**Introduction**

This guide focuses on using ARCCONF with Adaptec Smart Storage Controllers (SmartRAID/SmartHBA/SmartIOC/SmartROC). For information about using ARCCONF with Microchip Adaptec Series 8 (legacy) RAID controllers, see the *Adaptec RAID Controller Command Line Utility User’s Guide* (ESC-2160659).

**Important:** All commands in this document may not be supported for your controller. Check the ARCCONF command Help section for controller specific supported commands.
Table of Contents

Introduction.....................................................................................................................................................1

1. Getting Started with the Command Line Utility...................................................................................... 4
   1.1. Installing the Command Line Utility..................................................................................................4
   1.2. Starting the Command Line Utility...................................................................................................4

2. Using the Command Line Utility............................................................................................................ 6
   2.1. ARCCONF Commands...................................................................................................................... 6
   2.2. arcconf atapassword.........................................................................................................................7
   2.3. arcconf consistencycheck................................................................................................................8
   2.4. arcconf create..................................................................................................................................8
   2.5. arcconf delete................................................................................................................................11
   2.6. arcconf driverupdate......................................................................................................................11
   2.7. arcconf expanderlist.......................................................................................................................12
   2.8. arcconf expanderupgrade...............................................................................................................12
   2.9. arcconf getconfig...........................................................................................................................13
   2.10. arcconf getlogs.............................................................................................................................15
   2.11. arcconf getsmartstats..................................................................................................................16
   2.12. arcconf getstatus..........................................................................................................................16
   2.13. arcconf getversion.........................................................................................................................16
   2.14. arcconf identify.............................................................................................................................17
   2.15. arcconf imageupdate....................................................................................................................18
   2.16. arcconf key...................................................................................................................................18
   2.17. arcconf list....................................................................................................................................19
   2.18. arcconf maxcrypto.......................................................................................................................19
   2.19. arcconf maxcryptoaccounts...........................................................................................................21
   2.20. arcconf maxcryptokey....................................................................................................................22
   2.21. arcconf modify.............................................................................................................................23
   2.22. arcconf passthrough......................................................................................................................24
   2.23. arcconf phyerrorlog.........................................................................................................................26
   2.24. arcconf playconfig.........................................................................................................................27
   2.25. arcconf rescan................................................................................................................................28
   2.26. arcconf refresh................................................................................................................................28
   2.27. arcconf romupdate........................................................................................................................29
   2.28. arcconf saveconfig........................................................................................................................30
   2.29. arcconf savesupportarchive.........................................................................................................30
   2.30. arcconf setarrayparam..................................................................................................................31
   2.31. arcconf setboot.............................................................................................................................32
   2.32. arcconf setcache...........................................................................................................................32
   2.33. arcconf setconfig..........................................................................................................................34
   2.34. arcconf setconnectormode.............................................................................................................34
   2.35. arcconf setcontrolermode.............................................................................................................35
   2.36. arcconf setcontrollerparam..........................................................................................................36
   2.37. arcconf setmaxcache.....................................................................................................................39
   2.38. arcconf setname............................................................................................................................40
   2.39. arcconf setperform.......................................................................................................................40

© 2021 Microchip Technology Inc. and its subsidiaries
1. Getting Started with the Command Line Utility

This guide explains how your Microchip Smart Storage controller supports the use of the ARCCONF command line utility. This utility allows you to:

- Create and delete logical drives
- Encrypt and decrypt logical drive data (if supported by your controller)
- Display configuration settings
- Copy configurations from one computer to another
- Flash new firmware and BIOS onto the controller
- Enable the controller to check the removal and connection of any disk drives
- Provide access to the status and event logs of a controller

Note: This guide focuses on using ARCCONF with Adaptec Smart Storage Controllers (SmartRAID/SmartHBA/SmartIOC/SmartROC). For information about using ARCCONF with Microchip Adaptec Series 8 (legacy) RAID controllers, see the Microchip Adaptec RAID Controller Command Line Utility User's Guide (ESC-2160659).

1.1 Installing the Command Line Utility

Follow the instructions in this section to install ARCCONF on the supported operating systems.

1.1.1 Downloading the Installation Packages

Complete these steps to download the ARCCONF installation package for your operating system(s):

1. Open a browser window, then type start.adaptec.com in the address bar.
2. Navigate to your controller product page, then select Storage Manager downloads.
3. Download the ARCCONF Command Line Utility installation package.
4. When the download completes, extract the package contents to the installation directory on your machine (Program Files or /opt, for instance).
5. On Linux systems, ensure that arcconf has 'execute' privilege:
   chmod arcconf +x

1.1.2 Installing Remote ARCCONF

Use the following procedure to install Remote ARCCONF on a VMware ESXi system. Remote ARCCONF provides command line support on Windows and Linux Guest OSs.

1. Copy the arcconf folder to the remote machine using the Remote Desktop Connection utility (on Windows) or a remote copy utility, such as putty or scp (on Linux).

   Note: You can also get remote arcconf from the maxView™ installation directory in the esx_arcconf folder.

2. Run arcconf from the installation directory.

1.2 Starting the Command Line Utility

Note: You can run a subset of ARCCONF commands from the UEFI shell. For more information, see 3. Running ARCCONF in the UEFI Shell.

1. To start ARCCONF, enter one of the following commands:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>&lt;install_dir&gt;\arcconf.exe</td>
</tr>
<tr>
<td>Linux</td>
<td>/&lt;install_dir&gt;/arcconf</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>VMware ESXi with Remote ARCCONF</td>
<td><code>/usr/RemoteArcconf/arcconf</code></td>
</tr>
</tbody>
</table>

where Install_dir is the directory where the utility is installed.

2. To see a list of available commands, type `ARCCONF` at the prompt. For help with a specific command, type `ARCCONF <command_name> help`. 
2. Using the Command Line Utility

This chapter explains how to use the command line utility interactively or in batch mode. With interactive mode, enter commands at the prompt. In batch mode, create scripts and run the script in the appropriate shell, as described in the following table:

<table>
<thead>
<tr>
<th>Environment</th>
<th>Batch File</th>
<th>Run Script</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>.bat</td>
<td>CMD.EXE</td>
</tr>
<tr>
<td>Linux/Unix</td>
<td>.sh</td>
<td>sh / bash</td>
</tr>
</tbody>
</table>

In either mode, if your command fails, you immediately see an error message of command failed. Other script messages that you can get are command completed successfully, or command aborted.

The return values for each command are the same:

- **0x00**: SUCCESS
- **0x01**: FAILURE - The requested command failed
- **0x02**: ABORT - The command was aborted because parameters failed validation
- **0x03**: INVALID_ARGUMENTS - The arguments are incorrect. (Displays COMMAND help)
- **0x06**: INVALID_CARD_NUM - Unable to find the specified controller ID

To view a list of commands at the command line, type **ARCCONF** and press Enter.

To access the online help for a specific command, type **ARCCONF <command>**, then press Enter.

2.1 ARCCONF Commands

The following commands are available in ARCCONF for Smart Storage controllers. The commands are described on the following pages, in alphabetical order. In the command descriptions, <> indicates a required parameter and [] indicates an optional parameter.

**Attention:** ARCCONF supports commands for other controllers that are not listed in the following table. In addition, not all commands in the following table are supported by all Smart storage controllers. If you attempt to execute any command not listed in the following table, or any unsupported command for your controller, the firmware returns an error.
### Table 2-2. ARCCONF Commands for Smart Storage Controllers

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>atapassword</td>
<td>Sets or clears the password for SATA drives.</td>
</tr>
<tr>
<td>consistencycheck</td>
<td></td>
</tr>
<tr>
<td>create</td>
<td></td>
</tr>
<tr>
<td>delete</td>
<td></td>
</tr>
<tr>
<td>driverupdate</td>
<td></td>
</tr>
<tr>
<td>expanderlist</td>
<td></td>
</tr>
<tr>
<td>expanderupgrade</td>
<td></td>
</tr>
<tr>
<td>getconfig</td>
<td></td>
</tr>
<tr>
<td>getlogs</td>
<td></td>
</tr>
<tr>
<td>getsmartstats</td>
<td></td>
</tr>
<tr>
<td>getstatus</td>
<td></td>
</tr>
<tr>
<td>getversion</td>
<td></td>
</tr>
<tr>
<td>identify</td>
<td></td>
</tr>
<tr>
<td>imageupdate</td>
<td></td>
</tr>
<tr>
<td>key</td>
<td></td>
</tr>
<tr>
<td>list</td>
<td></td>
</tr>
<tr>
<td>maxcrypto(^1)</td>
<td></td>
</tr>
<tr>
<td>maxcryptoaccounts(^1)</td>
<td></td>
</tr>
<tr>
<td>maxcryptokey(^1)</td>
<td></td>
</tr>
<tr>
<td>modify</td>
<td></td>
</tr>
<tr>
<td>passthrough(^2)</td>
<td></td>
</tr>
<tr>
<td>phyerrorlog</td>
<td></td>
</tr>
<tr>
<td>playconfig</td>
<td></td>
</tr>
<tr>
<td>rescan</td>
<td></td>
</tr>
<tr>
<td>refresh</td>
<td></td>
</tr>
<tr>
<td>romupdate</td>
<td></td>
</tr>
<tr>
<td>saveconfig</td>
<td></td>
</tr>
<tr>
<td>savesupportarchive</td>
<td></td>
</tr>
<tr>
<td>setarrayparam</td>
<td></td>
</tr>
<tr>
<td>setboot</td>
<td></td>
</tr>
<tr>
<td>setcache</td>
<td></td>
</tr>
<tr>
<td>setconfig</td>
<td></td>
</tr>
<tr>
<td>setconnectormode</td>
<td></td>
</tr>
<tr>
<td>setcontrollermode</td>
<td></td>
</tr>
<tr>
<td>setcontrollerparam</td>
<td></td>
</tr>
<tr>
<td>setmaxcache</td>
<td></td>
</tr>
<tr>
<td>setname</td>
<td></td>
</tr>
<tr>
<td>setperform</td>
<td></td>
</tr>
<tr>
<td>setpower</td>
<td></td>
</tr>
<tr>
<td>setpriority</td>
<td></td>
</tr>
<tr>
<td>setstate</td>
<td></td>
</tr>
<tr>
<td>slotconfig(^2)</td>
<td></td>
</tr>
<tr>
<td>smp</td>
<td></td>
</tr>
<tr>
<td>splitmirror</td>
<td></td>
</tr>
<tr>
<td>task</td>
<td></td>
</tr>
<tr>
<td>uninit</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Available on controllers that support maxCrypto™ Controller-Based Encryption. See the Release Notes for more information.

2. Available in UEFI/ARCCONF only. See 3. Running ARCCONF in the UEFI Shell

### 2.2 arccconf atapassword

**Description**
Sets or clears the password for SATA drives.

**Syntax**

```
ARCCONF ATAPASSWORD <Controller#> [noprompt] [nologs]
ARCCONF ATAPASSWORD <Controller#> SET <new password> <Channel# ID#> [noprompt] [nologs]
ARCCONF ATAPASSWORD <Controller#> CLEAR <current password> <Channel# ID#> [noprompt] [nologs]
```

**Parameters**

- **new password | current password**
  - New password, current password.

- **Channel/ID**
  - Lists the space-delimited channel number and device number (ID) pairs for each drive on which to set or clear the password.

**Examples**

```
ARCCONF ATAPASSWORD 1 SET uR8ryx 0 1
ARCCONF ATAPASSWORD 1 CLEAR uR8ryx 0 1
```
2.3 arcconf consistencycheck

Description
Toggles the background consistency check modes of the controller.

Syntax

```
ARCCONF CONSISTENCYCHECK <Controller#> <on [Delay]|off> [nologs]
ARCCONF CONSISTENCYCHECK <Controller#> PARALLELCOUNT <Count> [nologs]
ARCCONF CONSISTENCYCHECK <Controller#> EVENTNOTIFY <Enable| Disable> [nologs]
ARCCONF CONSISTENCYCHECK <Controller#> INCONSISTENCYREPAIRPOLICY <Enable | Disable> [nologs]
```

Parameters

- **Controller#**
  Controller number.

- **On [Delay]**
  Turns background consistency check on, with optional 0 second–30 second delay period. The delay period sets the controller idle time, after which the consistency check will start. A value of 0 disables the consistency check (effectively the same as setting the parameter to Off). If Delay is unspecified, the consistency check mode is set to HIGH. If Delay is specified, the consistency check mode is set to IDLE for the specified period.

- **PARALLELCOUNT <Count>**
  Sets the parallel consistency check count. A value of 1 disables the consistency check.

- **EVENTNOTIFY <Enable| Disable>**
  Sets the inconsistency event notification and serial debug message generation setting for mirrored volumes. The Enable option enables the event notification and serial debug message generation. The Disable option disables the event notification and serial debug message generation.

- **INCONSISTENCYREPAIRPOLICY <Enable | Disable >**
  Sets the alternate inconsistency repair policy for RAID6 and RAID60 logical devices on the controller. The Enable option enables the inconsistency repair policy; the Disable option disables the inconsistency repair policy.

- **Noprompt**
  Optional parameter that suppresses the confirmation prompt.

Examples

```
ARCCONF CONSISTENCYCHECK 1 OFF
ARCCONF CONSISTENCYCHECK 1 PARALLELCOUNT 4
ARCCONF CONSISTENCYCHECK 1 EVENTNOTIFY enable
ARCCONF CONSISTENCYCHECK 1 INCONSISTENCYREPAIRPOLICY enable
```

2.4 arcconf create

Description
Creates a new encrypted or plaintext logical drive and, optionally, enables logical drive read caching, write caching. You must provide the channel and device ID of the physical devices.

On redundant logical drives, ARCCONF performs autosynchronization.

Note: Do not mix SMR and PMR drives in an array.
Syntax

ARCCONF CREATE <Controller#> LOGICALDRIVE [Options] <Size> <RAID#> <CHANNEL# ID#> [CHANNEL# ID#] ... [noprompt] [nologs]
ARCCONF CREATE <Controller#> LOGICALDRIVE [Options] <Size> <RAID#> ARRAY <Array#> [noprompt] [nologs]
ARCCONF CREATE <Controller#> LOGICALDRIVE ENCODE <Enable/Disable> USERROLE <userrole> [PASSWORD <password>] [Options] <Size> <RAID#> ARRAY <Array#> [noprompt] [nologs]
ARCCONF CREATE <Controller#> MAXCACHE [Options] DATALD, <LogicalDrive#> <Size> <RAID#> <CHANNEL# ID#> [Channel1# ID#]... [noprompt] [nologs]
ARCCONF CREATE <Controller#> MAXCACHE [Options] DATALD, <LogicalDrive#> <Size> <RAID#> ARRAY <maxCache Array#> [noprompt] [nologs]
ARCCONF CREATE <Controller#> RAIDZEROARRAY <Channel# ID#> [Channel# ID#]... [noprompt] [nologs]

Parameters

Controller#

The controller number.

Logical Drive, maxCache

Indicates a logical drive or maxCache Device, with the following options:

- Stripesize <STRIPE>—Allows the logical device stripe size to be built. Optional parameters for specifying a stripe size. STRIPE is specified in kilobytes 16, 32, 64, 128, 256, 512 and 1024 are supported. The default is 256 kB.
- Legs <LEG>—Optional parameters for specifying number of legs. Value is an integer.
  - LEG—Number of legs for RAID level 50 or 60.
    - Default—2 legs
- Name <NAME>—Optional parameter for specifying the alias name of a logical device that is displayed in the utilities. Value is a string of up to 64 characters.
- Method <METHOD>—Initialization method for the logical drive. Valid options include: BUILD, DEFAULT.
- LDcache—Sets the cache state for the logical device:
  - LON—cache on
  - LOFF—cache off
- SSDIOBYPASS <enable | disable>—Specifies to enable/disable SSD I/O bypass path on an array.
- CacheLineSize <CACHELINESIZE>—Specifies the cache line size in KB for maxCache. Adjusting the cache line size can impact maxCache performance and maximum size supported. The larger cache line size can support the larger maxCache size. The default value for this parameter is 64. Valid options can be 64, 128 and 256 based on controller support.
- Wcache—Sets the logical drive write cache mode for maxCache devices:
  - WT—write-through (disabled)
  - WB—write-back (enabled)

Data Logical Drive #

Specifies the existing data logical device number to be associated with the newly created cache logical device.

Encode <enable/disable>

Creates encrypted or plaintext logical devices, based on the maxCrypto status and Mixed Volumes logical device properties (see notes below; see also 2.18. arconf maxcrypto):

- Enable—Creates an encrypted logical device.
- Disable—Creates a plaintext logical device.
Note:
1. If maxCrypto status is Disabled, only plaintext logical devices can be created.
2. If maxCrypto status is Enabled and Mixed Volumes property is Enabled, both encrypted and plaintext logical devices can be created.
3. If maxCrypto status is Enabled and Mixed Volumes property is Disabled, only encrypted logical devices can be created.
4. If maxCrypto status is Enabled, then logical devices are encrypted by default.
5. To create plaintext logical devices, the Encode option must be specified with authentication credentials (Userrole/Password).

Userrole <userrole> [Password <password>]
maxCrypto user-role and password. Valid values are:
- crypto (maxCrypto administrator)
- user (standard user)

Array <Array#>
Array number on which to create the logical drive.

ARRAY <maxCache Array#>
The maxCache array number.

RAIDZEROARRAY
Create arrays from list of physical device(s) specified.
Each array will contain exactly one physical device and one RAID 0 logical device.
Default values will be applied for all logical device(s) created.

SSDOverProvisioningOptimization <enable | disable>
Specifies to initialize solid state drives that support the rapid parity initialization feature.

Size
Indicates the size of the logical device in megabytes. Use MAX to set size to available space.
Use MAXMBR to set the size to 2 TB.

RAID#
Indicates the RAID level for the new logical drive: 0, 1, 10, 1 Triple, 10 Triple, 50, 60, and 6 are supported.
Note: For a complete list of supported RAID levels for your controller, refer to the product release notes.

