Western Digital.

User Guide

WDDCS Tool

Software Version 4.2.2.0
Document D018-000215-000
Revision 10
November 2024

Table of Contents

Revision History

Date	Document Revision	Software Version	Description
August 2019	1.0	1.0.4.0	Initial release
March 2020	1.1	1.1.8.0	• Added Release Notes • Added Required/Recommended Utilities *(page 3)* • Added support for Windows Server throughout • Changed wording of `sg3_utils` and `smp_utils` references in getlog *(page 82)* • Separated instructions for enabling/disabling zoning in zone *(page 223)* • Added the following support for Ultrastar Data102, Ultrastar® Data60, and Ultrastar Serv60+8: ◦ Enclosure nickname feature for FW 2040+ (see diag nickname *(page 40)*) ◦ Pre-defined zoning and custom binaries for FW 2030+ (see zone *(page 223)*) ◦ E6 Event, Console, and Crash log collection (see getlog vendor *(page 86)*) for FW 2040+ • Added `zone status` command to report status and configuration of zoning • Added `read err_cnts` and `clear err_cnts` to rcli (Legacy) *(page 146)* and updated other sections of table
December 2020	1.2	1.1.8.0	Added note about setting IP addresses without specifying a device. See Release Notes and iom *(page 143)*.
January 2021	1.3	2.0.6.0	• Updated outputs for `help` command options • Updated Release Notes • Added instructions for the following commands: version *(page 222)*, diag reset-iom-<a|b> *(page 43)*, diag reset-enc *(page 41)*, diag clear-crashevent *(page 38)*, diag clear-eventlog *(page 39)*, `getlog drives-noprompt`, and `getlog all-noprompt` • Added `gpio`, `iom gpio`, and `show autosync` commands to rcli (Legacy) *(page 146)*. • Added Health Analysis *(page 112)* • Updated show *(page 217)* section with instructions for show handles *(page 218)* command

Date	Document Revision	Software Version	Description
July 2021	1.4	2.1.4.0	• Removed older OSs from Tested Operating Systems *(page 3)* • Updated Release Notes • Updated outputs for `help` and `version` commands • Added diag timestamp *(page 44)*, diag autosync-enable *(page 46)*, and diag autosync-disable *(page 47)* • Updated table of enclosure support for diag *(page 36)* commands • Added optional `-nostatdelay` flag to fw download *(page 75)*, and updated outputs in fw download_activate *(page 76)* and fw download_reset *(page 77)* • Updated table of information captured by getlog vendor *(page 86)* command • Removed note about `iom` prefix in rcli (Legacy) *(page 146)*
August 2021	01	2.1.4.0	Updated document number from 1ET1813 to D018-000215-000
August 2021	02	2.1.4.0	Added note about zoning files to zone file *(page 225)*

Date	Document Revision	Software Version	Description
May 2022	03	3.0.5.0	• Updated Notices *(page xii)* • Added OpenFlex™ Data24 to Supported Platforms *(page 2)* • Updated Tested Operating Systems *(page 3)* • Updated Known Issues, Fixed Issues, and New Features in Release Notes • Updated images in Installing on Windows Server (First Install) *(page 17)* and Installing on Windows Server (Reinstall) *(page 21)* • Added `http` command to outputs of help *(page 28)* and help *(page 28)* • Added help http *(page 32)* and http *(page 122)* sections • Added `-j` option to output of help show *(page 34)*; added JSON output to show *(page 217)* and show handles *(page 218)* • Added `oobm -j` argument to output of help iom *(page 33)*; added JSON output to iom *(page 143)* • Added `status -j` and `-8k` options to output of help fw *(page 30)*; updated firmware procedures with notes about `status -j` and `-8k` options • Added `timestamp -j` option to output of help diag *(page 29)*; added JSON output to diag timestamp *(page 44)* • Updated vendor information table in getlog vendor *(page 86)* • Added getlog drives-noprompt *(page 106)*, getlog drives-with-E6 *(page 107)*, getlog all-noprompt *(page 113)*, getlog all-with-E6 *(page 115)*, getlog E6-sn=<sn> *(page 118)*, and getlog E6-sn-file=<file> *(page 120)* sections • Added OpenFlex™ Data24 to Choosing the Correct Firmware Upgrade Process *(page 230)* and added Firmware Upgrade for OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 *(page 254)* • Updated diag *(page 36)*, fw *(page 74)*, getlog *(page 82)*, iom *(page 143)*, show *(page 217)*, and zone *(page 223)* sections for usage, options, examples, and platform support. • Added iom *(page 142)* • Added rcli (Legacy) *(page 146)* and reorganized section information

Date	Document Revision	Software Version	Description
August 2023	05	3.1.4.0	• Updated Tested Operating Systems *(page 3)* • Updated Known Issues, Fixed Issues, and New Features/Improvements in Release Notes • Updated screenshots in Unzipping the Installation File *(page 6)* and Uninstalling from Windows Server *(page 261)* • Updated all outputs in help *(page 28)* • Updated http *(page 122)* to add `getdevicelogs` command information • Updated getlog *(page 82)* to add information for all `full` command options • Updated platform support table in rcli (Legacy) *(page 146)* to include `status sas_link`, `sec1 status sas_link`, and `sec2 status sas_link` • Updated show handles *(page 218)* to include drive model, drive firmware, and expander PHY ID to outputs • Added File-Based Zoning *(page 226)* • Updated output in version *(page 222)*
November 2023	06	3.2.8.0	• Removed the Release Notes to create a standalone Release Notes document • Updated to include support for OpenFlex Data24 3200
April 2024	07	4.0.3.0	Updated to include support for the following products: • Ultrastar Data102 3000 Series • Ultrastar Transporter
July 2024	08	4.1.0.0	Updated to include support for Ultrastar Data60 3000 Series
October 2024	09	4.1.0.0	• Added FreeBSD 14.1 to Tested Operating Systems *(page 3)* • Updated format of Required/Recommended Utilities *(page 3)* • Added note to Installing FreeBSD Packages *(page 15)* to use the `pkg install` instead of `pkg add`

Date	Document Revision	Software Version	Description
November 2024	10	v4.2.2.0	• Added OpenFlex Data24 4000 to Supported Platforms *(page 2)* and platform support tables throughout • Consolidated all `diag show-slot` procedures into diag show-slot=<value> *(page 48)* • Consolidated all `diag clear-slot` procedures into diag clear-slot=<value> ident *(page 51)* and diag clear-slot=<value> devoff *(page 53)* • Consolidated all `diag set-slot` procedures into diag set-slot=<value> ident *(page 56)* and diag set-slot=<value> devoff *(page 58)* • Added diag broadcom-feature-hba=<index> *(page 67)*, diag broadcom-list *(page 63)*, diag broadcom-perfit-sas=<index> *(page 69)*, diag broadcom-tmt-itnexus=<index> *(page 65)*, diag broadcom-tmt-target=<index> *(page 64)* • Updated fw reset *(page 79)* and fw download_reset *(page 77)* to refer to "remote" and "local" IOMs instead of "first" and "second" • Updated in-band limitations in http *(page 122)* and added note about limited active sessions to http=<ipv4> getall *(page 136)* and http=<ipv4> getall-noprompt *(page 139)* • Consolidated all in-band and out-of-band `http getall` procedures into http=<ipv4> getall *(page 136)* and http=<ipv4> getall-noprompt *(page 139)* • Added the following RCLI topics: drv1 phyinfo *(page 182)*, drv1 phyinfo buffer *(page 185)*, drv1 show ac *(page 188)*, drv1 show drives *(page 189)*, drv1 show dual *(page 191)*, drv1 show enc *(page 191)*, drv1 show phys *(page 192)*, drv1 show sensor *(page 194)*, drv1 show ses *(page 196)*, drv2 phyinfo *(page 197)*, drv2 phyinfo buffer *(page 200)*, drv2 show phys *(page 203)*, hem phyinfo *(page 209)*, hem phyinfo buffer *(page 212)*, hem show hosts *(page 214)*, hem show phys *(page 215)*, hema show hosts *(page 205)*, hema show phys *(page 206)*, hemb show hosts *(page 207)*, hemb show phys *(page 208)* • Organized all legacy RCLI procedures under rcli (Legacy) *(page 146)* and newer RCLI procedures under rcli (Ultrastar Data60 & Data102 3000) *(page 169)*

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Overview

In This Chapter:

1.1 WDDCS Tool Overview

The WDDCS Tool is a command line utility for capturing discrete host and enclosure data for analysis and troubleshooting, and performing common management functions such as upgrading firmware and configuring drive zones. It runs on the most common Linux® and Windows server operating systems and leverages other utilities already installed on the host, such as sg3_utils and smp_utils.

1.2 Supported Platforms

The WDDCS Tool supports the following platforms:

Table 2: Supported Platforms

Product Name	Regulatory Model	Product ID
Ultrastar® Data60	H4060-J	H4060-J
Ultrastar Data60 3000 Series	H4060-J	UData60
Ultrastar Serv60+8	H4060-S	H4060-S
Ultrastar Data102	H4102-J	H4102-J
Ultrastar Data102 3000 Series	H4102-J	UData102
Ultrastar Transporter	DCS0030	DCS0030
OpenFlex™ Data24	DCS0010	DCS0010
OpenFlex Data24 3200	DCS0010	DCS0010
OpenFlex Data24 4000	DCS0010	DCS0010
4U60 G1 Storage Enclosure	G460-J-12	4U60_STOR_ENCL
4U60 G2 Storage Enclosure	G460-J-12	4U60G2_STOR_ENCL
2U24 Flash Storage Platform	G224-J-12	2U24_STOR_ENCL
Storage Enclosure Basic	EA7000	STOR ENCL JBOD

1.3 Tested Operating Systems

The WDDCS Tool has been tested on the following operating systems:

Attention: See the compatibility matrix for each product to determine the specific supported operating systems.

Operating System	Version
FreeBSD® **Note:** sg3_utils version 1.48 is required for these versions of FreeBSD.	14.1
	13.2
CentOS	7.x, 8.x
Debian	11, 12
Oracle Enterprise Linux (OEL)	7.x, 8.x
Red Hat® Enterprise Linux® (RHEL)	7.x, 8.x, 9.x
SUSE Linux Enterprise Server (SLES)	15 SP5
Ubuntu	20.x, 22.x
Windows Server	2019, 2022

1.4 Required/Recommended Utilities

The following utilities are either required or recommended for operating the WDDCS Tool:

Utility	Minimum Version	Status	OS	Download Location
sg3_utils[1]	1.42	Required	Windows & Linux	http://sg.danny.cz/sg/sg3_utils.html
smp_utils[2]	0.98	Recommended	Linux	http://sg.danny.cz/sg/smp_utils.html
ipmitool	N/A	Recommended	Linux	Visit the applicable Linux OS repository
sysstat	N/A	Recommended	Linux	
nvme cli	N/A	Recommended	Linux	
lsscsi	N/A	Recommended	Linux	
dmidecode	N/A	Recommended	Linux	
smartmontools	N/A	Recommended	Linux	

1. sg3_utils should be added to the *PATH* environment variable.
2. smp_utils is for Linux only.

Utility	Minimum Version	Status	OS	Download Location
device-mapper-multipath	N/A	Recommended	Linux	
pciutils	N/A	Recommended	Linux	
lshw	N/A	Recommended	Linux	
numactl	N/A	Recommended	Linux	

1.5 Intended Users

The intended users of the WDDCS Tool are:

- Customers of Western Digital products
- Western Digital Customer Support
- Western Digital Engineering

1.6 Third Party Licenses

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For open source licensing information, please download the **Third-Party Notices** from the Western Digital Business Support Center at https://www.westerndigital.com/company/innovation/open-source/product-compliance.

Installation

The WDDCS Tool may be installed on a variety of Linux operating systems as well as Windows Server. The following sections provide installation instructions for each package.

In This Chapter:

2.1 Unzipping the Installation File

Step 1: Transfer the `wddcs_<version>.zip` file to the desired directory on the server in question.

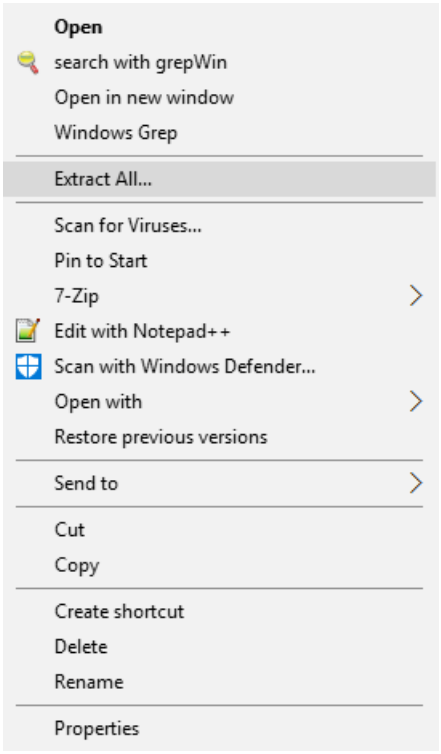
Step 2: Unzip/extract the `wddcs_<version>.zip` file:

a. For Linux operating systems, use the `unzip` command:

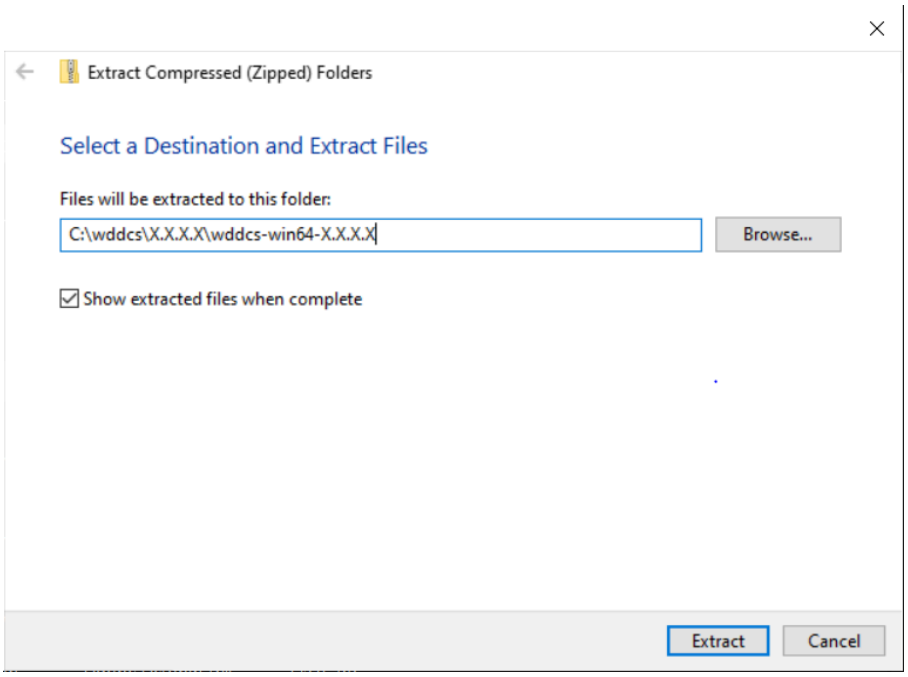
```
# unzip wddcs_<version>.zip
Archive:  wddcs_<version>.zip
  inflating: customer/wddcs-<version>-amd64.deb
  inflating: customer/wddcs-<version>-x86_64.rpm
  inflating: customer/wddcs-<version>-x86_64.tar.gz
```

b. For Windows Server operating systems:

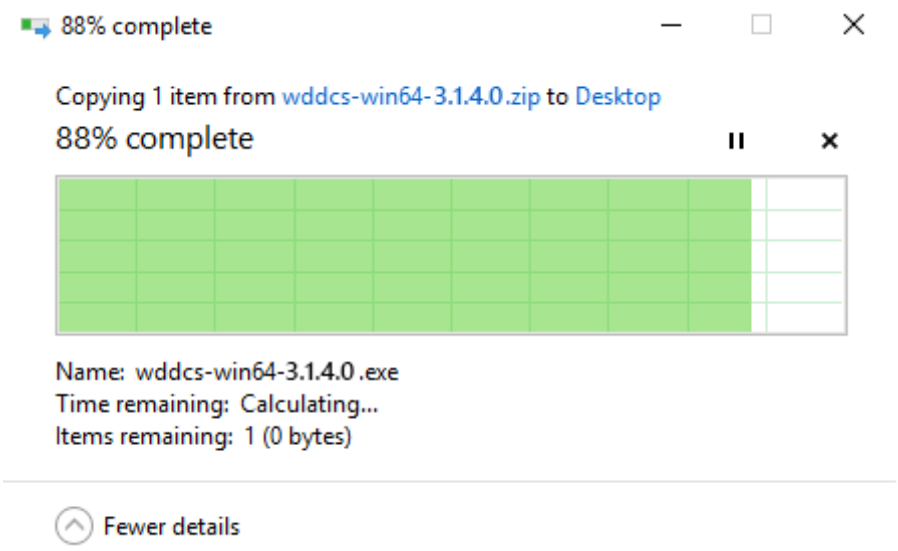
a. Right-click the zip file and select **Extract All**:



b. Accept or choose a directory for the extracted files. Click the checkbox for **Show extracted files when complete**. Then click the **Extract** button:



c. A window may appear briefly, showing the extraction progress:

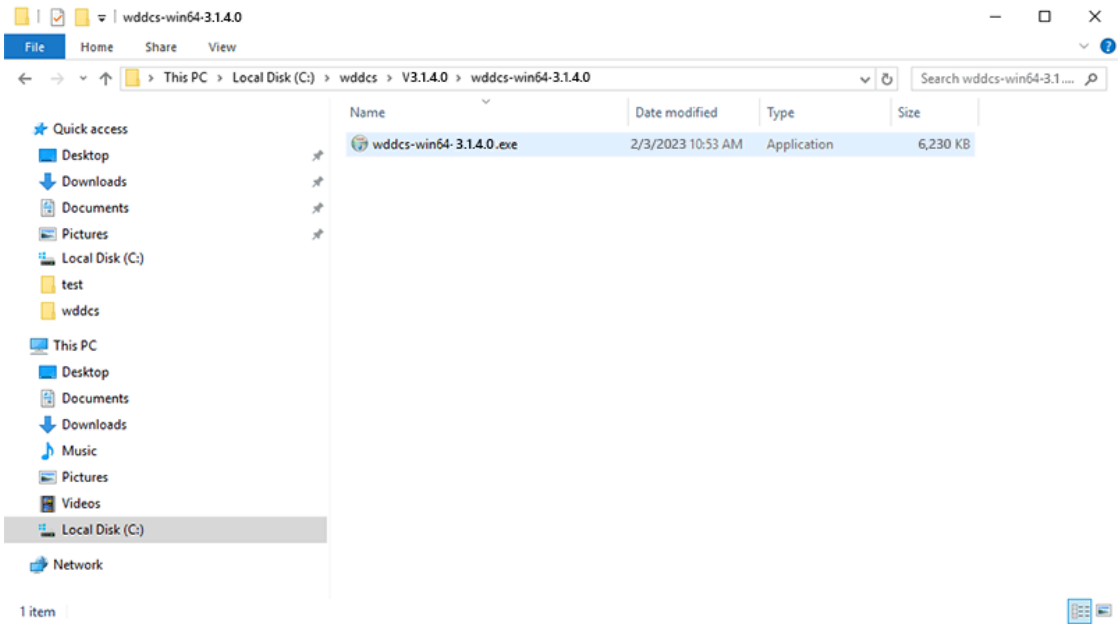


Step 3 : If needed, view the contents of the directory to verify the presence of the unzipped files:

a. For Linux operating systems, use the `ls` command:

```
# ls
wddcs-<version>-amd64.deb  wddcs-<version>-x86_64.rpm  wddcs-<version>-
x86_64.tar.gz
```

b. For Windows operating systems, the `wddcs-win64-<version>.exe` file is located within nested directories for the version and operating system.



The `.deb`, `.rpm`, `.tar.gz`, and `.exe` files provide four options for installing the WDDCS Tool package. Instructions for each option are provided in the following sections.

2.2 Installing on Debian/Ubuntu

Follow these steps to install the WDDCS Tool on Debian/Ubuntu operating systems.

Step 1: From the `customer` directory where the `.deb` file is located, use the `dpkg -i` command to install the `wddcs-<version>-amd64.deb` package. For example:

```
# dpkg –i wddcs-<version>-amd64.deb
Selecting previously unselected package wddcs.
(Reading database ... 527023 files and directories currently installed.)
Preparing to unpack wddcs-<version>-amd64.deb ...
Unpacking wddcs <version> ...
Setting up wddcs <version> ...
```

The `wddcs` executable file will be installed to the `/opt/wdc/wddcs/` directory.

Step 2: Verify that the `dpkg -l` command returns the tool name, version, and a description of the tool:

```
# dpkg -l | grep -i wddcs
ii wddcs    <version>    amd64    Western Digital tool to support Data Center
 System
```

Step 3: Run the `wddcs` command with no arguments.

a. If the EULA has already been accepted, the wddcs command syntax help text will appear:

```
wddcs v4.2.2.0
wddcs usage:
```

```
wddcs [target [...]] operation [operation argument [...]]
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are
 targeted
    operation - operation to execute
    [operation argument] - argument specific to given operation

The following operations are supported:
    diag       display, set, and clear diagnostic page data
    fw         firmware related operations
    getlog     capture various types of log data
    http       operations for OpenFlex Data24 enclosures
    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

b. If this is the first time the `wddcs` command has been used, the EULA prompt will appear. See End User License Agreement *(page 16)* for more details.

2.3 Installing on RHEL/CentOS/SLES

Follow these steps to install the WDDCS Tool on Red Hat Enterprise Linux (RHEL), CentOS, or SUSE Linux Enterprise Server (SLES) operating systems with the RPM Package Manager (RPM).

Step 1: From the `customer` directory where the `.rpm` file is located, use the `rpm -i` command to install the `wddcs-<version>-x86_64.rpm` package. For example:

```
# rpm –i wddcs-<version>-x86_64.rpm
```

Step 2: Run the `wddcs` command with no arguments.

a. If the EULA has already been accepted, the wddcs command syntax help text will appear:

```
wddcs v4.2.2.0
wddcs usage:
wddcs [target [...]] operation [operation argument [...]]
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are
 targeted
    operation - operation to execute
    [operation argument] - argument specific to given operation

The following operations are supported:
    diag       display, set, and clear diagnostic page data
    fw         firmware related operations
    getlog     capture various types of log data
    http       operations for OpenFlex Data24 enclosures
    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

b. If this is the first time the `wddcs` command has been used, the EULA prompt will appear. See End User License Agreement *(page 16)* for more details.

2.4 Installing the WDDCS Tool FIPS RPM on RHEL/CentOS

Follow these steps to install the WDDCS Tool on Red Hat Enterprise Linux (RHEL) or CentOS FIPS operating systems with the Red Hat Package Manager (RPM).

Step 1: Verify that FIPS is enabled using one of the following options.

- ```
  # fips-mode-setup --check
  ```

  ```
  FIPS mode is enabled.
  ```

- ```
  # cat /proc/sys/crypto/fips_enabled
  ```

  ```
  1
  ```

Note: This must be completed before the installation of the package.

