initiator can login to review the data.

remove recoverywizard	-c/--container <container name> -v/--volume<volumename> -s/--snap<snapname> -t/--tgt_name<tgt_name> -x/--xml (optional) Example: remove -c c0 -v vol1 -s snap1 -t iqn.1991-10.com.ami:itx00c09f2164459105:t08212006tgt1 recoverywizard remove -c c0 -v vol1 -v vol2 -v vol3 –s snap4v1T2 -s snap5v2T2 -s snap6v3T2 -t iqn.1991-10.com.ami:itx00c09f2164459105:t08222006tgt2 recoverywizard	Remove recoverywizard disables the target enabled in the Review recoverywizard, removes the set of snaps that have common 't' number across the given set of volume(s) from the LUN, and deactivates the snapshot. Note: 1) All Snaps have same't' number.

rollback recoverywizard	-c/--container <container name>
	-v/--volume<volumename>
	-s/--snap<snapname>
	-x/--xml (optional)
	
	Example:
	   rollback -c c0 -v vol1 -s snap1 recoverywizard
	   rollback -c c0 -v vol1 -v vol2 -v vol3 –s snap4v1T2 -s snap5v2T2 -s snap6v3T2 recoverywizard
		Rollback recoverywizard rollbacks the set of volumes to set of snapshots.
		
		Note:
		
		1) All Snaps have same't' number.

Storage Resource Management

These commands are used as part of SRM.

list srm	-q/--queue <workflow, pending, report>
	-n/--num_tasks <number of tasks>
	-o/--offset < offset in the queue >
	-f/--filename <xml filename >
	-x/--xml
	
	Example:
	   list -q report -n 20 -o 5 srm
	   list -q pending -n 20 -o 5 srm
		List the tasks in report, pending and workflow queue of the SRM

clear srm	-q/--queue <workflow , pending, report > -x/--xml Example: clear -q report srm	Clears the SRM queues such as workflow, pending, and report
start srm	Example: start srm	Start the Storage resource management activity. This is by default started in the iTX box
stop srm	Example: stop srm	Stop the Storage resource management activity

Local and Replicated Snapshot validation

These commands are used as part of snap validation.

enable snapvalidation	-t/--type local -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: enable -t local -c Cont0 -v Volume0 snapvalidation	This will enable local NAS snap validation for the given NAS volume. Once enabled, it will be in "resumed" state by default – meaning **ALL** scheduled snaps will be validated, both already present and those that will be created new.
disable snapvalidation	-t/--type local -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: disable –t local -c Cont0 -v Volume0 snapvalidation	This will disable local NAS snap validation for already enabled NAS volume.
pause snapvalidation	-t/--type local -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: pause -t local -c Cont0 -v Volume0snapvalidation	This pause validation of NAS snapshots for already enabled NAS volume.
resume snapvalidation	-t/--type local -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: resume –t local -c Cont0 -v Volume0snapvalidation	This will resume validation of NAS snapshots for already paused (enabled) NAS volume.
get snapvalidation	-t/--type local -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: get -t local -c Cont0 -v Volume0snapvalidation	This will return the status – paused / resumed of the given NAS Volume for snap validation. It will also return the list of snapshots that are validated so far with the status (passed / failed)
list snapvalidation	-t/--type local -x/--xml Example: list -t local snapvalidation	This will return the list of NAS volumes that are enabled for NAS snap validation, along with the current status – paused / resumed.
resume snapvalidation	-t/--type (SRP/HA) -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: resume -t SRP -c Cont0 -v Volume0 snapvalidation resume -t HA -c Cont0 -v Volume0 snapvalidation	This will resume replica validation for the given volume or volumes SRP/HA. The remote system information will be taken from the given replica pair itself, so no need to add them separately. SRP – Sync replica module HA – High availablility module
pause snapvalidation	-t/--type (SRP/HA) -c/--containername <containername>	Pauses the already running SRP/HA replica validation of given

