

# Intel® Virtual RAID on CPU (Intel® VROC) and Intel® Rapid Storage Technology enterprise (Intel® RSTe) - Command Line Interface (RSTCLI) Overview

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# Document Revision Table

| Revision | Date | Changes |
|---|---|---|
| 1.0 | December 2016 | Initial |
| 1.1 | October 2017 | Updated for RSTe 5.3 PV release |
| 1.2 | March 2018 | Updated for RSTe 5.4 PV release |

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# 1 Description

RSTCLI is an end user command line utility used to perform basic RAID operations on Intel® RSTe and/or Intel® VROC enabled systems. Both products supports RAID0, RAID1, RAID5, and RAID10 volumes. RSTCLI supports creating RAID volumes through the create mode and managing RAID volumes through the Manage mode. In addition there are miscellaneous options such as help, status and version. The CLI tool has to be run as administrator.

# 2 Options

Options for CLI tool are case sensitive. Both long and short versions of the options are given:

| Flag | Name | Description |
|---|---|---|
| -C | --create | Creates a volume and array if one does not already exist, creates a new volume on an existing array; used to denote Create Mode |
| -I | --information | Displays controller, array, volume, enclosure and disk information; used to denote Information Mode |
| -M | --manage | Manages specific components of arrays, volumes and disks; used to denote Manage Mode |
| -m | --modify | Modifies a volume or an array; used to denote Modify Mode |
| -h | --help | Prints documentation of how to invoke the program |
| -r | --rescan | Forces the system to rescan for hardware changes. |
| -V | --version | Prints version information |
| -q | --quiet | Suppress output for create, modify and manage. This will limit output to error return codes only. This mode is used to facilitate the use of command line scripts. |

## 2.1 General Usage

The general command line format of the Intel® RSTe 3.0 Command Line Interface (CLI) is as follows:

```
rstcli [optional mode] <raid-device> [option]{[options]}<component-device>
```

Note: rstcli.exe is for 32-bit Windows* operating systems and rstcli64.exe is for 64-bit. For the purposes of this document, rstcli will be used.

To see all available commands and options enter the following:

```
rstcli –-help
```

To obtain additional information on a particular optional mode enter the following command:

```
rstcli [mode] –-help
```

### 2.1.1 **Create**

The create option is used to create RAID volumes. To create a RAID volume, enter the following:

```
rstcli --create --level x [--size y] [--strip-size z] --name string  [--create-from-existing diskId] diskId {[diskId]}
```

Create Options:

| **Flag** | **Name** |
|---|---|
| -C | --create<br>*Creates a volume and array if one does not already exist. Creates a new volume on an existing array; used to denote Create Mode.* |
| -E <<host>-<bus>-<target>-<lun>> | --create-from-existing <<host>-<bus>-<target>-<lun>><br>*If data is to be migrated from one of the disks, specify the disk with this flag. Disk identifier is SCSI address.* |
| -l | --level |
| -n <Volume name> | --name <Volume name> |
| -s | --strip-size |
| -z <size in GB> | --size <size in GB><br>*Size in gigabytes. This is an optional switch. If switch is not used or size is specified to 0, then the maximum size available will be used.* |
| -W | --rwh – RAID Write Hole Closure |
| -j | --jd – Journaling Drive |
| -o | --span – Span VMD Domains |

Create Usage:
Creates a new volume and array or creates a new volume on an existing array.
--create --level x [--size y] [--stripe-size z] [--rwh a] [--jd b] [--span] --name string
[--create-from-existing diskId] diskId {[diskId]}

Create Examples:
-C -l 1 -n Volume 0-1-0-0 0-2-0-0
-C -l 1 -E 0-1-0-0 -n VolumeWithData 0-2-0-0
-C -l 1 -n Volume -o 2-0-0-0 3-0-1-0
-C -n newVolume -l 5 -W Distributed 0-1-0-0 0-2-0-0 0-3-0-0
--create --level 5 --rwh JournalingDrive --jd 0-0-0-0 --name newVolume 0-1-0-0 0-2-0-0 1-0-0-0 --span
--create --level 0 --size 5 --name RAID0Volume 0-3-0-0 0-4-0-0 0-5-0-0
--create --help
**********
WARNING: If --span is set and the volume you created contains disks from
different VMD Controllers it cannot be used as a bootable volume.
**********