Channel# ID#
Lists the space-delimited channel number and device number pairs for each device to add to the logical device.

Noprompt
No prompt for confirmation.

Examples
```
ARCCONF CREATE 1 LOGICALDRIVE STRIPESIZE 64 MAX 0 1 0 2 0 3 2 NOPROMPT
ARCCONF CREATE 1 LOGICALDRIVE ssdoverprovisioningoptimization enable 1024 0 ARRAY 0

ARCCONF CREATE 1 LOGICALDRIVE 1024 1 ARRAY 0
ARCCONF CREATE 1 LOGICALDRIVE stripesize 16 method build MAX 5 0 0 0 1 0 2
ARCCONF CREATE 1 MAXCACHE WB dataid 0 17000 1 0 0 0 1
ARCCONF CREATE 1 MAXCACHE dataid 0 17000 0 ARRAY 0
ARCCONF CREATE 1 LOGICALDRIVE ENCODE disable USERROLE crypto PASSWORD Abc@1234 MAX 5 0 0 0 1 0 2
```
## 2.5 arcconf delete

### Description
Deletes a logical drive, an array, or maxCache logical device. All data stored on the logical drive will be lost.

### Syntax

```bash
ARCCONF DELETE <Controller#> LOGICALDRIVE <LD#> [noprompt] [nologs]
ARCCONF DELETE <Controller#> LOGICALDRIVE ALL [noprompt] [nologs]
ARCCONF DELETE <Controller#> ARRAY <arr#> [noprompt] [nologs]
ARCCONF DELETE <Controller#> ARRAY ALL [noprompt] [nologs]
ARCCONF DELETE <Controller#> MAXCACHE <maxCache ld#> [noprompt] [nologs]
ARCCONF DELETE <Controller#> MAXCACHE ALL [noprompt] [nologs]
```

### Parameters

- **Controller#**
  - Controller# is the controller number.

- **LD#**
  - LogicalDrive# is the device number of the logical device to be deleted.

- **arr#**
  - arr# is the device number of the array to be deleted.

- **maxCache ld#**
  - maxCache ld# is the device number of the maxCache logical device to be deleted.

- **ALL**
  - Deletes all logical devices or arrays or maxCache.

- **Noprompt**
  - Optional parameter that suppresses alert messages.

### Examples

- `ARCCONF DELETE 1 LOGICALDRIVE 1`
- `ARCCONF DELETE 1 ARRAY 0`
- `ARCCONF DELETE 1 ARRAY ALL`

## 2.6 arcconf driverupdate

### Description
Updates the Windows device driver for the controller.

**Note:** This command is available on Windows systems only.

### Syntax

```bash
ARCCONF DRIVERUPDATE <DirName> [nologs]
```

### Parameters

- **DirName**
  - Absolute path to directory containing the Windows driver for the controller.

- **Nologs**
  - Optional parameter that suppresses log output to the log files.
Examples

```
ARCCONF DRIVERUPDATE C:\WINDOWS\ALL
```

2.7 **arcconf expanderlist**

**Description**

Returns a list of disk drive expanders on a controller.

**Syntax**

```
ARCCONF EXPANDERLIST <Controller#> [nologs]
```

**Parameters**

- **Controller#**
  
  Controller number.

**Examples**

```
ARCCONF EXPANDERLIST 1
```

2.8 **arcconf expanderupgrade**

**Description**

Allows new firmware to be flashed to an enclosure or expander.

**Syntax:**

```
ARCCONF EXPANDER UPGRADE <Controller#> ENCLOSURE <Connector# Channel# ID#> [ChunkSize#] <UpgradeType> <Filename> [Mode#] [noprompt] [nologs]
```

**Parameters**

- **Controller#**
  
  Controller number.

- **Channel#**
  
  Channel number of the device to be updated.

- **ID#**
  
  Device number of the device to be updated.

- **Connector#**
  
  Connector number of the device to be updated.

- **ChunkSize#**
  
  Chunk size in bytes to be used to update the firmware. The default value is 4096 bytes.

- **Filename**
  
  Name of the firmware update file.

- **UpgradeType**

  EXPANDER—update the firmware image on the expander or enclosure.
  MFG—update the manufacturing image (BOOT SEEPROM) on the expander or enclosure.
CPLD—update the CPLD image on the expander or enclosure.

**Note:** MFG and CPLD upgrade types are supported on the Microchip Adaptec AEC-82885T expander only.

### Mode#

The Mode parameter applies to EXPANDER and MFG upgrade types only. Valid values are:

- **2**—download microcode only; requires system reset or power cycle to activate (default).
- **6**—download microcode with offsets and activate.
- **7**—download microcode with offsets, save, and activate.
- **E**—download microcode with offsets and defer activation.
- **F**—activate deferred microcode. It does not require the filename as an input.

### Noprompt

Optional parameter that suppresses alert messages.

### Examples

```
arcconf EXPANDERUPGRADE 1 ENCLOSURE 2 0 0 1024 EXPANDER C:\FirmwareImage.bin 7
arcconf EXPANDERUPGRADE 1 ENCLOSURE 2 0 0 512 MFG C:\FirmwareImage.rom 6
arcconf EXPANDERUPGRADE 1 ENCLOSURE 2 0 0 256 CPLD C:\CPLDImage.bin noprompt
```

## 2.9 arcconf getconfig

### Description

Lists the following information:

- Array status, size and member drives
- Controller type, status, World Wide Name (WWN), manufacturing information, and mode
- Cache preservation status: enabled/disabled, % of cache pages preserved
- BIOS, Boot Block, device driver, and firmware versions
- Logical drive status, RAID level and size
- Logical drive mount points
- RAID 10, 50, 60 segment and group information
- maxCache status, SSD information, and statistics of the maxCache logical drive
- Device type, Device ID, presence of PFA
- Physical device state, mount point (for drives with OS partition)
- Enclosure information: fan, power supply, and temperature status
- SGPIO virtual SEP information (virtual enclosure device for SGPIO backplanes)
- Connectors backplane discovery protocol
- Connector/Lane/Phy mapping
- Green backup details
- I2C address, clock speed, and clock stretching status
- maxCrypto properties: status, mode, number of encrypted logical devices, master key configuration, account configuration
- Out-of-Band interface properties

Also displays controller BIOS settings if you do not include a device-type keyword.
Notes: When displaying adapter information (AD keyword), the Controller Status field is set to Ok or Not Ok. Its value is set to Not Ok only if:

1. Communication with the controller fails. This occurs when the driver returns an error code after attempting to send a command to the controller.
2. A logical drive was created with a newer version of arcconf. Update to the latest utilities.
3. The controller mode (RAID/Mixed/HBA) is supported by the hardware, but not the firmware. Usually, this means that an older version of arcconf is being used against a newer controller. Update to the latest utilities.

Syntax

```
ARCCONF GETCONFIG <Controller#> [AD|LD [LD#]| AR[AR#]|PD [Channel# ID# Channel# ID# ...]|MC|CN| [AL]] [nologs]
```

Parameters

Controller#

Controller number

LD#

Display information about the specified logical device

AR#

Display information about the specified array, including the associated split mirror array, if applicable

AD/PD/AL...

- AD—Adapter information only (including maxCrypto properties)
- LD—Logical drive information only
- AR—Array information only
- PD—Physical device information only
- MC—maxCache information only
- CN—Connector information only
- AL—All information
- LD#—Optionally displays information about the specified logical device
- AR#—Optionally displays information about the specified array
- DEBUGTOKEN—Debug token information

Channel# ID#

Channel# ID#: The Channel and ID of the physical device to be display.

Examples

```
arcconf getconfig 1
Controllers found: 1
-------------------------------------
Controller information
-------------------------------------
Controller Status : Optimal
Controller Mode : Mixed
Channel description : SCSI
Controller Model : MSCC Adaptec SmartRAID 3162-8i /e
Controller Serial Number : 7139F300097
Controller World Wide Name : 50000D1E001C7D80
Physical Slot : 6
Temperature : 62 C/ 143 F (Normal)
Host bus type : PCIe 3.0
Host bus speed : 7880 Mbps
Host bus link width : 8 bit(s)/link(s)
PCI Address (Bus:Device:Function) : 1:0:0
Number of Ports : 2
Internal Port Count : 2
External Port Count : 0
Defunct disk drive count : 0
```

© 2021 Microchip Technology Inc.
and its subsidiaries
### 2.10 arcconf getlogs

**Description**

Provides access to event logs including:

- A log of special events that may have occurred (rebuilds, LDMs, and so on)

**Syntax**

```
ARCCONF GETLOGS <Controller#> EVENT[tabular] [nologs]
ARCCONF GETLOGS <Controller#> DEVICE <clear> <Channel# ID#> [nologs]
ARCCONF GETLOGS <Controller#> DEVICE clear ALL [nologs]
```

**Parameters**

- **Controller#**
  - Controller number.
  - EVENT—controller event log
  - Clear—Clears the error counter for one or all physical drives on a controller. Clear device error counter is not applicable on 'Not Supported' drives.
  - Channel/ID—Channel and number of the physical device on the controller.
  - Tabular—Displays statistics in tabular (vs XML) format.

**Examples**

```
ARCCONF GETLOGS 1 EVENT tabular
ARCCONF GETLOGS 1 DEVICE clear 0 0
ARCCONF GETLOGS 1 DEVICE clear ALL
```
2.11  arcconf getsmartstats

Description
Displays SMART statistics for the hard drives and Solid State Drives (SSDs) on a controller.

Syntax
ARCCONF GETSMARTSTATS <Controller#> [Tabular] [nologs]

Parameters
Controller#
Controller number.

Tabular
Creates output in tabular format.

Examples
ARCCONF GETSMARTSTATS 1
ARCCONF GETSMARTSTATS 1 TABULAR

2.12  arcconf getstatus

Description
The GETSTATUS function displays the status of any background task that is currently running. The information includes the type of operation, status, logical drive number and logical drive size (for a logical device), channel ID/device ID (for a physical drive), and percentage of the operation completed.

Syntax
ARCCONF GETSTATUS <Controller#> [json] [nologs]

Parameters
Controller#
Controller# is the controller number

json
Displays the status of any background task that is currently running in JSON format.

Examples
ARCCONF GETSTATUS 1 JSON

2.13  arcconf getversion

Description
Lists version information for all controllers or a specific controller's software components, including information about the driver and firmware currently running.
2.14 arcconf identify

Description
Identifies a physical device by blinking its LEDs. Also, identifies all the physical devices that are used to create a logical drive, maxCache or array.

Syntax
ARCCONF IDENTIFY <Controller#> ALL [TIME <BlinkTime>] [STOP] [nologs]
ARCCONF IDENTIFY <Controller#> LOGICALDRIVE <LogicalDrive#> [TIME <BlinkTime>] [nologs]
ARCCONF IDENTIFY <Controller#> DEVICE <Channel# ID#> ... [TIME <BlinkTime>] [nologs]
ARCCONF IDENTIFY <Controller#> ARRAY <Array#> [TIME <BlinkTime>] [nologs]
ARCCONF IDENTIFY <Controller#> MAXCACHE [TIME <BlinkTime>] [nologs]

Parameters
Controller#
Controller number

LogicalDrive#
Device number of the logical drive to be identified

Array#
Array number

MAXCACHE
maxCache device to be identified

Channel# ID#
Channel number and ID number for the physical device(s) to be identified

ALL
Blinks all physical devices on the controller

TIME <BlinkTime>
Time, in seconds, for the LEDs to continue blinking

STOP
Stops blinking the device

Examples
ARCCONF IDENTIFY 1 DEVICE 0 0
ARCCONF IDENTIFY 1 ALL TIME 60
ARCCONF IDENTIFY 1 ALL STOP
2.15  arcconf imageupdate

Description
Allows new firmware to be flashed to the hard drive.

Syntax:

```
ARCCONF IMAGEUPDATE <Controller#> DEVICE <Channel# ID# ChunkSize# Filename> [Mode#] [BufferID#] [noprompt] [nologs]
```

Parameters

- **Controller**
  - Controller number.

- **Channel**
  - Channel number of the device to be updated.

- **ID**
  - Device number of the device to be updated.

- **ChunkSize**
  - Chunk size, in bytes, to be used to update the firmware.
  
  **Note**: For SATA drives, the chunk size must be a multiple of 512.

- **Filename**
  - Name of the firmware update file.

- **Mode**
  - Firmware update mode. Valid values for physical drives are:
    - 7—Download microcode with offsets, save, and activate
    - 5—Download microcode in single transfer and activate
    - 14(E)—Download microcode in 'ChunkSize' byte chunks, but do not activate
    - 239(E+F)—Download microcode in 'ChunkSize' byte chunks and activate

- **BufferID**
  - Mandatory for tape drive firmware update.

- **Noprompt**
  - Optional parameter that suppresses alert messages.

Examples

```
ARCCONF IMAGEUPDATE 1 DEVICE 0 0 32768 ados.lod 3
```

2.16  arcconf key

Description
Loads a feature key onto a controller.
### Syntax

```
ARCCONF KEY <Controller#> SET <Key#> [nologs]
```

### Parameters

**Controller#**

The controller number.

**Key#**

The key number provided by Microchip.

### Examples

```
ARCCONF KEY 1 SET ABCDEFGHIJKLMNOPQRSTUVWX
```

### 2.17 arcconf list

**Description**

Lists all controllers in the system, or the configuration of a specific controller.

**Syntax**

```
ARCCONF LIST [Controller#] [nologs]
```

### Parameters

**Controller#**

The controller number.

### Examples

```
ARCCONF LIST
ARCCONF LIST 1
```

### 2.18 arcconf maxcrypto

**Description**

Configures maxCrypto settings, including:

- maxCrypto master key
- Mode (enable/disable)
- Administrator account credentials
- Support for mixed encrypted/plaintext volumes

Also toggles the maxCrypto mode, encodes/encrypts arrays and logical drives, and shows the maxCrypto certificate.

**Syntax**

```
ARCCONF MAXCRYPTO <Controller#> SETUP manual MODE <enable <ACCEPT <yes | no> > | disable>
KEYMANAGEMENTMODE local MIXEDVOLUMES <enable | disable> MASTERKEY <masterkeystring> USERROLE
crypto [PASSWORD <crypto password>] [nologs]
```

```
ARCCONF MAXCRYPTO <Controller#> MODE <enable <ACCEPT <yes | no> > | disable> USERROLE <crypto | user>
| user> [PASSWORD <crypto/user password>] [nologs]
```

```
ARCCONF MAXCRYPTO <Controller#> ENCODE LOGICALDRIVE <logicaldrive#> DATA <preserve/discard>
USERROLE <crypto | user> [PASSWORD <crypto/user password>] [nologs]
```

```
ARCCONF MAXCRYPTO <Controller#> ENCODE ARRAY <array#> DATA <preserve/discard> USERROLE
```

© 2021 Microchip Technology Inc.
and its subsidiaries
Using the Command Line Utility

Parameters

Controller#
Controller number.

SETUP manual
Enables manual setup; all parameters are required.

MODE <enable <ACCEPT yes | no> | disable>
Enables creation of encrypted and plaintext logical devices and allows you to accept the maxCrypto Terms of Use. Valid values are:

- Enable: Authorized users can create encrypted logical devices or plaintext logical devices, based on the value of the MIXEDVOLUMES property.
- Disable: Authorized users can create plaintext (non-encrypted) logical devices only.

KEYMANAGEMENTMODE local
Enables local key management.

MIXEDVOLUMES
Enables mixing of encrypted and plaintext logical devices. Valid values are:

- Enable: Authorized users have the option to create encrypted logical devices or plaintext logical devices.
- Disable: New logical devices will be encrypted, with no option to create plaintext logical devices.

MASTERKEY <masterkeystring>
A 10 to 32 character string, using all printable ASCII characters.

Important: Be sure to record the master key and store in a safe place. Once set, the master key cannot be displayed or recovered, only reset.

USERROLE <userrole> [PASSWORD <password>]
maxCrypto user role and password. Valid values are:

- crypto (maxCrypto administrator)
- user (standard user)

The password is a 8-16 character string, comprising all printable ASCII characters. It must include at least one uppercase character, one lowercase character, one numeric, and one special character (#,!,@,...). If password is not entered on the command line, a prompt appears during command execution.

ENCODE
Encrypts an existing array or logical drive, based on the maxCrypto mode and MIXEDVOLUMES property.

DATA <preserve | discard>
Preserves or discards original data in encoded logical device.

SHOW certificate
 Displays the maxCrypto Terms of Use certificate.
2.19 arcconf maxcryptoaccounts

Description
Creates a maxCrypto standard user (non-administrator) account, sets password recovery question/answer, changes passwords, and recovers passwords.

Syntax

arcconf maxcryptoaccounts <Controller#> CREATEUSER [CRYPTOPASSWORD <crypto password> USERPASSWORD <user password>] [nologs]
arcconf maxcryptoaccounts <Controller#> CHANGEPASSWORD USERROLE <crypto | user> [OLDPASSWORD <crypto/user password> NEWPASSWORD <crypto/user password>] [nologs]
arcconf maxcryptoaccounts <Controller#> SETRECOVERYPARAM QUESTION "<Question>" ANSWER "<Answer>" USERROLE crypto [nologs]
arcconf maxcryptoaccounts <Controller#> RECOVERPASSWORD ANSWER "<Answer>" USERROLE crypto [NEWPASSWORD <crypto password>][nologs]
arcconf maxcryptoaccounts <Controller#> RECOVERPASSWORD SHOW question [nologs]

Parameters

Controller#
Controller number.

CREATEUSER
Creates a standard user account, using the maxCrypto Administrator account (crypto).

Note: The standard user account is limited to lock/unlock firmware update; see 2.36. arcconf setcontrollerparam.

CRYPTOPASSWORD <crypto password>
maxCrypto Administrator account (crypto) password. If crypto password is not entered on the command line, a prompt appears during command execution.