	-v/--volumename<volumename> -x/--xml Example: pause -t SRP -c Cont0 -v Volume0 snapvalidation pause -t HA -c Cont0 -v Volume0 snapvalidation	set. SRP – Sync replica module HA – High availability module
get snapvalidation	t/--type (SRP/HA) -c/--containername <containername> -v/--volumename<volumename> -x/--xml Example: get -t SRP -c Cont0 -v Volume0 snapvalidation get -t HA -c Cont0 -v Volume0 snapvalidation	This will return the status – paused / resumed as well as the list of snapshots validated. For SRP/HA with multiple volumes, the each validated snap of each volume will be returned. SRP – Sync replica module HA – High availability module
resume snapvalidation	-t/--type (CG) -c/--containername<containername> -n/--cgname <cgname> -x/--xml Example: resume -t CG -c Cont0 -n CG1 snapvalidation	This will resume replica validation for the given volume or volumes CG. The remote system information will be taken from the given replica pair itself, so no need to add them separately. CG – Snap assisted replication module
pause snapvalidation	-t/--type (CG) -c/--containername <containername> -n/--cgname <cgname> -x/--xml Example: pause -t CG -c Cont0 -n CG1 snapvalidation	Pauses the already running CG replica validation of given set. CG – Snap assisted replication module
get snapvalidation	-t/--type (CG) -c/--containername<containername> -n/--cgname <cgname> -x/--xml Example: get -t CG -c Cont0 -n CG1 snapvalidation	This will return the status – paused / resumed as well as the list of snapshots validated. For CGs with multiple volumes, the each validated snap of each volume will be returned. CG – Snap assisted replication module

Appendix A   Error Codes

Code	Description
0	Command Succeeded
1	Command Failed
2	Invalid Parameter
3	Insufficient buffer
4	Insufficient memory
5	Invalid Operation
6	Error in opening file
10	User does not exist
11	User already exists
12	Selected user is a NIS user
13	User type did not match ADS NIS and LOCAL
14	User Count in UserList is not set
15	Invalid User ID
20	Group does not exist
21	Group already exists
22	Selected group is a NIS Group
23	Group Count in GroupList is not set
24	Group type did not match ADS, NIS and LOCAL
25	Invalid Group ID
26	Not able to init CLI command list
27	Not able to init CLI error list
31	Share does not exist
32	Share already exists
33	Path does not exist
34	Share does not exist
35	Invalid share count
36	Unable to create share entry
37	Unable to delete the share entry
38	Share operations not possible on iSCSI volumes
40	Read less number of event log records, than requested.
41	Event log database is full.
42	Event log database is Empty.
43	Event is not in list
44	Corrupted event list file
45	No Matching records were found.
46	Log database is Empty.
47	Read less number of records, than requested.
51	Volume does not exist
52	Volume already exists
53	Volume is busy. Retry later.
54	Disk is not available for use by the volume
55	Disk count is invalid for the requested raid level
56	Invalid Raid level
57	Volume is not ready or Volume does not exist
58	Raid Volume is a bootable volume
59	No Raid OS volume
60	Snapshot unsupported
61	Snapshot is inactive
62	Invalid Snapshot count
63	iSCSI Volume sync error
64	Snapshot is mounted
65	Readable snapshot cannot be mounted
68	Input has missing parameters
69	Input has excess parameters

Code	Description
70	Null parameter
71	Invalid disk channel
72	Invalid Disk
73	Invalid Username
74	Invalid password
75	Invalid groupname
76	Invalid Network port
77	Invalid Path
78	Invalid Volume Name
79	Invalid share name
80	Invalid server name
81	Invalid member type
82	Invalid member count
83	Invalid access rights
84	Invalid address
85	Retry after system reboot
86	Invalid member name
87	Invalid service type
88	Invalid service status
90	Command is not processed
91	Command not supported
92	Reply packet is not good
93	Connection to Mstor Engine is lost
94	API is returned as success. but it got excess data than requested
95	Invalid payload size
96	Invalid host name
97	Invalid RPM name
98	Error in installing RPM
99	UPnP Share Does not exists
110	File open Error
111	User Operation busy
112	Unable to delete user
113	Unable to add group
114	Group operation busy
115	Unable to update user data
116	Unable to update group data
117	Invalid group ID
118	User ID already exists
119	Group ID already exists
120	Primary group error
121	Usergroup cache empty
122	Fewer members read
150	Group or Key does not exists in the file
151	Group already exists in the file
160	Error in initializing the health monitoring interface
161	Error in reading sensor value
162	Health monitoring SDK is not initialized
163	Path is used by other share
164	Record not found
165	Record addition failed
166	Record deletion failed
167	Record update failed
168	Entry not available
169	Error in getting container list
170	Volume list is NULL
171	Snapshot list is NULL
172	Entry addition failed
174	Error in setting ACL recursively