Step 2: Run the following SHA256sum command and verify the SHA256sum GPG Key appears:

Note: Please contact the Global Support Team to request secure delivery of the Western Digital RPM GPG Key.

```
# sha256sum RPM-GPG-KEY-WesternDigital
```

```
c587cf3a24d1f27432a407db11a3494998ecbf024dc9440034ae3e0b377408f0  RPM-GPG-KEY-
WesternDigital
```

Step 3: Initiate the Key Import of the Western Digital Public Key using the following command:

```
# rpm --import RPM-GPG-KEY-WesternDigital
```

Step 4: List and show the GPG Public Key.

a. Run the following command to list GPG Public Key:

```
# rpm -qa gpg-pubkey* | grep cbbd2600
```

```
gpg-pubkey-cbbd2600-624e16e1
```

b. Run the following command to show GPG Public Key:

```
# rpm -qi gpg-pubkey-cbbd2600-624e16e1
```

```
Name        : gpg-pubkey
Version     : cbbd2600
Release     : 624e16e1
Architecture: (none)
```

```
Install Date: Tue 01 Aug 2023 04:41:52 AM MDT
Group       : Public Keys
Size        : 0
License     : pubkey
Signature   : (none)
Source RPM  : (none)
Build Date  : Wed 06 Apr 2022 04:40:33 PM MDT
Build Host  : localhost
Relocations : (not relocatable)
Packager    : Western Digital pdl-platforms-security@wdc.com
Summary     : gpg(Western Digital pdl-platforms-security@wdc.com)
Description :
-----BEGIN PGP PUBLIC KEY BLOCK-----
Version: rpm-4.14.3 (NSS-3)

.
Truncated here
.
-----END PGP PUBLIC KEY BLOCK-----
```

Step 5 : **(Optional)** The GPG Public Key may also be listed by using the following commands.

a. Run the following command to list GPG Public Key:

```
# gpg --list-keys
```

```
gpg: out of core handler ignored in FIPS mode
```

b. Run the following command to show GPG Public Key:

```
# gpg --show-keys RPM-GPG-KEY-WesternDigital
```

```
gpg: out of core handler ignored in FIPS mode
pub   rsa2048 2022-04-06 [SC] [expires: 2027-04-05]
      9AD0AE5F4C82481DF9078D13B380A452CBBD2600
uid                      Western Digital pdl-platforms-security@wdc.com
sub   rsa2048 2022-04-06 [E] [expires: 2027-04-05]
```

Step 6 : Verify the Key Signature on the RPM file.

```
# rpm --checksig -v wddcs-x86_64-4.2.2.0.rpm
```

```
    Header V4 RSA/SHA256 Signature, key ID cbbd2600: OK
    Header SHA256 digest: OK
    Header SHA1 digest: OK
    Payload SHA256 digest: OK
    V4 RSA/SHA256 Signature, key ID cbbd2600: OK
```

Step 7 : From the `customer` directory where the `.rpm` file is located, use the `rpm -ivh` command to install the `wddcs-<version>-x86_64.rpm` package. For example:

```
# rpm -ivh wddcs-<version>-x86_64.rpm
```

```
Verifying...                          ################################# [100%]
Preparing...                          ################################# [100%]
Updating / installing...
```

```
   1:wddcs-4.2.2.0-1                ################################# [100%]
```

Step 8: Run the `wddcs` command with no arguments.

a. If the EULA has already been accepted, the wddcs command syntax help text will appear:

```
wddcs v4.2.2.0
wddcs usage:
wddcs [target [...]] operation [operation argument [...]]
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are
 targeted
    operation - operation to execute
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The following operations are supported:
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    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

b. If this is the first time the `wddcs` command has been used, the EULA prompt will appear. See End User License Agreement *(page 16)* for more details.

2.5 Installing via tar.gz

Follow these instructions to install the WDDCS Tool via tar.gz.

Step 1: From the directory where the `.tar.gz` file is located, use the `tar xvfz` command to gunzip/untar the `wddcs-<version>-x86_64.tar.gz` file. For example:

```
# tar xvfz wddcs-<version>-x86_64.tar.gz
wddcs-x86_64-<version>/opt/
wddcs-x86_64-<version>/opt/wdc/
wddcs-x86_64-<version>/opt/wdc/wddcs/
wddcs-x86_64-<version>/opt/wdc/wddcs/.wdc_lic
wddcs-x86_64-<version>/opt/wdc/wddcs/health_analysis
wddcs-x86_64-<version>/opt/wdc/wddcs/WDC_EULA.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/wddcs
wddcs-x86_64-<version>/opt/wdc/wddcs/Third-Party_Notices.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/eula.sh
wddcs-x86_64-<version>/opt/wdc/wddcs/EULA_Exhibit_A-Third_Party_Licenses.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelibit.so.07.1700.0200.0000
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelib.so.07.1602.0100.0000
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libmegaraid_wrapper.so
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/WDCKIT_EULA.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelibit.so.07
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelibir-3.so
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelibir-3.so.16
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/Third-Party_Notices.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelib.so.07
```

```
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelibit.so
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/EULA_Exhibit_A-
Third_Party_Licenses.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelib.so
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/Readme.txt
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/wdckit
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libstorelibir-3.so.16.13-0
wddcs-x86_64-<version>/opt/wdc/wddcs/wdckit/libadaptec_wrapper.so
```

The `wddcs` executable will be installed to the `wddcs-<version>-x86_64/opt/wdc/wddcs/` directory within the working directory where the installation files were unzipped.

Step 2: Change directory into the `<unzip location>/wddcs-<version>-x86_64/opt/wdc/wddcs/` directory. For example:

```
# cd <unzip location>/wddcs/wddcs-<version>-x86_64/opt/wdc/wddcs/
```

Step 3: Verify that the following files are available:

```
# ls -al
total 1064
drwxrwxr-x. 2 501 501    4096 Feb 28 05:50 .
drwxrwxr-x. 3 501 501    4096 Feb 28 05:50 ..
-rw-r--r--. 1 501 501       1 Jul 10 22:00 .wdc_lic
-rw-r--r--. 1 501 501    1199 Feb 28 05:50 EULA_Exhibit_A-
Third_Party_Licenses.txt
-rw-r--r--. 1 501 501   20349 Feb 28 05:50 Third-Party_Notices.txt
-rw-r--r--. 1 501 501   18117 Feb 28 05:50 WDC_EULA.txt
-rw-r--r--. 1 501 501     340 Feb 28 05:50 eula.sh
-rwxr-xr-x. 1 501 501 1024744 Feb 28 05:50 wddcs
```

Step 4: Run the `wddcs` command with no arguments.

a. If the EULA has already been accepted, the wddcs command syntax help text will appear:

```
wddcs v4.2.2.0
wddcs usage:
wddcs [target [...]] operation [operation argument [...]]
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are
 targeted
    operation - operation to execute
    [operation argument] - argument specific to given operation

The following operations are supported:
    diag       display, set, and clear diagnostic page data
    fw         firmware related operations
    getlog     capture various types of log data
    http       operations for OpenFlex Data24 enclosures
    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

b. If this is the first time the `wddcs` command has been used, the EULA prompt will appear. See End User License Agreement *(page 16)* for more details.

2.6 Installing FreeBSD tar.gz

Follow these instructions to install the WDDCS Tool via tar.gz using the wddcs-freebsd*.zip.

Step 1: From the directory where the `.tar.gz` file is located, use the `tar xvfz` command to gunzip/untar the `wddcs-freebsd-<wddcs version>.tar.gz` file. For example:

```
# tar xvfz wddcs-freebsd-<wddcs version>.tar.gz
wddcs-freebsd64-4.2.2.0/opt/
wddcs-freebsd64-4.2.2.0/opt/wdc/
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/WDC_EULA.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/eula.sh
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/.wdc_lic
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/EULA_Exhibit_A-Third_Party_Licenses.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/Third-Party_Notices.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/health_analysis
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wdckit/
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wdckit/WDCKIT_EULA.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wdckit/EULA_Exhibit_A-
Third_Party_Licenses.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wdckit/Readme.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wdckit/Third-Party_Notices.txt
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wdckit/wdckit
wddcs-freebsd64-4.2.2.0/opt/wdc/wddcs/wddcs
```

The `wddcs` executable will be installed to the `wddcs-freebsd-<wddcs version>/opt/wdc/wddcs/` directory within the working directory where the installation files were unzipped.

Step 2: Change directory into the `<unzip location>/wddcs-freebsd-<wddcs version>/opt/wdc/wddcs/` directory. For example:

```
# cd <unzip location>/wddcs-freebsd-<wddcs version>/opt/wdc/wddcs/
```

Step 3: Verify that the following files are available:

```
# ls -altotal 1136
drwxr-xr-x. 3 1001 1001    4096 Oct 31 14:41 .
drwxr-xr-x. 3 1001 1001    4096 Oct 31 14:41 ..
-rw-r--r--. 1 1001 1001    1334 Oct 31 14:41 EULA_Exhibit_A-
Third_Party_Licenses.txt
-rwxr-xr-x. 1 1001 1001     340 Oct 31 14:41 eula.sh
-rw-r--r--. 1 1001 1001    5624 Oct 31 14:41 health_analysis
-rw-r--r--. 1 1001 1001   10586 Oct 31 14:41 Third-Party_Notices.txt
-rw-r--r--. 1 1001 1001   18117 Oct 31 14:41 WDC_EULA.txt
drwxr-xr-x. 2 1001 1001    4096 Oct 31 14:41 wdckit
-rw-r--r--. 1 1001 1001       1 Oct 31 14:41 .wdc_lic
-rwxr-xr-x. 1 1001 1001 1095963 Oct 31 14:41 wddcs
```

Step 4: Run the `wddcs` command with no arguments.

a. If the EULA has already been accepted, the wddcs command syntax help text will appear:

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
wddcs usage:
wddcs [target [...]] operation [operation argument [...]]
```

```
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are
 targeted
    operation - operation to execute
    [operation argument] - argument specific to given operation

The following operations are supported:
    diag       display, set, and clear diagnostic page data
    fw         firmware related operations
    getlog     capture various types of log data
    http       operations for OpenFlex Data24 enclosures
    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

b. If this is the first time the `wddcs` command has been used, the EULA prompt will appear. See End User License Agreement *(page 16)* for more details.

2.7 Installing FreeBSD Packages

Follow these instructions to install the WDDCS Tool via pkg using the wddcs-4.2.2.0.pkg.

Step 1: Use the `pkg install` command to install the FreeBSD packages.

```
pkg install wddcs-4.2.2.0.pkg
```

```
Updating FreeBSD repository catalogue...
FreeBSD repository is up to date.
All repositories are up to date.
Checking integrity... done (0 conflicting)
The following 1 package(s) will be affected (of 0 checked):

New packages to be INSTALLED:
                wddcs: 4.2.2.0
Number of packages to be installed: 1

Proceed with this action? [y/N]:
```

Note: Install the packages using the `pkg install` command instead of the `pkg add` command. The `pkg add` command may produce an error regarding operating system compatibility.

Step 2: Enter `Y` or `y` to proceed:

```
y
```

```
[1/1] Installing wddcs-4.2.2.0...
Extracting wddcs-4.2.2.0: 100%
```

The WDDCS Tool notifies the user that the FreeBSD package has been installed.

Step 3: Run the `wddcs` command with no arguments.

a. If the EULA has already been accepted, the wddcs command syntax help text will appear:

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
wddcs usage:
wddcs [target [...]] operation [operation argument [...]]
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are
 targeted
    operation - operation to execute
    [operation argument] - argument specific to given operation

The following operations are supported:
    diag       display, set, and clear diagnostic page data
    fw         firmware related operations
    getlog     capture various types of log data
    http       operations for OpenFlex Data24 enclosures
    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

b. If this is the first time the `wddcs` command has been used, the EULA prompt will appear. See End User License Agreement *(page 16)* for more details.

2.8 End User License Agreement

Regardless of which Linux installation package is used, the WDDCS Tool will prompt the user to read the EULA before use:

```
Read the end user license agreement. [enter]:
```

Step 1: Press `enter` to read the EULA.

Step 2: If needed, press `space` to page through the EULA content, or press `q` to quit:

```
--More--[Press space to continue, 'q' to quit.]
```

After completing or quitting the EULA, the user is prompted to accept:

```
Do you accpet the EULA? [y/n]:
```

Step 3: Press `y` to accept the EULA.

If the EULA is not accepted, the following error message will appear:

```
ERROR: you have not accepted the license agreement (EULA)
```

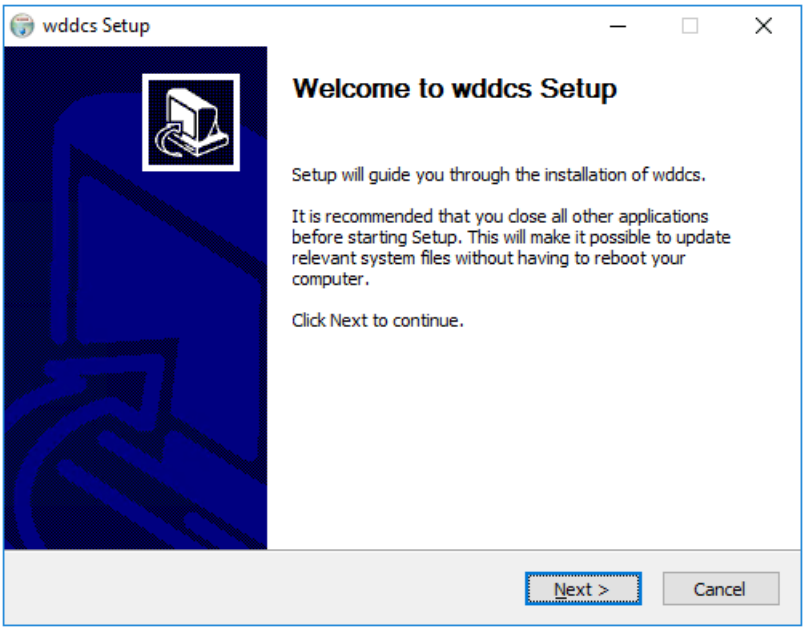
Note: Until the EULA is accepted, the user will be prompted to read it each time the WDDCS Tool is executed.

2.9 Installing on Windows Server (First Install)

Follow these instructions to install the WDDCS Tool for the first time on Windows Server operating systems.

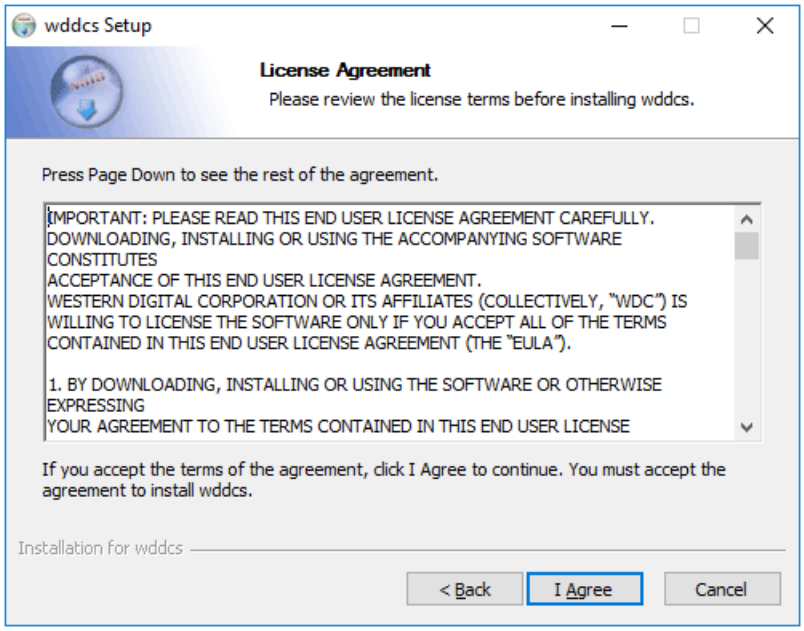
Step 1: In the directory containing the unzipped `.exe` file, double-click the `wddcs-win64-<version>.exe` file.

A **wddcs Setup** dialog box appears, welcoming the user:



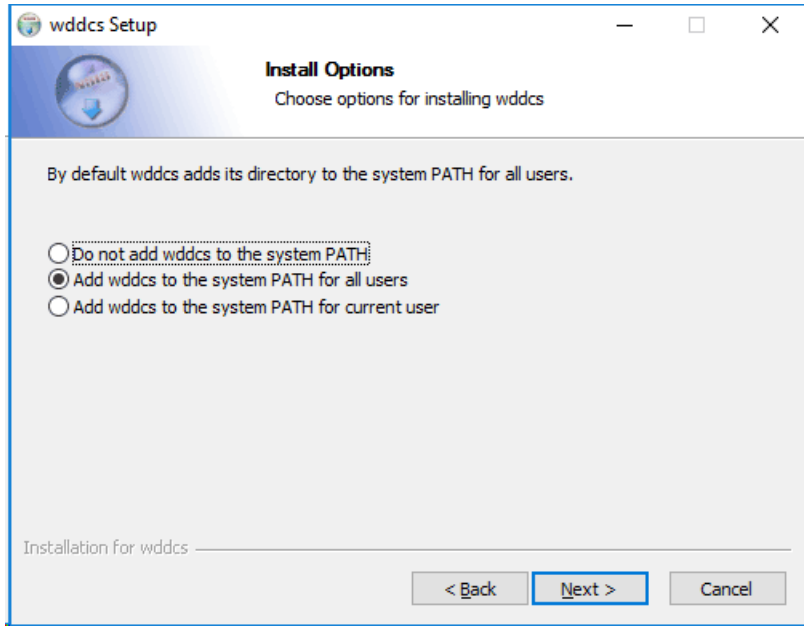
Step 2: Click the **Next** button.

The **wddcs Setup** window updates to show the license agreement:



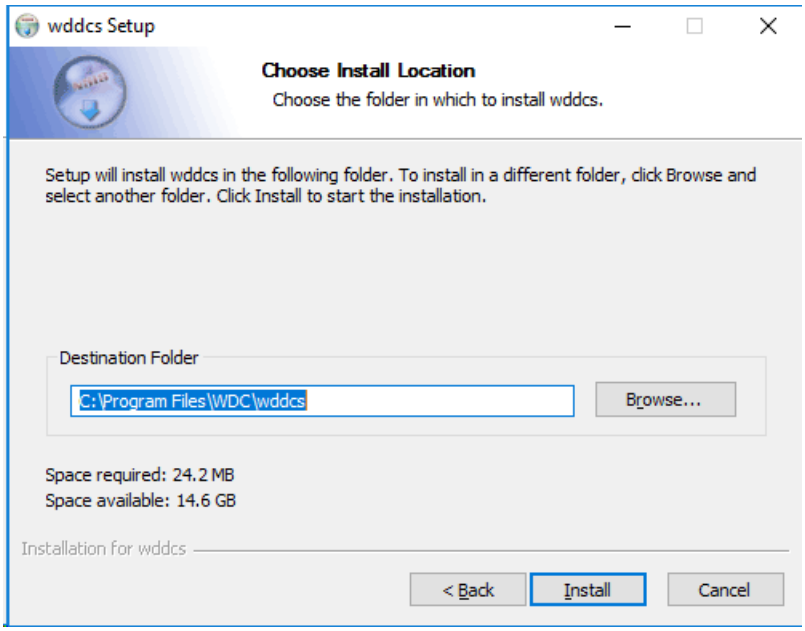
Step 3: Read through the license agreement, and then click the **I Agree** button.

The **wddcs Setup** window updates, prompting the user to choose a system PATH option. The *Add wddcs to the system PATH for all users* option is selected by default:



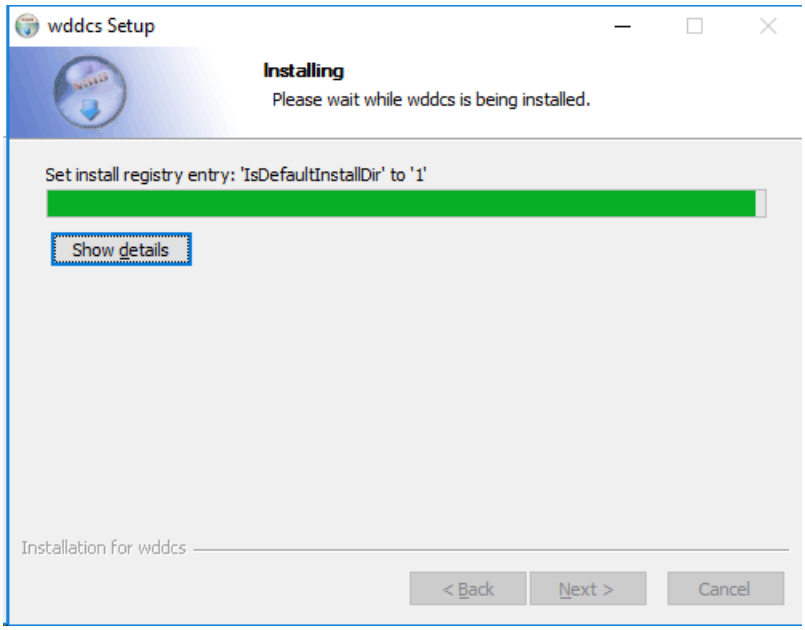
Step 4: Click the **Next** button.

The **wddcs Setup** window updates, prompting the user to accept the default installation directory or choose another:

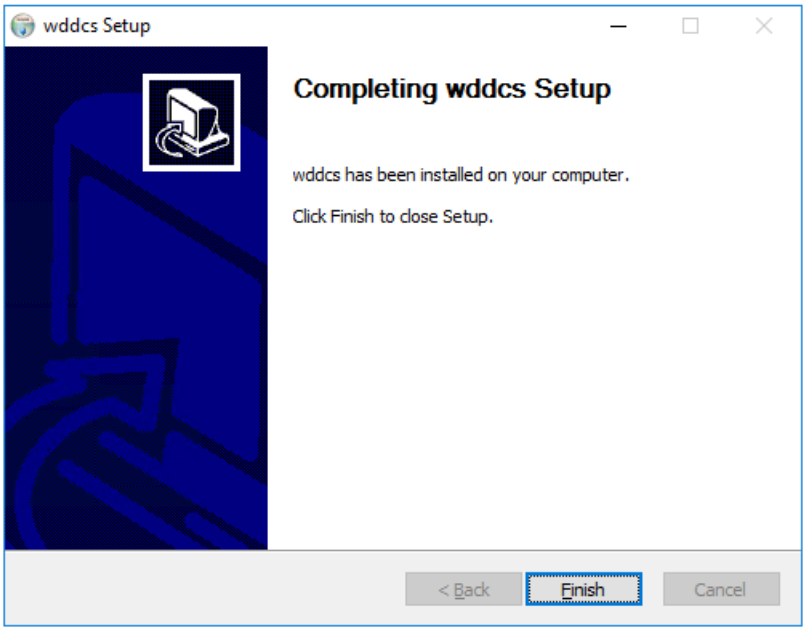


Step 5 : Click the **Install** button.

The **wddcs Setup** window updates, showing the installation progress:



After a few seconds, the **wddcs Setup** window updates again, showing that the installation is complete:



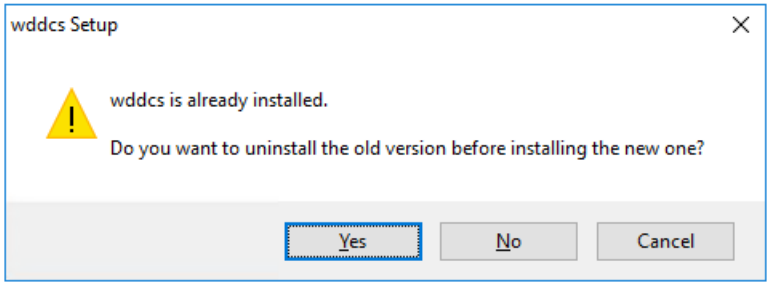
Step 6 : Click the **Finish** button.

2.10 Installing on Windows Server (Reinstall)

Follow these instructions to install a new version of the WDDCS Tool on Windows Server operating systems where an existing version has already been installed.

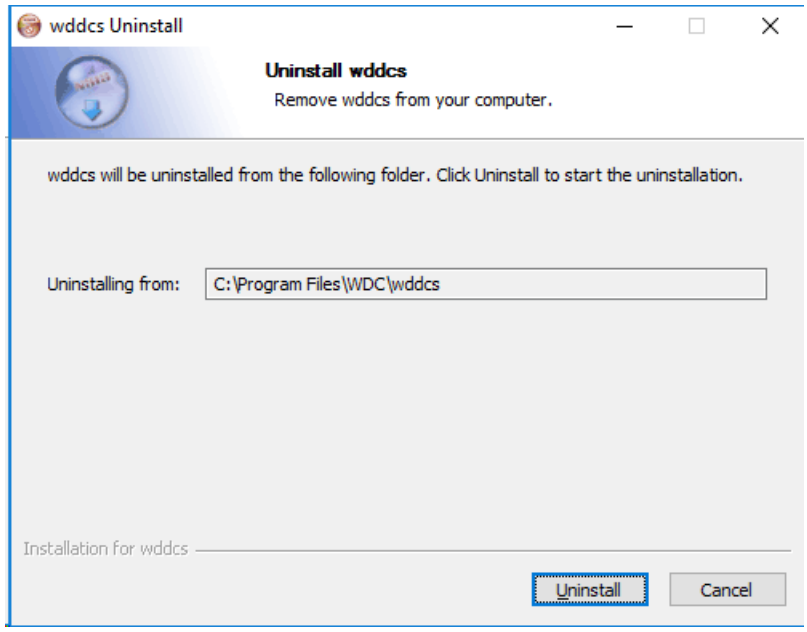
Step 1: In the directory containing the unzipped `.exe` file, double-click the `wddcs-win64-<version>.exe` file.