USERPASSWORD <user password>
maxCrypto standard account (user) password. The password is a 8-16 character string, comprising all printable ASCII characters. It must include at least one uppercase character, one lowercase character, one numeric, and one special character (#,!,@,...). If user password is not entered on the command line, a prompt appears during command execution.

CHANGEPASSWORD
Changes the password for the standard user or crypto (Administrator) account.

USERROLE <crypto | user>
The account type: crypto (Administrator) or user (standard user).

OLDPASSWORD <crypto/user password> NEWPASSWORD <crypto/user password>
The old password and new password for the crypto account or user account. The password is a 8-16 character string, comprising all printable ASCII characters. It must include at least one uppercase character, one lowercase character, one numeric, and one special character (#,!,@,...). If the password is not entered on the command line, a prompt appears during command execution.

SETRECOVERYPARAM QUESTION "<Question>" ANSWER "<Answer>"
Sets the password recovery question and answer for the crypto (Administrator) account. The question and answer must be enclosed in quotes.

**RECOVERPASSWORD ANSWER <"Answer"> [NEWPASSWORD <crypto password>]**

Answers the recovery question and sets the new password for the crypto (Administrator) account. If the password is not entered on the command line, a prompt appears during command execution.

**RECOVERPASSWORD SHOW question**

Shows the recovery question.

**Examples**

ARCCONF MAXCRYPTOACCOUNTS 1 CHANGEPASSWORD USERROLE crypto OLDPASSWORD Abc@1234 NEWPASSWORD Abc@123456
ARCCONF MAXCRYPTOACCOUNTS 1 CREATEUSER CRYPTOPASSWORD Abc@1234 USERPASSWORD Abc@123456
ARCCONF MAXCRYPTOACCOUNTS 1 SETRECOVERYPARAM QUESTION "Which planet are you from?" ANSWER "i am from planet earth" USERROLE crypto PASSWORD Abc123456
ARCCONF MAXCRYPTOACCOUNTS 1 RECOVERPASSWORD SHOW question
ARCCONF MAXCRYPTOACCOUNTS 1 RECOVERPASSWORD ANSWER "i am from planet earth" NEWPASSWORD Abc@123456

2.20 arcconf maxcryptokey

**Description**

Performs maxCrypto key management functions, including changing the master key, generating a new key for an encrypted array or logical drive, and importing a master key for a logical drive moved from another controller (allows the controller to access the encrypted data).

**Syntax**

ARCCONF MAXCRYPTOKEY <Controller#> CHANGEMASTERKEY <masterkey> USERROLE <crypto | user> [PASSWORD <crypto/user password>][nologs]
ARCCONF MAXCRYPTOKEY <Controller#> REKEY ARRAY <array#> USERROLE <crypto | user> [PASSWORD <crypto/user password>][nologs]
ARCCONF MAXCRYPTOKEY <Controller#> REKEY LOGICALDRIVE <logicaldrive# | ALL> USERROLE <crypto | user> [PASSWORD <crypto/user password>][nologs]
ARCCONF MAXCRYPTOKEY <Controller#> IMPORT MASTERKEY <masterkey> USERROLE <crypto | user> [PASSWORD <crypto/user password>][nologs]

**Parameters**

**Controller#**

Controller number.

**CHANGEMASTERKEY <masterkeystring>**

A 10 to 32 character string, using all printable ASCII characters.

**IMPORTANT:** Be sure to record the new master key and store in a safe place. Once set, the master key cannot be displayed or recovered, only reset.

**IMPORT MASTERKEY <masterkeystring>**

Imports the master key for a logical drive moved from another controller. The master key is a 10 to 32 character string, using all printable ASCII characters.

**REKEY**

Generates a new key for an encrypted array or logical drive.
USERROLE <crypto | user> [PASSWORD <crypto/user password>]

maxCrypto user role: crypto (Administrator) or user (standard account), with optional password. If password is not entered on the command line, a prompt appears during command execution.

Examples

ARCCONF MAXCRYPTOKEY 1 CHANGEMASTERKEY Abc@1234567 USERROLE crypto PASSWORD Abc@123456
ARCCONF MAXCRYPTOKEY 1 REKEY ARRAY 0 USERROLE crypto PASSWORD Abc@123456
ARCCONF MAXCRYPTOKEY 1 IMPORT MASTERKEY Abc@1234567 USERROLE crypto PASSWORD Abc@123456

2.21 arccconf modify

Description
Morphs a logical device from one RAID level to another (RAID Level Migration). Expands a logical device from original size to one with larger capacity (Online Capacity Expansion).

Expands, shrinks or moves an array, or moves a logical device to a new array.

Note: Do not mix SMR and PMR in an array.

Syntax

ARCCONF MODIFY <Controller#> FROM <LogicalDrive#> TO [Options] <Size> <RAID#> <CHANNEL# ID#> [CHANNEL# ID#] ... [noprompt] [nologs]

ARCCONF MODIFY <Controller#> ARRAY <Array#> MOVE <Channel# ID#> [Channel# ID#] ... [nologs]

ARCCONF MODIFY <Controller#> ARRAY <Array#> HEAL <Channel# ID#> [Channel# ID#] ... [nologs]

ARCCONF MODIFY <Controller#> LOGICALDRIVE <LD#> MOVEARRAY <Array#> [nologs]

ARCCONF MODIFY <Controller#> LOGICALDRIVE <LD#> NEWARRAY <Channel# ID#> [Channel# ID#] ... [nologs]

ARCCONF MODIFY <Controller#> ARRAY <Array#> EXPAND [modifyparitygroups] <Channel# ID#> [Channel# ID#] ... [nologs]

ARCCONF MODIFY <Controller#> ARRAY <Array#> SHRINK [modifyparitygroups] <Channel# ID#> [Channel# ID#] ... [nologs]

Parameters

Controller#

The controller number

LogicalDrive#

The logical drive number to be modified

Array#

The array ID of the array to be modified

Options

One of the following:

- Stripsize <size>—indicates the stripe size in KB. Options are 16, 32, 64, 128, 256, 512, and 1024. The default is 256KB.

Size

- Size in MB.
- MAX indicates that you want to use all available space on the disk.

RAID#

RAID level for the logical drive: 0, 1, 10, 50, and 60 are supported.

Channel# ID#

Channel number and device ID for the device
Note: The CHANNEL# and ID# parameters are the list of devices that will contain the target modification object. Channel and ID are repeatable parameters. For RAID 1 to Simple Volume migration, CHANNEL# and ID# parameters are ignored.

MOVE
Moves an array to a new set of physical devices. Number of new physical devices must equal the number of physical devices in the original array.

EXPAND
Expands an array by adding physical device(s) to it. Only the physical device(s) that need to be added should be specified.

SHRINK
Shrinks an array by removing physical device(s) from it. Only physical device(s) that need to be removed should be specified.

HEAL
Replaces failed physical devices in the array with the specified devices.

MOVEARRAY
Moves a logical device to an existing array.

NEWARRAY
Moves a logical device to a new array created with the specified physical devices.

modifyparitygroups
Reconfigures the logical device(s) parity groups based on the final number of physical devices in the array.

noprompt
Suppresses the user prompt

Examples

ARCCONF MODIFY 1 FROM 2 TO 2048 0 0 123 0 124 0 117
ARCCONF MODIFY 1 ARRAY 1 MOVE 0 2 0 3
ARCCONF MODIFY 1 ARRAY 1 HEAL 0 0 0 1
ARCCONF MODIFY 1 LOGICALDRIVE 0 MOVEARRAY 1
ARCCONF MODIFY 1 LOGICALDRIVE 0 NEWARRAY 0 4 0 5
ARCCONF MODIFY 1 ARRAY 1 EXPAND 0 0 0 1
ARCCONF MODIFY 1 ARRAY 1 SHRINK 0 0 0 1
ARCCONF MODIFY 1 ARRAY 1 EXPAND MODIFYPARITYGROUPS 0 0 0 1
ARCCONF MODIFY 1 ARRAY 1 SHRINK MODIFYPARITYGROUPS 0 0 0 1

2.22 arcconf passthrough

Description
Sends a passthrough SCSI command. The CDB bytes are enclosed in square brackets, hex encoded, space-delimited, and must number 6, 10, 12, or 16 bytes. Read data may be redirected to a file. Write data is taken from the specified file. Transfers are limited to 2048 bytes. Transfer lengths are inferred for common SCSI CDBs but may be overridden using the length parameter.

Syntax

ARCCONF PASSTHROUGH <Controller#> <Channel# ID#> <read|notransfer> [length] <[> CDB <]<>
[rawhex] [noprompt] [nologs]
ARCCONF PASSTHROUGH <Controller#> <Channel# ID#> <readwithsense|notransferwithsense> [length]
<[> <CDB<]<]> [rawhex] [noprompt] [nologs]
ARCCONF PASSTHROUGH <Controller#> <Channel# ID#> <write> [length] <[> <CDB<]<]> <Filename>
[rawhex] [noprompt] [nologs]
ARCCONF PASSTHROUGH <Controller#> <Channel# ID#> <writewithsense> [length] <[> <CDB<]<>
<Filename> [rawhex] [noprompt] [nologs]

© 2021 Microchip Technology Inc. and its subsidiaries
Parameters

CDB
SCSI Command Descriptor Block. The CDB bytes are enclosed in square brackets, hex encoded, space-delimited, and must be 6, 10, 12, or 16 bytes.

length
Read/write data buffer length.

Read
Command direction is read.

Write
Command direction is write.

notransfer
No command direction (No data to read/write from/to the device).

readwithsense
Command direction is read with sense data.

writewithsense
Command direction is write with sense data.

notransferwithsense
Read only the sense data.

rawhex
Displays Hex data only of the Passthrough response.

Controller#
The controller through which the passthrough CDB is to be sent.

Channel# ID#
The channel and ID of the physical device.

FileName
Write the CDB data input file.

noprompt
Suppress alert messages.

nologs
Suppress log output.

Supported Commands
Refer to the SCSI primary/block command specification for command format for each of the following commands.

Table 2-3. Passthrough CDB Commands

<table>
<thead>
<tr>
<th>Opcode</th>
<th>Command</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00</td>
<td>TEST UNIT READY</td>
<td>notransfer</td>
</tr>
<tr>
<td>0x03</td>
<td>REQUEST SENSE</td>
<td>read</td>
</tr>
<tr>
<td>0x08</td>
<td>READ (6)</td>
<td>read</td>
</tr>
<tr>
<td>0x0A</td>
<td>WRITE (6)</td>
<td>write</td>
</tr>
<tr>
<td>0x12</td>
<td>INQUIRY</td>
<td>read</td>
</tr>
<tr>
<td>Opcode</td>
<td>Command</td>
<td>Direction</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>0x15</td>
<td>MODE SELECT (6)</td>
<td>write</td>
</tr>
<tr>
<td>0x1A</td>
<td>MODE SENSE (6)</td>
<td>read</td>
</tr>
<tr>
<td>0x1B</td>
<td>START STOP UNIT</td>
<td>notransfer</td>
</tr>
<tr>
<td>0x1C</td>
<td>RECEIVE DIAGNOSTIC RESULTS</td>
<td>read</td>
</tr>
<tr>
<td>0x1D</td>
<td>SEND DIAGNOSTIC</td>
<td>write</td>
</tr>
<tr>
<td>0x25</td>
<td>READ CAPACITY (10)</td>
<td>read</td>
</tr>
<tr>
<td>0x28</td>
<td>READ (10)</td>
<td>read</td>
</tr>
<tr>
<td>0x2A</td>
<td>WRITE (10)</td>
<td>write</td>
</tr>
<tr>
<td>0x2E</td>
<td>WRITE AND VERIFY (10)</td>
<td>write</td>
</tr>
<tr>
<td>0x3B</td>
<td>WRITE BUFFER</td>
<td>write</td>
</tr>
<tr>
<td>0x3C</td>
<td>READ BUFFER</td>
<td>read</td>
</tr>
<tr>
<td>0x4C</td>
<td>LOG SELECT</td>
<td>write</td>
</tr>
<tr>
<td>0x4D</td>
<td>LOG SENSE</td>
<td>read</td>
</tr>
<tr>
<td>0x55</td>
<td>MODE SELECT (10)</td>
<td>write</td>
</tr>
<tr>
<td>0x5A</td>
<td>MODE SENSE (10)</td>
<td>read</td>
</tr>
<tr>
<td>0x5E</td>
<td>PERSISTENT RESERVE IN</td>
<td>read</td>
</tr>
<tr>
<td>0x5F</td>
<td>PERSISTENT RESERVE OUT</td>
<td>write</td>
</tr>
<tr>
<td>0x85</td>
<td>ATA PASSTHROUGH (16)</td>
<td>write</td>
</tr>
<tr>
<td>0x88</td>
<td>READ(16)</td>
<td>read</td>
</tr>
<tr>
<td>0xA0</td>
<td>REPORT LUNS</td>
<td>read</td>
</tr>
<tr>
<td>0xA8</td>
<td>READ (12)</td>
<td>read</td>
</tr>
<tr>
<td>0xAA</td>
<td>WRITE (12)</td>
<td>write</td>
</tr>
<tr>
<td>0xAE</td>
<td>WRITE AND VERIFY (12)</td>
<td>write</td>
</tr>
</tbody>
</table>

### 2.23 arcconf phyerrorlog

**Description**
Displays PHY error logs for physical devices on a controller.

**Syntax**

```
ARCCONF PHYERRORLOG <Controller#> DEVICE <Channel# ID#> [nologs]
ARCCONF PHYERRORLOG <Controller#> DEVICE ALL [nologs]
ARCCONF PHYERRORLOG <Controller#> ENCLOSE <Connector# Channel# ID#> EXPANDER <ExpanderID#>
PHY <PHY#> [noprompt]
ARCCONF PHYERRORLOG <Controller#> ENCLOSE <Connector# Channel# ID#> EXPANDER <ExpanderID#> PHY ALL [noprompt]
```
Parameters
Controller#
Controller number.

Channel/ID
Channel and number of the physical device on the controller.

ALL
Displays PHY error log for all physical devices.

PHY#
PHY identifier.

Expander#
Expander ID to whom the command needs to be sent.

Examples
ARCCONF PHYERRORLOG 1 DEVICE 0 0
ARCCONF PHYERRORLOG 1 DEVICE ALL
ARCCONF PHYERRORLOG <Controller#> ENCLOSURE <Connector# Channel# ID#> EXPANADER <ExpanderID#>
PHY <PHY#> [noprompt]
ARCCONF PHYERRORLOG <Controller#> ENCLOSURE <Connector# Channel# ID#> EXPANADER <ExpanderID#>
PHY ALL [noprompt]
ARCCONF PHYERRORLOG 1 ENCLOSURE 0 2 0 EXPANADER 0 PHY 8
ARCCONF PHYERRORLOG 1 ENCLOSURE 0 2 0 EXPANADER 0 PHY ALL

2.24 arcconf playconfig

Description
Configures a controller using a XML server template file produced by the SAVECONFIG command (see 2.28. arcconf saveconfig). Use this command to deploy the same controller configuration on multiple servers in your storage space.

Notes:
1. The XML server template file (default, saveconfig.xml) is editable. For example, you may need to change the disk drive capacity, logical drive size, or RAID level.
2. Drives from the same vendor with slightly different capacities (147GB vs 150GB, for instance) are considered interchangeable. If the interchange results in a change in logical drive capacity, the drive is scaled, as needed. For example, if the new drives have 4% more capacity due to vendor or model changes, then all logical drives are increased in size by 4%.
3. Be sure to check the log file to verify that the controller was configured successfully. The exit codes, shown in the following table, indicate the success or failure of the operation and if the system needs to be rebooted.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUCCESS</td>
<td>0</td>
<td>Configuration succeeded, no reboot is required.</td>
</tr>
<tr>
<td>FAILURE_GENERAL</td>
<td>1</td>
<td>An error occurred and the configuration could not be completed.</td>
</tr>
<tr>
<td>SUCCESS_REBOOT</td>
<td>2</td>
<td>Configuration succeeded, but a reboot is required.</td>
</tr>
</tbody>
</table>

Syntax
ARCCONF PLAYCONFIG <Input XML File> [LogFile] [FORCE ALL|LOGICALSIZE] [SLOTID][nologs]
The pathname of the server template file. The default server template file is available at C:\PMCS\Logs\saveconfig.xml.

LogFile

Sets the pathname of the error log file. By default, the error log is available at C:\PMCS\Logs\playconfig.log.

FORCE

Forces deployment of the server even if the controller does not support all features, or the drive capacity does not match the configuration in the input XML file. Use FORCE ALL to force deployment of all features; use FORCE LOGICALSIZE to force deployment of just the logical drives.

SLOTID

Apply the configuration based on Slot ID instead of Device ID.

Examples

ARCCONF PLAYCONFIG server1_config.xml playconfig.log FORCE ALL

2.25 arcconf rescan

Description

Enables the controller to check for the removal of any disk drives and to check for the connection of any new disk drives to the controller. Controller rescan runs in the background, asynchronously. When rescan is started, a message is displayed stating that the process is running in the background and may take 10 minutes to complete. Another message is displayed if a rescan is started while one is already in progress.

Syntax

ARCCONF RESCAN <Controller#> [nologs]
ARCCONF RESCAN ALL [nologs]

Parameters

Controller#

The controller number

ALL

Rescans all controllers in the system

Examples

ARCCONF RESCAN 1
ARCCONF RESCAN ALL

2.26 arcconf refresh

Description

Refresh the security status of Self Encryption Drive (SED).

Syntax

ARCCONF REFRESH <Controller#> SEDSECURITYSTATUS <LockedOnly|ALL> [nologs]
ARCCONF REFRESH <Controller#> SEDSECURITYSTATUS DEVICE <Channel# ID#> [nologs]
Parameters

Controller#  
The controller number

SEDSECURITYSTATUS  
SED security status

LockedOnly  
Option to refresh the security status of locked SED drives.

ALL  
Option to refresh the security status of all SED drives.