Code	Description
175	Error in mounting the share
200	Upgrade version error
201	Upgrade package already installed
202	Upgrade package dependency failure
203	Upgrade package installation failed
204	Upgrade requires more disk space
205	Invalid package name
220	Error in upgrade operation
230	Duplicate IP address
231	Invalid IP address
232	Invalid subnet mask
233	Invalid gateway
234	Invalid DNS server
235	Failed to set IP
240	Disks are differing in geometry
241	The partition of the disks differ
250	Raid Device is busy with resync or rebuild
251	Directory is shared
252	Error in deleting directory
253	Error in creating directory
254	Directory operations are not possible on ISCSI volumes
260	Invalid IPX internal network number
261	Invalid IPX external network number
262	Invalid IPX frame type
263	Invalid CIFS workgroup
264	Invalid SNMP Trap Destination
265	Invalid SNMP community
266	Invalid domain name
267	Duplicate SNMP Trap Destination
268	Duplicate Email ID
270	ACL database error
280	Error_net_join
281	ADS domain already exists
282	NIS domain already exists
290	Invalid time
291	Invalid date
292	Sync to NTP fail
293	Invalid time zone
300	Invalid network team mode
301	Invalid network team member
302	Invalid network team name
303	Network team already exists
304	Network adapter part of team
305	Invalid network team deletion order
306	Prerequisite not met
307	Network team does not exist
310	Invalid Rule Index
311	Rule limit exceeded
312	Rule Already exists
320	EVMS API General Failure
330	Invalid License File
331	Error in trying to update Evaluation License over existing Extended License
332	Incompatible License according to the Product Type
333	Invalid Customer ID
334	Invalid version
335	Invalid license features
336	License General error
337	License file open error

Code	Description
338	License file read write error
350	Duplicate Alias Name
351	Alias not found
352	Invalid Alias Name
353	DHCP is not supported for Alias Adapters
354	Maximum Alias Adapter count exceeded
355	Maximum Alias per NIC exceeded
500	No Target found
501	Object Not Found
502	Internal error
503	Limits exceeded for operation
504	Object does not have date
505	iSNS status returned
506	iSNS task error
507	Cannot communicate with iSNS daemon
508	Internal iSNS error
509	iSNS server signals error
510	iSNS object not found
511	iSCSI Service not running
512	Invalid Target name
513	iSNS service not running
514	Current operation failed as it needs iSCSI to be enabled on this Volume
515	Password for this user has to be between 12 and 16 characters
516	ISCSI Disk still in use
517	Too many ISNS servers
518	ISNS Server error
519	Cannot perform this operation; there are no iSNS servers
520	Unknown iSNS error
521	Cannot remove ISNS server, an operation is in progress
522	LUN serial number error
523	Error in loading SMA module
524	Error in unloading SMA module
525	Maximum number of LUNs/Volumes has been reached for this target
526	Cannot add NAS volume to target
527	Deactivate portal to change portal tag
528	LUN had been already added to target
529	Invalid LUN
550	Invalid Disk Selection
551	Invalid RAID Number
552	No RAID is Present
553	Invalid RAID Level
554	Invalid Cache Type
555	Invalid Disk Count for the RAID Level
556	Invalid Spare Disk Count
557	Invalid Disk Information
558	Selected array is part of Volume...Cannot be deleted
559	RAID Disks cannot be used as Spares
560	Size of Raid Array is greater than 2 TB
561	Distributed Spares is not supported in RAID0, RAID1 and RAID1n
562	Rebuild failed
601	Invalid controller
603	Function not supported
604	Null Controller list
605	Function not supported
606	Spare disk unsupported
607	Disk count limit exceeded
608	Error in initializing disk
609	IOCTL failure