### 2.1.2 **Information**

The Information option will provide information on arrays, controllers, disks, enclosures and volumes. To obtain the desired information, enter the following:

```
rstcli --information --controller --array --disk --enclosure --volume {[device]}
```

Information Options:

| Flag | Name |
|---|---|
| -I | --information<br>*Displays controller, array, volume, enclosure, and disk information; used to denote Information Mode.* |
| -a | --array<br>*Lists information about the arrays on the system.* |
| -c | --controller<br>*Lists information about the controllers on the system.* |
| -d | --disk<br>*Lists information about the disks in the system.* |
| -e | --enclosure<br>*Lists information about the enclosures on the system.* |
| -v | --volume<br>*Lists information about the volumes on the system when used in Info mode.*<br>*Stipulates the volume to act on in Modify or Manage.* |

Information Usage:
Displays disk, volume, array, enclosure, and controller information.
--information --controller --array --disk --enclosure --volume {[device]}

Information Examples:
-I -v Volume
-I -d 0-5-0-0
--information --array Array_0000
--information --help

### 2.1.3 **Manage**

The Manage option will be used to manage specific components of arrays, volumes and disks. To perform the desired management function, enter one the following:

```
rstcli --manage --cancel-verify volumeName
```

--manage --cancel-verify volumeName
--manage --delete volumeName
--manage --verify-repair volumeName
--manage --normal-volume volumeName
--manage --normal diskId
--manage --initialize volumeName
--manage --locate diskId

--manage --remove diskId
--manage --delete-metadata diskId
--manage --not-spare diskId
--manage --volume-cache-policy off|wb --volume volumeName
--manage --rebuild volumeName --target diskId
--manage --spare diskId
--manage --verify volumeName
--manage --write-cache true|false --array arrayName
--manage --delete-all-metadata
--manage --rwh policy --volume volumeName
--manage --change-rohi enable|disable --controller controllerName | --controllerMode SATA|sSATA|VMD
--manage --read-patrol enable|disable --controller controllerName | --controllerMode SATA|sSATA

Manage Options:

| **Flag** | **Name** |
|---|---|
| -M | --manage<br>*Manages specific components of arrays, volumes and disks; used to denote Manage Mode.* |
| -x <Volume name> | --cancel-verify <Volume name> |
| -D <Volume name> | --delete <Volume name> |
| -p <Volume name> | --verify-repair <Volume name><br>*Verifies and repairs the volume.* |
| -f <Volume name> | --normal-volume <Volume name><br>*Marks failed volume as normal.* |
| -F <<host>-<bus>-<target>-<lun>> | --normal <<host>-<bus>-<target>-<lun>><br>*Marks failed disk as normal.* |
| -i <Volume name> | --initialize <Volume name><br>*Initializes the redundant data on a volume.* |
| -L <<host>-<bus>-<target>-<lun>> | --locate <<host>-<bus>-<target>-<lun>><br>*Locates device and blinks the LED.* |
| -y | --remove |
| -T <<host>-<bus>-<target>-<lun>> | --delete-metadata <<host>-<bus>-<target>-<lun>> |
| -Z | --delete-all-metadata |
| -N <<host>-<bus>-<target>-<lun>> | --not-spare <<host>-<bus>-<target>-<lun>><br>*Resets a spare disk to available.* |
| -P <Volume name> | --volume-cache-policy <Volume name><br>*Sets volume cache policy to either off, wt (write-through) or wb (write-back)* |
| -R <Volume name> | --rebuild <Volume name> |
| -S <<host>-<bus>-<target>-<lun>> | --spare <<host>-<bus>-<target>-<lun>> |
| -t <<host>-<bus>-<target>-<lun>> | --target <<host>-<bus>-<target>-<lun>><br>*Indicates the pass-through disk for a rebuild.* |
| -U <Volume name> | --verify <Volume name> |
| -w <true or false> | --write-cache <true or false> |
| -W | --rwh – RAID Write Hole Closure |

| | |
|---|---|
| -j | --jd – Journaling Drive |
| -b | --controllerMode |
| -H | --change-rohi |

Manage Examples:
-M -D VolumeDelete
-M -F 0-2-0-0
-M -U VolumeVerify
-M -W Distributed -v vol
--manage --spare 0-3-0-0
--manage --write-cache true --array Array_0000
--manage --delete-all-metadata
--manage --rwh JournalingDrive --jd 0-1-0-0 --volume vol
--manage --help