Channel# ID#  
The Channel and ID of the SED physical device.

Examples

ARCCONF REFRESH 1 SEDSECURITYSTATUS LockedOnly
ARCCONF REFRESH 1 SEDSECURITYSTATUS Device 0 5

2.27  
arcconf romupdate

Description

Allows new firmware and BIOS to be flashed to the controller. A reboot is required for the new firmware to take effect.

Note:

1. This command is supported on all OSs that support maxView Storage Manager.

Syntax

ARCCONF ROMUPDATE <Controller#> <ImagePath> [once] [noprompt] [nologs]
ARCCONF ROMUPDATE 1 toggle [noprompt] [nologs]

Parameters

Controller#  
The controller number.

ImagePath  
This is the full path of the ROM image file.

toggle  
Toggles active ROM image to backup ROM image.

once*  
If specified, only the active ROM is flashed with the new image.

Note:

When updating the controller firmware, it is recommended not to add this parameter so that both the active and backup ROM images will be flashed.

Noprompt  
An optional parameter that suppresses the confirmation prompt.

Examples

ARCCONF ROMUPDATE 1 C:\firmwareImage\SmartFW.bin noprompt
ARCCONF ROMUPDATE 1 toggle
ARCCONF ROMUPDATE 1 C:\firmwareImage\SmartFW.bin once
2.28 arcconf saveconfig

Description
This command is supported on all OSs that support arcconf/maxView Storage Manager.

Saves the controller configuration to a XML server template file, including the controller type, operational settings, physical drive size, logical drive size, RAID level, and more. Use this file with the PLAYCONFIG command to deploy the same controller configuration to other servers in your storage space; see 2.24. arcconf playconfig for more information.

Note: Be sure to check the log file to verify that the configuration XML file was created successfully. The exit codes, shown in the following table, indicate the success or failure of the operation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUCCESS</td>
<td>0</td>
<td>Configuration XML generated successfully.</td>
</tr>
<tr>
<td>FAILURE_GENERAL</td>
<td>1</td>
<td>An error occurred and the configuration XML could not be generated.</td>
</tr>
</tbody>
</table>

Syntax
ARCCONF SAVECONFIG [Input XML File] [LogFile] [nologs]

Parameters
Input XML File
The pathname of the server template file. The default name (if you omit this parameter) is C:\PMCS\Logs\saveconfig.xml.

LogFile
The pathname of the error log file. By default, the error log is available at C:\PMCS\Logs\saveconfig.log.

Examples
ARCCONF SAVECONFIG server1_config.xml C:\LOGS\SERVER1.LOG

2.29 arcconf savesupportarchive

Description
Saves configuration and status information to help diagnose a problem with your system. Saved information includes device logs, drive logs, event logs, error logs, controller logs, history logs, basecode logs, and SMART statistics.

By default, the log files are saved in the Support folder in the standard logs directory for your operating system (/var/log for Linux, and so on).

Syntax
ARCCONF SAVESUPPORTARCHIVE [Path] [Firmware|Arcconf|Storlib|Basecode|GUI|Redfish] [Firmware Uartlog|Diagnostics] [nologs]

Parameters
Path
Path to store the log files.

Log type:
One of these options:

- **Firmware**: saves Firmware logs
- **Type**
  - **Uartlog**: saves controller serial logs
  - **Diagnostics**: saves controller debug logs
- **Arcconf**: saves Arcconf logs
- **Storlib**: saves StorLib logs
- **Basecode**: saves basecode logs
- **GUI**: saves GUI logs
- **Redfish**: saves Redfish logs

**Examples**

<table>
<thead>
<tr>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCCONF SAVESUPPORTARCHIVE</td>
</tr>
<tr>
<td>ARCCONF SAVESUPPORTARCHIVE Firmware</td>
</tr>
<tr>
<td>ARCCONF SAVESUPPORTARCHIVE C:\Adaptec\maxView Firmware</td>
</tr>
<tr>
<td>ARCCONF SAVESUPPORTARCHIVE firmware diagnostics</td>
</tr>
</tbody>
</table>

### 2.30 **arcconf setarrayparam**

**Description**
Changes a parameter of an array.

**Syntax**

<table>
<thead>
<tr>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCCONF SETARRAYPARAM &lt;Controller#&gt; &lt;Array#&gt; SPARETYPE &lt;Type&gt; [noprompt] [nologs]</td>
</tr>
<tr>
<td>ARCCONF SETARRAYPARAM &lt;Controller#&gt; &lt;Array#&gt; CONSOLIDATESPACE [noprompt] [nologs]</td>
</tr>
<tr>
<td>ARCCONF SETARRAYPARAM &lt;Controller#&gt; &lt;Array#&gt; SSDIOBYPASS &lt;enable/disable&gt; [nologs]</td>
</tr>
</tbody>
</table>

**Parameters**

- **Controller#**
  - Controller number

- **Array#**
  - Array number to be modified

- **SPARETYPE**
  - Sets the spare type for the array:
    - 1—Dedicated—A spare that replaces a failed drive in the array, and is shareable between arrays.
    - 2—Autoreplace—A spare that replaces a failed drive in the array, and is not sharable between arrays.

- **SSDIOBYPASS**
  - Enables or disables I/O bypass for all logical devices in the array. Default is enabled.
    - Enable—I/O bypass on array will be enabled.
    - Disable—I/O bypass on array will be disabled.

**Examples**

<table>
<thead>
<tr>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCCONF SETARRAYPARAM 1 0 SPARETYPE 1</td>
</tr>
<tr>
<td>ARCCONF SETARRAYPARAM 1 0 SSDIOBYPASS enable</td>
</tr>
</tbody>
</table>
2.31 arcconf setboot

Description
Sets the controller as a boot device for the system. This command is available only when the controller is offline.

Syntax
```
ARCCONF SETBOOT <Controller#> LOGICALDRIVE <LogicalDrive#> [TYPE <Boot Type>] [noprompt] [nologs]
ARCCONF SETBOOT <Controller#> DEVICE <Channel# ID#> TYPE <Boot Type> [nologs]
```

Parameters
- Controller#
  - Controller number
- LogicalDrive#
  - Logical drive number to mark as the boot device
- Channel# ID#
  - Channel and ID of the physical device to mark as the boot device.
- TYPE <Boot Type>
  - Boot type of the logical or physical device:
    - Primary—Primary boot logical/physical device
    - Secondary—Secondary boot logical/physical device
    - All—Primary and secondary boot logical/physical device.
    - None—Non-bootable

Examples
```
ARCCONF SETBOOT 1 LOGICALDRIVE 0 TYPE primary
ARCCONF SETBOOT 1 DEVICE 0 5 TYPE secondary
```

2.32 arcconf setcache

Description
Changes the cache mode for a logical drive, or the write cache mode for all drives or a single physical drive on a controller.

Syntax
```
ARCCONF SETCACHE <Controller#> LOGICALDRIVE <LogicalDrive#> | All <logical mode> [noprompt] [nologs]
ARCCONF SETCACHE <Controller#> DRIVESTORECACHEPOLICY <DriveType> <CachePolicy> [noprompt] [nologs]
ARCCONF SETCACHE <Controller#> CACHERATIO <read#> <write#> [nologs]
ARCCONF SETCACHE <Controller#> WRAITECACHEBYPASSTHRESHOLD <threshold size> [nologs]
ARCCONF SETCACHE <Controller#> NOBATTERYWRITECACHE <enable | disable> [nologs]
ARCCONF SETCACHE <Controller#> RECOVERCACHEMODULE [nologs]
```

Parameters
- Controller#
  - The controller number
- LogicalDrive#
  - Logical drive number to mark as the boot device
The number of the logical drive whose cache will be altered

Logical mode
Logical drive cache mode:
• con—cache enabled
• coff—cache disabled

Channel/ID
Lists the space-delimited channel number and device number pairs for each device.

DRIVETYPE
• Configured—drive write cache policy for configured drives
• Unconfigured—drive write cache policy for unconfigured drives
• HBA—drive write cache policy for HBA drives

CachePolicy
Write cache policy setting; choose any of the following values
• 0—default
• 1—enable
• 2—disable
• 3—Unchanged

Note: “Unchanged” write cache policy is only applicable for configured drives.

CACHERATIO <read#> <write#>
Sets the cache ratio for the controller:
• read#—read cache percentage
• write#—write cache percentage

Note: Some controllers support 8 GB DDR but only 4 GB can be backed up by the backup power source. In such scenario, write cache ratio can be configured to a maximum of 50 percent.

WAITFORCACHEROOM
Wait for room in the read/write cache when full instead of automatically bypassing it in favor of higher performance. Enabling this feature prevents RAID 1 inconsistencies that occur whenever the host changes buffer contents during write operations.
• Enable—wait for room in the read/write cache
• Disable—do not wait for room in the read/write cache

NOBATTERYWRITECACHE
Enables write caching when a battery or supercapacitor is not present or fully charged. This setting applies to all logical drives on the controller; at least one logical drive must exist before usage.
• Enable—enable write caching on controller without fully charged battery or supercapacitor
• Disable—disable write caching on controller without fully charged battery or supercapacitor

CAUTION
Enabling write caching without a fully charged battery/supercapacitor may cause data loss in the event of a power failure.

WRITECACHEBYPASSTHRESHOLD
Sets the write cache bypass threshold for the controller. This allows you to choose a value to bypass the cache when the large write reaches that threshold. Units are in KB and the value must be a multiple of 16 KB. The target can be any valid controller.
• Threshold size—the valid threshold size is between 16 KB and 1040 KB.
RECOVERCACHEMODULE

Recovers the failed cache module.

Examples

ARCCONF SETCACHE 1 CACHERATIO 60 40
ARCCONF SETCACHE 1 WAITFORCACHEROOM enable
ARCCONF SETCACHE 1 NOBATTERYWRITECACHE enable
ARCCONF SETCACHE 1 DRIVEWRITECACHEPOLICY Configured 0 Unconfigured 1 hba 2
ARCCONF SETCACHE 1 WRITECACHEBYPASTHRESHOLD 1040
ARCCONF SETCACHE 1 RECOVERCACHEMODULE

2.33 arcconf setconfig

Description

Resets the controller configuration. Logical drives are deleted, hard disks are reset to the READY state, cache contents are lost, and controller settings are reset to default values. Optionally, you can clear the maxCrypto configuration, including all keys, passwords, and maxCrypto users (administrator and standard user).

Syntax

SETCONFIG <Controller#> [DEFAULT | CLEARMAXCRYPTOCONFIG] [noprompt] [nologs]

Parameters

Controller#

The controller number.

Default

Restores the controller's default configuration.

Clearmaxcryptoconfig

Restores the default maxCrypto configuration.

Noprompt

No prompt for confirmation.

Examples

ARCCONF SETCONFIG 1 DEFAULT
ARCCONF SETCONFIG 1 CLEARMAXCRYPTOCONFIG

2.34 arcconf setconnectormode

Description

Use this command to configure controller connectors to different operating modes:

- **HBA Mode**—Allows the connector to act and be used as a Host Bus Adapter. RAID functions of the controller are disabled. All attached drives are surfaced as RAW devices.
- **RAID: Hide RAW**—All RAID functions of the controller are enabled for the connector, but RAW devices are not exposed to the operating system.
- **Mixed**—RAID volumes and RAW drives on the connector are exposed to operating system.
Syntax:
ARCCONF SETCONNECTORMODE <Controller#> <Connector #> <Functional Mode#> <Connector #> <Functional Mode#> ... [noprompt] [nologs]

Parameters
Controller#
Controller number.

Connector#
Connector number.

Functional Mode#
One of the following values:
- 1—HBA Mode
- 2—RAID: Hide RAW
- 3—Mixed

nologs
Suppresses log output.

Examples
ARCCONF SETCONNECTORMODE 1 1 1
ARCCONF SETCONNECTORMODE 1 3 3

2.35 arcconf setcontrollermode

Description
Use this command to configure the controller operating mode for all connectors:
- HBA Mode—Allows the controller to act and be used as a Host Bus Adapter. RAID functions of the controller are disabled. All attached drives are surfaced as RAW devices.
- RAID: Hide RAW—All RAID functions of the controller are enabled, but RAW devices are not exposed to the operating system.
- Mixed—RAID volumes and RAW drives are exposed to operating system.

Syntax
ARCCONF SETCONTROLLERMODE <Controller#> <Controller Mode> [nologs]

Parameters
Controller Mode
Change a controller's mode.
- 2—HBA Mode
- 3—RAID: Hide RAW
- 5—Mixed

Examples
ARCCONF SETCONTROLLERMODE 1 2
## 2.36 arcconf setcontrollerparam

**Description**  
Changes a parameter of a controller.

**Syntax**

```
ARCCONF SETCONTROLLERPARAM <Controller#> QUEUEDEPTH <QDepth> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> SPAREACTIVATIONMODE <Mode> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> ELEVATORSORT <Enable | Disable> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> LATENCY <Latency> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> SANITIZELOCK <sanitizeLock> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> MIXEDVOLUMES <Enable | Disable> USERROLE <userrole>  
ARCCONF SETCONTROLLERPARAM <Controller#> FWLOCK <Enable | Disable> USERROLE <userrole>  
ARCCONF SETCONTROLLERPARAM <Controller#> PASSWORD <password> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> DISCOVERYPROTOCOL <All discoveryProtocol> [noprompt] [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> DISCOVERYPROTOCOL <Connector# discoveryProtocol> [noprompt] [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> DISCOVERYPROTOCOL <All DirectAttachedCable NUMBEROFTARGETS NumberOfTargets#> [noprompt] [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> DISCOVERYPROTOCOL <Connector# DirectAttachedCable NUMBEROFTARGETS NumberOfTargets#> [Connector# DirectAttachedCable NUMBEROFTARGETS]... [noprompt] [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> OOBINTERFACE <OOBinterface> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> OOBINTERFACE PBSI I2CADDRESS <i2cAddress> I2CCLOCKSTRETCH <i2cClockStretch> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> OOBINTERFACE MCTP I2CADDRESS <i2cAddress> SMBUSDEVICETYPE <SMBusDeviceType> SMBUSCHANNEL <SMBusChannel> STATICEID <StaticEID> VDMNOTIFICATION <VDMNotification> [nologs]  
ARCCONF SETCONTROLLERPARAM <Controller#> EXPANDERSCANDURATION <duration> [nologs]
```

**Parameters**

- **Controller#**  
  Controller number

- **QUEUEDEPTH <QDepth>**  
  Sets the queue depth for the controller. Valid values are 0, 2, 4, 8, 16, and 32. A value of 0 indicates automatic queue depth.

- **SPAREACTIVATIONMODE <mode>**  
  Sets the spare activation mode from activation on failure to predictive spare activation. Valid values are:
  - 0—Activate on failure (default)
  - 1—Activate on predictive failure

- **ELEVATORSORT**  
  Sets the behavior of the controller cache write Elevator sort algorithm.

- **LATENCY**  
  Sets the flexible latency scheduler. Valid values are:
  - 0—Disable (default).
  - 1—Low. Sets value to 250.
  - 2—Medium. Sets value to 100.
• 3—High. Sets value to 50.
• 4—Aggressive level 1. Sets value to 30.
• 5—Aggressive level 2. Sets value to 10.

SANITIZELOCK
Sets the Sanitize lock on the controller.

• sanitizeLock
  – None—Default setting
  – Freeze—Freezes the Sanitize operation on all supported drives
  – AntiFreeze—Blocks setting the Freeze mode on all supported drives. Prevents further attempts to freeze the Sanitize operation on the hard drive.

MIXEDVOLUMES
Enables mixing of encrypted and plaintext logical devices. Valid values are:

• Enable—Authorized users have the option to create encrypted logical devices or plaintext logical devices (not encrypted).
• Disable—New logical devices will be encrypted, with no option to create plaintext logical devices.

FWLOCK
Locks/unlocks controller firmware update. Valid values are:

• Enable—Authorized users can update the controller firmware.
• Disable—Controller firmware cannot be updated.

USERROLE <userrole> PASSWORD <password>
MaxCrypto user-role and password. Valid values are:

• crypto (maxCrypto administrator)
• user (standard user)

OOBINTERFACE
Sets the Out-of-band interface settings for the controller. Parameters for configuring OOB interface:

• PBSI
• MCTP

PBSI
Sets the Out-of-band interface as PBSI.

<table>
<thead>
<tr>
<th>PBSI Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I2CADDRESS</td>
<td>Sets the I2C Address of the controller. Hexadecimal input from range of 0x00—0xFF</td>
</tr>
</tbody>
</table>
| i2cClockSpeed   | Sets I2C clock speed
  • 1—I2C clock speed 10 kHz
  • 2—I2C clock speed 100 kHz
  • 3—I2C clock speed 400 kHz
  • 4—I2C clock speed 800 kHz |
| i2cClockStretch | Sets the I2C clock stretch
  • Enable—Enables I2C Clock Stretching
  • Disable—Disables I2C Clock Stretching |

MCTP
Sets the Out-of-band interface as MCTP.
## MCTP parameters

<table>
<thead>
<tr>
<th>MCTP parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I2CADDRESS</td>
<td>Sets the I2C address of the controller. Hexadecimal input. For valid range, refer to the Management Component Transport Protocol (MCTP) SMBus/I2C Transport Binding Specification document.</td>
</tr>
<tr>
<td>SMBusDeviceType</td>
<td>Sets System Management(SM) Bus Device Type</td>
</tr>
<tr>
<td></td>
<td>• 0—Default</td>
</tr>
<tr>
<td></td>
<td>• 1—Fixed: Fixed and not discoverable. If this value is set, the I2C address is fixed and will not be able to be assigned with ARP.</td>
</tr>
<tr>
<td></td>
<td>• 2—Address Resolution Protocol (ARP) capable Bus master can assign the I2C address dynamically to slave devices to resolve the address conflicts.</td>
</tr>
<tr>
<td>SMBusChannel</td>
<td>Sets the System Management(SM) Bus Channel setting</td>
</tr>
<tr>
<td></td>
<td>• Enable—Enables SM Bus Channel</td>
</tr>
<tr>
<td></td>
<td>• Disable—Disables SM Bus Channel</td>
</tr>
<tr>
<td>StaticEID</td>
<td>Sets the Static End Point Identifier (EID) Setting</td>
</tr>
<tr>
<td></td>
<td>• Enable—Enables Static EID</td>
</tr>
<tr>
<td></td>
<td>• Disable—Firmware passes EID as 0 (internally) and the bus owner assigns the EID.</td>
</tr>
<tr>
<td>VDMNotification</td>
<td>Sets the Vendor Defined Message (VDM) discovery notification</td>
</tr>
<tr>
<td></td>
<td>• Enable—Enabling VDM Discovery Notify supports sending discovery notification during a PCI bus re-enumeration. This message is available for use as a common message for enabling an endpoint to announce its presence to the bus owner. This is typically used as a part of the endpoint discovery process when an MCTP device is hot-plugged onto or becomes powered-up on an MCTP bus.</td>
</tr>
<tr>
<td></td>
<td>• Disable—Disables VDM discovery Notification</td>
</tr>
</tbody>
</table>

### DISABLE

Sets the Out-of-band interface as Disable

### RESET

Resets the Out-of-band interface

### DISCOVERYPROTOCOL

Sets the protocol of a connector to discover the connected backplane.