Code	Description
610	No spare support
611	Max limit reached
612	No MD device available
613	MD creation failed
614	Add entry to configuration file failed
615	disk is not free
616	Minimum disk count
617	Error in updating configuration file
618	Error in reading from configuration file read error
619	Raid hot remove failed
620	Disk partitioning failed
621	Raid hot add failed
622	No raid array found
623	OS raid device error
624	Swap raid device error
625	Device open Error
626	Error raid creation in progress
627	Invalid Sub raid disk count
628	Error on transforming offline raid
629	Invalid raid number
631	Invalid spare disk count
632	Illegal spare type
633	Invalid raid cache type
634	Invalid raid drive size
635	Maximum raid size
636	Insufficient disk space
637	Raid cannot be shrunk
638	API failure
639	Disk is not a Spare
640	Var Log device error
642	LD Create & Expand/Transform not supported while another LD Expand/Transform is in progress
643	LD Expand/Transformation is in progress, not able to change the configuration
644	Battery Not Available
645	Cache type is not supported by the controller
701	Container count limit exceeded
702	FileSystem error
703	Volume creation error
704	DM mount error
705	Delete container error
706	Create container error
707	Duplicate device error
708	Volume Deletion error
709	DM umount error
710	NAS Volume freeze error
711	NAS Volume unfreeze error
712	Start Container failed
713	Stop Container failed
714	Invalid LD Device
715	Invalid Container chunk size
716	Resource is busy
717	Error in getting container info
718	Invalid Container name
719	Error in deactivating snap
720	Error in activating snap
721	Error in creating snap
722	Error in deleting snap
723	Error in mounting volume
724	Error in unmounting volume

Code	Description
725	Error in mounting file system
726	Error in getting snap info
727	Error in creating writable snap
728	Error in getting volume info
729	Max space reached
730	Invalid dialect
731	Invalid Snap
732	Error in rolling back Snap
734	Error in unmounting file system
735	Error in reading metadata
736	Serial already exists
737	Invalid mount type
738	Quota operations not possible on iSCSI volumes
739	Snapshot already activated
740	Snapshot already deactivated
741	Maximum volume count limit reached
742	Error in resizing the volume
743	Unsupported option
744	Error in DM reload
745	FileSystem growth failure
746	Volume already activated
747	Volume already deactivated
748	DMsetup info error
749	No space left in container
750	Permission denied
751	Session not found
752	Max user session limit
753	Max session limit
754	Management administrator not found
760	Maximum management stations configured
800	No free space to expand
801	Volume expansion limit exceeded
802	Read only snapshot count exceeded
803	Read write snapshot count exceeded
852	License – Read only snapshot count exceeded the license count
853	License – iSCSI volume license expired/disabled
854	License - SAS hard disk license expired/disabled
855	License – SATA hard disk license expired/disabled
856	License - Enclosure count exceeded/disabled
857	License - NAS volume license expired/disabled
858	License - Container size exceeded the license limit
859	License - Invalid License Key
860	License - License Structure is missing or License is absent
861	License - Service key is missing
862	License - Updation of Evaluation time failed
863	License - Limit on the particular feature is reached
864	License - Time for the particular feature usage expired or disabled
865	License - License Structure is corrupted
866	License - Temp file creation failed
867	License - Incorrect License for the System
868	License - Error Copying files
869	License - License File Decryption Failure
870	License - License File Encryption Failure
871	License - Setting License Failure
872	License - License Key is absent, License Module is not loaded.
873	License - Incorrect System for the License Key
874	Error in WINBIND
875	Error in YPBIND

Code	Description
876	Error in BIND
877	License - HA pair creation license expired/disabled
878	License - Unable to Read the License File
879	License - License Validation Failure
880	License - New Motherboard or New Motherboard with Some External NIC cards found, For service key generation, remove all External NIC cards from the system
881	License - Thin provision license expired/disabled, request denied.
882	License - ILM license expired/disabled, request denied.
883	License - Applying Old License File Again, request denied.
900	Replication is enabled
901	Incorrect Replication
902	Replication is enabled, secondary volume present in container
903	Replication is enabled, replication pair non-operational
904	Resource group is not owned
905	Resource group already started
906	Resource group is out of sync
907	Unable to get resource group information
908	Invalid resource group state
909	Machines chosen for HA are not identical
910	Subnet does not match in machines. All NICS should be on different subnets
911	Remote Resource group not accessible
912	Unable to set virtual ipaddress
913	Maximum of 1 Alias per NIC per RG exceeded
914	Primary Target Name already used for a different volume in secondary
915	Error in regenerating target name
916	Portal is inactive in Local/Remote
917	Replication command timed out on the remote box due to it being busy
918	No Target found for volume either in Primary/Secondary
919	Replication – Operation not permitted on Secondary
1001	Replication - General error
1002	Replication - Invalid parameters
1003	Replication - Insufficient memory for performing the operation
1004	Replication - Permission denied
1005	Replication - system busy
1006	Replication - Fatal error
1007	Replication - Master Logical drive NOT available
1008	Replication - Volume error
1009	Replication - Volume size error
1010	Replication - iSCSI target serial number error
1011	Replication - Error while accessing Container DDF
1012	Replication - Error while accessing Replication DDF
1013	Replication - Initiator error
1014	Replication - Remote device error
1015	Replication - Error while accessing tab bits
1016	Replication - iSCSI login error
1017	Replication - Error while activation
1018	Replication - Remote Volume device NOT found
1019	Replication - Remote Management device NOT found
1020	Replication - Sync replication feature is not licensed or time period expired
1021	Replication - Error in establishing MPIO Session: Please check if secondary or link to it is alive, and it's portal is activated
1022	Replication - Error in creating HA Pair. Volume is part of a SAR pair
1023	Replication - Resource group count exceeded
1024	Replication - Resource group already present
1025	Replication - Resource group not present
1026	Replication - Failed to modify the resource group config
1027	Replication - Resource group entry not present
1028	Replication - Duplicate entry present in resource group config