A **wddcs Setup** dialog appears, asking if the user wants to uninstall the previous version of the WDDCS Tool:



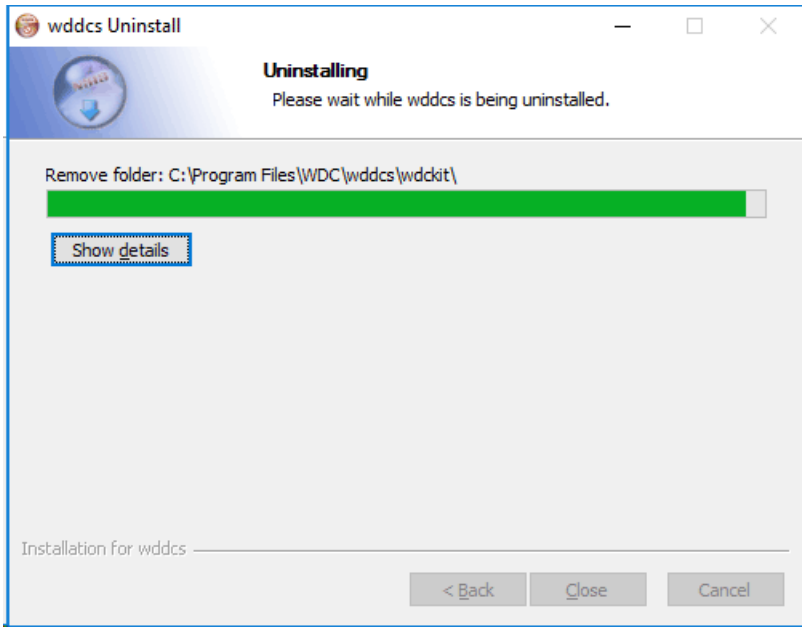
Step 2: Click the **Yes** button:

A **wddcs Uninstall** dialog box appears, notifying the user of the directory from which the WDDCS Tool will be uninstalled:

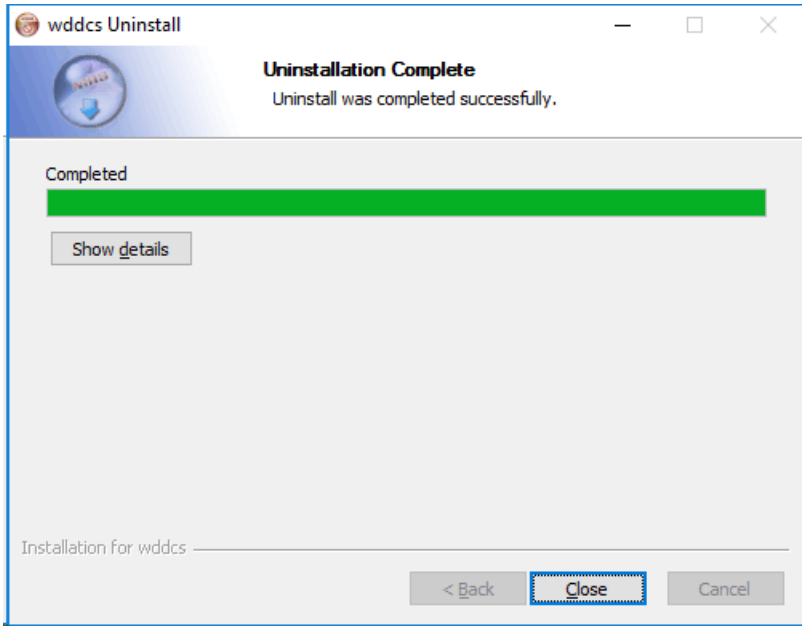


Step 3: Click the **Uninstall** button.

The **wddcs Uninstall** window updates, showing that the WDDCS Tool is being uninstalled:

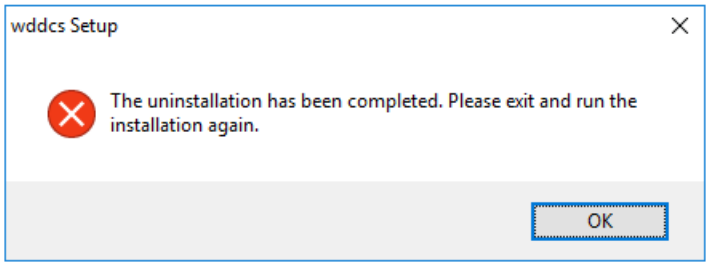


After a few seconds, the **wddcs Uninstall** window updates again, showing that the uninstallation is complete:



Step 4 : Click the **Close** button.

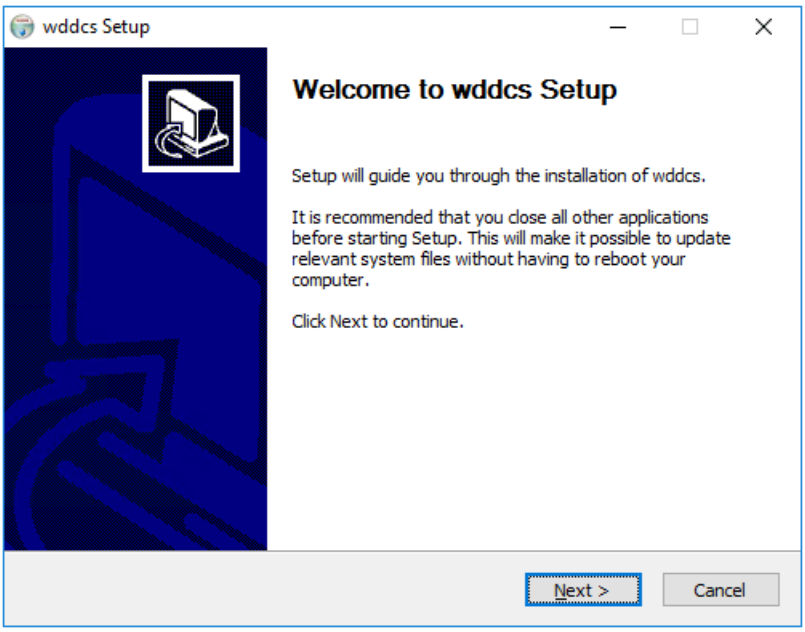
The **wddcs Setup** window reappears, asking the user to exit and run the installation again:



Step 5 : Click the **OK** button.

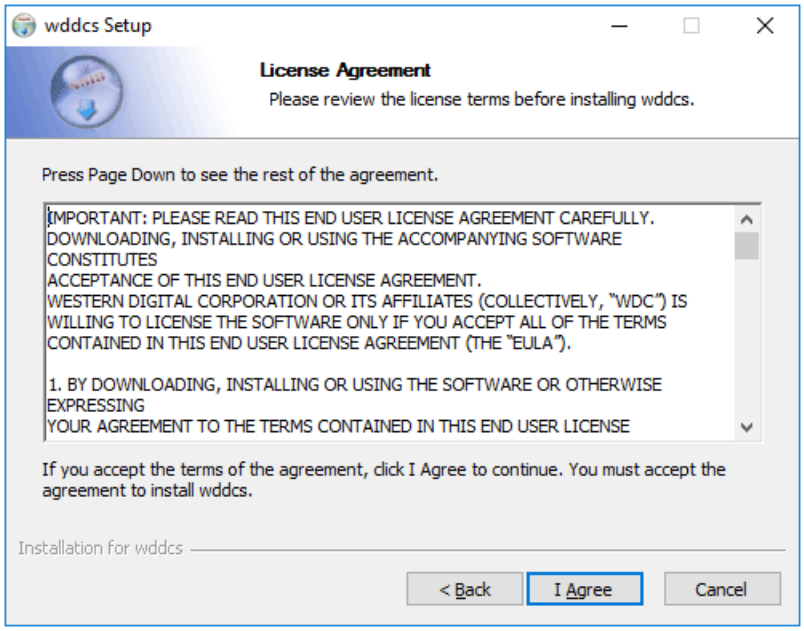
Step 6 : In the `wddcs-win64-<version>` directory, double-click the `wddcs-win64-<version>.exe` file again to start the new installation.

A **wddcs Setup** dialog box appears, welcoming the user:



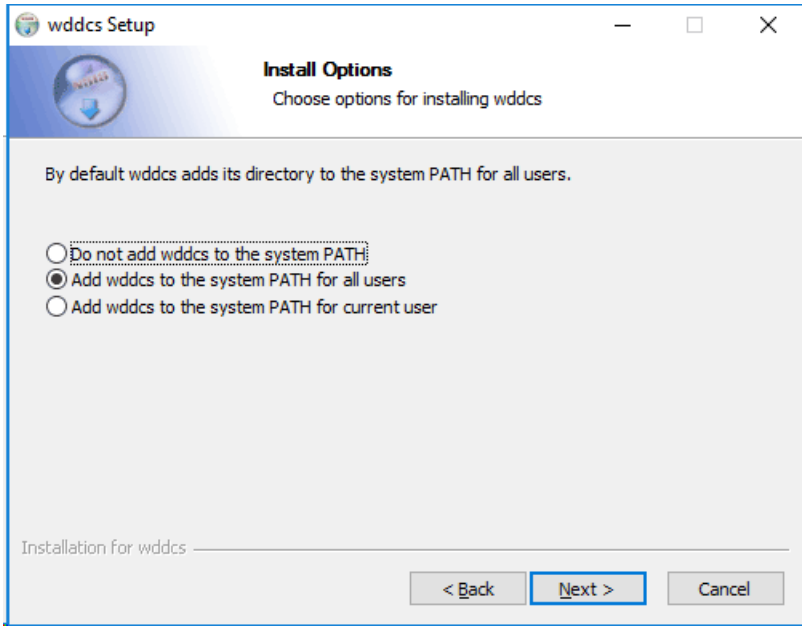
Step 7 : Click the **Next** button.

The **wddcs Setup** window updates to show the license agreement:



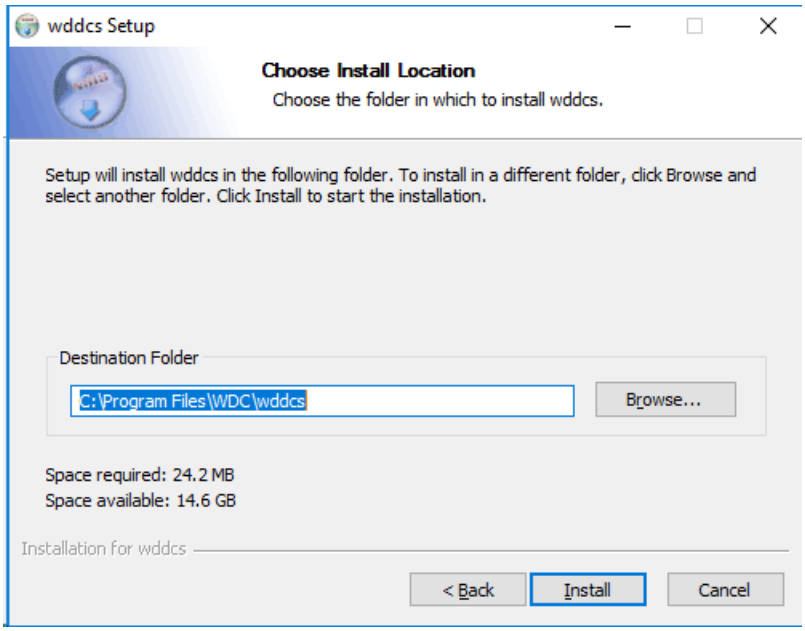
Step 8 : Read through the license agreement, and then click the **I Agree** button.

The **wddcs Setup** window updates, prompting the user to choose a system PATH option. The *Add wddcs to the system PATH for all users* option is selected by default:



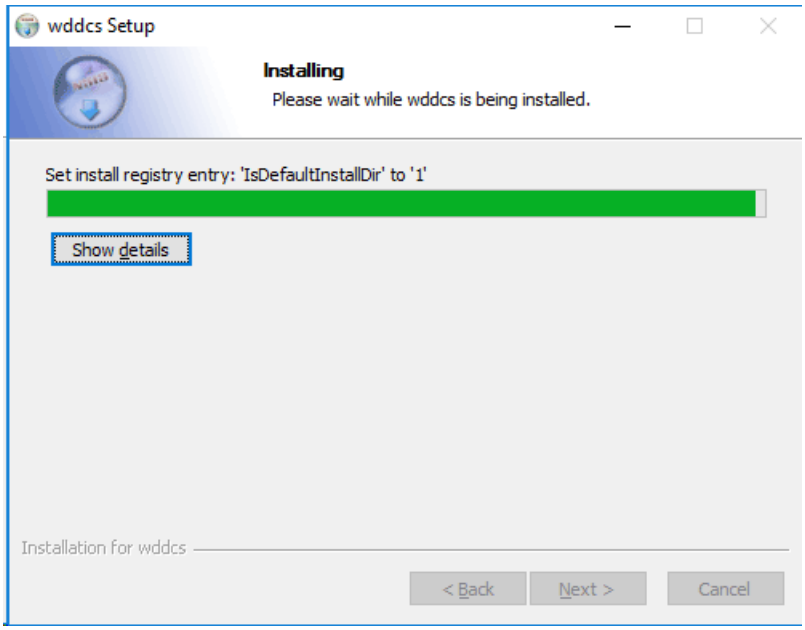
Step 9 : Click the **Next** button.

The **wddcs Setup** window updates, prompting the user to accept the default installation directory or choose another:

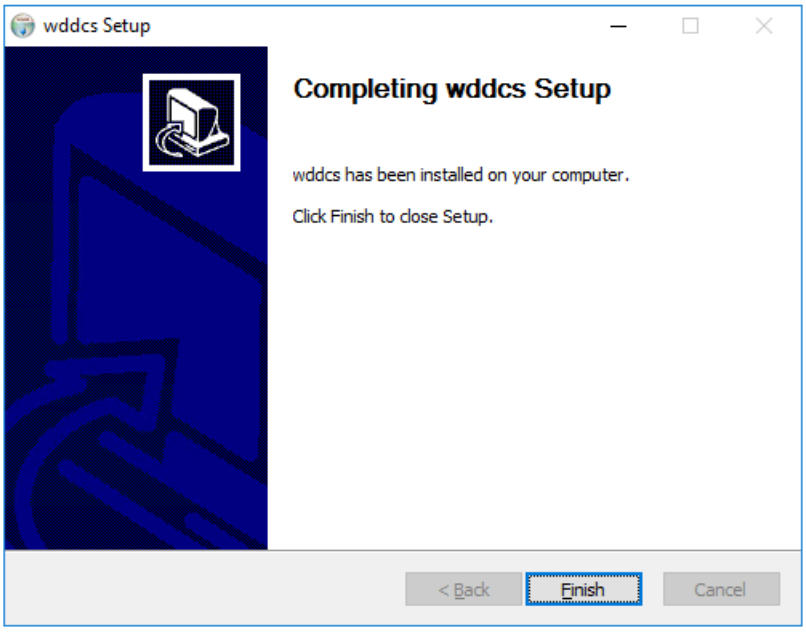


Step 10 : Click the **Install** button.

The **wddcs Setup** window updates, showing the installation progress:



After a few seconds, the **wddcs Setup** window updates again, showing that the installation is complete:



Step 11: Click the **Finish** button.

Commands

This section provides instructions for issuing commands from the WDDCS Tool.

In This Chapter:

Important: Because the WDDCS Tool supports both Linux and Windows operating systems, OS-specific command prompts (`#` or `C:\>`), device references (`/dev/sg0` or `SCSI1:4,64,0`), and paths (`/wddcs/v4.2.2.0` or `wddcs\v4.2.2.0`) have been included where command shell outputs are OS-specific; they have been omitted or replaced with generic references (`<device>`, `<path>`, etc.) where outputs apply to both OSs.

3.1 help

The `wddcs help` command is used to print the usage text (command syntax, operations, arguments, and explanations) for the following WDDCS Tool commands:

- `diag`
- `fw`
- `getlog`
- `http`
- `iom`
- `rcli`
- `show`
- `zone`

The topics in this section detail the usage text for each of these commands.

3.1.1 help

The `wddcs help` command is used to print the usage text for the `help` command.

Step 1: Use the `wddcs help` command to print the usage text for the `help` command:

```
wddcs help
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

wddcs usage:
wddcs [target [...]] operation [operation argument [...]]
    [target] - device path (ie: /dev/sg1)
               up to 128 targets may be specified
               if no targets are specified, all detected devices are targeted
    operation - operation to execute
    [operation argument] - argument specific to given operation

The following operations are supported:
    diag       display, set, and clear diagnostic page data
    fw         firmware related operations
    getlog     capture various types of log data
    http       operations for OpenFlex Data24 enclosures
    iom        display and set IOM configuration
    rcli       display detailed data about the enclousure and components
    show       scan SEP devices and display the product or device data
    zone       display and configure zones
```

Note: Using the `wddcs help version` command produces the same output.

3.1.2 help diag

The `wddcs help diag` command is used to print the usage text for the `wddcs diag` command.

Step 1: Use the `wddcs help diag` command to print the usage text for the `wddcs show` command:

```
wddcs help diag
```

```
wddcs v4.2.2.0
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Usage:
    diag <identifier>

Options for <identifier>:
    clear-crashevent   clear crash event logs
    clear-eventlog     clear event logs
    nickname           display current nickname diagnostic page
    nickname=<string>  set new nickname (use quotes if name has spaces)
    nickname=          clear any previously set nickname
    reset-enc          reset the enclosure
    reset-iom-a        reset IOM A of the enclosure
    reset-iom-b        reset IOM B of the enclosure
    power-cycle        shut down the enclosure and then power it back on
    timestamp          display the enclosure's internal date and time
    timestamp -j       display the above data in JSON format
    timestamp=<value>  set the enclosure's temporary internal date and time
                       <value> must be a 32-bit epoch time value
    autosync-enable    enable auto synchronization feature
    autosync-disable   disable auto synchronization feature

    show-slot=<value>                  display current states for the given
 slot(s)
    clear-slot=<value> <ident|devoff>  clear the action for the given device
 slot(s)
    set-slot=<value> <ident|devoff>    set the action for the given device
 slot(s)
                                       <value> can be <index> or <index-
index>
                                       <index> must be a non-negative slot
 value

    show-enc                           display current ident state for the
 enclosure
    clear-enc <ident>                  clear the ident action for the
 enclosure
    set-enc <ident>                    set the ident action for the enclosure

    broadcom-list                      list Broadcom channel adapters found
    broadcom-tmt-target=<index>        set Task Management Reset to Target
 Reset
    broadcom-tmt-itnexus=<index>       set Task Management Reset to IT_Nexus
 Reset
    broadcom-feature-hba=<index>       set 9600-16e/9600W-16e adapter Profile
 ID to FeatureHBA
    broadcom-perfit-sas=<index>        set 9600-16e/9600W-16e adapter Profile
 ID to PerfIT SAS/SATA
```

```
    broadcom-reset-controller=<index>  reset HBA

Examples:
    diag nickname=DC2
    diag nickname="DC2 Cage2"
    diag show-slot=all
    diag set-slot=0-10 ident
    diag clear-slot=1 devoff
```

Note: The Broadcom commands are designed to take action only on Broadcom channel adapters. With the exception of `broadcom-list`, all of the listed Broadcom commands require a reset of the adapter to make the change take effect. **These commands should only be used during a maintenance window with the host out of production.**

3.1.3 help fw

The `wddcs help fw` command is used to print the usage text for the `wddcs fw` command.

Step 1: Use the `wddcs help fw` command to print the usage text for the `wddcs fw` command:

```
wddcs help fw
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

fw activate | reset | status
    fw download* <file> [-nostatdelay]

Options for [argument]:
    download <file>            download microcode with the given binary file
    download_activate <file>   download followed by the activate command
    download_reset <file>      download followed by the IOM reset command
    activate                   activate the previously downloaded firmware
    reset                      reset IOMs
    status                     display the download microcode diagnostic page
 0Eh
    status -j                  display the above data in JSON format
    show_keystore              display the content of SES page 12h
    -nostatdelay               optional flag to skip the default delay after
 a download command

The "fw" command requires the user to specify one target device.
Example: ./wddcs /dev/sg0 fw download <file>
Example: ./wddcs /dev/sg0 fw download_activate <file> -nostatdelay
```

or

```
...
Example: wddcs SCSI1:4,64,0 fw download <file>
Example: wddcs SCSI1:4,64,0 fw download_activate <file> -nostatdelay
```

3.1.4 help getlog

The `wddcs help getlog` command is used to print the usage text for the `wddcs getlog` command.

Step 1: Use the `wddcs help getlog` command to print the usage text for the `wddcs getlog` command:

```
wddcs help getlog
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Usage:
    getlog [<identifier> [<identifier>] ...]

Options for <identifier>:
    common               get publicly known SAS/SATA JBOD/F enclosure logs
    vendor               get vendor specific SAS/SATA JBOD/F enclosure logs
    system-heavy         get system host logs that cause heavy loads on the
 drives
    system-light         get system host logs that cause light load on drives
    system               combination of system-heavy and system-light
    drives               get simple logs from the attached physical drives
 (nvme, sas, sata)
    drives-noprompt      same as above but without prompting for user
 confirmation
    drives-with-E6       same as above but includes the vendor E6 logs
 (default modes)
    drives-with-E6-full  same as above but includes the vendor E6 logs (all
 modes)
    all                  includes common, vendor, system, and drives
    all-noprompt         same as above but without prompting for user
 confirmation
    all-with-E6          same as above but includes the vendor E6 logs
 (default modes)
    all-with-E6-full     same as above but includes vendor E6 logs (all
 modes)
    pack=<path>          move all requested logs into a single packaged file
                         "=<path>" is optional (saved to the default log dir
 if not specified)
    timeout=<sec>        seconds to wait when spawning a process to get logs
    E6-sn=<sn>              get default E6 log from the first drive matching
 the given serial number
    E6-full-sn=<sn>         get E6 log (all modes) from the first drive
 matching the given serial number
    E6-sn-file=<file>       get default E6 logs from drives matching the
 serial numbers inside the given file
    E6-full-sn-file=<file>  get E6 logs (all modes) from drives matching the
 serial numbers inside the given file

    Notes:
    The options starting with "all*" will by default move all logs into a
 single packaged file
```

3.1.5 help http

The `wddcs help http` command is used to print the usage text for the `wddcs http` command.

Step 1: Use the `wddcs help http` command to print the usage text for the `wddcs help http` command:

```
wddcs help http
```

```
wddcs v4.2.2.0
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Description:
    General out-of-band or in-band operations for OpenFlex Data24 enclosures

Usage:
    http=<ipv4> [[user=<id> pass=<password> slot=<#> time=<#> ssl]
 <identifier>]

Options for <identifier>:
    fw status                    display the firmware update status
    fw download=<file>           send the given firmware file
    fw activate                  activate/reset to complete the firmware
 update
    fw download_activate=<file>  send the firmware file and complete the
 update

    getlog                       retrieve vendor logs from the enclosure
    getlog dir=<path>            retrieve vendor logs and save to the given
 path

    getdevicelogs                retrieve device related vendor logs from the
 enclosure
    getdevicelogs dir=<path>     retrieve device related vendor logs and save
 to the given path

    health              display health state for all enclosure components
    health=bad          display only when health state is not ok

    iom                 display current IO module settings
    iom reboot          reboot the IO module

    show                list available <device> names for the command below
    show=<resource>     display data for the given device resource

    getall              package all http commands plus "getlog system" and
 "getlog drives"
    getall dir=<path>   save the above package to the given path
    getall-noprompt             package all http commands plus "getlog
 system" and "getlog drives-noprompt"
    getall-noprompt dir=<path>   save the above package to the given path

Optional flags:
    user=<id>           credential identification (default is admin)
    pass=<password>     credential password (default is admin)

slot=<#>            refers to the Data24 IOM (1 is IOM A, 2 is IOM B) on in-
band only
```

```
    time=<#>            timeout in seconds (default varies per command type)
    ssl                 use HTTPS protocol instead of HTTP

Notes:
    "<ipv4>" is a 4 field IP address with an optional port number (#.#.#.#:#)
    Specify the "ssl" flag to use HTTPS protocol instead of HTTP
    When <ipv4> is an in-band address:
      - "slot=<#>" is required for fw|getlog|getdevicelogs
      - "slot=<#>" value is ignored when not necessary
      - If "slot=<#>" is not specified, it defaults to both slots for
 appropriate options

Examples:
    http=10.11.12.13 show
    http=10.11.12.13:80 user=admin pass=admin getlog
    http=10.11.12.13 user=admin pass=admin slot=1 ssl fw status
```

3.1.6 help iom

The `wddcs help iom` command is used to print the usage text for the `wddcs iom` command.

Step 1: Use the `wddcs help iom` command to print the usage text for the `wddcs iom` command:

```
wddcs help iom
```

```
wddcs v4.2.2.0
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Usage:
    iom [oobm|oobm=<iom>,<ip>,<netmask>,<gateway>]

Arguments:
    oobm        display current OOBM values
    oobm -j     display the above data in JSON format
    oobm=<args> set new OOBM values
         <iom>     = [A|B]
         <ip>      = [x.x.x.x]
         <netmask> = [x.x.x.x]
         <gateway> = [x.x.x.x]
                     x must be 0-255

    Default is to display current IOM single or dual setting

Example to change IOM A to static addresses:
    iom oobm=A,192.168.0.10,255.255.255.0,192.168.0.1

Example to change IOM B to DHCP:
    iom oobm=B,0.0.0.0,0.0.0.0,0.0.0.0

Example to display current OOBM:
    iom oobm

Example to display if enclosure is set to single or dual IOM:
    iom
```

3.1.7 help rcli

The `wddcs help rcli` command is used to print the usage text for the `wddcs rcli` command.