Available connector discovery protocols are: Autodetect, UBM, SGPIO, VPP and DIRECTATTACHEDCABLE.

- All: Sets the discovery protocol for all the connectors
- DiscoveryProtocol:
  - AutoDetect*: The controller attempts to automatically detects the discovery protocol of the backplane attached to the connector.
  - UBM: The controller uses the UBM protocol to communicate with the backplane attached to the connector.
  - SGPIO: The controller uses the SGPIO protocol to communicate with the backplane attached to the connector.
  - VPP: The controller uses the VPP protocol to communicate with the backplane attached to the connector.
- **DIRECTATTACHEDCABLE**: The controller firmware uses the direct-attached cable protocol to communicate with direct attached drives. Number of targets (Physical devices) must be set to match the cable's supported target.
- **NUMBEROFTARGETS**: Sets the maximum number of physical devices that can be attached to the connector.
- **NumberOfTargets**: This option is applicable and mandatory for direct-attached cable. If the number of targets is not configured correctly, the target drives may not be discovered. The possible values are 2, 4, and 8.*
  
  **Note**: * Default parameter in most circumstances.
- **noprompt**: Do not prompt for confirmation.

**EXPANDERSCANDURATION**

Controller waits for the specified seconds to scan/discover the drives attached to the expander on the next power cycle. Set this to a nonzero value if some devices do not appear in the topology after controller boot or on rescan requests.

- **duration**: Time duration a controller will wait for during expander discovery. Time duration should be in seconds.

**Examples**

```
ARCCONF SETCONTROLLERPARAM 1 SANITIZELOCK Freeze
ARCCONF SETCONTROLLERPARAM 1 MIXEDVOLUMES enable USERROLE crypto PASSWORD Abc@1234
ARCCONF SETCONTROLLERPARAM 1 FWLOCK enable USERROLE crypto PASSWORD Abc@1234
ARCCONF SETCONTROLLERPARAM 1 OOBINTERFACE Disable
ARCCONF SETCONTROLLERPARAM 1 OOBINTERFACE PBSI I2CAddress 0xD0 I2CCLOCKSPEED 3
I2CCLOCKSTRETCH Enable
ARCCONF SETCONTROLLERPARAM 1 OOBINTERFACE SCTP I2CAddress 0xD0 SMBUSDEVICETYPE 1 SMBUSCHANNEL
Enable STATICID Enable VMMNotification Enable
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL ALL UBM
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL 0 SGPIO 1 UBM 2 SGPIO
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL 0 VPP
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL 1 EXPANDERSCANDURATION 5
```

```
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL 0 SGPIO 1 UBM 2 AutoDetect 3
DirectAttachedCable NUMBEROFTARGETS 8
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL ALL DirectAttachedCable NUMBEROFTARGETS 8
ARCCONF SETCONTROLLERPARAM 1 DISCOVERYPROTOCOL 1 DirectAttachedCable NUMBEROFTARGETS 8
```

**2.37 arcconf setmaxcache**

**Description**

Updates the maxCache write cache policy for one or more logical drives.

**Syntax: Write Caching**

```
ARCCONF SETMAXCACHE <Controller#> LOGICALDRIVE <LD#> [<LD#> <LD#>..] MAXCACHEWRITEPOLICY <Policy> [nologs]
```

**Parameters**

- **Controller#**
  
  The controller number.

- **LogicalDrive#**
  
  The number of the logical drive. You can specify one or more logical drives.
MAXCACHEWRITEPOLICY

Changes the MaxCache Write Cache policy on the logical device.
  • Policy - MaxCache Write Cache Policy
    – WB - Write Back Cache Policy
    – WT - Write Through Policy

Examples

ARCCONF SETMAXCACHE 1 LOGICALDRIVE 0 MAXCACHEWRITEPOLICY wt

2.38   arcconf setname

Description
Renames a logical drive.

Syntax

ARCCONF SETNAME <Controller#> LOGICALDRIVE <LogicalDrive#> <New Name> [nologs]

Parameters
Controller#
  Controller number

LogicalDrive#
  The number of the logical drive to be renamed

New Name
  The new name of the logical drive, and must be of 1 to 64 characters long, using only ASCII characters.

Examples

ARCCONF SETNAME 1 LOGICALDRIVE 1 BACKUP_A

2.39   arcconf setperform

Description
Changes controller settings based on the application type.

Syntax

ARCCONF SETPERFORM <Controller#> MNPDELAY <Delay> [nologs]
ARCCONF SETPERFORM <Controller#> DPO <Enable | Disable> [nologs]

Parameters
Controller#
  The controller number

MNPDELAY <Delay>
  Sets the monitor and performance delay for the controller, in minutes. Default is 60 minutes.
  Valid range for delay is 0-1440 minutes.
DPO
Degraded mode performance optimization setting for the controller.
  • Enable—Enables DPO setting
  • Disable—Disables DPO setting

Examples

ARCCONF SETPERFORM 1 MNPDELAY 1400
ARCCONF SETPERFORM 1 DPO enable

2.40 arccconf setpower

Description
Modifies the power management settings.

Syntax
ARCCONF SETPOWER <Controller#> POWERMODE <mode> SURVIVALMODE <mode> [nologs]

Parameters
Controller#
The controller number.

POWERMODE
Specifies the power mode for the controller.
  • 1—Minimum power-Set static settings to lowest possible values and reduce power
dynamically based on workload.
  • 2—Balanced power—Set static settings based on configuration and reduce power
dynamically based on workload.
  • 3—Maximum performance-Set static settings to highest possible values and do not
reduce power dynamically.

Note:
1. Some controllers do not support this mode.

SURVIVALMODE
Survival mode allows the controller to throttle back dynamic power settings to their minimum
when temperatures exceed the warning threshold.
This allows the server to continue running in more situations, but performance may decrease.
  • Enable—Survival mode enabled.
  • Disable—Survival mode disabled.

Examples

ARCCONF SETPOWER 1 POWERMODE 2
ARCCONF SETPOWER 1 SURVIVALMODE 1
2.41 arcconf setpriority

Description
Changes a task's execution priority or a controller's global background task priority.

Syntax
```
ARCCONF SETPRIORITY <Controller#> <REBUILD|EXPAND> <New Priority> [nologs]
```

Parameters
- **Controller#**
  - The controller number
- **New Priority**
  - LOW, MEDIUM, or HIGH. For REBUILD only: MEDIUMHIGH (if rapid rebuild priority is supported on the controller).
- **REBUILD**
  - Sets the controller's rebuild priority.
- **EXPAND**
  - Sets the controller's capacity expansion (OCE) priority.

Examples
```
ARCCONF SETPRIORITY 1 EXPAND LOW
ARCCONF SETPRIORITY 1 REBUILD MEDIUM
```

2.42 arcconf setstate

Description
Changes the state of a physical device or logical device or maxcache from its current state to the designated state.

Syntax
```
ARCCONF SETSTATE <Controller#> DEVICE <Channel#> <Device#> <State> [ARRAY <AR#> [AR#] ... ] [SPARETYPE <TYPE>] [noprompt] [nologs]
ARCCONF SETSTATE <Controller#> LOGICALDRIVE <LD#> OPTIMAL [ADVANCED <option>] [noprompt] [nologs]
ARCCONF SETSTATE <Controller#> MAXCACHE <LD#> OPTIMAL [noprompt] [nologs]
```

Parameters
- **Controller#**
  - The controller number
- **Channel#**
  - The channel number for the drive.
- **Device#**
  - Device number for the device.
- **LD#**
  - Logical drive number.
**AR#**

Array number.

**State**

- **HSP**—Create a hot spare from a ready drive. Dedicates the HSP to one or more.
- **RDY**—Remove a hot spare designation. Attempts to change a drive from Failed to Ready.
- **DDD**—Force a drive offline (to Failed).
- **EED**—Enable the erased drive.

**MAXCACHE**

Optional keyword for maxCache devices only. Include if State is HSP or RDY, and the hot spare is for a maxCache device.

- **maxCache ld#**—maxCache logical device ID to be forced optimal.

**Type**

- **1**—Dedicated—A dedicated spare temporarily takes over for a failed drive and can be shared between arrays.
- **2**—Autoreplace—An autoreplace spare replaces a failed drive and cannot be shared between arrays.

**SPARETYPE**

Sets the sparetype for the array.

**Noprompt:**

No prompt for confirmation.

**Examples**

```bash
ARCCONF SETSTATE 1 LOGICALDRIVE 1 OPTIMAL
ARCCONF SETSTATE 1 DEVICE 0 0 DDD
ARCCONF SETSTATE 1 DEVICE 0 0 RDY
ARCCONF SETSTATE 1 DEVICE 0 0 HSP ARRAY 0 SPARETYPE 2
ARCCONF SETSTATE 1 DEVICE 0 0 HSP ARRAY 0
ARCCONF SETSTATE 1 MAXCACHE 0 OPTIMAL
```

---

### 2.43 arcconf slotconfig

**Description**

Lists the channel ID and device ID of the devices in each slot of an enclosure. A slot with no devices marked as EMPTY.

**Syntax**

```bash
ARCCONF SLOTCONFIG <Controller#> <ConnectorID# EnclosureID#> <Slot#> [nologs]
ARCCONF SLOTCONFIG <Controller#> <ConnectorID# EnclosureID#> MAP [nologs]
ARCCONF SLOTCONFIG <Controller#> <ConnectorName EnclosureID#> <Slot#> [nologs]
ARCCONF SLOTCONFIG <Controller#> <ConnectorName EnclosureID#> MAP [nologs]
ARCCONF SLOTCONFIG <Controller#> ALL MAP [nologs]
```

**Parameters**

- **Controller#**
  
  The controller for which slot configuration is required.

- **ConnectorID#**
  
  The connector ID of enclosure whose slot configuration is needed.

- **ConnectorName**

---
The connector name of enclosure whose slot configuration is needed.

EnclosureID#

The enclosure where slot configuration is required.

Slot#

The slot number of the drive where information is required.

ALL

Display the slot configuration of all enclosures connected to controller.

MAP

Display the slot configuration of an enclosure.

Examples

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCCONF SLOTCONFIG 1 0 2 2</td>
<td></td>
</tr>
<tr>
<td>ARCCONF SLOTCONFIG 1 CN0 1 0</td>
<td></td>
</tr>
<tr>
<td>ARCCONF SLOTCONFIG 1 CN0 2 MAP</td>
<td></td>
</tr>
<tr>
<td>ARCCONF SLOTCONFIG 1 ALL MAP</td>
<td></td>
</tr>
</tbody>
</table>

2.44 arcconf smp

Description

Sends a SAS Management Protocol (SMP) function request to a SMP target device.

Syntax:

ARCCONF SMP <Controller#> Enclosure <Connector# Channel# Device#> Expander <Expander#> <CommandType1> [ASCII] [nologs]
ARCCONF SMP <Controller#> Enclosure <Connector# Channel# Device#> Expander <Expander#> <CommandType2> PHY <PHY#> [ASCII] [nologs]

Parameters

Controller#

Controller number.

Connector# Channel# ID#

Connector ID, Channel ID and Device ID of the enclosure that contains the expander.

Expander#

Expander number on the controller (SMP target device).

PHY#

The PHY Identifier (valid only for for Discover and PHY Error Log Request).

CommandType#

CommandType1:

• RGR—Report General Request
• RMR—Report Manufacturer Request

CommandType2:

• DR—Discover Request
• RPELR—Report PHY Error Log Request

ASCII

Displays the SMP response in ASCII format along with Hex formatted output.
2.45 arcconf splitmirror

Description
Splits an array consisting of one or more RAID 1, RAID 10, RAID 1 Triple or RAID10 Triple logical devices into two new arrays with identical contents.

Syntax
```
ARCCONF SPLITMIRROR <Controller#> ARRAY <Array#> SPLITWITHBACKUP [noprompt] [nologs]
ARCCONF SPLITMIRROR <Controller#> ARRAY <Array#> REMIRROR [noprompt] [nologs]
ARCCONF SPLITMIRROR <Controller#> ARRAY <Array#> ROLLBACK [noprompt] [nologs]
ARCCONF SPLITMIRROR <Controller#> ARRAY <Array#> ACTIVATEBACKUP [noprompt] [nologs]
```

Parameters
**Controller#**
Controller number

**Array#**
Array number

**SPLITWITHBACKUP**
Splits the array into two new arrays: a primary array and a backup array, with the following characteristics:

- If the original array contained RAID 1 or RAID 10 drives, the primary array will contain RAID 0 drives.
- If the original array contained RAID 1 Triple drives, the primary array will contain RAID 1 drives.
- If the original array contained RAID 10 Triple drives, the primary array will contain RAID 1+0 drives.

The backup array always contains RAID 0 logical drives. The primary array continues to be fully accessible to the operating system while the backup array is hidden from the operating system.

**REMIRROR**
Remirrors the array by preserving the existing data and discarding the backup array. This option re-creates the original mirrored array with the contents of the primary array.

**ROLLBACK**
Remirrors the array by rolling back to the contents of the backup array and discarding existing data. This option re-creates the mirrored array but restores its contents to the point in time when the backup array was created.

⚠️ **CAUTION**
We do not recommend using this option while the array is online, or while the logical drive to be rolled back is mounted or in use by the operating system.

**ACTIVATEBACKUP**
Activates the backup array and makes it fully accessible to the operating system.
### Examples

- `ARCCONF SPLITMIRROR 1 ARRAY 0 SPLITWITHBACKUP`
- `ARCCONF SPLITMIRROR 1 ARRAY 0 REMIRROR`
- `ARCCONF SPLITMIRROR 1 ARRAY 0 ROLLBACK`
- `ARCCONF SPLITMIRROR 1 ARRAY 0 ACTIVATEBACKUP`

### 2.46 arcconf task

#### Description

Performs a task on a logical drive, physical drive, array, or maxCache logical device. Uninitializes physical drives on a controller. Erases an encrypted logical drive or array, encodes (encrypts) a plaintext logical drive, and creates a new key for an encrypted logical device.

#### Syntax:

- `ARCCONF TASK START <Controller#> DEVICE <Channel# ID#> <secureerase> PATTERN <erasePattern> [Unrestricted] [noprompt] [nologs]`
- `ARCCONF TASK START <Controller#> DEVICE ALL UNINITIALIZE [nologs]`
- `ARCCONF TASK START <Controller#> DEVICE <Channel# ID#> UNINITIALIZE [nologs]`
- `ARCCONF TASK STOP <Controller#> DEVICE <Channel# ID#> [nologs]`

#### Syntax: maxCrypto Usage

- `ARCCONF TASK START <Controller#> LOGICALDRIVE <LogicalDrive#> CRYPTOERASE USERROLE <userrole> PASSWORD <password>`
- `ARCCONF TASK START <Controller#> ARRAY <Array#> CRYPTOERASE USERROLE <userrole> PASSWORD <password>`
- `ARCCONF TASK START <Controller#> LOGICALDRIVE <LogicalDrive#> ENCODE DATA <Preserve | Discard> USERROLE <userrole> PASSWORD <password>`
- `ARCCONF TASK START <Controller#> LOGICALDRIVE <LogicalDrive#> REKEY USERROLE <userrole> PASSWORD <password>`
- `ARCCONF TASK START <Controller#> ARRAY <Array#> REKEY USERROLE <userrole> PASSWORD <password>`

#### Parameters

- **Controller#**: The controller number
- **Channel# ID#**: Channel number and device ID for the device

#### Options:

- Physical device options:
  - `secureerase PATTERN <pattern>`—removes all data from the drive in a secure fashion to prevent any possible recovery of the erased data. Erase patterns:
    - 1—Zero - Initializes all blocks to zero.
    - 2—Random Zero - This erase method writes random data on the drive for the first pass then writes zeros for the second pass.
    - 3—Random Random Zero - This erase method writes random data on the drive for the first and second passes and then zeros for the third pass.
    - 4—Crypto Scramble Sanitize Method - HDDs and SSDs. Causes the physical device to change encryption keys to prevent correct decryption of previously stored information, which may cause protection information, if any, to be indeterminate.
    - 5—Block Erase Sanitize Method - SSDs only. Erase voltage is applied to all NAND cells.
• 6—Overwrite Sanitize Method - HDDs only. Initializes blocks using complex multi-byte data pattern.
  – Unrestricted—Applicable only to the sanitize erase methods (Crypto Scramble / Block Erase / Overwrite). With the Sanitize Erase option, the physical device is available for configuration if sanitize erase fails or could not complete. If not provided, value defaults to 'Restricted'. With the default option, if Sanitize Erase fails, the only operation allowed is to start another sanitize.
  – UNINITIALIZE—When specified with ALL, clears meta-data and any OS partitions from all drives on the controller; existing data on the drive is destroyed.