Code	Description
1029	Replication - Volume is not in sync
1030	Replication - Box owns RG but volumes are secondary
1031	Replication - Box is not the orignal owner of the RG
1032	Replication - Box does not own RG but volumes are primary
1101	Asynchronous Replication – Asynchronous Replication CG not found
1102	Asynchronous Replication – General Failure
1103	Asynchronous Replication – Duplicate Asynchronous Replication CG name
1104	Asynchronous Replication – Volume already part of Asynchronous Replication CG name
1105	Asynchronous Replication – Invalid Volume size
1106	Asynchronous Replication – Invalid Asynchronous Replication CG role
1107	Asynchronous Replication – Invalid volume count
1108	Asynchronous Replication – Volume not empty
1109	Asynchronous Replication – IOCTL error
1110	Asynchronous Replication – Error in Handshake
1111	Asynchronous Replication – Maximum CG reached
1112	Asynchronous Replication - Invalid opertion - replication not yet started - No valid snaps found
1113	Asynchronous Replication - CG config metadata area is corrupted
1114	Asynchronous Replication - Error in getting passive side CG info
1115	Asynchronous Replication - Error in getting passive side CG list
1116	Asynchronous Replication - Error in updating passive side CG info
1117	Asynchronous Replication - Error in passive side resume operation
1118	Asynchronous Replication - Error in passive side pause operation
1119	Asynchronous Replication - No common T number snapshot found
1120	Asynchronous Replication - Given T number snapshot info not available
1121	Asynchronous Replication - Given volume already part of another CG
1122	Asynchronous Replication - Remote machine unavailable
1123	Asynchronous Replication - Invalid Remote machine CG info
1124	Asynchronous Replication - Active volumes already paired with another SAR CG in this remote box
1125	Asynchronous Replication - Volumes having different scheduler settings
1126	Asynchronous Replication - Invalid Volume Chunk Size
1127	Asynchronous Replication - Unable to get the initiator name
1128	Asynchronous Replication - Unable to get mtarget name
1130	Asynchronous Replication - Minimum snapshot retention should be more than 3 per level
1131	Asynchronous Replication - Volume part of synchronous replication or HA grouping
1132	Asynchronous Replication - Invalid configuration
1200	JM – Failed to create Journal
1201	JM – Journal File count limit exceeded
1202	JM – Failed to create Journal File
1203	JM – Error in getting Journal info
1204	JM – Error in starting Journal
1205	JM – Error in stopping Journal
1206	JM – Invalid Journa Name
1207	JM – Journal Count limit exceeded
1208	JM – Failed to delete Journal
1209	JM – Journal Event Failed
1210	JM – Failed to expand Journal
1211	JM – Failed to delete Journal File
1212	JM – Error in getting Journal File Name
1213	Invalid T number
1214	JM – Journal in use
1215	JM – JournalFile size exceeded the Free Space available in Journal
1250	JM – Reached EOF
1300	Snap Validation – Info file creation error
1301	Snap Validation – Already paused
1302	Snap Validation – Already resumed
1303	Snap Validation – Config file creation error
1304	Snap Validation – Block Dedupe enabled
1305	Snap Validation – Remote side snapshot not available