### 2.1.4 **Modify**

The Modify option is used to modify volumes and arrays. To perform a modification, enter the one of the following:

```
rstcli --modify --volume VolumeName --add diskId {[diskId]}
  --modify --volume VolumeName --expand
  --modify --volume VolumeName --level L [--add diskId {[diskId]}  [--strip-size s]
  --modify --volume VolumeName --name n
```

Modify Options:

| **Flag** | **Name** |
|---|---|
| -m | --modify |
| -A <<host>-<bus>-<target>-<lun>> | --Add <<host>-<bus>-<target>-<lun>> |
| -X | --expand |
| -l <0, 1, 5, 10> | --level <0, 1, 5, 10><br>*Raid level options are 0, 1, 5 and 10.* |
| -n | --name |
| -s <size in KB> | --strip-size <size in KB><br>*Strip size in kilobytes (2^10 bytes). Valid for RAID 0, RAID 5 and RAID 10. Options are 4, 8, 16, 32, 64 and 128.* |
| -v | --volume |

Modify Usage:
Modifies an existing volume or array.
--modify --volume VolumeName --add diskId {[diskId]}
--modify --volume VolumeName --expand
--modify --volume VolumeName --level L [--add diskId {[diskId]}
[--stripe-size s] [--name N]
--modify --volume VolumeName --name n

Modify Examples:
-m -v Volume_0000 -A 0-3-0-0 0-4-0-0
-m -v ModifyVolume -l 5
--modify --volume Volume --name RenameVolume
--modify --volume Volume --level 5 --add 2-0-0-0 --stripe-size 64
--modify --help

### 2.1.5 Rescan

The Rescan option is used to force the system to rescan for hardware changes. To perform a system rescan, enter the following:

```
rstcli --rescan (or -r)
```

### 2.1.6 Quiet

The Quiet option is used to suppress output for create and manage. This option is not valid for information mode. To initiate quiet mode, enter the following:

```
rstcli --quiet (or –q)
```

### 2.1.7 Version

The Version option will print the version information of the driver, OROM, middleware and rstcli components that are installed on the system

```
rstcli --version
```

This output will resemble the following.

```
Intel(R)RSTCLI
    Middleware Version: <major>.<minor>
    Driver Version: <major>.<minor>
    OROM Version: <major>.<minor>
```

### 2.1.8 OPTIONS:

-A <<host>-<bus>-<target>-<lun>>, --add <<host>-<bus>-<target>-<lun>>
Adds new disks to an existing volume.

-a, --array
Lists information about the arrays in the storage system.

-B <enable or disable>, --read-patrol <enable or disable>

Changes read patrol state.

-b, --controllerMode
Changes the properties of a controller.

-C, --create
Creates a new volume and array or creates a new volume on an existing array.

-c, --controller
Lists information about the controllers in the storage system.

-D <Volume name>, --delete <Volume name>
Deletes the specified volume.

-d, --disk
Lists information about the disks in the storage system.

-E <<host>-<bus>-<target>-<lun>>, --create-from-existing <<host>-<bus>-<target>-<lun>>
Identifies the disk if data is to be migrated from one of the disks. Disk identifier is SCSI address.

-F <<host>-<bus>-<target>-<lun>>, --normal <<host>-<bus>-<target>-<lun>>
Resets failed or SMART event disk to normal.

-f <Volume name>, --normal-volume <Volume name>
Resets failed RAID 0 volume to normal and recovers data.

-H <enable or disable>, --change-rohi <enable or disable>
Changes Rebuild on hot insert state.

-h, --help
Displays help documentation for command line utility modes, options, usage, examples, and return codes. When used with a mode switch (create, information, mange, or modify), instructions for that mode display. For example, --create --help displays Create option help.

-I, --information
Displays disk, volume, array and controller information.

-i <Volume name>, --initialize <Volume name>
Initializes the redundant data on a RAID 1, 5 or 10 volume.

-j, --jd

Journaling drive.

-L <<host>-<bus>-<target>-<lun>>, --locate
<<host>-<bus>-<target>-<lun>>
Locates device and blinks the LED.

-l <0, 1, 5, 10>, --level <0, 1, 5, 10>
Changes the Raid type of an existing volume. Options are migrations from RAID 1 to RAID 0 or 5, RAID 0 to RAID 5, and RAID 10 to RAID 5.

-M, --manage
Manages arrays, volumes and disks present in the storage system.