Step 1: Use the `wddcs help rcli` command to print the usage text for the `wddcs rcli` command:

```
wddcs help rcli
```

```
wddcs v4.2.2.0
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Usage:
    rcli <command string>

Arguments:
    <command string>
        Any of the commands allowed by the enclosure firmware.
        Specify in quotes if the command has spaces.
        Maximum command length is 256 characters.

Example:
    rcli "show drives"
```

3.1.8 help show

The `wddcs help show` command is used to print the usage text for the `wddcs show` command.

Step 1: Use the `wddcs help show` command to print the usage text for the `wddcs show` command:

```
wddcs help show
```

```
wddcs v4.2.2.0
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Usage:
    show           scan for all enclosures and display the following:
                       product description
                       serial number
                       firmware revision
                       product name
    show handles   display connected drives with slot #, serial number,
 capacity,
    -j             option to display in JSON format
                   port address, expander, and OS device handle name
```

3.1.9 help zone

The `wddcs help zone` command is used to print the usage text for the `wddcs zone` command.

Step 1: Use the `wddcs help zone` command to print the usage text for the `wddcs zone` command:

```
wddcs help zone
```

```
wddcs v4.2.2.0
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Usage:
    zone config=<value>
    zone file=<file>
    zone status

Details:
    config=<value>  configure zones to the given pre-defined value
    config=0        disable zoning
    config=<1-3>    pre-defined configuration per product type
                    H4102-J:
                      1: 17 drives visible to each host port
                      2: 34 drives visible to each pair of consecutive host
 ports (i.e. A1, A2)
                      3: 51 drives visible to each 3x consecutive host ports
 (i.e. A1, A2, A3)
                    H4060-J:
                      1: 10 drives visible to each host port
                      2: 20 drives visible to each pair of consecutive host
 ports (i.e. A1, A2)
                      3: 30 drives visible to each 3x consecutive host ports
 (i.e. A1, A2, A3)
    file=<file>     send binary config file to the IOM
    status          display current zone configuration setting

The "zone" command requires the user to specify one target device
Example: ./wddcs /dev/sg0 zone config=1
```

3.2 diag

The `wddcs diag` command is used to display, set, or clear diagnostic page information for the feature or component specified in the command option.

Usage

The following example demonstrates the correct syntax for the `wddcs diag` command:

- `diag <identifier>`

Note: For additional usage details, see help diag *(page 29)*.

Note: For instructions on using the `diag clear/set` commands for zoned enclosures, see clear/set Zoned Command Examples *(page 267)*.

Platform Support

The `wddcs diag` command and options are not supported on JBOF platforms; they are only supported on the following JBOD platforms:

Table 5: Current Products

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series
`diag`	✓	✓	✓	✓
`diag clear-crashevent`	✓	✓	✓	✓
`diag clear-eventlog`	✓	✓	✓	✓
`diag nickname`	✓	✓	✓	✓
`diag reset-enc`	✓	✓	✓	✓
`diag reset-iom-<a|b>`	✓	✓	✓	✓
`diag power-cycle`	✗	✓	✗	✓
`diag timestamp`	✓	✓	✓	✓
`diag autosync-enable`	✓	✗	✓	✗
`diag autosync-disable`	✓	✗	✓	✗
`diag show-slot=<value>`	✓	✓	✓	✓

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series
`diag clear-slot=<value> <ident|devoff>`	✓	✓	✓	✓
`diag set-slot=<value> <ident|devoff>`	✓	✓	✓	✓
`diag show-enc`	✓	✓	✓	✓
`diag clear-enc <ident>`	✓	✓	✓	✓
`diag set-enc <ident>`	✓	✓	✓	✓

Table 6: EOL Products

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`diag`	✗	✗	✗	✓
`diag clear-crashevent`	✓	✗	✓	✓
`diag clear-eventlog`	✗	✗	✗	✓
`diag nickname`	✗	✗	✗	✓
`diag reset-enc`	✓	✗	✓	✓
`diag reset-iom-<a|b>`	✗	✗	✓	✗
`diag power-cycle`	✗	✗	✗	✗
`diag timestamp`	✓	✗	✓	✓
`diag autosync-enable`	✗	✗	✗	✗
`diag autosync-disable`	✗	✗	✗	✗
`diag show-slot=<value>`	✗	✗	✗	✗
`diag clear-slot=<value> <ident|devoff>`	✗	✗	✗	✗
`diag set-slot=<value> <ident|devoff>`	✗	✗	✗	✗
`diag show-enc`	✗	✗	✗	✗

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`diag clear-enc <ident>`	⊗	⊗	⊗	⊗
`diag set-enc <ident>`	⊗	⊗	⊗	⊗

3.2.1 diag clear-crashevent

The `wddcs <device> diag clear-crashevent` command is used to clear crash event records from all primary and secondary expanders for a given device.

Step 1: Use the `wddcs show` command to determine the device handle for the desired enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product_abbreviation>
    serial  : <serial_number>
    firmware: <fw_version>
    name    : <product_name>

...
```

Step 2: Use the device handle along with the `wddcs <device> rcli "debug dump"` command to verify the presence of crash event logs for that enclosure:

```
wddcs <device> rcli "debug dump"
```

```
wddcs v4.2.2.0
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Device: <device>

Total records created: 1

FW Crash(2000-004) Time Stamp: 216744:13:22, Reason: General exception

  General purpose registers
  pc      0xc012a2c0    r7      0x00000001    r14      0x00000000    r21
 0x00000000
  r1      0x9c0979b8    r8      0xc2100000    r15      0x000000c2    r22
 0x00000000
  r2      0x9c05acb0    r9      0x00000000    r16      0x9c05ac68    r23
 0x00000000
  r3      0x00000000    r10     0x00000010    r17      0xc2100000    r24
 0x00000001
  r4      0x9c05acb0    r11     0x00000001    r18      0x00000004    r25
 0x00000001
  r5      0xc2100000    r12     0xc0129454    r19      0x00000000    r26
 0x00000000
```

```
 r6     0x00000004    r13    0x00100000    r20      0x00000000    r27
0x00000000
 gp     0x9c009000    sp     0x9c07f888    fp       0x00000000    ra
0xc00b3c80
 Special registers
 Cause  0x80800408    EPC    0xc012a2c0    BadVAddr 0xc2100000    EBase
0x9f041000

 CAUSE: TLB Exception.
```

Step 3: Use the `wddcs <device> diag clear-crashevent` command to clear the crash event logs:

```
wddcs <device> diag clear-crashevent
```

```
wddcs v4.2.2.0
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Device: <device>
Commands have been sent to clear the crash logs
```

Step 4: Repeat the `wddcs <device> rcli "debug dump"` command to verify that the crash event logs were cleared:

```
wddcs <device> rcli "debug dump"
```

```
wddcs v4.2.2.0
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Device: <device>
No crash records available
```

3.2.2 diag clear-eventlog

The `wddcs <device> diag clear-eventlog` command is used to clear event logs from all primary and secondary expanders for a given SEP device. Clearing event logs prior to troubleshooting is useful for limiting subsequent logs to only those problematic events that were purposefully reproduced.

Before you begin:

- The `wddcs <device> diag clear-eventlog` command requires FW version 3000 or later for Ultrastar Data102, Ultrastar® Data60, and Ultrastar Serv60+8 platforms.

Step 1: Use the `wddcs show` command to determine the device handle for the desired enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product_abbreviation>
    serial  : <serial_number>
    firmware: <fw_version>
    name    : <product_name>
```

```
...
```

Step 2: Use the device handle along with the `wddcs getlog vendor` or `wddcs getlog all` command to capture log data (including event logs) for the device.

Step 3: Navigate to the output directory where the log files are stored. This will either be the temporary directory or the directory specified in the `pack=<path>` command option, if used.

Step 4: Review the list of event log files and note their file sizes (bolded in the following example):

```
-rw-r--r--. 1 root root 129856 <date> <time> eventlog_exp_0_<device>.bin
-rw-r--r--. 1 root root    160 <date> <time> eventlog_exp_1_<device>.bin
-rw-r--r--. 1 root root    576 <date> <time> eventlog_exp_2_<device>.bin
...
```

Step 5: Use the `wddcs <device> diag clear-eventlog` command to clear the event logs:

```
wddcs <device> diag clear-eventlog
```

```
wddcs v4.2.2.0
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Device: <device>
Commands have been sent to clear the event logs
```

Step 6: Repeat the `wddcs getlog vendor` or `wddcs getlog all` command to capture the new event logs.

Step 7: Review the list of event log files and note their reduced file sizes (bolded in the following example):

```
-rw-r--r--. 1 root root    64 <date> <time> eventlog_exp_0_<device>.bin
-rw-r--r--. 1 root root    64 <date> <time> eventlog_exp_1_<device>.bin
-rw-r--r--. 1 root root    64 <date> <time> eventlog_exp_2_<device>.bin
...
```

3.2.3 diag nickname

The `wddcs <device> diag nickname` command is used to display, set, and clear values of the nickname diagnostic page.

Step 1: Use the `wddcs <device> diag nickname` command to view the nickname diagnostic page for a single device within a WD enclosure:

```
wddcs <device> diag nickname
```

```
wddcs v4.2.2.0
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Device: <device>
Page id           : 0Fh
Page length       : 2Ch
Generation code   : 0h
Nickname status   : 00h - No errors
Additional status : 00h
Language code     : 0000h
```

```
Nickname          :
```

a. To set the nickname, include the `nickname=<string>` argument. For example:

```
wddcs <device> diag nickname="Cloud DataCenter Rack1"
```

```
wddcs v4.2.2.0
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Device: <device>
Enclosure nickname has been set to: Cloud DataCenter Rack1
```

Executing the `wddcs <device> diag nickname` command again will show that the nickname has been set to the specified value:

```
wddcs <device> diag nickname
```

```
wddcs v4.2.2.0
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Device: <device>
Page id           : 0Fh
Page length       : 2Ch
Generation code   : 0h
Nickname status   : 00h - No errors
Additional status : 00h
Language code     : 0000h
Nickname          : Cloud DataCenter Rack1
```

b. To clear the nickname, include the `nickname=` argument without specifying a value. For example:

```
wddcs <device> diag nickname=
```

```
wddcs v4.2.2.0
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Device: <device>
Enclosure nickname has been cleared
```

Executing the `wddcs <device> diag nickname` command again will show that the nickname has been cleared:

```
wddcs <device> diag nickname
```

```
wddcs v4.2.2.0
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Device: <device>
Page id           : 0Fh
Page length       : 2Ch
Generation code   : 0h
Nickname status   : 00h - No errors
Additional status : 00h
Language code     : 0000h
Nickname          :
```

3.2.4 diag reset-enc

The `wddcs <device> diag reset-enc` command is used to reset both IOMs in a staggered fashion.

Before you begin:

- The order of the IOM resets will depend on which IOM device handle is specified in the reset command. The specified IOM will be the last device to reset.

Attention: Single IOM Configurations: The only operating IOM in the enclosure will be reset during this procedure.

Step 1: Use the `wddcs <device> iom` command to determine the device handle and IOM identifier for both IOMs:

```
wddcs <device> iom
```

```
wddcs v4.2.2.0
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Device: <device>
Dual IOM operation
IOM B

Device: <device>
Dual IOM operation
IOM A
```

Step 2: Use the `wddcs <device> diag reset-enc` command to reset both IOMs in a staggered fashion. The IOM device specified in the command will be the last device to be reset:

```
wddcs <device> diag reset-enc
```

```
wddcs v4.2.2.0
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Device: <device>
Commands have been sent to reset the enclosure
```

Step 3: If needed, use the `wddcs <device> iom` command again to verify which IOM is being reset. In the following example, the enclosure reports `Dual IOM operation`, but the IOM being reset doesn't appear in the output:

```
wddcs <device> iom
```

```
wddcs v4.2.2.0
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Device: <device>
Dual IOM operation
IOM A
```

When both IOMs have finished resetting, the `wddcs <device> iom` command will display both devices again:

```
wddcs <device> iom
```

```
wddcs v4.2.2.0
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Device: <device>
Dual IOM operation
IOM B

Device: <device>
Dual IOM operation
IOM A
```

3.2.5 diag reset-iom-<a|b>

The `wddcs <device> diag reset-iom-<a|b>` command is used to reset an IOM.

Step 1: Use the `wddcs <device> iom` command to determine the device handle and IOM identifier for the desired IOM:

```
wddcs <device> iom
```

```
wddcs v4.2.2.0
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Device: <device>
Dual IOM operation
IOM B

Device: <device>
Dual IOM operation
IOM A
```

Step 2: Use the appropriate reset command (either `wddcs <device> diag reset-iom-a` or `wddcs <device> diag reset-iom-b`) with the device handle to reset the IOM:

```
wddcs <device> diag reset-iom-<a|b>
```

```
wddcs v4.2.2.0
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Device: <device>
Commands have been sent to reset the IOM
```

Step 3: If needed, use the `wddcs <device> iom` command again to verify that the IOM is being reset. In the following example, the enclosure reports `Dual IOM operation`, but the IOM being reset doesn't appear in the output:

```
wddcs <device> iom
```

```
wddcs v4.2.2.0
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Device: <device>
```

```
Dual IOM operation
IOM A
```

When the IOM has finished resetting, the `wddcs <device> iom` command will display both devices again:

```
wddcs <device> iom
```

```
wddcs v4.2.2.0
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Device: <device>
Dual IOM operation
IOM B

Device: <device>
Dual IOM operation
IOM A
```

3.2.6 diag power-cycle

The `wddcs <device> diag power-cycle` command is used to power cycle the enclosure.

Attention: This procedure is required for resetting the Ultrastar Data60 3000 and Data102 3000 Series enclosure only.

Step 1: Use the `wddcs <device> diag power-cycle` command to power-cycle the enclosure:

```
wddcs <device> diag power-cycle
```

```
wddcs v4.2.2.0
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Device: <device>

A REQUEST HAS BEEN ISSUED TO POWER CYCLE THE ENCLOSURE.
THIS WILL CAUSE A TEMPORARY LOSS OF ACCESS TO THE DRIVES WHILE THE POWER
 CYCLE OCCURS.
ARE YOU SURE YOU WANT TO CONTINUE AT THIS TIME?

To continue with the power cycle, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the enclosure will go offline.

Step 2: Enter Y or y to proceed:

```
y
```

```
Command to power cycle was successful
```

3.2.7 diag timestamp

The `wddcs <device> diag timestamp` command is used to display or set an IOM's internal date and time.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag timestamp` command, along with the device handle for an IOM, to view that IOM's internal date and time:

```
wddcs <device> diag timestamp
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: <device>
  Microseconds (RTC)      = 000609F4F49EC143h
  Seconds (Epoch)         = 1699797540 (6550DA24h)
  Local date (yyyy/mm/dd) = 2023/11/12
  Local time (24hh:mm:ss) = 06:59:00
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs <device> diag timestamp -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
{
    "wddcs":    {
        "application":    {
            "name":       "wddcs",
            "version":    "4.2.2.0"
        },
        "results":    [{
                "microsecondsRTC":    "0x00047E7E1204C0E5h",
                "secondsEpoch":    "1264979840",
                "localDate":    "2022/04/13",
                "localTime":    "15:48:44"
            }]
    }
}
```

b. To set the timestamp, include the `=<value>` argument. The value must be a 32-bit epoch time value. For example:

```
wddcs <device> diag timestamp=1618591800
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
The time stamp has been set to 0x6553A66C
```

Executing the `wddcs <device> diag timestamp` command again will show that the timestamp has been set to the specified value:

```
wddcs <device> diag timestamp
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: <device>
  Microseconds (RTC)      = 00060A1FA65AA162h
  Seconds (Epoch)         = 1699980911 (6553A66Fh)
  Local date (yyyy/mm/dd) = 2023/11/14
  Local time (24hh:mm:ss) = 09:55:11
```

Step 3: If needed, repeat these steps to display or modify the other IOM's internal date and time.

3.2.8 diag autosync-enable

The `wddcs <device> diag autosync-enable` command is used to enable the firmware autosync feature of an enclosure.

Attention: For Ultrastar Data60 and Data102 only: Manually power-cycle the enclosure or issue the `diag reset-enc` command to reset the enclosure.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> rcli "show vpd"` command, along with one of the IOM device handles, to view the vital product data for the enclosure and confirm that the autosync feature is currently **disabled**. The enclosure configuration bits will provide this information:

```
wddcs <device> rcli "show vpd"
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
  ...
  Encl:Config       = x5A0000000000000
  ...
```

Note: If the highlighted bits from this example are set to `08` on the enclosure, the autosync feature is already **enabled**.

Step 3: Use the `wddcs <device> diag autosync-enable` command, along with one of the IOM device handles, to enable the autosync feature:

```
wddcs <device> diag autosync-enable
```

```
wddcs v4.2.2.0
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Device: <device>
Auto synchronization has been enabled
```

Step 4: Repeat the `wddcs <device> rcli "show vpd"` command to view the enclosure configuration bits and verify that the autosync feature was enabled:

```
wddcs <device> rcli "show vpd"
```

```
wddcs v4.2.2.0
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Device: <device>
  ...
  Encl:Config       = x5A0000000000800
  ...
```

Step 5: Manually power-cycle the enclosure or use the `reset-enc` command for the `autosync` feature to take place.

Result: The autosync feature is now enabled.

3.2.9 diag autosync-disable

The `wddcs <device> diag autosync-disable` command is used to disable the firmware autosync feature of an enclosure.

Attention: For Ultrastar Data60 and Data102 only: Manually power-cycle the enclosure or issue the `diag reset-enc` command to reset the enclosure.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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```

```
Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> rcli "show vpd"` command, along with one of the IOM device handles, to view the vital product data for the enclosure and confirm that the autosync feature is currently **enabled**. The enclosure configuration bits will provide this information:

```
wddcs <device> rcli "show vpd"
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
  ...
  Encl:Config       = x5A0000000000800
  ...
```

Note: If the highlighted bits from this example are set to `00` on the enclosure, the autosync feature is already **disabled**.

Step 3: Use the `wddcs <device> diag autosync-disable` command, along with one of the IOM device handles, to disable the autosync feature:

```
wddcs <device> diag autosync-disable
```

```
wddcs v4.2.2.0
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Device: <device>
Auto synchronization has been disabled
```

Step 4: Repeat the `wddcs <device> rcli "show vpd"` command to view the enclosure configuration bits and verify that the autosync feature was disabled:

```
wddcs <device> rcli "show vpd"
```

```
wddcs v4.2.2.0
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Device: <device>
  ...
  Encl:Config       = x5A0000000000000
  ...
```

Step 5: Manually power-cycle the enclosure or use the `reset-enc` command for the `autosync` feature to take place.

Result: The autosync feature is now disabled.

3.2.10 diag show-slot=<value>

The `wddcs <device> diag show-slot =<value>` command is used to display the status code, ident bit value, and devoff bit value for the slot(s) specified by the <value>.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag show-slot` command along with the device handle to display the status code, ident bit value, and devoff bit value for the slot(s) specified by the <value>.

Single Slot Number:

```
wddcs <device> diag show-slot=0
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Range of Slot Numbers:

```
wddcs <device> diag show-slot=0-5
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 3
```

```
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 4
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 5
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

All Slots:

```
wddcs <device> diag show-slot=all
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
.
Status for index 99
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 100
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 101
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Note: Using a value that is negative or outside the accepted range will produce the following error message:

```
wddcs v4.2.2.0
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Device: <device>
```

```
ERROR: This product supports slots from 0 to 101
```

Result: The status code, ident bit value, and devoff bit value for the specifiec slot(s) are now displayed.

3.2.11 diag clear-slot=<value> ident

The `wddcs <device> diag clear-slot =<value> ident` command is used to clear the ident bit (set it to `0`) for the array device slot(s) specified by the <value>, which will disable the corresponding LED(s).

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag clear-slot ident` command along with one of the device handles to clear the ident bit (set it to `0`) for the array device slot(s) specified by the <value>.

Single Slot Number:

```
wddcs <device> diag clear-slot=0 ident
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Command to change the value to slot 0 was successful
```

Range of Slot Numbers:

```
wddcs <device> diag clear-slot=0-5 ident
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Command to change the value to slots 0-5 was successful
```

All Slots:

```
wddcs <device> diag clear-slot=all ident
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
```

```
Command to change the value to all slots was successful
```

Step 3 : Use the `wddcs <device> diag show-slot=<value>` command to display the current state of the slot(s) changed in step *2 (page 51)*.

Single Slot Number:

```
wddcs <device> diag show-slot=0
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Range of Slot Numbers:

```
wddcs <device> diag show-slot=0-5
```

```
wddcs v4.2.2.0
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Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 3
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 4
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 5
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

All Slots:

```
wddcs <device> diag show-slot=all
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
```

```
Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
.
Status for index 99
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 100
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 101
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Result: The the ident bit of the array device slot(s) specified by the <value> have now been cleared.

3.2.12 diag clear-slot=<value> devoff

The `wddcs <device> diag clear-slot =<value> devoff` command is used to clear the devoff bit (set it to `0`) for the array device slot(s) specified by the <value>, which will power-on the drive(s) in those slots.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag clear-slot devoff` command along with one of the device handles to clear the devoff bit (set it to `0`) for the array device slot(s) specified by the <value>.

Single Slot Number:

```
wddcs <device> diag
            clear-slot=0 devoff
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the value to slot 0 was successful
```

Range of Slot Numbers:

```
wddcs <device> diag
            clear-slot=0-5 devoff
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Command to change the value to slots 0-5 was successful
```

All Slots:

```
wddcs <device> diag
            clear-slot=all devoff
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Command to change the value to all slots was successful
```

Step 3 : Use the `wddcs <device> diag show-slot=<value>` command to display the current state of the slot(s) changed in step 2 *(page 53)*.

Single Slot Number:

```
wddcs <device> diag show-slot=0
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Range of Slot Numbers:

```
wddcs <device> diag show-slot=0-5
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
```

```
Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 3
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 4
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 5
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

All Slots:

```
wddcs <device> diag show-slot=all
```

```
wddcs v4.2.2.0
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Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
.
Status for index 99
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 100
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 101
```

```
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Result: The the devoff bit for the array device slot(s) specified by the <value> have now been cleared.

3.2.13 diag set-slot=<value> ident

The `wddcs <device> diag set-slot =<value> ident` command is used to set the ident bit for the array device slot(s) specified by the <value>, which will enable the corresponding LED(s).

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag set-slot ident` command along with one of the device handles to set the ident bit for the array device slot(s) specified by the <value>.

Single Slot Number:

```
wddcs <device> diag set-slot=0 ident
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the value to slot 0 was successful
```

Range of Slot Numbers:

```
wddcs <device> diag set-slot=0-5 ident
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Command to change the value to slots 0-5 was successful
```

All Slots:

```
wddcs <device> diag set-slot=all ident
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
```

```
Device: <device>
Command to change the value to all slots was successful
```

Step 3 : Use the `wddcs <device> diag show-slot=<value>` command to display the current state of the slot(s) changed in step *2 (page 56)*.

Single Slot Number:

```
wddcs <device> diag show-slot=0
```

```
wddcs v4.2.2.0
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Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 1
  devoff: 0
```

Range of Slot Numbers:

```
wddcs <device> diag show-slot=0-5
```

```
wddcs v4.2.2.0
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Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 3
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 4
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 5
  code  : 1 (ok)
  ident : 1
  devoff: 0
```

All Slots:

```
wddcs <device> diag show-slot=all
```

```
wddcs v4.2.2.0
```

```
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 1
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 2
  code  : 1 (ok)
  ident : 1
  devoff: 0
.
.
.
Status for index 99
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 100
  code  : 1 (ok)
  ident : 1
  devoff: 0
Status for index 101
  code  : 1 (ok)
  ident : 1
  devoff: 0
```

Result: The the ident bit of the array device slot(s) specified by the <value> have now been set.

3.2.14 diag set-slot=<value> devoff

The `wddcs <device> diag set-slot =<value> devoff` command is used to set the devoff bit for the array device slot(s) specified by the <value>, which will power-off the drives in those slots.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag set-slot devoff` command along with one of the device handles to set the devoff bit for the array device slot(s) specified by the <value>

Single Slot Number:

```
wddcs <device> diag set-slot=0 devoff
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the value to slot 0 was successful
```

Range of Slot Numbers:

```
wddcs <device> diag set-slot=0-5 devoff
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the value to slots 0-5 was successful
```

All Slots:

```
wddcs <device> diag set-slot=all devoff
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the value to all slots was successful
```

Step 3 : Use the `wddcs <device> diag show-slot=<value>` command to display the current state of the slot(s) changed in step 2 *(page 58)*.

Single Slot Number:

```
wddcs <device> diag show-slot=0
```

```
wddcs v4.2.2.0
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Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 1
```

Range of Slot Numbers:

```
wddcs <device> diag show-slot=0-5
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 1 (ok)
```

```
  ident : 0
  devoff: 1
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 3
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 4
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 5
  code  : 1 (ok)
  ident : 0
  devoff: 1
```

All Slots:

```
wddcs <device> diag show-slot=all
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 1
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 2
  code  : 1 (ok)
  ident : 0
  devoff: 1
.
.
.
Status for index 99
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 100
  code  : 1 (ok)
  ident : 0
  devoff: 1
Status for index 101
  code  : 1 (ok)
  ident : 0
```

```
  devoff: 1
```

Result: The the devoff bit of the array device slot(s) specified by the <value> have now been set.

3.2.15 diag show-enc

The `wddcs diag show-enc` command is used to display the enclosure status code and ident bit value for the enclosure. The diag show-enc option applies to the Ultrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs diag show-enc` command to display the enclosure:

```
wddcs diag show-enc
```

```
wddcs v4.2.2.0
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Device: <device>
  Enclosure status
  code  : 1 (ok)
  ident : 0
```

Result: The enclosure status code and ident bit value is now identified.

3.2.16 diag clear-enc <ident>

The `wddcs <device> diag clear-enc <ident>` command sets the specified ident bit value to 0 for the enclosure. Setting the ident bit value to 0 by using the diag clear-enc ident operation will disable the identification LED for the specified enclosure. The diag clear-slot ident option applies to the Ultrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs show` command to determine the device handles for the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs <device> diag show-enc ident` command to display ident bit that is set to 1. The enclosure configuration bits will provide this information:

```
wddcs <device> diag show-enc
```

```
wddcs v4.2.2.0
```

```
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Enclosure status
  code  : 1 (ok)
  ident : 1
```

Step 3: Use the `wddcs <device> diag clear-enc ident` command to set the ident bit to 0. The enclosure configuration bits will provide this information:

```
wddcs <device> diag clear-enc <ident>
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the enclosure setting was successful
```

Step 4: Use the `wddcs <device> diag show-enc` command to display that the bit of the enclosure has been set back to 0. The enclosure configuration bits will provide this information:

```
wddcs <device> diag show-enc
```

```
wddcs v4.2.2.0
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Device: <device>
Enclosure status
  code  : 1 (ok)
  ident : 0
```

Result: The enclosure ident bit value is now set to 0.

3.2.17 diag set-enc <ident>

The `wddcs diag set-enc <ident>` command sets the specified bit value to 1 for the enclosure. Setting the ident bit value to 1 by using the diag set-enc ident operation will enable the identification LED for the enclosure specified. The diag set-enc ident option applies to the Ultrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs show` command to determine the handle the enclosure:

```
wddcs show
```

```
wddcs v4.2.2.0
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Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs diag show-enc` command to display the ident bit value.

```
wddcs diag show-enc
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Enclosure status
  code  : 1 (ok)
  ident : 0
```

Step 3: Use the `wddcs diag set-enc <ident>` command to set the ident bit value to 1.

```
wddcs diag set-enc <ident>
```

```
wddcs v4.2.2.0
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Device: <device>
Command to change the enclosure setting was successful
```

Step 4: Use the `wddcs diag show-enc` command to display the ident bit value.

```
wddcs diag show-enc
```

```
wddcs v4.2.2.0
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Device: <device>
Enclosure status
  code  : 1 (ok)
  ident : 1
```

Result: The set-enc ident bit value is now set to 1.