Code	Description
1306	Snap Validation – Local snapshot not available
1307	Snap Validation – User snapshot validation pending
1308	Snap Validation – Snapshot already validated
1325	Read only snap count max reached
1326	Snap count per volume max reached
1327	Snap count per system max reached
1345	Duplicate Frequency/Level entered for Snapshot Schedule
1351	iSCSI MirrorConfig – Physical disk size mismatch found
1352	iSCSI MirrorConfig – Invalid physical disk mapping found
1353	iSCSI MirrorConfig – Hotspare creation failed
1354	iSCSI MirrorConfig – Logical drive creation failed
1355	iSCSI MirrorConfig – Container creation failed
1400	CDP – General error
1401	CDP – Invalid parameter
1402	CDP – Invalid Journal file name
1403	CDP – Invalid Container name
1404	CDP – Journal not present
1405	CDP – Failed to open resource
1406	CDP – Snapshot not available
1407	CDP – Memory constraint
1408	CDP – Snapshot not available in Journal
1409	CDP – CDP session for given parameters not available
1410	CDP – Failed to renew CDP session
1411	CDP – Event missing in Journal file
1412	CDP – Thread creation error
1413	CDP – Journal file overflow error
1414	CDP – Snapshot is in unstable state
1415	CDP – Failed to read from journal file
1504	Upgrading packages failed
1506	Upgrade Checksum failed
1507	Upgrade error in downloading image
1508	Upgrade image version is older than current version
1509	Upgrade image version is same as current version
1510	Insufficient disk space for upgrade
1511	Upgrade image file is corrupted
1512	Error in performing upgrade
1513	Invalid parameters in upgrade
1514	Upgrade image version is invalid
1515	License is not valid for upgrade
1516	Invald IP address or Host name
1517	Error in performing upgrade
2001	Remote Communication - General Error
2002	Remote Communication - Invalid Parameters
2003	Remote Communication - Insufficient memory for performing the operation
2004	Remote Communication - Permission Denied
2005	Remote Communication - Management Target Busy
2006	Remote Communication - Fatal Error
2010	Remote Communication - Invalid Packet Signature
2011	Remote Communication - Version Error
2012	Remote Communication - No such remote module
2013	Remote Communication - Connection Error
2014	Remote Communication - Inter-node Initiator error
2015	Remote Communication - Login Error
2016	Remote Communication - Module Connection Error
2017	Remote Communication - Remote Device Error
4096	DVM - Lib node open error
4097	DVM - Lib invalid data
4098	DVM - Device End of file

Code	Description
4099	DVM - Device open error
4100	DVM - Device access error
4101	DVM - general error
4102	DVM - Lib DM suspend error
4103	DVM - Lib DM resume error
8192	DVM - generic error
8193	DVM - memory allocation errors
8194	DVM - IOCTL Parameter passing failures copy_from_user, copy to user etc
8195	DVM - generic invalid parameter error
8196	DVM - container name is empty / unrecognizable by DVM driver
8197	DVM - volume is empty / unrecognizable by DVM driver
8198	DVM - snapshot name is empty / unrecognizable by DVM driver
8199	DVM - Error persisting metadata to disk (or) reading metadata from disk
8200	DVM - The number of LD segments is invalid
8201	DVM - The stripe size for the LD segments is invalid
8202	DVM - Duplicate container name
8203	DVM - Too many containers in the system
8204	DVM - Failed to open the LD segment
8205	DVM - volume size specified container
8206	DVM - invalid provisioning type specified
8207	DVM - snap type specified is invalid
8208	DVM - invalid UUID specified
8209	DVM - duplicate volume name specified
8210	DVM - duplicate volume UUID specified
8211	DVM - too many volumes in the system
8212	DVM - cannot create exact provisioned volume - No space available
8213	DVM - when trying to take a snap of snapshot - assumes writ. snapshot is another ioctl
8214	DVM - duplicate snap name
8215	DVM - too many snaps in the volume or a writable snapshot already exists
8216	DVM - too many snaps in the system
8217	DVM - if the ld segment length is invalid
8218	DVM - when trying to take a "writable" snap of volume
8219	DVM - volume is in use
8220	DVM - snap is in use
8221	DVM - snap rollback bg fail
8222	DVM - compaction bg fail
8223	DVM - compaction already running
8224	DVM - cannot pause compaction
8225	DVM - cannot stop compaction
8226	DVM - log fail
8227	DVM - Container couldn't start, conflicts in vol-index with existing container-volumes
8228	DVM - Obsolete command
8229	DVM – Redundant Snapshot
8230	DVM - Operation failed on invalidated snapshot
8231	DVM – Invalid Pinned Volume
8232	DVM – Pinned Volume exists
8233	DVM – Source & Dest Volume size mismatch
8234	DVM – Destination Volume is not empty
8236	DVM - No events

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