Cryptoerase
Erases an encrypted logical drive or array. (After erasing, the logical device remains encrypted.)

Encode Data <Preserve | Discard>
Encrypts a logical drive or array, with option of preserving or discarding the original data.

Rekey
Generates a new key for encrypted devices.

USERROLE <userrole> PASSWORD <password>
maxCrypto user-role and password. Valid values are:
• crypto (maxCrypto administrator)
• user (standard user)

Examples

<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninitializes one or more physical drives. The uninitialized command clears meta-data and any OS partitions from a drive; existing data on the drive is destroyed.</td>
<td>ARCCONF UNINIT &lt;Controller#&gt; &lt;Channel# Drive#&gt; [Channel# Drive#] ... [nologs] ARCCONF UNINIT &lt;Controller#&gt; ALL [nologs]</td>
</tr>
</tbody>
</table>

2.47 arcconf uninit

Description
Uninitializes one or more physical drives. The uninitialize command clears meta-data and any OS partitions from a drive; existing data on the drive is destroyed.

Note: Uninitialized drives are compatible with any HBA and can be exchanged with drives on the motherboard's SATA interface.

Syntax:

Parameters
Controller#
Controller number.

Channel#
The channel number of the device to be uninitialized.

Drive#
The drive number of the device to be uninitialized.
**ALL**

Uninitializes all physical devices on the controller.

**nologs**

Suppresses log output for the command.

**Examples**

```bash
ARCCONF UNINIT 1 0 12 0 13
ARCCONF UNINIT 1 ALL
```
Running ARCCONF in the UEFI Shell

This appendix describes how to run ARCCONF in the UEFI shell. UEFI/ARCCONF supports a subset of commands available on the command line. Most commands have the same form and syntax as their command line counterparts, with the exceptions noted in 3. UEFI/ARCCONF Commands. Additionally, some commands are supported in UEFI/ARCCONF only.

Prerequisites
To run UEFI/ACCONF, ensure that your system meets these requirements:

- System is running UEFI Shell v2.2 or higher
- MSCC UEFI driver is installed:
  a. Boot the machine to the UEFI shell prompt.
  b. Type: drivers
  c. Verify that ‘MSCC UEFI Driver (version)’ is listed.

Starting UEFI/ARCCONF
To start UEFI/ARCCONF:

1. Boot the machine to the UEFI shell prompt.
2. At the prompt, enter a command in the form:
   
   arcconf <command_name> <parameters> ...

3. To see a list of supported commands, type ARCCONF at the prompt; to include pagebreaks, type ARCCONF -b. For help with a specific command, type ARCCONF <command_name> help.

UEFI/ARCCONF Commands
The following table lists the commands supported in UEFI/ARCCONF. Follow the link in the Usage column for command forms and syntax. Where syntax differs from the command line, a separate usage statement is listed.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSISTENCYCHECK</td>
<td>Toggles background consistency check modes of the controller.</td>
<td>Usage: CONSISTENCYCHECK &lt;Controller#&gt; &lt;on [Delay]off&gt; [noprompt] Usage: CONSISTENCYCHECK &lt;Controller#&gt; PARALLELCOUNT &lt;Count&gt; Usage: CONSISTENCYCHECK &lt;Controller#&gt; INCONSISTENCYREPAIRPOLICY &lt;Enable</td>
</tr>
<tr>
<td>CREATE</td>
<td>Creates a new logical drive; optionally, enables logical drive read caching, write caching.</td>
<td>See 2.4. arcconf create</td>
</tr>
<tr>
<td>DELETE</td>
<td>Deletes a logical drive.</td>
<td>See 2.5. arcconf delete</td>
</tr>
<tr>
<td>EXPANDERLIST</td>
<td>Returns list of disk drive expanders on a controller.</td>
<td>See 2.7. arcconf expanderlist</td>
</tr>
<tr>
<td>EXPANDERUPGRADE</td>
<td>Allows new firmware to be flashed to an enclosure or expander.</td>
<td>See 2.8. arcconf expanderupgrade</td>
</tr>
<tr>
<td>GETCONFIG</td>
<td>Lists information about controllers and physical drives.</td>
<td>See 2.9. arcconf getconfig</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>Usage</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>GETLOGS</td>
<td>Provides access to controller status, event logs, and usage statistics.</td>
<td>Usage: GETLOGS &lt;Controller#&gt; &lt;Type 1&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Usage: GETLOGS &lt;Controller&gt; &lt;Type 2&gt; LOGICALDRIVE &lt;LD#&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see 2.10. arcconf getlogs</td>
</tr>
<tr>
<td>GETVERSION</td>
<td>Lists version information for all controllers or a specific controller's software components.</td>
<td>See 2.13. arcconf getversion</td>
</tr>
<tr>
<td>IDENTIFY</td>
<td>Identifies a physical device by blinking its LEDs.</td>
<td>See 2.14. arcconf identify</td>
</tr>
<tr>
<td>IMAGEUPDATE</td>
<td>Allows new firmware to be flashed to the hard drive.</td>
<td>See 2.15. arcconf imageupdate</td>
</tr>
<tr>
<td>LIST</td>
<td>Lists controllers in the system.</td>
<td>See 2.17. arcconf list</td>
</tr>
<tr>
<td>PASSTHROUGH</td>
<td>Sends SCSI passthrough protocol (SCSI) function request to a disk drive.</td>
<td>See 2.22. arcconf passthrough</td>
</tr>
<tr>
<td>RESCAN</td>
<td>Check for removal of disk drives and for connection of new disk drives to the controller.</td>
<td>See 2.25. arcconf rescan</td>
</tr>
<tr>
<td>ROMUPDATE</td>
<td>Allows new firmware and BIOS to be flashed to the controller.</td>
<td>Usage: ROMUPDATE &lt;Controller#&gt; &lt;ImagePath&gt; [noprompt] [nologs]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see 2.27. arcconf romupdate</td>
</tr>
<tr>
<td>SAVESUPPORTARCHIVE</td>
<td>Saves configuration and status information.</td>
<td>Usage: SAVESUPPORTARCHIVE [Path]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see 2.29. arcconf savesupportarchive</td>
</tr>
<tr>
<td>SETARRAYPARAM</td>
<td>Changes a parameter of an array.</td>
<td>See 2.30. arcconf setarrayparam</td>
</tr>
<tr>
<td>SETBOOT</td>
<td>Sets controller as a boot device for the system.</td>
<td>See 2.31. arcconf setboot</td>
</tr>
<tr>
<td>SETCONFIG</td>
<td>Resets the controller configuration.</td>
<td>Usage: SETCONFIG &lt;Controller#&gt; &lt;DEFAULT&gt; [noprompt] [nologs]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>see 2.33. arcconf setconfig</td>
</tr>
<tr>
<td>SETCONNECTORMODE</td>
<td>Change the connector operating mode.</td>
<td>See 2.34. arcconf setconnectormode</td>
</tr>
<tr>
<td>SETSTATE</td>
<td>Changes the state of a physical device or logical device.</td>
<td>See 2.42. arcconf setstate</td>
</tr>
<tr>
<td>SLOTCONFIG</td>
<td>Lists the channel ID and device ID of the devices in each enclosure slot.</td>
<td>See 2.43. arcconf slotconfig</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMP</td>
<td>Sends a SAS Management Protocol (SMP) function request to a SMP target device.</td>
<td>See 2.44. arcconf smp</td>
</tr>
</tbody>
</table>
## Controller, Array, Logical and Physical Device Properties

This appendix provides detailed description of the controller, array, logical and physical device properties of ARCCONF in the command-line.

Table 4-1. Controller

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller Status</td>
<td>Overall status of the controller based on its resources.</td>
</tr>
<tr>
<td>Controller Mode</td>
<td>Operating mode of the controller.</td>
</tr>
<tr>
<td>Channel description</td>
<td>Channel description of the controller.</td>
</tr>
<tr>
<td>Controller Model</td>
<td>Model name of the controller connected to the system.</td>
</tr>
<tr>
<td>Vendor ID</td>
<td>Vendor ID of the controller.</td>
</tr>
<tr>
<td>Device ID</td>
<td>Device ID of the controller.</td>
</tr>
<tr>
<td>Subsystem Vendor ID</td>
<td>Subsystem Vendor ID of the controller.</td>
</tr>
<tr>
<td>Subsystem Device ID</td>
<td>Subsystem Device ID of the controller.</td>
</tr>
<tr>
<td>Controller Serial Number</td>
<td>A unique number assigned to the controller, used for identification and inventory purposes.</td>
</tr>
<tr>
<td>Controller World Wide Name</td>
<td>A World Wide Name (WWN) is an unique identifier of the controller.</td>
</tr>
<tr>
<td>Physical Slot</td>
<td>PCI slot number to which the controller is connected.</td>
</tr>
<tr>
<td>Temperature</td>
<td>Current temperature of the controller.</td>
</tr>
<tr>
<td>Host bus type</td>
<td>Type of host expansion bus standard.</td>
</tr>
<tr>
<td>Host bus speed</td>
<td>Speed of the host expansion bus standard in Mbps.</td>
</tr>
<tr>
<td>Host bus link width</td>
<td>Data width of the host expansion bus standard in bits.</td>
</tr>
<tr>
<td>PCI Address</td>
<td>PCI address describes the PCI address for the controller.</td>
</tr>
<tr>
<td>(Domain:Bus:Device:Function)</td>
<td></td>
</tr>
<tr>
<td>Number of Ports</td>
<td>Describes number of internal and external ports of the controller.</td>
</tr>
<tr>
<td>Internal Port Count</td>
<td>Describes number of internal ports of the controller.</td>
</tr>
<tr>
<td>External Port Count</td>
<td>Describes number of external ports of the controller.</td>
</tr>
<tr>
<td>Defunct disk drive count</td>
<td>Number of failed drive.</td>
</tr>
<tr>
<td>NCQ status</td>
<td>Native Command Queuing, or NCQ, lets SATA disk drives arrange commands into the most efficient order for optimum performance.</td>
</tr>
<tr>
<td>Queue Depth</td>
<td>Queue Depth controls the behavior of the cache write queue. This option is used to tune controller performance for video applications. The valid values are 2, 4, 8, 16, 32, or Automatic.</td>
</tr>
<tr>
<td>Monitor and Performance Delay</td>
<td>This option controls the behavior of the controller Monitor and Performance Analysis Delay and is expressed in values ranging from 0 to 1440 minutes. This option is primarily used to tune the controller's performance for video applications.</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Elevator Sort</td>
<td>This option controls the behavior of the controller cache write elevator sort algorithm. This option is used to tune controller performance for video applications. The possible options are Enable or Disable.</td>
</tr>
<tr>
<td>Degraded Mode Performance Optimization</td>
<td>Degraded Mode Performance Optimization setting applies to RAID 5 logical devices in Degraded mode only. Enabling this setting directs the controller to improve performance of large read requests by buffering physical drive requests. Disabling this feature forces the controller to read from the same drives multiple times. This option is used to tune controller performance for video applications. The possible options are Enable or Disable.</td>
</tr>
<tr>
<td>Latency</td>
<td>Latency describes Flexible Latency Schedule (FLS) setting. Flexible Latency Scheduler (FLS) is a controller option where the controller can re-prioritize I/O requests to prevent some requests to HDDs from timing out. Under normal operation (when FLS is disabled, or in controllers that don support FLS), the controller will sort incoming requests in order to minimize the amount of travel for the HDD read heads (Elevator Sort). This strategy works well for workloads that access sequential data, or workloads that require multiple requests from localized sectors in the drive. For highly random workloads, such as transaction processing, some requests will end up on the wrong side of the disk platter and, due to their high latency, will be marked as timed out. When FLS is enabled, it will detect these high-latency requests and apply a cut-off value, after which it will suspend elevator sorting and service the request right away.</td>
</tr>
<tr>
<td>Post Prompt Timeout</td>
<td>Post prompt timeout describes the F1/F2 Post prompt timeout for the controller during system boot.</td>
</tr>
<tr>
<td>Statistics Data Collection Mode</td>
<td>Use the Statistics Viewer to view the advanced statistics for the controllers, hard drives, SSDs, logical drives, and maxCache devices in your storage space, including virtual volumes and the maxCache container.</td>
</tr>
<tr>
<td>Boot Controller</td>
<td>Boot controller can be changed only in the offline environment and only applies to booting in Legacy BIOS Boot mode. The boot controller is the first controller that the system examines (after power-up) to find a bootable logical device or a physical device. The controller boots from the first local drive by default. It is recommended that leaving the default setting disabled to prevent an error when booting after replacing the boot volume or controller.</td>
</tr>
<tr>
<td>Primary Boot Volume</td>
<td>Describes which logical device or physical device is the primary boot volume on the current controller.</td>
</tr>
<tr>
<td>Secondary Boot Volume</td>
<td>Describes which logical device or physical device is the secondary boot volume on the current controller.</td>
</tr>
<tr>
<td>Driver Name</td>
<td>Driver name describes the name of the driver.</td>
</tr>
<tr>
<td>Driver Supports SSD I/O Bypass</td>
<td>Driver supports SSD I/O Bypass describes whether the driver supports the SSD I/O Bypass feature.</td>
</tr>
<tr>
<td>Manufacturing Part Number</td>
<td>Describes the hardware part number information about the controller.</td>
</tr>
<tr>
<td>Manufacturing Spare Part Number</td>
<td>Describes the hardware spare part number information about the controller.</td>
</tr>
<tr>
<td>Manufacturing Wellness Log</td>
<td>Describes the hardware wellness log information about the controller.</td>
</tr>
<tr>
<td>Manufacturing Model</td>
<td>Describes the manufacturing model information about the controller.</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NVRAM Checksum Status</td>
<td>Describes the NVRAM Checksum status.</td>
</tr>
</tbody>
</table>
| Sanitize Lock Setting       | Set the sanitize lock policy of the controller. This policy will be applied to all SATA physical devices that support the feature.  
2. Freeze—Supported physical devices are freeze locked and sanitize is not allowed.  
3. Anti-Freeze—Supported physical devices are anti-freeze locked and freezing the physical devices is not allowed. |
| Pending Sanitize Lock Setting| Sanitize lock is in pending state, reboot the system and requires all physical devices to be power cycled or hot-plugged for the lock state to be applied to the physical devices. |
| Current Power Mode          | Power mode setting that determines controller static settings based on workload.                                                                                                                             |
| Pending Power Mode          | Power mode setting is in pending state, reboot the system for the new power mode setting to be applied.                                                                                                  |
| Survival Mode               | Enabling survival mode will allow the controller to throttle back dynamic power settings to their minimum when temperature exceeds the warning threshold. This allows the server to continue running in more situations, but performance may decrease. |
| Cache Status                | Determines the preservation status of the cache module.                                                                                                                                                |
| Cache Serial Number         | A unique number assigned to the cache module.                                                                                                                                                              |
| Cache memory                | Cache memory size in the controller. Value in MB.                                                                                                                                                           |
| Read Cache Percentage       | The current read cache percent for the controller.                                                                                                                                                         |
| Write Cache Percentage      | The current write cache percent for the controller.                                                                                                                                                       |
| No-Battery Write Cache      | This setting decides the controller to enable write cache when no battery is present or when the battery fails. Values are Enable or Disable.                                                              |
| Wait for Cache Room         | This setting causes the controller to always wait for room in the read/write cache when full, instead of automatically bypassing it in favor of higher performance.                                              |
| Write Cache Bypass Threshold Size | All writes larger than the specified value will bypass the write cache and be written directly to the disk for non-parity RAID volumes. Value in KB. |