3.2.18 diag broadcom-list

The `wddcs diag broadcom-list` command is used to display all Broadcom HBAs installed on the host.

Before you begin: This command is supported by all Broadcom Channel 93xx/94xx/95xx/96xx IT HBAs.

Step 1: Use the `wddcs diag broadcom-list` command to display all Broadcom HBAs installed on the host:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
```

```
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : Target Reset
```

Result: All Broadcom HBAs installed on the host are now displayed.

3.2.19 diag broadcom-tmt-target=<index>

The `wddcs diag broadcom-tmt-target =<index>` command is used to change the Task Management Reset Type of Broadcom host bus adapters (HBAs) from IT Nexus Reset to Target Reset.

Before you begin:

Note: For more information about the purpose and differences between Target Reset and IT Nexus Reset, see https://support-en.westerndigital.com/app/answers/detail/a_id/32058/.

Step 1: Use the `wddcs diag broadcom-list` command to display all Broadcom HBAs installed on the host:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : IT Nexus Reset
```

Note: In this example, the HBA at index 2 is currently set to `IT Nexus Reset`.

Step 2: Use the `wddcs diag broadcom-tmt-target =<index>` command to change the Task Management Reset Type of the HBA at index 2 to Target Reset:

```
# wddcs diag broadcom-tmt-target=2
```

```
wddcs v4.2.2.0
```

```
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x3 (PerfIT SAS Only)
Reset type   : IT Nexus Reset

THE HBA CONTROLLER WILL BE RESET FOR THE TASK MANAGEMENT RESET CHANGE TO TAKE
 EFFECT.
THIS PROCEDURE IS TO BE PERFORMED DURING A MAINTENANCE WINDOW TO AVOID LOSS
 OF ACCESS TO DATA.

To continue with the setting change and HBA reset, press 'Y' or 'y':
```

The user is notified that the HBA must be reset for this change to take effect.

Step 3: Enter `Y` or `y` to reset the HBA:

```
y
```

```
Changing task management reset type to: Target Reset
Please wait...
The command was sent successfully
```

The user is notified that the reset command was successful.

Step 4: Repeat the `wddcs diag broadcom-list` command to verify the Task Management Reset Type change:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x3 (PerfIT SAS Only)
Reset type   : Target Reset
```

Result: The Task Management Reset Type of the Broadcom HBA has now been changed to Target Reset.

3.2.20 diag broadcom-tmt-itnexus=<index>

The `wddcs diag broadcom-tmt-itnexus =<index>` command is used to change the Task Management Reset Type of Broadcom host bus adapters (HBAs) from Target Reset to IT Nexus Reset.

Before you begin:

Note: For more information about the purpose and differences between Target Reset and IT Nexus Reset, see https://support-en.westerndigital.com/app/answers/detail/a_id/32058/.

Step 1: Use the `wddcs diag broadcom-list` command to display all Broadcom HBAs installed on the host:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : Target Reset
```

Note: In this example, the HBA at index 2 is currently set to `Target Reset`.

Step 2: Use the `wddcs diag broadcom-tmt-itnexus =<index>` command to change the Task Management Reset Type of the HBA at index 2 to IT Nexus Reset:

```
# wddcs diag broadcom-tmt-itnexus=2
```

```
wddcs v4.2.2.0
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HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : Target Reset

THE HBA CONTROLLER WILL BE RESET FOR THE TASK MANAGEMENT RESET CHANGE TO TAKE
 EFFECT.
```

```
THIS PROCEDURE IS TO BE PERFORMED DURING A MAINTENANCE WINDOW TO AVOID LOSS
 OF ACCESS TO DATA.

To continue with the setting change and HBA reset, press 'Y' or 'y':
```

The user is notified that the HBA must be reset for this change to take effect.

Step 3: Enter `Y` or `y` to reset the HBA:

```
y
```

```
Changing task management type to: IT_Nexus Reset
Please wait...
The command was sent successfully
```

The user is notified that the reset command was successful.

Step 4: Repeat the `wddcs diag broadcom-list` command to verify the Task Management Reset Type change:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : IT Nexus Reset
```

Result: The Task Management Reset Type of the Broadcom HBA has now been changed to IT Nexus Reset.

3.2.21 diag broadcom-feature-hba=<index>

The `wddcs diag broadcom-feature-hba =<index>` command is used to change the Profile ID of Broadcom 9600-16e and 9600W-16e host bus adapters (HBAs) from PerfIT SAS Only to FeatureIT/ FeatureHBA.

Before you begin:

Note: The 9600-16e HBA must be on firmware 8.7 or later to support changing the Profile ID.

Caution: Changing the Profile ID will also return the Task Management Reset Type to `Target Reset` (the Broadcom default setting). To set the Task Management Reset Type back to `IT Nexus`, see diag broadcom-tmt-itnexus=<index> *(page 65)*.

Note: For more information about the purpose and differences between FeatureIT/FeatureHBA and PerfIT SAS Only modes, see https://support-en.westerndigital.com/app/answers/detail/a_id/52035.

Step 1: Use the `wddcs diag broadcom-list` command to display all Broadcom HBAs installed on the host:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x3 (PerfIT SAS Only)
Reset type   : Target Reset
```

Note: In this example, the only compatible HBA is the 9600-16e at index 2, and it is currently set to `PerfIT SAS Only`.

Step 2: Use the `wddcs diag broadcom-feature-hba =<index>` command to change the Profile ID of the HBA at index 2 to FeatureIT/FeatureHBA mode:

```
# wddcs diag broadcom-feature-hba=2
```

```
wddcs v4.2.2.0
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HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x3 (PerfIT SAS Only)
Reset type   : Target Reset

HBA has been set to personality profile 2
```

```
THE HBA CONTROLLER MUST BE RESET FOR THE PROFILE CHANGE TO TAKE EFFECT.
THIS PROCEDURE IS TO BE PERFORMED DURING A MAINTENANCE WINDOW TO AVOID LOSS
 OF ACCESS TO DATA.

To continue with the reset now, press 'Y' or 'y':
```

The user is notified that the HBA must be reset for this change to take effect.

Step 3: Enter `Y` or `y` to reset the HBA:

```
y
```

```
Reset in progress. Please wait...
The reset command was sent successfully
```

The user is notified that the reset command was successful.

Step 4: Repeat the `wddcs diag broadcom-list` command to verify the profile ID change:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : Target Reset
```

Result: The Profile ID of the Broadcom HBA has now been changed to FeatureIT/FeatureHBA.

3.2.22 diag broadcom-perfit-sas=<index>

The `wddcs diag broadcom-perfit-sas =<index>` command is used to change the Profile ID of Broadcom 9600-16e and 9600W-16e host bus adapters (HBAs) from FeatureIT/FeatureHBA (default) to PerfIT SAS Only.

Before you begin:

Note: The 9600-16e HBA must be on firmware 8.7 or later to support changing the Profile ID.

Caution: Changing the Profile ID will also return the Task Management Reset Type to `Target Reset` (the Broadcom default setting). To set the Task Management Reset Type back to `IT Nexus`, see diag broadcom-tmt-itnexus=<index> *(page 65)*.

Note: For more information about the purpose and differences between FeatureIT/FeatureHBA and PerfIT SAS Only modes, see https://support-en.westerndigital.com/app/answers/detail/a_id/52035.

Step 1: Use the `wddcs diag broadcom-list` command to display all Broadcom HBAs installed on the host:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : Target Reset
```

Note: In this example, the only compatible HBA is the 9600-16e at index 2, and it is currently set to `FeatureHBA`, which is the default mode.

Step 2: Use the `wddcs diag broadcom-perfit-sas =<index>` command to change the Profile ID of the HBA at index 2 to PerfIT mode:

```
# wddcs diag broadcom-perfit-sas=2
```

```
wddcs v4.2.2.0
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HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : Target Reset

HBA has been set to personality profile 3

THE HBA CONTROLLER MUST BE RESET FOR THE PROFILE CHANGE TO TAKE EFFECT.
THIS PROCEDURE IS TO BE PERFORMED DURING A MAINTENANCE WINDOW TO AVOID LOSS
 OF ACCESS TO DATA.

To continue with the reset now, press 'Y' or 'y':
```

The user is notified that the HBA must be reset for this change to take effect.

Step 3: Enter `Y` or `y` to reset the HBA:

```
y
```

```
Reset in progress. Please wait...
The reset command was sent successfully
```

The user is notified that the reset command was successful.

Step 4: Repeat the `wddcs diag broadcom-list` command to verify the profile ID change:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x3 (PerfIT SAS Only)
Reset type   : Target Reset
```

Result: The Profile ID of the Broadcom HBA has now been changed to PerfIT SAS Only.

3.2.23 diag broadcom-reset-controller=<index>

The `wddcs diag broadcom-reset-controller =<index>` command is used to reset Broadcom host bus adapters (HBAs).

Before you begin:

Caution: This command will reset the HBA firmware and is disruptive.

Note: This command is the equivalent of performing one of the following commands:

ScrutinyCLI:

```
# scrtnycli.x86_64 -i <index> reset -c
```

StorCLI2:

```
# /opt/MegaRAID/storcli2/storcli2 /cx reset
```

Step 1: Use the `wddcs diag broadcom-list` command to display all Broadcom HBAs installed on the host:

```
# wddcs diag broadcom-list
```

```
wddcs v4.2.2.0
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HBA index    : 1
Vendor id    : 0x1000
Device id    : 0xE6
Board name   : HBA 9500-16e
Serial number: SPB2807158
Profile id   : N/A
Reset type   : IT Nexus Reset

HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : IT Nexus Reset
```

Note: In this example, note the index of each HBA.

Step 2: Use the `wddcs diag broadcom-reset-controller =<index>` command along with the index number to reset the HBA in question.

```
# wddcs diag broadcom-reset-controller=2
```

```
wddcs v4.2.2.0
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HBA index    : 2
Vendor id    : 0x1000
Device id    : 0xA5
Board name   : eHBA 9600-16e Tri-Mode Storage Adapter
Serial number: SPC4504930
Profile id   : 0x2 (FeatureHBA)
Reset type   : IT Nexus Reset

THE HBA CONTROLLER WILL BE RESET.
THIS PROCEDURE IS TO BE PERFORMED DURING A MAINTENANCE WINDOW TO AVOID LOSS
 OF ACCESS TO DATA.

To continue with the setting change and HBA reset, press 'Y' or 'y':
```

The user is prompted to confirm the reset.

Step 3: Enter Y or y to reset the HBA:

```
y
```

```
Reset in progress. Please wait...
```

```
The reset command was sent successfully
```

The user is notified that the reset command was successful.

Result: The Broadcom HBA has now been reset.

3.3 fw

The `wddcs fw` command—along with its options—is used to perform firmware-related operations for WD enclosures.

Usage

The following example demonstrates the correct syntax for the `wddcs fw` command:

- `fw activate | reset | status`
- `fw download* <file> [-nostatdelay]`

Note: All of the `wddcs fw` command options require the user to specify a single target device. For example:

```
wddcs <device> fw activate
```

Important: The `wddcs fw` command options are intened to be used in different sequences or combinations depending on various factors, such as enclosure type and maintenance availability. To choose the appropriate process, see Choosing the Correct Firmware Upgrade Process *(page 230)*.

Note: For additional usage details, see help fw *(page 30)*.

Platform Support

The `wddcs fw` command and options are supported on the following platforms:

Table 7: Current Products

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`fw download`	✓	✓	✓	✓	✗	✗	✗
`fw download_activate`	✓	✓	✓	✓	✗	✗	✗
`fw download_reset`	✓	✓	✓	✓	✗	✗	✗
`fw activate`	✓	✓	✓	✓	✗	✗	✗
`fw reset`	✓	✓	✓	✓	✗	✗	✗
`fw status`	✓	✓	✓	✓	✗	✗	✗

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`-nostatdelay`	✓	✓	✓	✓	✗	✗	✗

Table 8: EOL Products

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`fw download`	✓	✓	✓	✓	✓
`fw download_activate`	✓	✓	✓	✓	✓
`fw download_reset`	✗	✗	✗	✗	✓
`fw activate`	✓	✓	✓	✓	✓
`fw reset`	✗	✗	✗	✗	✓
`fw status`	✓	✓	✓	✓	✓
`-nostatdelay`	✗	✗	✗	✗	✓

3.3.1 fw download

The `wddcs <device> fw download <file>` command is used to execute a firmware download of a SEP FW binary file—or a SEP /OOBM FW bundle—to a single device within a WD enclosure.

Before you begin:

- The `wddcs <device> fw download <file>` command requires availability of an SEP FW file—or if applicable, an SEP/OOBM FW bundle—on the host in question.
- The `wddcs <device> fw download <file>` command requires—and will only accept—a single device handle.
- If the download command fails as a result of a download failure, the `wddcs <device> fw download <file>` command should come back to the prompt immediately.

Step 1: Use the `wddcs <device> fw download <file>` command to perform a firmware download to a single device within a WD enclosure. For example:

```
wddcs <device> fw download <file>
```

Note: This only applies to Ultrastar® Data60, and Ultrastar Data102 . There is a default fifteen (15) **minute** delay before the WDDCS Tool begins checking SES page 0xe for the download completion status at fifteen (15) **second** intervals. To skip the initial fifteen (15) minute delay, use the `-nostatdelay` flag. However, be aware that skipping the default delay may result in intermittent status errors.

```
wddcs <device> fw download <file> -nostatdelay
```

The user is prompted to either issue the `fw activate` or `fw reset` command when ready. The recommended commands will vary, depending on the product type:

```
wddcs v4.2.2.0
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Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
When ready, please issue the "fw activate" or "fw reset" command for the new
 firmware to take effect
```

3.3.2 fw download_activate

The `wddcs <device> fw download_activate <file>` command is used to execute a firmware download of a SEP FW binary file—or a SEP/OOBM FW bundle—to a single device within a WD enclosure and subsequently activate the downloaded firmware.

Before you begin:

- This command requires availability of an SEP FW file—or if applicable, an SEP/OOBM FW bundle—on the host in question.
- The `wddcs <device> fw download_activate <file>` command requires—and will only accept—a single device handle.
- If the download command fails as a result of a download failure, the `wddcs <device> fw download_activate <file>` command should come back to the prompt immediately.

Step 1: Use the `wddcs <device> fw download_activate <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently activate the downloaded firmware. For example:

```
wddcs <device> fw download_activate <file>
```

```
wddcs v4.2.2.0
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Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
```

```
Firmware was downloaded successfully
Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the IOM or enclosure will go offline.

Step 2: Enter `Y` or `y` to proceed:

```
y
```

```
Firmware activation command was sent successfully
```

3.3.3 fw download_reset

The `wddcs <device> fw download_reset <file>` command is used to execute a firmware download of a SEP FW binary file—or a SEP/OOBM FW bundle—to a single device within a WD enclosure and subsequently reset the IOMs for that device.

Before you begin:

- This command requires availability of an SEP FW file—or if applicable, an SEP/OOBM FW bundle—on the host in question.
- The `wddcs <device> fw download_reset <file>` command requires—and will only accept—a single device handle.
- If the download command fails as a result of a download failure, the `wddcs <device> fw download_reset <file>` command should come back to the prompt immediately.

Step 1: Use the `wddcs <device> fw download_reset <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently reset the IOMs for that device. For example:

```
wddcs <device> fw download_reset <file>
```

```
wddcs v4.2.2.0
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Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the reset process...

Please ensure both paths to each drive are available before proceeding
```

```
with the reset of the remote IOM to ensure that at least one path to each
 drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

Note: The output for the Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series platform will **not** include the following text:

```
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.
```

The WDDCS Tool notifies the user that the remote IOM will go offline.

Step 2: Enter `Y` or `y` to proceed:

```
y
```

```
The remote IOM has been reset

Please ensure both paths to each drive are available before proceeding
with the reset of the local IOM to ensure that at least one path to each
 drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

The WDDCS Tool notifies the user that the remote IOM was reset and that the local IOM will go offline.

Step 3: Enter `Y` or `y` to proceed:

```
y
```

```
The local IOM has been reset

IOM was reset successfully
```

The WDDCS Tool notifies the user that the local IOM was reset.

3.3.4 fw activate

The `wddcs <device> fw activate` command is used to activate previously-downloaded firmware on a single device within a WD enclosure.

Before you begin:

- This task requires that an SEP FW binary file or SEP/OOBM FW bundle file has already been successfully downloaded to the IOM/Enclosure in question.
- The `wddcs <device> fw activate` command requires—and will only accept—a single device handle.
- For the 2U24 Flash Storage Platform and the 4U60 G1 Storage Enclosure:

- The `wddcs <device> fw activate` command must be run **for each IOM within a chassis**. This also assumes that the method used to download the firmware involves using mode 0xE (download microcode with offsets, save, and defer activate) instead of mode 0x7 (download microcode with offsets, save, and activate).

Step 1: Use the `wddcs <device> fw activate` command to activate previously-downloaded firmware on a single device within a WD enclosure. For example:

```
wddcs <device> fw activate
```

```
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Device: <device>
This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The user is notified that the IOM or enclosure will go offline.

Step 2: Enter `Y` or `y` to continue:

```
y
```

```
Firmware activation command was sent successfully
```

3.3.5 fw reset

The `wddcs <device> fw reset` command is used to sequentially reset each IOM on a WD enclosure after a successful firmware download.

Step 1: Use the `wddcs <device> fw reset` command to sequentially reset each IOM on a WD enclosure after a successful firmware download. For example:

```
wddcs <device> fw reset
```

```
wddcs v4.2.2.0
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Device: <device>
Please ensure both paths to each drive are available before proceeding
with the reset of the remote IOM to ensure that at least one path to each
 drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

The user is prompted to ensure that both paths to each drive are available before resetting the remote IOM.

Step 2: Enter `Y` or `y` to continue:

```
y
```

```
The remote IOM has been reset

Please ensure both paths to each drive are available before proceeding
with the reset of the local IOM to ensure that at least one path to each
 drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

The user is notified that the remote IOM was reset—thereby activating the firmware—and is then prompted to ensure that both paths to each drive are available before resetting the local IOM.

Step 3: Enter `Y` or `y` to continue:

```
y
```

```
The local IOM has been reset

IOM was reset successfully
```

The user is notified that the local IOM was reset and that the IOM reset process was successful.

3.3.6 fw status

The `wddcs <device> fw status` command is used to check the firmware download status for a SEP binary file or a SEP/OOBM bundle, either during the download process or afterward, or it will notify the user that no download is in progress.

Before you begin:

- The `wddcs <device> fw status` command must be run in a second shell, separate from the one running the `wddcs <device> fw download <file>` command.
- To format the response as JSON, use the -j option:

```
wddcs <device> fw status -j
```

Step 1: Use the `wddcs <device> fw status` command, while the firmware download is in progress, to check the status of the download.

Important: The first status command may return incorrect information. Run the command **at least twice** to get an accurate status.