-m, --modify
Modifies an existing volume or array.

-N <<host>-<bus>-<target>-<lun>>, --not-spare
<<host>-<bus>-<target>-<lun>>
Resets a spare disk to available.

-n <Volume name>, --name <Volume name>
Specifies a name for the volume created. Renames an existing volume in Modify mode.

-o, --span
Flag, which enables spanning while creating or modifying volume.

-P <Volume name>, --volume-cache-policy <Volume name>
Sets volume cache policy to either off or wb.

-p <Volume name>, --verify-repair <Volume name>
Verifies and repairs the volume.

-q, --quiet
Suppresses output for create, modify, and manage modes. Not valid on info mode.

-R <Volume name>, --rebuild <Volume name>
Rebuilds the degraded volume.

-r, --rescan
Forces the system to rescan for hardware changes.

-S <<host>-<bus>-<target>-<lun>>, --spare <<host>-<bus>-<target>-<lun>>
Marks a disk as a spare.

-s <size in KB>, --stripe-size <size in KB>
Sets a stripe size in kilobytes (2^10 bytes) for a volume. Valid when creating or changing the type of a volume and for RAID 0, RAID 5 and RAID 10. Options are 4, 8, 16, 32, 64 and 128 KB.

-T <<host>-<bus>-<target>-<lun>>, --delete-metadata
<<host>-<bus>-<target>-<lun>>
Deletes the metadata from the specified disk.

-t <<host>-<bus>-<target>-<lun>>, --target
<<host>-<bus>-<target>-<lun>>
Indicates the pass-through disk to be used for rebuilding a degraded volume.

-U <Volume name>, --verify <Volume name>
Verifies data on the volume.

-u <password>, --unlock <password>
Unlocks a disk.

-V, --version
Displays version information.

-v, --volume
Lists information about the volumes on the system. Stipulates the volume to act on when used in Modify or Manage mode.

-W, --rwh
Close RAID Write Hole policy. Options are Off, Distributed, JournalingDrive.

-w <true or false>, --write-cache <true or false>
Enables or disables write cache for all disks that are part of an array.

-X, --expand
Expands a volume to consume all available space in an array.

-x <Volume name>, --cancel-verify <Volume name>
Cancels a verify operation in progress.

--xml
XML output of the current system state.

--xmlfile <foo.xml>
File Name for XML file.

-y <<host>-<bus>-<target>-<lun>>, --remove
<<host>-<bus>-<target>-<lun>>
Safe remove device and blinks the LED.

-Z, --delete-all-metadata
Deletes the metadata from all disks on the system.

-z <size in GB>, --size <size in GB>
Sets a size in gigabytes. This is an optional switch. If the size is not specified or specified to 0, then the maximum size available will be used.

# 3 Return Codes

Return codes listed are generalized. Specific details returned will depend on the call being made.

| Code | Return | Description |
|---|---|---|
| 0 | SUCCESS | Successful completion of request |
| 1 | FAILURE | At least some part of request failed |
| 2 | INVALID_REQUEST | Unrecognized command; request formatted incorrectly |
| 3 | INVALID_DEVICE | Request not formatted correctly, device passed in does not exist. Detail return message will include device identifier and operation. Detail message will be returned unless --quiet switch is used. |
| 4 | REQUEST_UNSUPPORTED | Request is not supported on this system. Request was formatted correctly, but is not supported on this system (this would probably indicate a bug, as unsupported requests should result in an INVALID_REQUEST return). |
| 5 | DEVICE_STATE_INVALID | Device specified in this request is not in a state that supports this operation. Detail message will include device identification and state that device is in. Detail message will be returned unless --quiet switch is used. |

| Code | Return | Description |
|---|---|---|
| 20 | INVALID_STRIP_SIZE | Strip size is not supported |
| 21 | INVALID_NAME | Name of volume is too long or has invalid characters |
| 22 | INVALID_SIZE | Size requested is invalid |
| 23 | INVALID_NUMBER_DISKS | Number of disks is invalid |
| 24 | INVALID_RAID_LEVEL | RAID level requested is not valid |
| 34 | Incorrect RWH policy | Raid Write Hole policy was incorrect. |
| 35 | RWH policy is same | Passed policy is same as previous one. There is no need to change it |
| 36 | Invalid JD | Passed journaling drive is invalid. |

| | | |
|---|---|---|
| 37 | RWH disk unmark failure | Failed to unmark journaling drive. |