.............continued
<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
</table>
| Configured Drives      | Sets the write cache policy for the configured physical devices on the controller  
  • Default: Allows the controller to control the drive write cache policy of all configured physical devices.  
  • Enabled: The drive write cache for the physical device will be enabled by the controller.  
  Setting to enabled can increase write performance but risks losing the data in the cache on sudden power loss to all configured physical devices.  
  • Disabled: The drive write cache for the physical devices will be disabled by the controller.  
  • Unchanged: Sets the physical devices factory default policy for all configured drives. |
| Unconfigured Drives    | Sets the write cache policy for the unconfigured physical devices on the controller  
  • Default: The controller does not modify the drive write cache of the physical devices.  
  • Enabled: The drive write cache for the physical device will be enabled by the controller.  
  Setting to enabled can increase write performance but risks losing the data in the cache on sudden power loss to all unconfigured physical devices.  
  • Disabled: The drive write cache for the physical devices will be disabled by the controller. |
| HBA Drives             | Sets the write cache policy for the HBA physical devices on the controller  
  • Default: The controller does not modify the drive write cache of the physical devices.  
  • Enabled: The drive write cache for the physical drive will be enabled by the controller.  
  Setting to enabled can increase write performance but risks losing the data in the cache on sudden power loss to all physical devices.  
  • Disabled: The drive write cache for the physical devices will be disabled by the controller. |
<p>| maxCache Version       | maxCache version of controller.                                                                                                                                                                           |
| maxCache RAID5 WriteBack Enabled | Status of write back setting for RAID5 maxCache at controller level.                                                                                                                                          |
| Logical devices/Failed/Degraded | Total number of logical devices/number of logical devices failed/number of logical devices degraded.                                                                                                          |
| Spare Activation Mode  | Spare activation mode feature enables the controller firmware to activate a spare drive. The firmware starts rebuilding a spare drive only when a data drive fails when the mode is Failure. With the predictive failure activation mode, rebuilding can begin before the drive fails when a data drive reports a predictive failure (SMART) status which will reduce the likelihood of data loss that could occur if an additional drive fails. |
| Background consistency check | If your controller supports background consistency check, maxView Storage Manager continually and automatically checks your logical drives for bad or inconsistent data once they're in use. |</p>
<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistency Check Delay</td>
<td>Determines the time interval for which a controller must be inactive before a consistency check is initiated on the physical drives that are connected to it. The value can be between 0 and 30 to specify the duration of the delay in seconds. A value of 0 disables the scan.</td>
</tr>
<tr>
<td>Parallel Consistency Check Supported</td>
<td>Status of the Parallel Consistency Check support.</td>
</tr>
<tr>
<td>Parallel Consistency Check Count</td>
<td>Parallel consistency check count describes the number of logical devices on which the controller will perform consistency check in parallel.</td>
</tr>
<tr>
<td>Inconsistency Repair Policy</td>
<td>Inconsistency repair policy searches for a single inconsistent strip and repairs the strip on that one drive only.</td>
</tr>
<tr>
<td>Consistency Check Inconsistency Notify</td>
<td>This property enables the event notification messages and serial debug log messages for mirrored volumes.</td>
</tr>
<tr>
<td>Rebuild Priority</td>
<td>Rebuild priority determines the urgency with which the controller treats an internal command to rebuild a failed logical drive. At the low setting, normal system operations take priority over a rebuild. At the medium setting, rebuilding occurs for half of the time, and normal system operations occur for the rest of the time. At the medium high setting, rebuilding is given a higher priority over normal system operations. At the high setting, the rebuild takes precedence over all other system operations.</td>
</tr>
<tr>
<td>Expand Priority</td>
<td>Determines the urgency with which the controller treats an internal command to expand an array. At the low setting level, normal system operations take priority over an array expansion. At the medium setting, expansion occurs for half of the time, and normal system operations occur for the rest of the time. At the high setting, the expansion takes precedence over all other system operations.</td>
</tr>
<tr>
<td>Firmware</td>
<td>Active firmware version of the controller.</td>
</tr>
<tr>
<td>Driver</td>
<td>Current version of driver installed on the system.</td>
</tr>
<tr>
<td>Hardware Revision</td>
<td>Describes the hardware revision information about the controller.</td>
</tr>
<tr>
<td>maxCrypto Supported</td>
<td>maxCrypto feature ensures the sensitive data is encrypted and protected by secure 256 bit AES, in-line encryption.</td>
</tr>
<tr>
<td>maxCrypto Status</td>
<td>Indicates whether maxCrypto is enabled or disabled.</td>
</tr>
<tr>
<td>Crypto Officer Password</td>
<td>Crypto officer password indicates, whether the crypto officer(Admin) has configured password or not.</td>
</tr>
<tr>
<td>User Password</td>
<td>User officer password indicates whether the user has configured password or not.</td>
</tr>
<tr>
<td>Controller Password</td>
<td>Indicates whether the controller has configured password or not.</td>
</tr>
<tr>
<td>Allow New Plaintext Logical device(s)</td>
<td>Allow new plaintext logical device(s) indicates, whether the new logical devices created can be encrypted or Plaintext (Non-Encrypted).</td>
</tr>
<tr>
<td>Master Key</td>
<td>Master key is a cryptographic secret key.</td>
</tr>
<tr>
<td>FW Locked for Update</td>
<td>Firmware locked for update prevents the updating of firmware on the controller.</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Password Recovery Parameters Set</td>
<td>Crypto officer password recovery parameters indicates, whether the crypto officer has set the recovery question and answer.</td>
</tr>
<tr>
<td>Controller Password Unlock Attempts Remaining</td>
<td>Indicates the number of controller login attempts remaining.</td>
</tr>
<tr>
<td>SSD I/O Bypass Mixing</td>
<td>maxCrypto/SSD I/O bypass mixing indicates that mixing of maxCrypto and SSD I/O bypass is supported or not.</td>
</tr>
<tr>
<td>maxCache Mixing</td>
<td>Indicates whether mixing of maxCrypto and maxCache is supported or not.</td>
</tr>
<tr>
<td>Crypto Account Password Unlock Attempts Remaining</td>
<td>Indicates the number of crypto officer login attempts remaining.</td>
</tr>
<tr>
<td>User Account Password Unlock Attempts Remaining</td>
<td>Indicates the number of user login attempts remaining.</td>
</tr>
<tr>
<td>Number of maxCrypto Physical devices</td>
<td>Total number of encrypted physical device which are part of encrypted logical device.</td>
</tr>
<tr>
<td>Number of maxCrypto Data Logical devices</td>
<td>Total number of encrypted logical device.</td>
</tr>
<tr>
<td>Number of maxCrypto Foreign Logical devices</td>
<td>Encrypted Foreign Logical Device Count, Total number of encrypted foreign logical device.</td>
</tr>
<tr>
<td>Number of maxCrypto Logical devices with maxCrypto off</td>
<td>Total number of logical devices without maxCrypto.</td>
</tr>
<tr>
<td>Sensor ID</td>
<td>ID describes unique sensor identifier within the controller.</td>
</tr>
<tr>
<td>Current Value</td>
<td>Current temperature of the specific sensor.</td>
</tr>
<tr>
<td>Max Value Since Powered On</td>
<td>Maximum temperature of the specific sensor after being powered on the controller.</td>
</tr>
<tr>
<td>Location</td>
<td>Location of the specific sensor on the controller.</td>
</tr>
<tr>
<td>Expander Scan Duration</td>
<td>Time duration in seconds until which a controller waits for expander discovery.</td>
</tr>
<tr>
<td>I2C Address</td>
<td>I2C address describes the Inter-Integrated Circuit (I2C) slave address.</td>
</tr>
<tr>
<td>I2C Clock Speed</td>
<td>I2C clock speed describes the I2C clock speed.</td>
</tr>
<tr>
<td>I2C Clock Stretching</td>
<td>I2C stretching status describes the I2C clock status.</td>
</tr>
<tr>
<td>Expander Scan Time-out</td>
<td>Maximum time(seconds) that controller waits for expander scanning devices completion.</td>
</tr>
<tr>
<td>Reboot Required Reasons</td>
<td>Have controller settings changed requiring reboot. Property provides list of reasons for a reboot.</td>
</tr>
<tr>
<td>Backup Power Status</td>
<td>The backup power status of the controller.</td>
</tr>
<tr>
<td>Battery/Capacitor Pack Count</td>
<td>The total installed battery pack count.</td>
</tr>
<tr>
<td>Hardware Error</td>
<td>The backup hardware error.</td>
</tr>
<tr>
<td>OOB Interface</td>
<td>Out of Band Interface setting.</td>
</tr>
</tbody>
</table>
### Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pending OOB Interface</td>
<td>Out of Band Interface is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>I2C Address</td>
<td>The Inter-Integrated Circuit(I2C) slave address.</td>
</tr>
<tr>
<td>Pending I2C Address</td>
<td>I2C address is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>Power settings</td>
<td>Power setting information (The total board power, which is the total power of all the power sensors plus a static board value.)</td>
</tr>
</tbody>
</table>

#### PBSI related properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I2C Clock Speed</td>
<td>I2C clock speed. Value in KHz.</td>
</tr>
<tr>
<td>Pending I2C Clock Speed</td>
<td>I2C clock speed is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>I2C Clock Stretching</td>
<td>I2C clock stretching is enabled or disabled.</td>
</tr>
<tr>
<td>Pending I2C Clock Stretching</td>
<td>I2C clock stretching is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
</tbody>
</table>

#### MCTP related properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMBus Device Type</td>
<td>System Management(SM) Bus Device Type</td>
</tr>
<tr>
<td>SMBus Channel</td>
<td>System Management(SM) Bus Channel setting</td>
</tr>
<tr>
<td>Static EIDs Use On Initialization</td>
<td>Static End Point Identifiers(EID) usage during initialization</td>
</tr>
<tr>
<td>VDM Notification</td>
<td>Vendor Defined Message(VDM) discovery notification</td>
</tr>
<tr>
<td>Pending SMBus Device Type</td>
<td>SMBus Device Type is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>Pending SMBus Channel</td>
<td>SMBus Channel is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>Pending Static EIDs Use On Initialization</td>
<td>Static EIDs Use On Initialization is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>Pending VDM Notification</td>
<td>VDM Notification is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
</tbody>
</table>

### Table 4-2. Array

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array Number</td>
<td>ID describes unique array identifier within the controller.</td>
</tr>
<tr>
<td>Status</td>
<td>Status of array is based on health of the member disk drives.</td>
</tr>
<tr>
<td>Name</td>
<td>Name describes unique name of an array.</td>
</tr>
<tr>
<td>Transformation Status</td>
<td>Transformation status indicates whether the array is transforming or not.</td>
</tr>
<tr>
<td>Interface</td>
<td>Disk drives that are the member of array can have interface type such SAS, SATA, SAS SSD, and SATA SSD. The interface type of array is based on the member disk drives interface type.</td>
</tr>
</tbody>
</table>
### Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total size</td>
<td>Total usable size is the total space available in the array for creating logical device.</td>
</tr>
<tr>
<td>Unused Size</td>
<td>Unused size is the free space available to create new logical device to store the data.</td>
</tr>
<tr>
<td>Block size</td>
<td>Block size indicates the maximum size of data block on disk drives that are member of an array (can be 512 Bytes or 4K).</td>
</tr>
<tr>
<td>Array Utilization</td>
<td>Total space utilization of an array.</td>
</tr>
<tr>
<td>Type</td>
<td>Describes the type of the array such as data array, backup array, and so on.</td>
</tr>
<tr>
<td>Associated Split Mirror Array</td>
<td>Name of its associated array, if array is of type split mirror.</td>
</tr>
<tr>
<td>Spare Rebuild Mode</td>
<td>Spare Rebuild mode describes the spare type for the array. It can be &quot;dedicated&quot; or &quot;auto replace&quot; if the array is valid.</td>
</tr>
<tr>
<td>SSD I/O Bypass</td>
<td>SSD I/O Bypass enables an optimized data path to high performance solid state drives. The optimized path bypasses the controllers RAID processing components and sends I/O directly to the drives.</td>
</tr>
</tbody>
</table>

### Logical Device

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical Device Number</td>
<td>ID describes unique logical device identifier within the controller.</td>
</tr>
<tr>
<td>Logical Device Name</td>
<td>Logical device name can be of maximum 64 characters and it should contain only ASCII characters in Operation System.</td>
</tr>
<tr>
<td>Disk Name</td>
<td>Name of the logical disk drive.</td>
</tr>
<tr>
<td>Block Size of member drives</td>
<td>Maximum size of data block on disk drives which are RAID member of logical device (can be 512 Bytes or 4K).</td>
</tr>
<tr>
<td>Array</td>
<td>Identifier of the Array on which the logical device.</td>
</tr>
<tr>
<td>RAID level</td>
<td>RAID level on which the logical device has been created.</td>
</tr>
<tr>
<td>Unique Identifier</td>
<td>The logical device unique identifier.</td>
</tr>
<tr>
<td>Status of Logical Device</td>
<td>Status of logical device based on health of RAID members of logical device.</td>
</tr>
<tr>
<td>maxCache state</td>
<td>State of the associated maxCache logical device.</td>
</tr>
<tr>
<td>Additional details</td>
<td>Describes the way of logical device creation.</td>
</tr>
<tr>
<td>Parity Initialization Status</td>
<td>RPI status of this logical device.</td>
</tr>
<tr>
<td>maxCache Status</td>
<td>Status of maxCache.</td>
</tr>
<tr>
<td>Size</td>
<td>Logical device size.</td>
</tr>
<tr>
<td>Parity Space</td>
<td>The parity space of the logical device.</td>
</tr>
<tr>
<td>Stripe-unit size</td>
<td>Stripe size is the amount of data (in KB) written to one disk drive, before moving to the next disk drive in the logical device. Stripe size options vary, depending on your controller and RAID level.</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Full Stripe Size</td>
<td>Full stripe size refers to the combined size of all the strips across all physical devices, excluding parity-only devices.</td>
</tr>
<tr>
<td>Cache Line Size</td>
<td>Specifies the cache line size (KB).</td>
</tr>
<tr>
<td>Interface Type</td>
<td>Disk drives which are the member of logical can have interface type such SAS, SATA, SAS SSD and SATA SSD.</td>
</tr>
<tr>
<td>Device Type</td>
<td>Indicates logical drive is of type data or cache.</td>
</tr>
<tr>
<td>Heads</td>
<td>Indicates the predefined space set aside for RAID redundant information on a logical device.</td>
</tr>
<tr>
<td>Sectors Per Track</td>
<td>Specifies the number of sectors that are to comprise each track.</td>
</tr>
<tr>
<td>Cylinders</td>
<td>Indicates the set of all tracks having equal diameter in a logical device.</td>
</tr>
<tr>
<td>Caching</td>
<td>Indicates the setting of cache used for this logical device.</td>
</tr>
<tr>
<td>Mount Points</td>
<td>Describes the operating system device names of the logical device and vice versa.</td>
</tr>
<tr>
<td>Associated Logical Id</td>
<td>Associated logical device for maxCache.</td>
</tr>
<tr>
<td>maxCache write cache policy</td>
<td>maxCache policy setting to WT or WB.</td>
</tr>
<tr>
<td>Backup Creation Timestamp</td>
<td>Split Mirror Set Backup logical creation time.</td>
</tr>
<tr>
<td>LD Acceleration Method</td>
<td>Setting of the LD acceleration method. Controller cache or SSD I/O Bypass or maxCache.</td>
</tr>
<tr>
<td>Volume Unique Identifier</td>
<td>Logical device unique string identifier.</td>
</tr>
<tr>
<td>Plaintext (Non-Encrypted) Logical Device</td>
<td>Setting to identify a non-encrypted logical device.</td>
</tr>
<tr>
<td>Volatile maxCrypto Keys</td>
<td>Setting to identify if logical device supports Volatile key.</td>
</tr>
<tr>
<td>Boot Type</td>
<td>A bootable logical device is a logical device that the system can attempt to boot from after a system power-on. A controller can have up to two bootable logical device, where one is a primary boot logical device and the other a secondary boot logical device. When the system looks at a controller for a boot logical device, it will first attempt to boot from a primary boot logical device, and if that fails, then it will attempt to boot from a secondary boot logical device.</td>
</tr>
<tr>
<td>maxCrypto</td>
<td>Setting of the maxCrypto for the logical device.</td>
</tr>
<tr>
<td>Encrypted</td>
<td>Indicate user whether the logical device is encrypted or not.</td>
</tr>
</tbody>
</table>

**maxCache statistics**

<table>
<thead>
<tr>
<th>maxCache statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Cache Hits</td>
</tr>
<tr>
<td>Read Cache Miss (Total)</td>
</tr>
<tr>
<td>Read Cache Hit Rate</td>
</tr>
<tr>
<td>Write Cache Hits</td>
</tr>
</tbody>
</table>
### Properties

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write Cache Miss (Total)</td>
</tr>
<tr>
<td>Write Cache Hit Rate</td>
</tr>
</tbody>
</table>