```
wddcs <device> fw status
```

```
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Device: <device>
```

```
Page id           : 0Eh
Page length       : 14h
Generation code   : 0h
Download status   : 03h -Updating nonvolatile storage with deferred microcode
Additional status : 0h
Download max size : 19FFEAh (1703914)
Buffer id         : 0h
Buffer offset     : 0h
```

Step 2: Use the `wddcs <device> fw status` command, after the firmware has been downloaded, to verify the status of the download. For example:

```
wddcs <device> fw status
```

```
wddcs v4.2.2.0
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Device: <device>
Page id           : 0Eh
Page length       : 14h
Generation code   : 0h
Download status   : 11h -Download completed. Requires hard reset or power on
Additional status : 0h
Download max size : 19FFEAh (1703914)
Buffer id         : 0h
Buffer offset     : 0h
```

Step 3: Using the `wddcs <device> fw status` command, when no download is in progress, returns the following:

```
wddcs <device> fw status
```

```
wddcs v4.2.2.0
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Device: <device>
Page id           : 0Eh
Page length       : 14h
Generation code   : 0h
Download status   : 00h -No download operation is in progress
Additional status : 0h
Download max size : 19FFEAh (1703914)
Buffer id         : 0h
Buffer offset     : 0h
```

3.4 getlog

The `wddcs getlog` command—along with its options—is used to capture various types of log data for WD enclosures.

Usage

The following example demonstrates the correct syntax for the `wddcs getlog` command:

- `getlog [<identifier> [<identifier>] ...]`

Options

The procedures in this section provide instructions for each of the following `<identifier>` options:

- `common` retrieves publicly-known logs
- `vendor` retrieves vendor-specific logs
- `system-heavy` retrieves system host logs that cause heavy loads on the drives
- `system-light` retrieves system host logs that cause light loads on the drives
- `system` a combination of `system-heavy` and `system-light`
- `drives` retrieve logs from the attached physical drives (NVMe, SAS, SATA).
- `drives-noprompt` same as above but without prompting for user confirmation
- `drives-with-E6` same as above but includes the vendor E6 logs (default modes)
- `drives-with-E6-full` same as above but includes the vendor E6 logs (all modes)
- `all` includes all of the above identifiers
- `all-noprompt` same as above but without prompting for user confirmation
- `all-with-E6` same as above but includes the vendor E6 logs (default modes)
- `all-with-E6-full` same as above but includes vendor E6 logs (all modes)
- `pack=<path>` in addition to individual output files, combines all requested logs into a single, packaged file in the specified path. Intended to be used with the other options listed here.
  - If `pack=<path>` is not specified, the file will be saved to the temporary directory on the host in question: `/tmp` (for Linux) or `C:\Users\<username>\AppData\Local\Temp\` (for Windows).
  - For Windows, the `pack=<path>` option requires PowerShell 5+. For later versions, the system will print `Packing not done: requires PowerShell version 5 or above`. On Windows Server, upgrading to Windows Management Framework 5.x will provide PowerShell 5.x.
- `timeout=<sec>` specifies the maximum time, in seconds, before the WDDCS Tool moves on to the next command for retrieving data. The default is sixty (60) seconds.
- `E6-sn=<sn>` get default E6 log from the first drive matching the given serial number
- `E6-full-sn=<sn>` get E6 log (all modes) from the first drive matching the given serial number
- `E6-sn-file=<file>` get default E6 logs from drives matching the serial numbers inside the given file
- `E6-full-sn-file=<file>` get E6 logs (all modes) from drives matching the serial numbers inside the given file

Notes

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Note: The options starting with `all*` will by default move all logs into a single packaged file.

Note: Before collecting log data, installation of `sg3_utils` (version 1.42+) is **required**, and `smp_utils` (version 0.98+) is **recommended**. These utilities may be downloaded from the following locations:

- http://sg.danny.cz/sg/sg3_utils.html
- http://sg.danny.cz/sg/smp_utils.html

3.4.1 getlog common

The `wddcs getlog common` command is used to capture `sg_ses` and `sg_inq` info for each IOM within WD enclosures.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into a subdirectory named `ses`.
- The name of the output files will include the device sg handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

The `wddcs getlog common` command will capture the following information (listed by enclosure type):

Table 9: Enclosure Information Captured by the `getlog common` Command (Current Products)

	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
SES Pages							
0x0	✓	✓	✓	✓	✗	✗	✗
0x1	✓	✓	✓	✓	✗	✗	✗
0x2	✓	✓	✓	✓	✗	✗	✗
0x3	✓	✓	✓	✓	✗	✗	✗
0x5	✓	✓	✓	✓	✗	✗	✗
0x7	✓	✓	✓	✓	✗	✗	✗

	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
0xA	✓	✓	✓	✓	✗	✗	✗
Join	✓	✓	✓	✓	✗	✗	✗
SG_INQ							
SG INQ	✓	✓	✓	✓	✗	✗	✗
SG INQ Hex	✓	✓	✓	✓	✗	✗	✗
SG INQ 0x83	✓	✓	✓	✓	✗	✗	✗

Table 10: Enclosure Information Captured by the `getlog common` Command (EOL Products)

	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
SES Pages					
0x0	✓	✓	✓	✓	✓
0x1	✓	✓	✓	✓	✓
0x2	✓	✓	✓	✓	✓
0x3	✓	✓	✓	✓	✓
0x5	✓	✓	✓	✓	✓
0x7	✓	✓	✓	✓	✓
0xA	✓	✓	✓	✓	✓
Join	✓	✓	✓	✓	✓
SG_INQ					
SG INQ	✓	✓	✓	✓	✓
SG INQ Hex	✓	✓	✓	✓	✓
SG INQ 0x83	✓	✓	✓	✓	✓

Step 1: Use the `wddcs getlog common` command to retrieve the SES pages and SG_INQ info for each IOM within WD enclosures:

Example of Linux output:

```
# wddcs getlog common
```

```
wddcs v4.2.2.0
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Device: /dev/sg1
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_00h_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_01h_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_02h_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_03h_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_05h_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_07h_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_0Ah_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
ses_join_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/sg_inq_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
sg_inq_hex_sg1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
sg_inq_page_83h_sg1.txt
...
```

Example of Windows output:

```
C:\> wddcs getlog common
```

```
wddcs v4.2.2.0
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Device: SCSI4:0,35,0
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_00h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_01h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_02h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_03h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_05h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_07h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_0Ah_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\ses_join_scsi4_0-35-0.txt
```

```
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\sg_inq_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\sg_inq_hex_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses
\sg_inq_page_83h_scsi4_0-35-0.txt
...
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog common
```

b. To combine the logs into a single, packaged file, include the `pack` option and specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog common pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog common pack=<path> timeout=<sec>
```

3.4.2 getlog vendor

The `wddcs getlog vendor` command is used to capture vendor-specific log information for each IOM within specific Western Digital enclosures.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the subdirectories named `ses` and `jbodlogs`
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

The `wddcs getlog vendor` command will capture the following vendor-related information (listed by enclosure type):

Table 11: Vendor Information Captured by the `getlog vendor` Command (Current Products)

	Ultrastar® Data60	Ultrastar Data102	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
SES Pages					
0xEA	✓	✓	✗	✗	✗

	Ultrastar® Data60	Ultrastar Data102	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
0xEB	✗	✗	✗	✗	✗
0xED	✓	✓	✗	✗	✗
0x17	✓	✓	✗	✗	✗
0x85	✗	✗	✗	✗	✗
0x87	✗	✗	✗	✗	✗
0x95	✗	✗	✗	✗	✗
0x97	✗	✗	✗	✗	✗
RCLI Commands					
`debug dump`	✓	✓	✗	✗	✗
`err_cnts 0-35 read`	✗	✗	✗	✗	✗
`err_cnts 0-47 read`	✓	✓	✗	✗	✗
`err_cnts 36-67 read`	✗	✗	✗	✗	✗
`gpio`	✓	✓	✗	✗	✗
`hash_tbl_map_get`	✓	✓	✗	✗	✗
`i2c read fpga port 1`	✓	✓	✗	✗	✗
`i2c read fpga port 2`	✓	✓	✗	✗	✗
`i2c read fpga port 3`	✓	✓	✗	✗	✗
`i2c read fpga port 4`	✓	✓	✗	✗	✗
`i2c scan`	✓	✓	✗	✗	✗
`iom ...`	✗	✗	✗	✗	✗
`logrt_info_list`	✓	✓	✗	✗	✗
`logrt_into display`	✓	✓	✗	✗	✗

	Ultrastar® Data60	Ultrastar Data102	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
phyinfo	✓	✓	✗	✗	✗
phyinfo buffer	✓	✓	✗	✗	✗
qinfo	✓	✓	✗	✗	✗
rmt debug dump	✗	✗	✗	✗	✗
rmt err_cnts 0-35 read	✗	✗	✗	✗	✗
rmt err_cnts 36-67 read	✗	✗	✗	✗	✗
rmt phyinfo	✗	✗	✗	✗	✗
rmt phyinfo buffer	✗	✗	✗	✗	✗
rmt qinfo	✗	✗	✗	✗	✗
rmt show phys	✗	✗	✗	✗	✗
rmt show threads	✗	✗	✗	✗	✗
rmt status sas_phy	✗	✗	✗	✗	✗
sec1 debug dump	✓	✓	✗	✗	✗
sec1 err_cnts 0-35 read	✗	✗	✗	✗	✗
sec1 err_cnts 0-60 read	✓	✓	✗	✗	✗
sec1 err_cnts 36-67 read	✗	✗	✗	✗	✗
sec1 phyinfo	✓	✓	✗	✗	✗
sec1 phyinfo buffer	✓	✓	✗	✗	✗
sec1 qinfo	✓	✓	✗	✗	✗
sec1 show phys	✓	✓	✗	✗	✗
sec1 show threads	✓	✓	✗	✗	✗

	Ultrastar® Data60	Ultrastar Data102	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
sec1 status sas_phy	✓	✓	✗	✗	✗
sec2 debug dump	✓	✓	✗	✗	✗
sec2 err_cnts 0-35 read	✗	✗	✗	✗	✗
sec1 err_cnts 0-60 read	✓	✓	✗	✗	✗
sec2 err_cnts 36-67 read	✗	✗	✗	✗	✗
sec2 phyinfo	✓	✓	✗	✗	✗
sec2 phyinfo buffer	✓	✓	✗	✗	✗
sec2 qinfo	✓	✓	✗	✗	✗
sec2 show phys	✓	✓	✗	✗	✗
sec2 show threads	✓	✓	✗	✗	✗
sec2 status sas_phy	✓	✓	✗	✗	✗
show ac	✓	✓	✗	✗	✗
show autosync	✓	✓	✗	✗	✗
show cable	✓	✓	✗	✗	✗
show drives	✓	✓	✗	✗	✗
show drives high	✓	✓	✗	✗	✗
show drives low	✓	✓	✗	✗	✗
show dual	✓	✓	✗	✗	✗
show enc	✓	✓	✗	✗	✗
show gpio	✓	✓	✗	✗	✗
show hosts	✓	✓	✗	✗	✗

	Ultrastar® Data60	Ultrastar Data102	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
show le	✓	✓	✗	✗	✗
show monitor	✓	✓	✗	✗	✗
show phys	✓	✓	✗	✗	✗
show sensor	✓	✓	✗	✗	✗
show ses	✓	✓	✗	✗	✗
show thermon	✓	✓	✗	✗	✗
show threads	✓	✓	✗	✗	✗
show vpd	✓	✓	✗	✗	✗
status sas_phy	✓	✓	✗	✗	✗
wddcs_iom.txt	✓	✓	✗	✗	✗
wddcs_show.txt	✓	✓	✗	✗	✗
zonecfg	✓	✓	✗	✗	✗
E6 Logs					
E6 Console Log Capture	✓	✓	✗	✗	✗
E6 Crash Log Expander 1 Capture	✓	✓	✗	✗	✗
E6 Crash Log Expander 2 Capture	✓	✓	✗	✗	✗
E6 Crash Log Expander 3 Capture	✓	✓	✗	✗	✗
E6 Event Log Expander 1 Capture	✓	✓	✗	✗	✗
E6 Event Log Expander 2 Capture	✓	✓	✗	✗	✗
E6 Event Log Expander 3 Capture	✓	✓	✗	✗	✗
bundle_log.tgz	✓	✓	✗	✗	✗

Table 12: Vendor Information Captured by the `getlog vendor` Command for Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series

	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
SES Pages		
SES Page EAh	✓	✓
SES Page EDh	✓	✓
SES Page 17h	✓	✓
SES Page 12h	✓	✓
RCLI Commands		
`hem i2c scan`	✓	✓
`drv1 i2c scan`	✓	✓
`drv1 show gpio`	✓	✓
`hem show enc`	✓	✓
`drv1 show enc`	✓	✓
`drv2 show enc`	✗	✓
`hem show dual`	✓	✓
`drv1 show dual`	✓	✓
`hem show hosts`	✓	✓
`hem show host resets`	✓	✓
`hem show phys`	✓	✓
`drv1 show phys`	✓	✓
`drv2 show phys`	✗	✓
`drv1 show ac`	✓	✓
`drv1 show le`	✓	✓

	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv1 show sensor	✓	✓
drv1 show drives	✓	✓
drv1 show slots	✓	✓
drv1 show ses	✓	✓
hem phyinfo	✓	✓
hem phyinfo buffer	✓	✓
drv1 phyinfo	✓	✓
drv1 phyinfo buffer	✓	✓
drv2 phyinfo	✗	✓
drv2 phyinfo buffer	✗	✓
hem debug dump	✓	✓
drv1 debug dump	✓	✓
drv2 debug dump	✗	✓
hem err_cnts 0-55 read	✓	✓
drv1 err_cnts 0-75 read	✓	✓
drv2 err_cnts 0-75 read	✗	✓
hem show threads	✓	✓
drv1 show threads	✓	✓
drv2 show threads	✗	✓
hem qinfo	✓	✓
drv1 qinfo	✓	✓
drv2 qinfo	✗	✓

	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
xo show vpd	✓	✓
hem zonecfg	✓	✓
drv1 zonecfg	✓	✓
drv2 zonecfg	✗	✓
bundle_log.tgz	✓	✓
wddcs_iom.txt	✓	✓
wddcs_show.txt	✓	✓
drv1 show thermon	✓	✓
drv1 show monitor	✓	✓
hem logrt_info_list	✓	✓
hem logrt_info display	✓	✓
hem hash_tbl_map_get	✓	✓
E6 Console Log Capture	✓	✓
E6 Crash Log Expander 1 Capture	✓	✓
E6 Crash Log Expander 2 Capture	✓	✓
E6 Crash Log Expander 3 Capture	✓	✓
E6 Event Log Expander 1 Capture	✓	✓
E6 Event Log Expander 2 Capture	✓	✓
E6 Event Log Expander 3 Capture	✓	✓
hem status sas_phy	✓	✓
drv1 status sas_phy	✓	✓
drv2 status sas_phy	✗	✓

	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
hem status sas_link	✓	✓
drv1 status sas_link	✓	✓
drv2 status sas_link	✗	✓
hem gpio	✓	✓
drv1 gpio	✓	✓
drv2 gpio	✗	✓
progfpga show	✓	✓
hem debug last_gasp log	✓	✓
hem debug last_gasp regs	✓	✓
hem debug last_gasp stack	✓	✓
hem debug last_gasp thread	✓	✓
drv1 debug last_gasp log	✓	✓
drv1 debug last_gasp regs	✓	✓
drv1 debug last_gasp stack	✓	✓
drv1 debug last_gasp thread	✓	✓
drv2 debug last_gasp log	✓	✓
drv2 debug last_gasp regs	✓	✓
drv2 debug last_gasp stack	✓	✓
drv2 debug last_gasp thread	✗	✓
hem tx_para_get 0-55	✓	✓
drv1 tx_para_get 0-75	✓	✓
drv2 tx_para_get 0-75	✗	✓

	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
`hem show iomupdate`	✓	✓
`drv1 show iomupdate`	✓	✓
`drv2 show iomupdate`	✗	✓
`hem show fw`	✓	✓
`drv1 show fw`	✓	✓
`drv2 show fw`	✗	✓
`hem show devices`	✓	✓
`drv1 show devices`	✓	✓
`drv2 show devices`	✗	✓

Table 13: Vendor Information Captured by the `getlog vendor` Command (EOL Products)

	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
SES Pages					
0xEA	✓	✗	✗	✓	✓
0xEB	✓	✗	✗	✗	✗
0xED	✓	✗	✗	✓	✓
0x17	✓	✗	✗	✗	✓
0x85	✓	✗	✗	✗	✗
0x87	✓	✗	✗	✗	✗
0x95	✓	✗	✗	✗	✗
0x97	✓	✗	✗	✗	✗
RCLI Commands					
`bundle_log.tgz`	✗	✗	✗	✗	✓

	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
debug dump	✓	✗	✗	✓	✗
err_cnts 0-35 read	✓	✗	✗	✓	✓
err_cnts 0-47 read	✗	✗	✗	✗	✗
err_cnts 36-67 read	✓	✗	✗	✗	✓
gpio	✓	✗	✗	✓	✓
hash_tbl_map_get	✓	✗	✗	✓	✓
i2c read fpga port 1	✗	✗	✗	✗	✓
i2c read fpga port 2	✗	✗	✗	✗	✓
i2c read fpga port 3	✗	✗	✗	✗	✓
i2c read fpga port 4	✗	✗	✗	✗	✓
i2c scan	✓	✗	✗	✓	✗
iom ...	✗	✗	✗	✗	✓
logrt_info_list	✓	✗	✗	✓	✓
logrt_into display	✗	✗	✗	✓	✓
phyinfo	✓	✗	✗	✓	✓
phyinfo buffer	✓	✗	✗	✓	✓
qinfo	✓	✗	✗	✓	✗
rmt debug dump	✓	✗	✗	✗	✗
rmt err_cnts 0-35 read	✓	✗	✗	✗	✗
rmt err_cnts 36-67 read	✓	✗	✗	✗	✗
rmt phyinfo	✓	✗	✗	✗	✗

	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
rmt phyinfo buffer	✓	✗	✗	✗	✗
rmt qinfo	✓	✗	✗	✗	✗
rmt show phys	✓	✗	✗	✗	✗
rmt show threads	✓	✗	✗	✗	✗
rmt status sas_phy	✓	✗	✗	✗	✓
sec1 debug dump	✗	✗	✗	✗	✗
sec1 err_cnts 0-35 read	✗	✗	✗	✗	✓
sec1 err_cnts 0-60 read	✗	✗	✗	✗	✗
sec1 err_cnts 36-67 read	✗	✗	✗	✗	✓
sec1 phyinfo	✗	✗	✗	✗	✓
sec1 phyinfo buffer	✗	✗	✗	✗	✓
sec1 qinfo	✗	✗	✗	✗	✓
sec1 show phys	✗	✗	✗	✗	✓
sec1 show threads	✗	✗	✗	✗	✓
sec1 status sas_phy	✗	✗	✗	✗	✓
sec2 debug dump	✗	✗	✗	✗	✗
sec2 err_cnts 0-35 read	✗	✗	✗	✗	✓
sec1 err_cnts 0-60 read	✗	✗	✗	✗	✗
sec2 err_cnts 36-67 read	✗	✗	✗	✗	✓
sec2 phyinfo	✗	✗	✗	✗	✓
sec2 phyinfo buffer	✗	✗	✗	✗	✓

	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
sec2 qinfo	✗	✗	✗	✗	✓
sec2 show phys	✗	✗	✗	✗	✓
sec2 show threads	✗	✗	✗	✗	✓
sec2 status sas_phy	✗	✗	✗	✗	✓
show ac	✓	✗	✗	✓	✗
show autosync	✗	✗	✗	✗	✓
show cable	✗	✗	✗	✗	✓
show drives	✓	✗	✗	✓	✓
show drives high	✓	✗	✗	✓	✓
show drives low	✓	✗	✗	✓	✓
show dual	✗	✗	✗	✓	✓
show enc	✗	✗	✗	✓	✓
show gpio	✓	✗	✗	✓	✓
show hosts	✓	✗	✗	✓	✓
show le	✓	✗	✗	✓	✓
show monitor	✗	✗	✗	✗	✓
show phys	✓	✗	✗	✓	✓
show sensor	✓	✗	✗	✓	✓
show ses	✓	✗	✗	✓	✓
show thermon	✓	✗	✗	✓	✓
show threads	✓	✗	✗	✓	✓

	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`show vpd`	✗	✗	✗	✓	✓
`status sas_phy`	✓	✗	✗	✓	✓
`wddcs_iom.txt`	✓	✗	✗	✓	✓
`wddcs_show.txt`	✓	✗	✗	✓	✓
`zonecfg`	✗	✗	✗	✓	✓
E6 Logs					
E6 Console Log Capture	✗	✗	✗	✗	✓
E6 Crash Log Expander 1 Capture	✗	✗	✗	✗	✓
E6 Crash Log Expander 2 Capture	✗	✗	✗	✗	✓
E6 Crash Log Expander 3 Capture	✗	✗	✗	✗	✓
E6 Event Log Expander 1 Capture	✗	✗	✗	✗	✓
E6 Event Log Expander 2 Capture	✗	✗	✗	✗	✓
E6 Event Log Expander 3 Capture	✗	✗	✗	✗	✓

Step 1: Use the `wddcs getlog vendor` command to capture vendor-specific log information for each IOM within specific Western Digital enclosures. For example:

Note: Actual captured files may vary, based on the enclosures attached to the host in question.

Example of Linux output:

```
# wddcs getlog vendor
```

```
wddcs v4.2.2.0
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Device: /dev/sg3
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_EAh_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_EDh_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_17h_sg3.txt
```

```
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/jbodlogs/
i2c_scan_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/jbodlogs/
show_gpio_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/jbodlogs/
show_enc_sg3.txt
...
```

Example of Windows output:

```
C:\> wddcs getlog vendor
```

```
wddcs v4.2.2.0
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Device: SCSI4:0,35,0
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_EAh_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_EDh_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_17h_scsi4_0-35-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\jbodlogs
\consolelog_exp_0_scsi4_0-35-0.bin
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\jbodlogs
\consolelog_exp_1_scsi4_0-35-0.bin
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\jbodlogs
\consolelog_exp_2_scsi4_0-35-0.bin
...
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog vendor
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog vendor pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog vendor pack=<path> timeout=<sec>
```

3.4.3 getlog system-heavy

The `wddcs getlog system-heavy` command is used to capture a smaller subset of host data than the `wddcs getlog system` command; it includes only the operations that cause heavy system load and excludes all others.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the following subdirectories:
  - For Linux - `disks`
  - For Windows - `hostlogs`
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog system-heavy` command to capture the host data:

Example of Linux output:

```
# wddcs getlog system-heavy
```

```
wddcs v4.2.2.0
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[<datestamp> <timestamp>] Creating system-heavy files
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/disks
```

Example of Windows output:

```
C:\> wddcs getlog system-heavy
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\hostlogs
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog system-heavy
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog system-heavy pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog system-heavy pack=<path> timeout=<sec>
```

3.4.4 getlog system-light

The `wddcs getlog system-light` command is used to capture a smaller subset of host data than the `wddcs getlog system` command; it includes operations that cause a light system load and excludes all others.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the following subdirectories:
  - For Linux - `disks`, `logs`, `jbodlogs`, `proc`, `ses`, `smp`, and `system`
  - For Windows - `disks`, `hostlogs`, and `ses`
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog system-light` command to capture the host data:

Important: This function may take up a large amount of space in the temporary directory, which could affect the root file system. Please ensure the file system has enough space to support this operation. Several megabytes of data may be captured, depending on the number of drives and enclosures attached to the host in question.

Example of Linux output:

```
# wddcs getlog system-light
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/proc
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/logs
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/smp
```

Example of Windows output:

```
C:\> wddcs getlog system-light
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\disks
```

```
Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\hostlogs
Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog system-light
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog system-light pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog system-light pack=<path> timeout=<sec>
```

3.4.5 getlog system

The `wddcs getlog system` command is used to capture the host data related to disks, host message logs, and system-related information. It combines the operations of both the `wddcs getlog system-light` and `wddcs getlog system-heavy` commands.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the following subdirectories:
  - For Linux - `disks`, `logs`, `jbodlogs`, `proc`, `ses`, `smp`, and `system`
  - For Windows - `disks`, `hostlogs`, and `ses`
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog system` command to capture the host data:

Important: This function may cause a heavy load on the system. To capture a smaller subset of the host data and reduce the system load, see getlog system-light *(page 101)*.

Important: This function may take up a large amount of space in the temporary directory, which could affect the root file system. Please ensure the file system has enough space to support this operation. Several megabytes of data may be captured, depending on the number of drives and enclosures attached to the host in question.

Example of Linux output:

```
# wddcs getlog system
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/proc
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/logs
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/smp
```

Example of Windows output:

```
C:\> wddcs getlog system
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\disks
Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\hostlogs
Created files in C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog system
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog system pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog system pack=<path> timeout=<sec>
```

3.4.6 getlog drives

The `wddcs getlog drives` command is used to capture logs from the attached physical drives (NVMe, SAS, SATA). This feature is not meant to take the place of tools like HUGO to capture E6 Logs from HDDs.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into a subdirectory named `ses`.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog drives` command to retrieve the drive info:

```
wddcs getlog drives
```

```
wddcs v4.2.2.0
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The data capture on drives can be intensive when they are under a heavy I/O
 load.
Please consider capturing the drive logs while the drives are under a lighter
 I/O load.
If you want proceed with the capture of the drive logs, press 'Y' or 'y':
```

The user is notified of the potential system load resulting from capturing drive data.

Step 2: Enter `Y` or `y` to proceed:

Example of Linux output:

```
# y
```

```
Scanning for drives to collect data from. Please wait...

Creating files for individual drives...
Device: /dev/sda
*File saved: /tmp/wddcs_cos-l4-hulk_20230119_110636/disks/drive_data/
smartctl_-x_sda.txt
*File saved: /tmp/wddcs_cos-l4-hulk_20230119_110636/disks/drive_data/
sg_logs_-p0x18_sda.txt
*File saved: /tmp/wddcs_cos-l4-hulk_20230119_110636/disks/drive_data/
sg_inq_sda.txt
*File saved: /tmp/wddcs_cos-l4-hulk_20230119_110636/disks/drive_data/sg_inq_-
p0x80_sda.txt
*File saved: /tmp/wddcs_cos-l4-hulk_20230119_110636/disks/drive_data/sg_inq_-
p0x83_sda.txt
...
```

Example of Windows output:

```
C:\> y
```

```
Scanning for drives to collect data from. Please wait...

Creating files for individual drives...
```

```
device: /dev/sda
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\<hostname>_<datestamp>_<timestamp>\disks\smartctl_health_sda.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\<hostname>_<datestamp>_<timestamp>\disks\smartctl_extended_sda.txt
...
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog drives
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog drives pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog drives pack=<path> timeout=<sec>
```

d. To skip user prompts during the operation, use the `-noprompt` command. For example:

```
wddcs <device> getlog drives-noprompt
```

3.4.6.1 getlog drives-noprompt

The `wddcs getlog drives-noprompt` command is the same as the `wddcs getlog drives` command but doesn't prompt the user about the potential system load resulting from capturing drive data.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into a subdirectory named `ses`.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog drives-noprompt` command to retrieve the drive info:

```
wddcs getlog drives-noprompt
```

```
wddcs v4.2.2.0
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Device: <device>
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/smartctl_-
x_sda.txt
```

```
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_logs_-
p0x18_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sdparm_-i_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_-
p0x80_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_-
p0x83_sda.txt
Device: <device>
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/smartctl_-
x_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_logs_-
p0x18_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sdparm_-
i_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_-
p0x80_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_-
p0x83_sdaa.txt

...
```

3.4.6.2 getlog drives-with-E6

The `wddcs getlog drives-with-E6` command is the same as the `wddcs getlog drives` command but includes the large vendor E6 logs.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The output files will be placed into a subdirectory named `disks`.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog drives-with-E6` command to retrieve the drive info:

Linux Example:

```
wddcs getlog drives-with-E6
```

```
wddcs v4.2.2.0
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Scanning for drives ...

Creating files for individual drives
Device: /dev/sda
```

```
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\smartctl_-
x_sda.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_logs_-
p0x18_sda.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_sda.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x80_sda.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x83_sda.txt
Device: /dev/sdaa
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\smartctl_-
x_sdaa.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_logs_-
p0x18_sdaa.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_sdaa.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x80_sdaa.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x83_sdaa.txt
Skipping device /dev/sdab with SN=2MGLWHDB, already processed by /dev/sdaa
Device: /dev/sdac
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\smartctl_-
x_sdac.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_logs_-
p0x18_sdac.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_sdac.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x80_sdac.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x83_sdac.txt
...
Device: /dev/sdaa
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data
\2MGLWHDB_14112023_101811_E6_2.16.0.0.bin
Device: /dev/sdac
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data
\2MGD9JLB_14112023_101833_E6_2.16.0.0.bin
Device: /dev/sdad
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data
\2MGLHPVB_14112023_101854_E6_2.16.0.0.bin
```

```
Device: /dev/sdaf
```

Windows Example:

```
wddcs getlog drives-with-E6
```

```
wddcs v4.2.2.0
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Scanning for drives to collect data from. Please wait...

Preparing for E6 log collection...

[2023-11-14 10:22:21] Creating files for individual drives
Device: PD0
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_logs_-
p0x18_PD0.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_PD0.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x80_PD0.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x83_PD0.txt
Device: PD1
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_logs_-
p0x18_PD1.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_PD1.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x80_PD1.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x83_PD1.txt
Device: PD2
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_logs_-
p0x18_PD2.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_PD2.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x80_PD2.txt
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data\sg_inq_-
p0x83_PD2.txt

...

Device: disk60
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data
\3WG50JKK_14112023_102449_E6_2.16.0.0.bin
Device: disk87
```

```
*File saved: C:\Users\<user>\AppData\Local\Temp
\1\wddcs_<hostname>_<datestamp>_<timestamp>\disks\drive_data
\8DG4AR4D_14112023_102632_E6_2.16.0.0.bin
Device: disk33
```

3.4.6.3 getlog drives-with-E6-full

The `wddcs getlog drives-with-E6-full` command is the same as the `wddcs getlog drives` command but includes all modes of the vendor E6 logs.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The output files will be placed into a subdirectory named `disks`.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog drives-with-E6-full` command to retrieve the drive info:

```
wddcs getlog drives-with-E6-full
```

```
wddcs v4.2.2.0
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Scanning for drives to collect data from. Please wait...

Preparing for E6 log collection...

Creating files for individual drives
Device: /dev/sda
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
smartctl_-x_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_logs_-p0x18_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x80_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x83_sda.txt
Device: /dev/sdaa
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
smartctl_-x_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_logs_-p0x18_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_sdaa.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x80_sdaa.txt
```

```
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x83_sdaa.txt
Device: /dev/sdab
.
.
Device: /dev/bus/0 -d megaraid,0
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
smartctl_-x_megaraid,0.txt
Device: /dev/sda
*File not saved: E6 log is not supported
Device: /dev/sdaa
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5VMEZ_23012023_115634_E6_2.15.1.0.bin
Device: /dev/sdab
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5S0GZ_23012023_115659_E6_2.15.1.0.bin
Device: /dev/sdac
```

3.4.7 getlog all

The `wddcs getlog all` command is used to capture all log data for all devices within WD enclosures. It combines the `common`, `vendor`, `system`, and `drives` command options.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the subdirectories named `disks`, `jbodlogs`, `hostlogs`, and `ses`.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog all` command to retrieve the device info:

Example of Linux output:

```
# wddcs getlog all
```

```
wddcs v4.2.2.0
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Device: <device>
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_00h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_01h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_02h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_03h_sg3.txt
```

```
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_05h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_07h_sg3.txt
...
```

Example of Windows output:

```
C:\> wddcs getlog all
```

```
wddcs v4.2.2.0
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Device: SCSI4:0,32,0
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_00h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_01h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_02h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_03h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_05h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_07h_scsi4_0-32-0.txt
...
```

Note: Actual captured files may vary, based on the enclosures attached to the host in question.

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog all
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog all pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog all pack=<path> timeout=<sec>
```

d. To skip user prompts during the operation, use the `all-noprompt` command. For example:

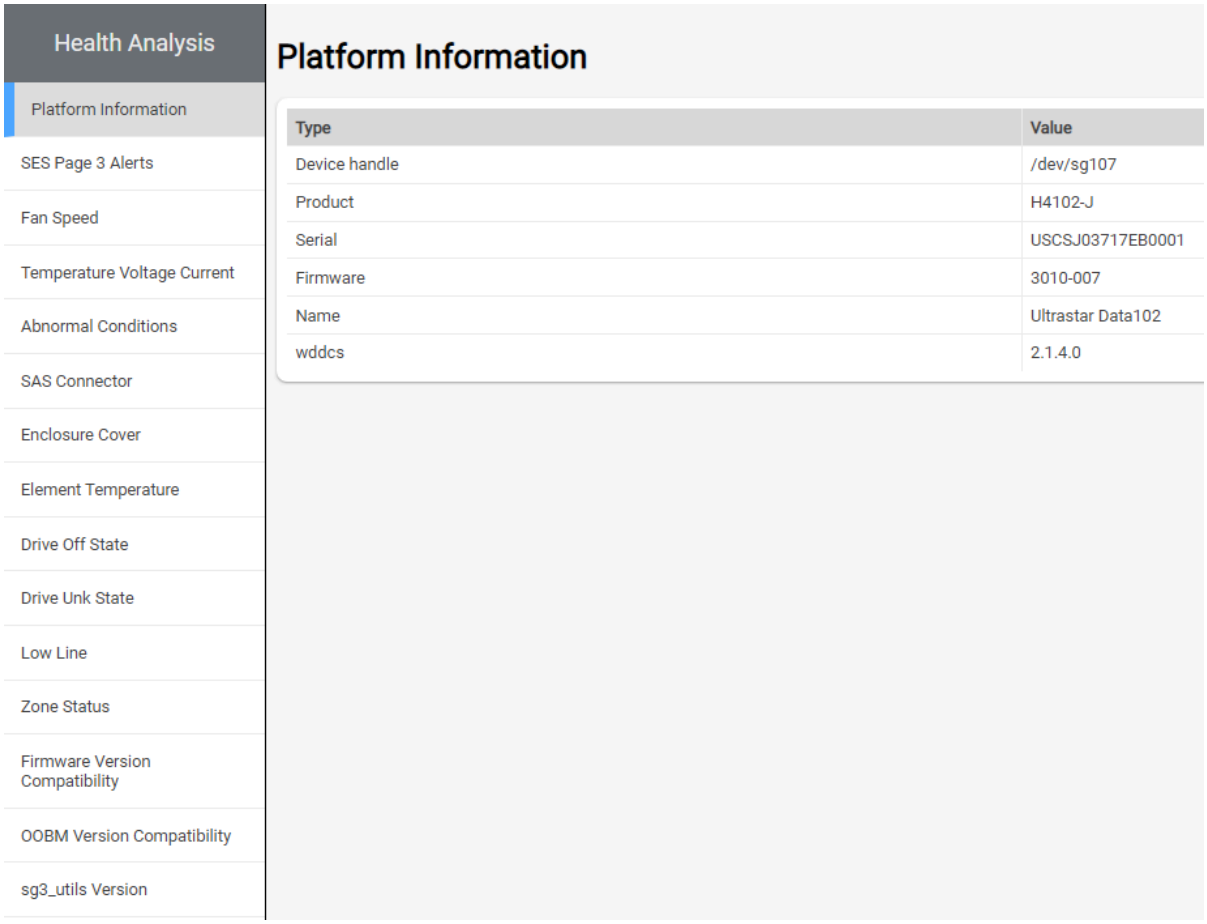
```
wddcs <device> getlog all-noprompt
```

3.4.7.1 Health Analysis

In addition to capturing log data in text files, the `wddcs getlog all` command produces an html file that can be opened in a browser. This provides a user-friendly method of reviewing log data.

Open the `health_analysis.html` file in a browser to view the log data in a GUI format. The following image shows the **Platform Information** page. Use the navigation bar on the left side to access additional pages.

Figure 22: Health Analysis - Platform Information



3.4.7.2 getlog all-noprompt

The `wddcs getlog all-noprompt` command is the same as the `wddcs getlog all` command but without prompting for user confirmation.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the subdirectories named `disks`, `jbodlogs`, `hostlogs`, and `ses`.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog all-noprompt` command to retrieve the device info:

Example of Linux output:

```
# wddcs getlog all-noprompt
```

```
wddcs v4.2.2.0
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Device: <device>
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_00h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_01h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_02h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_03h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_05h_sg3.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses/
page_07h_sg3.txt
...
```

Example of Windows output:

```
C:\> wddcs getlog all-noprompt
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: SCSI4:0,32,0
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_00h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_01h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_02h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_03h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_05h_scsi4_0-32-0.txt
*File saved: C:\Users\ADMINI~1\AppData\Local\Temp
\2\wddcs_<hostname>_<datestamp>_<timestamp>\ses\page_07h_scsi4_0-32-0.txt
...
```

Note: Actual captured files may vary, based on the enclosures attached to the host in question.

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog all
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog all pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog all pack=<path> timeout=<sec>
```

d. To skip user prompts during the operation, use the `-noprompt` command. For example:

```
wddcs <device> getlog all-noprompt
```

3.4.7.3 getlog all-with-E6

The `wddcs getlog all-with-E6` command is the same as the `wddcs getlog all` command but includes the large vendor E6 logs.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the subdirectories named `disks`, `jbodlogs`, `hostlogs`, and `ses`.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog all-with-E6` command to capture the log data:

```
# wddcs getlog all-with-E6
```

```
wddcs v4.2.2.0
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Creating system-light files
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/disks
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/ses
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/system
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/proc
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/logs
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/smp

Creating system-heavy files
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/disks
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/system
```

```
Creating enclosure files for: /dev/sg15
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_00h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_01h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_02h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_03h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_05h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_07h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_0Ah_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/ses_join_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/sg_inq_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/sg_inq_hex_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/
sg_inq_page_83h_sg15.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/
health_analysis_sg15.html

...

Creating files for individual drives...
The data capture on drives can be intensive when they are under a heavy I/O
 load.
Please consider capturing the drive logs while the drives are under a
 lighter I/O load.
If you want to proceed with the capture of the drive logs, press 'Y' or 'y':
```

Note: Actual captured files may vary, based on the enclosures attached to the host in question.

The user is notified of the potential system load resulting from capturing drive data.

Step 2 : Enter `Y` or `y` to proceed:

```
y
```

```
Device: <device>
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/smartctl_-
x_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_logs_-
p0x18_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sdparm_-i_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_-
p0x80_sda.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/sg_inq_-
p0x83_sda.txt

...
```

a. To limit the results to a single device, include that device handle. For example:

```
wddcs <device> getlog all-with-E6
```

b. To combine the logs into a single, packaged file, include the `pack` option. In addition, specify the target location for the file by including `=<path>`. For example:

```
wddcs <device> getlog all-with-E6 pack=<path>
```

c. To specify a maximum wait time for each subsequent log retreival issued by the getlog command, include the `timeout` option and specify the number of seconds to wait by including `=<sec>`. For example:

```
wddcs <device> getlog all-with-E6 pack=<path> timeout=<sec>
```

d. To skip user prompts during the operation, use the `-noprompt` command. For example:

```
wddcs <device> getlog all-with-E6 -noprompt
```

3.4.7.4 getlog all-with-E6-full

The `wddcs getlog all-with-E6-full` command is the same as the `wddcs getlog all-with-E6` command but includes all modes of the vendor E6 logs.

Before you begin:

- Unless the `pack=<path>` option is used, the output directory and files will be saved in the temporary directory on the host in question.
- The name of the output directory will include the host name and timestamp (when the command was executed), for traceability.
- The output files will be placed into the subdirectories named `disks`, `jbodlogs`, `hostlogs`, and `ses`.
- The name of the output files will include the device handle, to denote which device was queried.

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog all-with-E6-full` command to capture the log data:

```
# wddcs getlog all-with-E6-full
```

```
wddcs v4.2.2.0
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Scanning for drives to collect data from. Please wait...

Creating system-light ses files
Created files in /tmp/<hostname>_<datestamp>_<timestamp>/ses

Creating enclosure files for: /dev/sg1
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_00h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_01h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_02h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_03h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_05h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_07h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_0Ah_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/ses_join_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/sg_inq_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/sg_inq_hex_sg1.txt
```

```
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/
sg_inq_page_83h_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_EAh_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_EDh_sg1.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/page_17h_sg1.bin
.
.
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5M2BZ_19012023_163941_E6_2.15.1.0.bin
Device: /dev/sdck
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5RK7Z_19012023_164005_E6_2.15.1.0.bin
Device: /dev/sdcl
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5VGJZ_19012023_164027_E6_2.15.1.0.bin
Device: /dev/sdcm
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5RSNZ_19012023_164050_E6_2.15.1.0.bin
Device: /dev/sdcn
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5T38Z_19012023_164113_E6_2.15.1.0.bin
Device: /dev/sdco
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/
drive_data/8DG5VVDZ_19012023_164137_E6_2.15.1.0.bin
Device: megaraid:0.0.0
*File not saved: E6 log is not supported
Device: megaraid:5.0.0
*File not saved: could not retrieve the E6 log

Creating general tool data files
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/wddcs_show.txt
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/ses/wddcs_iom.txt

Created package file: /tmp/<hostname>_<datestamp>_<timestamp>.tgz
```

Note: Actual captured files may vary, based on the enclosures attached to the host in question.

3.4.8 getlog E6-sn=<sn>

The `wddcs getlog E6-sn=<sn>` command is used to get the default E6 log from the first drive matching the given serial number.

Before you begin:

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog E6-sn=<sn>` command to get the default E6 log from the first drive matching the given serial number:

Example of Linux output:

```
# wddcs getlog E6-sn=<sn>
```

```
wddcs v4.2.2.0
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Scanning for drives ...

Creating E6 file for <serialnumber>
Device: <device>
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/
<serialnumber>_<datestamp>_<timestamp>_E6_2.9.2.0.bin
```

a. To combine the logs into a single packaged file, include the `pack` option:

```
wddcs getlog E6-sn=<sn> pack
```

b. To save the packaged file to a directory other than the default log directory, add the `=<path>` option:

```
wddcs getlog E6-sn=<sn> pack=<path>
```

3.4.9 getlog E6-full-sn=<sn>

The `wddcs getlog E6-full-sn=<sn>` command is used to get all modes of the E6 log from the first drive matching the given serial number.

Before you begin:

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Use the `wddcs getlog E6-full-sn=<sn>` command to get all modes of the E6 log from the first drive matching the given serial number:

Example of Linux output:

```
# wddcs getlog E6-full-sn=<sn>
```

```
wddcs v4.2.2.0
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Preparing for E6 log collection...

Creating E6 file for <serialnumber>
Device: /dev/sdbd
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/disks/drive_data/
<serialnumber>_<datestamp>_<timestamp>/disks/drive_data/_E6_2.15.1.0.bin
```

a. To combine the logs into a single packaged file, include the `pack` option:

```
wddcs getlog E6-full-sn=<sn> pack
```

b. To save the packaged file to a directory other than the default log directory, add the `=<path>` option:

```
wddcs getlog E6-full-sn=<sn> pack=<path>
```

3.4.10 getlog E6-sn-file=<file>

The `wddcs getlog E6-sn-file=<file>` command is used to get the default E6 logs from drives matching the serial numbers inside the given file.

Before you begin:

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Save a text file (`.txt`) on the host, containing a list of drive serial numbers, with each number on a separate line.

Example text file contents:

```
8DG3VH7D
8DGN6GNH
8DGN0JSH
...
```

Step 2: Use the `wddcs getlog E6-sn-file=<file>` command to get the default E6 logs from drives matching the serial numbers inside the given file, where `<file>` is the filepath/filename of the text file.

Example of Linux output:

```
# wddcs getlog E6-sn-file=<file>
```

```
wddcs v4.2.2.0
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Scanning for drives ...

Creating E6 file for 8DG3VH7D
Device: <device>
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/
disks/8DG3VH7D_<datestamp>_<timestamp>/disks/drive_data/_E6_2.9.2.0.bin

Creating E6 file for 8DGN6GNH
Device: <device>
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/
disks/8DGN6GNH_<datestamp>_<timestamp>/disks/drive_data/_E6_2.9.2.0.bin

Creating E6 file for 8DGN0JSH
Device: <device>
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/
disks/8DGN0JSH_<datestamp>_<timestamp>/disks/drive_data/_E6_2.9.2.0.bin
```

```
...
```

3.4.11 getlog E6-full-sn-file=<file>

The `wddcs getlog E6-full-sn-file=<file>` command is used to get all modes of E6 logs from drives matching the serial numbers inside the given file.

Before you begin:

Note: Each time the `wddcs getlog` command—with any option—is used, a text file named `wddcs_trace.txt` will capture the output of that command. The text file will be stored in the same timestamped directory as the log files.

Step 1: Save a text file (`.txt`) on the host, containing a list of drive serial numbers, with each number on a separate line.

Example text file contents:

```
2MGLHMZB
2MGJ47NB
3JH6KHVG
...
```

Step 2: Use the `wddcs getlog E6-full-sn-file=<file>` command to get all modes of E6 logs from drives matching the serial numbers inside the given file, where `<file>` is the filepath/filename of the text file.

Example of Linux output:

```
# wddcs getlog E6-full-sn-file=<file>
```

```
wddcs v4.2.2.0
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Scanning for drives ...

Creating E6 file for 2MGLHMZB
Device: /dev/sdca
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/
disks/2MGLHMZB_<datestamp>_<timestamp>/disks/drive_data/_E6_2.13.0.0.bin

Creating E6 file for 2MGJ47NB
Device: /dev/sdce
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/
disks/2MGJ47NB_<datestamp>_<timestamp>/disks/drive_data/_E6_2.13.0.0.bin

Creating E6 file for 3JH6KHVG
Device: /dev/sdcg
*File saved: /tmp/<hostname>_<datestamp>_<timestamp>/
disks/3JH6KHVG_<datestamp>_<timestamp>/disks/drive_data/_E6_2.13.0.0.bin

...
```

3.5 http

The `wddcs http` command is used to perform general management operations for JBOF platforms at the specified IP address. HTTP and HTTPS protocols are supported starting with version 3.2.8.0.

In-Band Requirements and Limitations

- Only one OpenFlex API client should be active at a time. When the WDDCS Tool is making calls to the OpenFlex API running on the proxy server, there should not be any GUIs active on the same enclosure. Having more than one active session at a time may cause commands to fail or timeout due to resource limitations.

Usage

The following example demonstrates the correct syntax for the `wddcs http` command:

- http=<ipv4> [[user=<id> pass=<password> slot=<#> time=<#> ssl] <identifier>]

Note: The `<ipv4>` part of this command can be either the out-of-band (OOB) IP address for one of the enclosure's IOMs or the in-band IP address of the OpenFlex API running on the Proxy Host.

Note: When `user` or `pass` is not specified, each will default to `admin`.

Note: For more information related to the usage, see help http *(page 32)* and the following table of command options.

Examples

```
http=10.11.12.13 show
http=10.11.12.13:80 user=admin pass=admin getlog
http=10.11.12.13 user=admin pass=admin slot=1 ssl fw status
```

Platform Support

Note: The `wddcs http` command and options are supported only on the OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 platforms.

Table 14: Current Products

Command	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`http fw status`	✓	✓	✓
`http fw download=<file>`	✓	✓	✓
`http fw activate`	✓	✓	✓

Command	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`http fw download_activate=<file>`	✓	✓	✓
`http getlog`	✓	✓	✓
`http getlog dir=<path>`	✓	✓	✓
`http getdevicelogs`	✓	✓	✓
`http getdevicelogs dir=<path>`	✓	✓	✓
`http health`	✓	✓	✓
`http health=bad`	✓	✓	✓
`http iom`	✓	✓	✓
`http iom reboot`	✓	✓	✓
`http show`	✓	✓	✓
`http show=<resource>`	✓	✓	✓
`http getall`	✓	✓	✓
`getall dir=<path>`	✓	✓	✓
`getall-noprompt`	✓	✓	✓
`getall-noprompt dir=<path>`	✓	✓	✓

3.5.1 http=<ipv4> fw status

The `wddcs http=<ipv4> fw status` command is used to display the status of a firmware update.

Step 1: Use the `wddcs http=<ipv4> fw status` command to display the status of a firmware update.

```
wddcs http=<ipv4> fw status
```

```
wddcs v4.2.2.0
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Device  : <device>
Slot #  : <slot_number>
Version : <fw_version>
```

```
Last activation (current or previous)
  Completion  : <percent>
  State       : <status>

Last download (current or previous)
  Completion  : <percent>
  State       : <status>
```

3.5.2 http=<ipv4> fw download=<file>

The `wddcs http=<ipv4> fw download=<file>` command is used to download the specified firmware file to the enclosure.

Attention: This procedure must be completed on each IOM for the OpenFlex™ Data24 and OpenFlex Data24 3200.

Step 1: Use the `wddcs http=<ipv4> fw download=<file>` command to download the specified firmware file to the enclosure.

```
wddcs http=<ipv4> fw download=<file>
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

File upload started
|-- Upload completed: 77140 KB
Firmware update started
|-- Operation completed in 145 seconds

When ready, please issue the "fw activate" command for the new firmware to
 take effect
```

3.5.3 http=<ipv4> fw activate

The `wddcs http=<ipv4> fw activate` command is used to activate/reset to complete the firmware update.

Attention: This procedure must be completed on each IOM for the OpenFlex™ Data24 and OpenFlex Data24 3200.

Step 1: Use the `wddcs http=<ipv4> fw activate` command to activate/reset to complete the firmware update.

```
wddcs http=<ipv4> fw activate
```

```
wddcs v4.2.2.0
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```

```
Device: <device>
Slot #: <slot>

Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.
The enclosure will go offline for a period of time while the update is
 finalized.

To continue with the activation now, press 'Y' or 'y':
```

The user is prompted to indicate whether or not to continue with the activation.

Step 2: Enter `Y` or `y`.

```
y
```

```
Firmware activation started
|-- Operation completed in 15 seconds

Firmware activation command was sent successfully.
```

3.5.4 http=<ipv4> fw download_activate=<file>

The `wddcs http=<ipv4> fw download_activate=<file>` command is used to send the firmware file and complete the update.

Attention: This procedure must be completed on each IOM for the OpenFlex™ Data24 and OpenFlex Data24 3200.

Step 1: Use the `wddcs http=<ipv4> fw download_activate=<file>` command to send the firmware file and complete the update.

```
wddcs http=<ipv4> fw
            download_activate=<file>
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

File upload started
|-- Upload completed: 77140 KB
Firmware update started
|-- Operation completed in 146 seconds

Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.
The enclosure will go offline for a period of time while the update is
 finalized.
```

```
To continue with the activation now, press 'Y' or 'y':
```

The user is prompted to indicate whether or not to continue with the activation.

Step 2: Enter `Y` or `y`.

```
y
```

```
Firmware activation started
|-- Operation completed in 15 seconds
Firmware was uploaded and activation command was sent successfully.
```

3.5.5 http=<ipv4> getlog

The `wddcs http=<ipv4> getlog` command is used to retrieve vendor logs from the enclosure at the specified IP address.

Step 1: Use the `wddcs http=<ipv4> getlog` command to retrieve vendor logs from the enclosure.

```
wddcs http=<ipv4> getlog
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

Logging process started
|-- Log collection completed in 85 seconds.
Log download started
|-- Download completed: 204546 KB
File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/<platform>-
<device>_<slot>_log.bundle
```

3.5.5.1 http=<ip> getlog dir=<path>

The `wddcs http=<ip> getlog dir=<path>` command is used to retrieve vendor logs from the enclosure and save them to the specified path.

Step 1: Use the `wddcs http=<ip> getlog dir=<path>` command to retrieve vendor logs from the enclosure and save them to the specified path.

```
wddcs http=<ip> getlog dir=<path>
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

Logging process started
|-- Log collection completed in 85 seconds.
Log download started
|-- Download completed: 204546 KB
```

```
File saved: <path>/<platform>-<device>_<slot>_log.bundle
```

3.5.6 http=<ipv4> getdevicelogs

The `wddcs http=<ipv4> getdevicelogs` command is used to retrieve a series of log files of vendor-specific data from IOMA or IOMB at the specified IP address.

The following log files are retreived with this command:

- Audit Log
- Customer Log
- Build Info
- Telemetry

Step 1: Use the `wddcs http=<ipv4> getdevicelogs` command to retrieve a series of log files of vendor-specific data from IOMA or IOMB.