## Table 4-4. Physical Device

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED Security Status</td>
<td>SED Security status is locked or not?</td>
</tr>
<tr>
<td>SED Qualification Status</td>
<td>Device qualification status is in progress or failed.</td>
</tr>
<tr>
<td>Device</td>
<td>The SCSI ID for a physical device reported by the controller.</td>
</tr>
<tr>
<td>Device Type</td>
<td>Type of physical device such as &quot;hard disk drive&quot;, &quot;solid state drive&quot; or</td>
</tr>
<tr>
<td></td>
<td>&quot;shingled magnetic recording (SMR) hard disk drive.&quot;</td>
</tr>
<tr>
<td>State</td>
<td>Current state of the physical device based on the operations done on it.</td>
</tr>
<tr>
<td>Drive has stale RIS data</td>
<td>Specifies whether the physical device has stale RIS data.</td>
</tr>
<tr>
<td>Disk name</td>
<td>Name of the physical disk drive in Operating System.</td>
</tr>
<tr>
<td>Block Size</td>
<td>Maximum size of the data block on disk drives that are RAID member of the</td>
</tr>
<tr>
<td></td>
<td>logical device (can be 512 Bytes or 4K).</td>
</tr>
<tr>
<td>Dedicated Spare for drive</td>
<td>If drive is acting as spare.</td>
</tr>
<tr>
<td>Transfer Speed</td>
<td>Description of the drive speed.</td>
</tr>
<tr>
<td>Reported Channel,Device (T:L)</td>
<td>The channel ID and SCSI Device ID to which the physical device is</td>
</tr>
<tr>
<td></td>
<td>connected.</td>
</tr>
<tr>
<td>Vendor</td>
<td>Physical device manufacturer name.</td>
</tr>
<tr>
<td>Model</td>
<td>Product model; name of the physical device.</td>
</tr>
<tr>
<td>Firmware</td>
<td>Firmware version of the physical device.</td>
</tr>
<tr>
<td>Serial number</td>
<td>Serial number of the physical device.</td>
</tr>
<tr>
<td>World Wide Name</td>
<td>Reported world wide name provided by the manufacturer.</td>
</tr>
<tr>
<td>Total Size</td>
<td>Total data storage capacity of the physical device.</td>
</tr>
<tr>
<td>Reserved Size</td>
<td>Reserved space for internal use.</td>
</tr>
<tr>
<td>Used Size</td>
<td>Used space of the drive.</td>
</tr>
<tr>
<td>Unused Size</td>
<td>Unused space of the drive.</td>
</tr>
<tr>
<td>S.M.A.R.T.</td>
<td>SMART supported.</td>
</tr>
<tr>
<td>S.M.A.R.T. warnings</td>
<td>Any SMART error reported in the physical device.</td>
</tr>
<tr>
<td>SSD</td>
<td>If drive type is SSD.</td>
</tr>
<tr>
<td>Device-On-Boot Connector</td>
<td>Device connected through the boot connector.</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NCQ status</td>
<td>Indicates whether the native command queuing is enabled/disabled on this physical device.</td>
</tr>
<tr>
<td>NCQ supported</td>
<td>Specifies whether this physical device supports native command queuing.</td>
</tr>
<tr>
<td>Rotational Speed</td>
<td>Indicates the rotational speed of the physical device.</td>
</tr>
<tr>
<td>Current Temperature</td>
<td>Current temperature of the physical device.</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>The maximum temperature reported by the physical device.</td>
</tr>
<tr>
<td>Threshold Temperature</td>
<td>The threshold temperature reported by the physical device.</td>
</tr>
<tr>
<td>PHY Count</td>
<td>Drive PHY count.</td>
</tr>
<tr>
<td>Drive Configuration Type</td>
<td>Determines the presence/type of logical devices of which this physical device is a part.</td>
</tr>
<tr>
<td>Mount Point(s)</td>
<td>Mount point(s) describes the operating system device names of the physical device.</td>
</tr>
<tr>
<td>Drive Exposed to OS</td>
<td>Indicates whether the physical device is exposed to the operating system.</td>
</tr>
<tr>
<td>Sanitize Erase Support</td>
<td>Specifies whether the sanitize erase is supported by this physical device.</td>
</tr>
<tr>
<td>Sanitize Lock Freeze Support</td>
<td>Specifies whether the sanitize freeze is supported by this physical device.</td>
</tr>
<tr>
<td>Sanitize Lock Anti-Freeze Support</td>
<td>Specifies whether the sanitize lock anti-freeze is supported by this physical device.</td>
</tr>
<tr>
<td>Sanitize Lock Setting</td>
<td>Sanitize Lock Setting information.</td>
</tr>
<tr>
<td>Usage Remaining</td>
<td>SSD life utilization.</td>
</tr>
<tr>
<td>SSD Smart Trip Wearout</td>
<td>SSD wear out occurred.</td>
</tr>
<tr>
<td>56 Day Warning Present</td>
<td>SSD have lesser than or equal to 56 days of the calculated usage left.</td>
</tr>
<tr>
<td>Drive Unique ID</td>
<td>ID to uniquely identify the physical device.</td>
</tr>
<tr>
<td>Last Failure Reason</td>
<td>Describes previous drive failure reason.</td>
</tr>
<tr>
<td>Encrypted</td>
<td>A SED (or Self-Encrypting Drive) is a type of hard drive that automatically and continuously encrypts the data on the drive without any user interaction.</td>
</tr>
<tr>
<td>Volatile maxCrypto Key</td>
<td>Whether this device has volatile keys.</td>
</tr>
<tr>
<td>Interface Type</td>
<td>Interface type supported by the physical device.</td>
</tr>
<tr>
<td>Boot Type</td>
<td>A bootable physical device is a physical device from which the system attempts to boot after a system power-on. A controller can have up to two bootable physical devices, where one is a primary boot physical device and the other is a secondary boot physical device. When the system looks at a controller for a boot physical device, it will first attempt to boot from a primary boot physical device, and if that fails, then it will attempt to boot from a secondary boot physical device.</td>
</tr>
<tr>
<td>Encrypted Drive</td>
<td>Indicates whether this physical device is a part of any encrypted logical device.</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Drive Encryption Capability</td>
<td>Device is Self-Encryption Drive or not?</td>
</tr>
<tr>
<td><strong>Drive PHY information</strong></td>
<td></td>
</tr>
<tr>
<td>Negotiated Physical Link Rate</td>
<td>Indicating the negotiated physical link rate on all the PHYs of this device.</td>
</tr>
<tr>
<td>Negotiated Logical Link Rate</td>
<td>Indicating the negotiated logical link rate on all the PHYs of this device.</td>
</tr>
<tr>
<td>Maximum Link Rate</td>
<td>Maximum possible link rate for a PHY.</td>
</tr>
<tr>
<td>Negotiated Link Rate</td>
<td>PHY negotiated link rate.</td>
</tr>
<tr>
<td><strong>Runtime Error Counters</strong></td>
<td></td>
</tr>
<tr>
<td>Hardware Error Count</td>
<td>Hardware Error Count</td>
</tr>
<tr>
<td>Medium Error Count</td>
<td>Medium Error Count</td>
</tr>
<tr>
<td>Parity Error Count</td>
<td>Parity Error Count</td>
</tr>
<tr>
<td>Link Failure Count</td>
<td>Link Failure Count</td>
</tr>
<tr>
<td>Aborted Command Count</td>
<td>Aborted Command Count</td>
</tr>
<tr>
<td>SMART Warning Count</td>
<td>SMART Warning Count</td>
</tr>
<tr>
<td><strong>Device Error Counters</strong></td>
<td></td>
</tr>
<tr>
<td>Aborted Commands</td>
<td>Aborted Commands</td>
</tr>
<tr>
<td>Bad Target Errors</td>
<td>Bad Target Errors</td>
</tr>
<tr>
<td>ECC Recovered Read Errors</td>
<td>ECC Recovered Read Errors</td>
</tr>
<tr>
<td>Failed Read Recovers</td>
<td>Failed Read Recovers</td>
</tr>
<tr>
<td>Failed Write Recovers</td>
<td>Failed Write Recovers</td>
</tr>
<tr>
<td>Format Errors</td>
<td>Format Errors</td>
</tr>
<tr>
<td>Hardware Errors</td>
<td>Hardware Errors</td>
</tr>
<tr>
<td>Hard Read Errors</td>
<td>Hard Read Errors</td>
</tr>
<tr>
<td>Hard Write Errors</td>
<td>Hard Write Errors</td>
</tr>
<tr>
<td>Hot Plug Count</td>
<td>Hot Plug Count</td>
</tr>
<tr>
<td>Media Failures</td>
<td>Media Failures</td>
</tr>
<tr>
<td>Not Ready Errors</td>
<td>Not Ready Errors</td>
</tr>
<tr>
<td>Other Time Out Errors</td>
<td>Other Time Out Errors</td>
</tr>
<tr>
<td>Predictive Failures</td>
<td>Predictive Failures</td>
</tr>
<tr>
<td>Retry Recovered Read Errors</td>
<td>Retry Recovered Read Errors</td>
</tr>
<tr>
<td>Retry Recovered Write Errors</td>
<td>Retry Recovered Write Errors</td>
</tr>
<tr>
<td>SCSI Bus Faults</td>
<td>SCSI Bus Faults</td>
</tr>
<tr>
<td>Properties</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Sectors Reads</td>
<td>Sectors Reads</td>
</tr>
<tr>
<td>Sectors Written</td>
<td>Sectors Written</td>
</tr>
<tr>
<td>Service Hours</td>
<td>Service Hours</td>
</tr>
</tbody>
</table>

**Table 4-5. Connector Information**

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>The ID for a connector reported by the controller</td>
</tr>
<tr>
<td>Functional Mode</td>
<td>Operating mode of the connector. Possible values RAID(Hide RAW), HBA and Mixed.</td>
</tr>
<tr>
<td>Connector Location</td>
<td>Physical location of the connector on the controller.</td>
</tr>
<tr>
<td>SAS Address</td>
<td>SAS address of the connector.</td>
</tr>
<tr>
<td>Current Discovery Protocol</td>
<td>The current backplane discovery protocol connector operates in.</td>
</tr>
<tr>
<td>Pending Discovery Protocol</td>
<td>Backplane discovery protocol is in pending state, reboot the system for the new setting to be applied.</td>
</tr>
<tr>
<td>PHY Count</td>
<td>The number of PHYs the connector has.</td>
</tr>
<tr>
<td>Current Number of Targets</td>
<td>Number of devices supported on the connector when the protocol is set to “Direct-Attached Cable”.</td>
</tr>
<tr>
<td>Pending Number of Targets</td>
<td>Number of targets has changed and is in pending state, reboot the system for the new value to be applied. Valid only for discovery protocol “Direct-Attached Cable”.</td>
</tr>
</tbody>
</table>
5. **Revision History**

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
</table>
| D        | 11/2021 | ● Updated the syntax/description/examples of arconf atapassword, arconf consistencycheck, arconf create, arconf expanderupgrade, arconf getlogs, arconf getstatus, arconf identify, arconf maxcrypto, arconf maxcryptoaccounts, arconf maxcryptokey, arconf phyerrorlog, arconf savesupportarchive, arconf setarrayparam, arconf setboot, arconf setcache, arconf setcontrollerparam, arconf setperform, arconf setpower, arconf setstate, arconf slotconfig, arconf smp, and arconf splitmirror  
● Removed arconf restatstatisticscounter and arconf setstatsdatacollection |
<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
</table>
| C        | 07/2021 | - Updated the Introduction section  
|          |        | - Updated the description in arconf consistencycheck  
|          |        | - Updated description of Wcache, CacheLineSize <CACHELINESIZE>, and Legs <LEG> in arconf create  
|          |        | - Updated syntax and description of options parameter in arconf task  
|          |        | - Added DEBUGTOKEN in arconf getconfig  
|          |        | - Updated syntax of arconf getstatus  
|          |        | - Updated the description for Mode# parameter in arconf imageupdate  
|          |        | - Updated parameters in arconf getlogs  
|          |        | - Updated the Controller, Array, Logical and Physical Device Properties section  
|          |        | - Added a new table “Connector Information” in the Controller, Array, Logical and Physical Device Properties section |
| B        | 05/2021 | - Added VPP to DISCOVERYPROTOCOL in arconf setcontrollerparam  
|          |        | - Removed CONSOLIDATESSPACE from arconf setarrayparam  
|          |        | - Updated CachePolicy in arconf setcache  
|          |        | - Updated the description for Configured Drives, Unconfigured Drives, HBA Drives in the Controller, Array, Logical and Physical Device Properties section  
| A        | 02/2021 | Initial Revision (previously, ESC-2161616) |
The Microchip Website

Microchip provides online support via our website at www.microchip.com/. This website is used to make files and information easily available to customers. Some of the content available includes:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user’s guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip design partner program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

Product Change Notification Service

Microchip’s product change notification service helps keep customers current on Microchip products. Subscribers will receive email notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, go to www.microchip.com/pcn and follow the registration instructions.

Customer Support

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Embedded Solutions Engineer (ESE)
- Technical Support

Customers should contact their distributor, representative or ESE for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in this document.

Technical support is available through the website at: www.microchip.com/support

Microchip Devices Code Protection Feature

Note the following details of the code protection feature on Microchip products:

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner, within operating specifications, and under normal conditions.
- Microchip values and aggressively protects its intellectual property rights. Attempts to breach the code protection features of Microchip product is strictly prohibited and may violate the Digital Millennium Copyright Act.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of its code. Code protection does not mean that we are guaranteeing the product is “unbreakable”. Code protection is constantly evolving. Microchip is committed to continuously improving the code protection features of our products.

Legal Notice

This publication and the information herein may be used only with Microchip products, including to design, test, and integrate Microchip products with your application. Use of this information in any other manner violates these terms. Information regarding device applications is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. Contact your local Microchip sales office for additional support or, obtain additional support at www.microchip.com/en-us/support/design-help/client-support-services.
THIS INFORMATION IS PROVIDED BY MICROCHIP "AS IS". MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTIES RELATED TO ITS CONDITION, QUALITY, OR PERFORMANCE.

IN NO EVENT WILL MICROCHIP BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL LOSS, DAMAGE, COST, OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE INFORMATION OR ITS USE, HOWEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE. TO THE FULLEST EXTENT ALLOWED BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THE INFORMATION OR ITS USE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THE INFORMATION.

Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip name and logo, the Microchip logo, Adaptec, AnyRate, AVR, AVR logo, AVR Freaks, BesTime, BitCloud, CryptoMemory, CryptoRF, dsPIC, flexPWR, HELDO, IGLOO, JukeBox, KeeLoq, Kleer, LANCheck, LinkMD, maxStylus, maXTouch, MediaLB, megaAVR, Microsemi, Microsemi logo, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, PolarFire, Prochip Designer, QTouch, SAM-BA, SenGenuity, SpyNIC, SST, SST Logo, SuperFlash, Symmetricom, SyncServer, Tachyon, TimeSource, tinyAVR, UNI/O, Vectron, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

AgileSwitch, APT, ClockWorks, The Embedded Control Solutions Company, EtherSynch, Flashtec, Hyper Speed Control, HyperLight Load, IntelliMOS, Libero, motorBench, mTouch, Powermite 3, Precision Edge, ProASIC, ProASIC Plus, ProASIC Plus logo, Quiet- Wire, SmartFusion, SyncWorld, Temux, TimeCesium, TimeHub, TimePictra, TimeProvider, TrueTime, WinPath, and ZL are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, Augmented Switching, BlueSky, BodyCom, CodeGuard, CryptoAuthentication, CryptoAutomotive, Crypto Companion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, Espresso T1S, EtherGREEN, GridTime, IdealBridge, In-Circuit Serial Programming, ICSP, INICnet, Intelligent Paralleling, Inter-Chip Connectivity, JitterBlocker, Knob-on-Display, maxCrypto, maxview, memBrain, Mindi, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, NVM Express, NVMe, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PowerSmart, PureSilicon, QMatrix, REAL ICE, Ripple Blocker, RTAX, RTG4, SAM-ICE, Serial Quad I/O, simpleMAP, SimpliPHY, SmartBuffer, SmartHLS, SMART-I.S., storClad, SQI, SuperSwitcher, SuperSwitcher II, Switchtec, SynchroPHY, Total Endurance, TSHARC, USBCheck, VariSense, VectorBlox, VeriPHY, ViewSpan, WiperLock, XpressConnect, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

The Adaptec logo, Frequency on Demand, Silicon Storage Technology, Symmcom, and Trusted Time are registered trademarks of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2021, Microchip Technology Incorporated and its subsidiaries. All Rights Reserved.

ISBN: 978-1-5224-9128-6
Quality Management System

For information regarding Microchip's Quality Management Systems, please visit www.microchip.com/quality.
## Worldwide Sales and Service

<table>
<thead>
<tr>
<th>AMERICAS</th>
<th>ASIA/PACIFIC</th>
<th>ASIA/PACIFIC</th>
<th>EUROPE</th>
</tr>
</thead>
</table>
| Corporate Office  
2355 West Chandler Blvd.  
Chandler, AZ 85224-6199  
Tel: 480-792-7200  
Fax: 480-792-7277  
Technical Support:  
www.microchip.com/support | Australia - Sydney  
Tel: 61-2-9886-6733 | India - Bangalore  
Tel: 91-80-3090-4444 | Austria - Wels  
Tel: 43-7242-2244-39  
Fax: 43-7242-2244-393 |
| | China - Beijing  
Tel: 86-10-8569-7000 | India - New Delhi  
Tel: 91-11-4160-8631 | Denmark - Copenhagen  
Tel: 45-4485-5910  
Fax: 45-4485-2829 |
| | China - Chengdu  
Tel: 86-28-8665-5511 | India - Pune  
Tel: 91-20-4121-0141 | Finland - Espoo  
Tel: 358-9-4520-820 |
| | China - Chongqing  
Tel: 86-23-8980-9588 | Japan - Osaka  
Tel: 81-6-6152-7160 | France - Paris  
Tel: 33-1-69-53-63-20  
Fax: 33-1-69-30-90-79 |
| | China - Dongguan  
Tel: 86-769-8702-9880 | Japan - Tokyo  
Tel: 81-3-6880-3770 | Germany - Garching  
Tel: 49-8931-9700 |
| | China - Guangzhou  
Tel: 86-20-8755-8029 | Korea - Daegu  
Tel: 82-53-744-4301 | Germany - Haan  
Tel: 49-2129-3766400 |
| | China - Hangzhou  
Tel: 86-571-8792-8115 | Korea - Seoul  
Tel: 82-2-554-7200 | Germany - Heilbronn  
Tel: 49-7131-72400 |
| | China - Hong Kong SAR  
Tel: 852-2943-5100 | Malaysia - Kuala Lumpur  
Tel: 60-3-7651-7906 | Germany - Karlsruhe  
Tel: 49-721-625370 |
| | China - Nanjing  
Tel: 86-25-8473-2460 | Malaysia - Penang  
Tel: 60-4-227-8870 | Germany - Munich  
Tel: 49-89-627-144-0  
Fax: 49-89-627-144-44 |
| | China - Qingdao  
Tel: 86-532-8502-7355 | Philippines - Manila  
Tel: 63-2-634-9065 | Germany - Rosenheim  
Tel: 49-8031-354-560 |
| | China - Shanghai  
Tel: 86-21-3326-8000 | Singapore  
Tel: 65-6334-8870 | Israel - Ra'anana  
Tel: 972-9-744-7705 |
| | China - Shenyang  
Tel: 86-24-2334-2829 | Taiwan - Hsin Chu  
Tel: 886-3-577-8366 | Italy - Milan  
Tel: 39-0331-742611  
Fax: 39-0331-468781 |
| | China - Shenzhen  
Tel: 86-755-8864-2200 | Taiwan - Kaohsiung  
Tel: 886-7-213-7830 | Italy - Padova  
Tel: 39-049-7625286 |
| | China - Suzhou  
Tel: 86-186-6233-1526 | Taiwan - Taipei  
Tel: 886-2-2508-8600 | Netherlands - Drunen  
Tel: 31-416-690399  
Fax: 31-416-690340 |
| | China - Wuhan  
Tel: 86-27-5980-5300 | Thailand - Bangkok  
Tel: 66-2-694-1351 | Norway - Trondheim  
Tel: 47-72864388 |
| | China - Xian  
Tel: 86-29-8833-7252 | Vietnam - Ho Chi Minh  
Tel: 84-28-5448-2100 | Poland - Warsaw  
Tel: 48-22-3325737 |
| | China - Xiamen  
Tel: 86-592-2388138 | | Romania - Bucharest  
Tel: 40-21-407-87-50 |
| | China - Zuhai  
Tel: 86-756-3210040 | | Spain - Madrid  
Tel: 34-91-708-08-90  
Fax: 34-91-708-08-91 |
| | | | Sweden - Gothenberg  
Tel: 46-31-704-60-40 |
| | | | Sweden - Stockholm  
Tel: 46-8-5090-4654 |
| | | | UK - Wokingham  
Tel: 44-118-921-5800  
Fax: 44-118-921-5820 |

© 2021 Microchip Technology Inc. and its subsidiaries