```
wddcs http=<ipv4> getdevicelogs
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1

File saved: /tmp/<hostname>_<datestamp>_<timestamp>/openflex-data24-
usalp02921qa20de_slot1_auditlog.txt
File saved: /tmp/<hostname>_<datestamp>_<timestamp>/openflex-data24-
usalp02921qa20de_slot1_customerlog.txt
File saved: /tmp/<hostname>_<datestamp>_<timestamp>/openflex-data24-
usalp02921qa20de_slot1_buildinfo.txt
File saved: /tmp/<hostname>_<datestamp>_<timestamp>/openflex-data24-
usalp02921qa20de_slot1_telemetry.tgz
```

3.5.6.1 http=<ip> getdevicelogs dir=<path>

The `wddcs http=<ip> getdevicelogs dir=<path>` command is used to retrieve a series of log files of vendor-specific data from IOMA or IOMB at the specified IP address and save them to a specific location.

The following log files are retreived with this command:

- Audit Log
- Customer Log
- Build Info
- Telemetry

Step 1: Use the `wddcs http=<ip> getdevicelogs` command to retrieve a series of log files of vendor-specific data from IOMA or IOMB.

```
wddcs http=<ip> getdevicelogs dir=/data/home/wddcs_test_log_data/<version>/
Data24/
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
```

```
Device: openflex-data24-usalp02921qa20de
Slot #: 1

File saved: /data/home/wddcs_test_log_data/<version>/Data24/openflex-data24-
usalp02921qa20de_slot1_<datestamp>_<timestamp>_auditlog.txt
File saved: /data/home/wddcs_test_log_data/<version>/Data24/openflex-data24-
usalp02921qa20de_slot1_<datestamp>_<timestamp>_customerlog.txt
File saved: /data/home/wddcs_test_log_data/<version>/Data24/openflex-data24-
usalp02921qa20de_slot1_<datestamp>_<timestamp>_buildinfo.txt
File saved: /data/home/wddcs_test_log_data/<version>/Data24/openflex-data24-
usalp02921qa20de_slot1_<datestamp>_<timestamp>_telemetry.tgz
```

3.5.7 http=<ipv4> health

The `wddcs http=<ipv4> health` command is used to display the health status of all enclosure components.

Step 1: Use the `wddcs http=<ipv4> health` command to display the health status of all enclosure components.

```
wddcs http=<ipv4> health
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

State      : In service
Health     : OK
Details    : None

Adapters:

  ID         : 1
  Name       : IOM-A-AIC-A
  State      : In service
  Health     : OK
  Details    : None

  ...

Controllers:

  ID         : 1
  Name       : IO MODULE A
  State      : In service
  Health     : OK
  Details    : None

  ...

CoolingDevices:

  ID         : 1
```

```
  Name        : COOLING FRU A
  State       : In service
  Health      : OK
  Details     : None

  ...

Media:

  ID          : 1
  Name        : DEVICE 1
  State       : In service
  Health      : OK
  Details     : None

  ...

  ID          : 24
  Name        : BLANK 24
  State       : In service
  Health      : Unknown
  Details     : None

Ports:

  ID          : 70_b3_d5_76_87_93_192_168_1_51_24
  State       : In service
  Health      : OK
  Details     : None

  ...

PowerSupplies:

  ID          : 1
  Name        : POWER SUPPLY A
  State       : In service
  Health      : OK
  Details     : None

  ...

Sensors:

  ID          : TEMP_DRIVE_01_2_1
  Name        : TEMP DRIVE 01
  State       : In service
  Health      : OK
  Details     : None

  ...
```

3.5.7.1 http=<ip> health=bad

The `wddcs http=<ip> health=bad` command is used to display the health status of all enclosure components whose status is not `OK` .

Step 1: Use the `wddcs http=<ip> health=bad` command to display the health status of all enclosure components whose status is not `OK` .

```
wddcs http=<ip> health=bad
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

Media:
  ID        : 24
  Name      : BLANK 24
  State     : In service
  Health    : Unknown
  Details   : None

Sensors:
  ID        : TEMP_DRIVE_24_2_24
  Name      : TEMP DRIVE 24
  State     : In service
  Health    : Unknown
  Details   : None
```

3.5.8 http=<ipv4> iom

The `wddcs http=<ipv4> iom` command is used to display the current IO module settings.

Step 1: Use the `wddcs http=<ipv4> iom` command to display the current IO module settings.

```
wddcs http=<ipv4> iom
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

ID          : <id>
State       : In service
IPv4Address : <address>
IPv4Gateway : <gateway>
MACAddress  : <mac_address>
Type        : DHCPv4
```

3.5.8.1 http=<ipv4> iom reboot

The `wddcs http=<In-Band IP> iom reboot slot=<n>` command is used to reboot an IOM with the WD OpenFlex Data24.

Caution: Please use the http iom reboot command with caution. Rebooting an IOM or IOMs will cause a temporary loss of access to the drives while the IOM(s) are rebooting.

Step 1: Use the `iom reboot` command to reboot the IOMs.

- The command reboots the OpenFlex Data24 IOM specified. If the OOB IP is for IOM A, reboot IOM A. If the OOB IP is for IOM B, reboot IOM B.
- Run the 'wddcs http=<OOB IP> iom reboot' command where IP is either the OOB management IP address of IOM A (Slot 1) or IOM B (Slot 2).

```
wddcs http=<In-Band IP> iom reboot slot=<n>
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1

IOM A on slot 1 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

a. Use the `iom reboot` command to reboot IOM A.

```
wddcs http=<In-Band IP> iom reboot slot=1
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1

IOM A on slot 1 will be rebooted.
If you want to proceed, press 'Y' or 'y': y
```

b. To proceed with the reboot process on IOM A, type `y`:

```
IOM reboot started
```

c. Use the `iom reboot` command to reboot IOM B.

```
wddcs http=<In-Band IP> iom reboot slot=2
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 2

IOM B on slot 2 will be rebooted.
```

```
If you want to proceed, press 'Y' or 'y': y
```

d. To proceed with the reboot process on IOM B, type **y**:

```
IOM reboot started
```

3.5.8.1.1 http=<OOB IP> iom reboot

The `wddcs http=<OOB IP IOM> iom reboot` command will reboot the enclosure IOM.

Caution: Please use the http iom reboot command with caution. Rebooting an IOM or IOMs will cause a temporary loss of access to the drives while the IOM(s) are rebooting.

Note: If the OOB IP is for IOM A, reboot IOM A. If the OOB IP is for IOM B, reboot IOM B.

Step 1: Use the `wddcs http=<OOB IP IOMA> iom reboot` command to reboot IOM A.

```
wddcs http=<OOB IP IOMA> user=admin pass=<pass> iom reboot
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1

IOM A on slot 1 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

a. To continue the reboot process on IOM A, type **y**:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

Step 2: Use the `wddcs http=<OOB IP IOMB> iom reboot` command to reboot IOM B.

```
wddcs http=<OOB IP IOMB> user=admin pass=<pass> iom reboot
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 2

IOM B on slot 2 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

a. To continue the reboot process on IOM B, type **y**:

```
If you want to proceed, press 'Y' or 'y': y
```

```
IOM reboot started
```

3.5.8.1.2 http=<In-Band IP> iom reboot

The `wddcs http=<In-Band IP> iom reboot` command will reboot the enclosure IOMs.

Caution: Please use the http iom reboot command with caution. Rebooting an IOM or IOMs will cause a temporary loss of access to the drives while the IOM(s) are rebooting.

Step 1: Use the `wddcs http=<In-Band IP> iom reboot` command to reboot both enclosure IOMs.

```
wddcs http=<In-Band IP> iom reboot
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1
If you want to proceed, press 'Y' or 'y':
```

a. To continue the reboot process on IOM A, type `y`:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

```
Device: openflex-data24-usalp02921qa20de
Slot #: 2

IOM B on slot 2 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

b. To continue the reboot process on IOM B, type `y`:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

3.5.8.1.3 http=<In-Band IP> iom reboot (One IOM at a time)

The `wddcs http=<In-Band IP> iom reboot slot=<n>` command will reboot the enclosure IOMs one at a time.

Caution: Please use the http iom reboot command with caution. Rebooting an IOM or IOMs will cause a temporary loss of access to the drives while the IOM(s) are rebooting.

Step 1: Use the `wddcs http=<In-Band IP> iom reboot slot=<n>` command to reboot IOM A.

```
wddcs http=<In-Band IP> iom reboot slot=1
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1

IOM A on slot 1 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

a. To continue the reboot process on IOM A, type `y`:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

Step 2: Use the `wddcs http=<In-Band IP> iom reboot slot=<n>` command to reboot IOM B.

```
wddcs http=<In-Band IP> iom reboot slot=2
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 2

IOM B on slot 2 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

a. To continue the reboot process on IOM B, type `y`:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

3.5.8.1.4 http=<In-Band IP> ssl iom reboot

The `wddcs http=<In-Band IP> ssl iom reboot` command will reboot the enclosure IOMs.

Caution: Please use the http iom reboot command with caution. Rebooting an IOM or IOMs will cause a temporary loss of access to the drives while the IOM(s) are rebooting.

Step 1: Use the `wddcs http=<In-Band IP> ssl iom reboot` command to reboot both enclosure IOMs.

```
wddcs http=<In-Band IP> ssl iom reboot
```

```
wddcs v4.2.2.0
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Device: openflex-data24-usalp02921qa20de
Slot #: 1
If you want to proceed, press 'Y' or 'y':
```

a. To continue the reboot process on IOM A, type `y`:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

```
Device: openflex-data24-usalp02921qa20de
Slot #: 2

IOM B on slot 2 will be rebooted.
If you want to proceed, press 'Y' or 'y':
```

b. To continue the reboot process on IOM B, type `y`:

```
If you want to proceed, press 'Y' or 'y': y

IOM reboot started
```

3.5.9 http=<ipv4> show

The `wddcs http=<ipv4> show` command is used to list the available device/resource names for the `show=<resource>` command.

Step 1: Use the `wddcs http=<ipv4> show` command to list the available device/resource names for the `show=<resource>` command.

```
wddcs http=<ipv4> show
```

```
wddcs v4.2.2.0
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Model       : OpenFlex Data24
Serial      : <serial_number>
Name        : <device>
Firmware    : <fw_version>
Slot        : <slot>
State       : In service
Health      : OK
Details     : None
Capacity    : 88.33 TB

More data is available for the following resource types:
  adapter
  controller
  cooling
  media
  port
  power
  sensor
  clock

Enter "show=<resource>" to get more data
Example: wddcs http=1.2.3.4 show=media
```

3.5.9.1 http=<ip> show=<resource>

The `wddcs http=<ip> show=<resource>` command is used to display data for the given device resource.

Step 1: Use the `wddcs http=<ip> show=<resource>` command to display data for the given device resource. The following output is an example of using the command to show adapter resources.

```
http=<ip> show=adapter
```

```
wddcs v4.2.2.0
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Device: <device>
Slot #: <slot>

Data for Adapters

ID           : 1
Name         : IOM-A-AIC-A
Hostname     : <device>-iom-a-aic-a
State        : In service
Health       : OK
Details      : None
Controller ID: 1
Port ID      : 70_b3_d5_76_87_93_192_168_1_51_24
Sensors      : TEMP_AIC-A-A_6_1

ID           : 2
Name         : IOM-A-AIC-B
Hostname     : <device>-iom-a-aic-b
State        : In service
Health       : OK
Details      : None
Controller ID: 1
Port ID      : 70_b3_d5_76_87_84_192_168_1_52_24
Sensors      : TEMP_AIC-A-B_6_2

...
```

3.5.10 http=<ipv4> getall

The `wddcs http=<ipv4> getall` command will create a log bundle file that can be used for analysis.

Note: The `<ipv4>` part of this command can be either the out-of-band (OOB) IP address for one of the enclosure's IOMs or the in-band IP address of the OpenFlex API running on the Proxy Host.

Caution: When using this command for in-band management, only one OpenFlex API client should be active at a time. When the WDDCS Tool is making calls to the OpenFlex API running on the proxy server, there should not be any GUIs active on the same enclosure. Having more than one active session at a time may cause commands to fail or timeout due to resource limitations.

Step 1: Use the `wddcs http=<ipv4> getall` command to create a log bundle file that can be used for analysis. To specify a directory location for the log bundle file, use the `dir=<path>` option.

Without Path Option:

```
wddcs http=<ipv4> getall
```

With Path Option:

```
wddcs http=<ipv4> getall dir=<path>
```

The user will be prompted to confirm the request:

```
wddcs v4.2.2.0
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The data capture on drives can be intensive when they are under a heavy I/O
 load.
Please consider capturing the drive logs while the drives are under a lighter
 I/O load.
If you want to proceed with the capture of the drive logs, press 'Y' or 'y':
```

Step 2: To proceed with capturing the logs, enter `Y` or `y`:

```
y
```

```
Scanning for drives to collect data from. Please wait...

Creating http in-band files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/http

Creating system-light ses files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses

Creating system-light files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/proc
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/logs
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data/rdma_commands
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
ethernet
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data/Broadcom
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data/Mellanox
```

```
Creating system-heavy files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks

Creating files for individual drives
Device: /dev/sda
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
smartctl_-x_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_logs_-p0x18_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x80_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x83_sda.txt
Device: /dev/nvme10
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_-H_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_-H_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_-H_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_error-log_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-drive-log_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-get-crash-dump_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme10n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme10n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme10nffffffff.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme10nffffffff.txt
.
.
Device: /dev/nvme9
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_-H_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_-H_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_-H_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_error-log_nvme9.txt
```

```
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-drive-log_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-get-crash-dump_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme9n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme9n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme9nffffffff.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme9nffffffff.txt
```

Result: The log bundle file has now been captured.

3.5.11 http=<ipv4> getall-noprompt

The `wddcs http=<ipv4> getall-nonprompt` command is the same as the `wddcs http=<ipv4> getall` command but won't prompt the user about the potential system load resulting from capturing drive data. This command will create a log bundle file that can be used for analysis.

Note: The `<ipv4>` part of this command can be either the out-of-band (OOB) IP address for one of the enclosure's IOMs or the in-band IP address of the OpenFlex API running on the Proxy Host.

Caution: When using this command for in-band management, only one OpenFlex API client should be active at a time. When the WDDCS Tool is making calls to the OpenFlex API running on the proxy server, there should not be any GUIs active on the same enclosure. Having more than one active session at a time may cause commands to fail or timeout due to resource limitations.

Step 1: Use the `wddcs http=<ipv4> getall-nonprompt` command to create a log bundle file that can be used for analysis. To specify a directory location for the log bundle file, use the `dir=<path>` option.

Without Path Option:

```
wddcs http=<ipv4> getall-nonprompt
```

With Path Option:

```
wddcs http=<ipv4> getall-nonprompt dir=<path>
```

The tool will begin collecting log files without prompting the user:

```
wddcs v4.2.2.0
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Scanning for drives to collect data from. Please wait...

Creating http out-of-band files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/http

Creating system-light ses files
```

```
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/ses

Creating system-light files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/proc
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/logs
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data/rdma_commands
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
ethernet
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data/Broadcom
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/system/
RNIC_Data/Mellanox

Creating system-heavy files
Created files in /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks

Creating files for individual drives
Device: /dev/sda
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
smartctl_-x_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_logs_-p0x18_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x80_sda.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
sg_inq_-p0x83_sda.txt
Device: /dev/nvme10
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_-H_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_-H_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_-H_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_error-log_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-drive-log_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-get-crash-dump_nvme10.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme10n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme10n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme10nffffffff.txt
```

```
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme10nffffffff.txt
.
.
Device: /dev/nvme9
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_smart-log_-H_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ctrl_-H_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_show-regs_-H_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_error-log_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-drive-log_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_wdc-get-crash-dump_nvme9.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme9n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme9n1.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_nvme9nffffffff.txt
*File saved: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>/disks/drive_data/
nvme_id-ns_-H_nvme9nffffffff.txt

Created package file: /tmp/wddcs_<hostname>_<datestamp>_<timestamp>.tgz
```

Result: he log bundle file has now been captured.

3.6 iom

The `wddcs iom` command—without arguments—is used to determine the IOM configuration for devices within WD enclosures. With arguments, the `wddcs iom <args>` command is used to either determine current OOBM values or set new OOBM values.

Usage

The following example demonstrates the correct syntax for the `wddcs iom` command:

- `iom [oobm|oobm=<iom>,<ip>,<netmask>,<gateway>]`

Options

The procedure in this section provides instructions for using these command options:

- `oobm` displays the current OOBM value
- `oobm -j` displays the above data in JSON format
- `oobm=<args>` sets new OOBM values:
  - `<iom>` = [A|B]
  - `<ip>` = [x.x.x.x]
  - `<netmask>` = [x.x.x.x]
  - `<gateway>` = [x.x.x.x], where x is 0-255

Note: The default output is to display the current IOM single or dual setting.

Examples

- Change IOM A to static addresses: `iom oobm=A,192.168.0.10,255.255.255.0,192.168.0.1`
- Change IOM B to DHCP: `iom oobm=B,0.0.0.0,0.0.0.0,0.0.0.0`
- Display current OOBM: `iom oobm`
- Display if enclosure is set to single or dual IOM: `iom`

Platform Support

The `wddcs iom` command and options are supported on the following platforms:

Table 15: Current Products

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`iom`	✓	✓	✓	✓	✗	✗	✗
`iom oobm`	✓	✓	✓	✓	✗	✗	✗
`iom oobm -j`	✓	✓	✓	✓	✗	✗	✗

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`iom oobm` (set static)	✓	✓	✓	✓	✗	✗	✗
`iom oobm` (set DHCP)	✓	✓	✓	✓	✗	✗	✗

Table 16: EOL Products

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`iom`	✓	✗	✗	✓	✓
`iom oobm`	✗	✗	✗	✗	✓
`iom oobm -j`	✗	✗	✗	✗	✓
`iom oobm` (set static)	✗	✗	✗	✗	✓
`iom oobm` (set DHCP)	✗	✗	✗	✗	✓

3.6.1 iom

The `wddcs <device> iom` command is used to determine the IOM configuration for devices within WD enclosures, to determine current OOBM values, or to set new OOBM values.

Before you begin:

Possible IOM configurations by enclosure:

- Ultrastar Data102 – dual or single, depending on configuration
- Ultrastar® Data60 – dual or single, depending on configuration
- Ultrastar Serv60+8 – single only
- 4U60 G2 Storage Enclosure – dual or single, depending on configuration
- Storage Enclosure Basic – single only

Step 1: Use the `wddcs <device> iom` command to print the IOM configuration.

- The output will print `Dual IOM operation` for devices with a dual IOM configuration.
- The output will print `Single IOM operation` for devices with a single IOM configuration.

```
wddcs <device> iom
```

```
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Device: <device>
Dual IOM operation
```

```
IOM B

Device: <device>
Dual IOM operation
IOM A
```

a. To limit the results to a single device, add the device handle:

```
wddcs <device> iom
```

```
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Device: <device>
Dual IOM operation
```

b. To determine the current OOBM values, include the `oobm` argument:

```
wddcs <device> iom oobm
```

```
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Device: <device>
    IOM B   : DHCP (1)
    IP      : <ip_address>
    Netmask : <netmask>
    Gateway : <gateway>
    OOBM FW : <version>
    MAC     : <mac_address>
```

c. To set the OOBM values, include the `oobm=<iom>,<ip>,<netmask>,<gateway>` option, where:

- `<iom>` = `A` or `B`
- `<ip>` = #.#.#.# (the IP address as four, decimal-separated, numerical values from 0-255)
- `<netmask>` = #.#.#.# (the netmask as four, decimal-separated, numerical values from 0-255)
- `<gateway>` = #.#.#.# (the gateway as four, decimal-separated, numerical values from 0-255)

For example, to set IOM A to `static`:

```
wddcs <device> iom oobm=A,192.168.0.10,255.255.255.0,192.168.0.1
```

To change IOM B to `DHCP`:

```
wddcs <device> iom oobm=B,0.0.0.0,0.0.0.0,0.0.0.0
```

d. To view the OOBM values in JSON format, use the `-j` option:

```
wddcs <device> iom oobm -j
```

```
wddcs v4.2.2.0
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```

```
{
    "wddcs":    {
        "application":    {
            "name":       "wddcs",
            "version":    "4.2.2.0"
        },
        "results":    [{
                "device":     "<device>",
                "iomA":       "DHCP (1)",
                "ip":         "<ip_address>",
                "netmask":    "<netmask>",
                "gateway":    "<gateway>",
                "oobmFw":     "<version>",
                "mac":        "<mac_address>"
            }, {
                "device":     "<device>",
                "iomB":       "DHCP (1)",
                "ip":         "<ip_address>",
                "netmask":    "<netmask>",
                "gateway":    "<gateway>",
                "oobmFw":     "<version>",
                "mac":        "<mac_address>"
            }]
    }
}
```

3.7 rcli (Legacy)

The `wddcs <device> rcli <command string>` command is used to capture detailed data about WD enclosures and their components. The commands in this section are intended for management of legacy JBOD platforms.

Note: The following section **does not** contain all of the available RCLI commands. Please see `help rcli` for a given JBOD platform for all supported commands.

Usage

The following example demonstrates the correct syntax for the `wddcs <device> rcli <command string>` command:

- `rcli <command string>`

Options

The procedures in this section provide examples of using various command strings:

- `<command string>` can be any of the commands allowed by the enclosure firmware.

Note: If the command contains spaces, enclose it in quotes. The maximum command length is 256 characters.

Note: Commands that are not supported on a certain enclosures will report as `not supported`. For example:

```
wddcs <device> rcli <command string>
```

```
wddcs v4.2.2.0
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Device: <device>
rcli cmd: <command string>
This command is not supported on this platform
```

Examples

- Using the `show drives` command: `rcli "show drives"`

Platform Support

Platform support for the `wddcs <device> rcli <command string>` command and options are listed in the following table. Click the linked command strings—where applicable—to view an example of that string used in conjunction with the `wddcs rcli` command.

Note: Numbers in the table cells indicate supported ranges.

Note: The commands in this section are intended for management of legacy JBOD platforms and do not apply to the Ultrastar Data60 3000 and Ultrastar Data102 3000 Series platforms or JBOF platforms.

Table 17: Current Products

RCLI Command String	Ultrastar® Data60	Ultrastar Data102
`clear err_cnts`	✓	✓
`debug dump`	✓	✓
`err_cnts 0-35 clear`	✓	✓
`err_cnts 0-47 clear`	✓	✓
`err_cnts 0-60 clear`	✗	✗
`err_cnts 36-67 clear`	✗	✗
`err_cnts <PHY_ID> clear`	0-47	0-47
`err_cnts 0-35 read`	✓	✓
`err_cnts 0-47 read`	✓	✓
`err_cnts 0-60 read`	✗	✗
`err_cnts 36-67 read`	✗	✗
`err_cnts <PHY_ID> read`	0-47	0-47
`gpio`	✓	✓
`help`	✓	✓
`i2c scan`	✓	✓
`iom gpio`	✓	✓
`phyinfo` *(page 156)*	✓	✓
`phyinfo buffer` *(page 156)*	✓	✓
`qinfo`	✓	✓
`read err_cnts`	✓	✓

RCLI Command String	Ultrastar® Data60	Ultrastar Data102
rmt debug dump	✗	✗
rmt err_cnts 0-35 clear	✗	✗
rmt err_cnts 36-67 clear	✗	✗
rmt err_cnts <PHY_ID> clear	✗	✗
rmt err_cnts 0-35 read	✗	✗
rmt err_cnts 36-67 read	✗	✗
rmt err_cnts <PHY_ID> read	✗	✗
rmt phyinfo	✗	✗
rmt phyinfo buffer	✗	✗
rmt qinfo	✗	✗
rmt show phys	✗	✗
rmt show threads	✗	✗
rmt status sas_phy	✗	✗
sec1 debug dump	✓	✓
sec1 err_cnts 0-35 clear	✓	✓
sec1 err_cnts 0-60 clear	✓	✓
sec1 err_cnts 36-67 clear	✓	✓
sec1 err_cnts <PHY_ID> clear	0-67	0-67
sec1 err_cnts 0-35 read	✓	✓
sec1 err_cnts 0-60 read	✓	✓
sec1 err_cnts 36-67 read	✓	✓
sec1 err_cnts <PHY_ID> read	0-67	0-67
sec1 phyinfo *(page 157)*	✓	✓

RCLI Command String	Ultrastar® Data60	Ultrastar Data102
sec1 phyinfo buffer *(page 158)*	✓	✓
sec1 qinfo	✓	✓
sec1 show phys *(page 161)*	✓	✓
sec1 show threads	✓	✓
sec1 status sas_link	✓	✓
sec1 status sas_phy	✓	✓
sec1 tx_para_get<0-67>	✓	✓
sec2 debug dump	✓	✓
sec2 err_cnts 0-35 clear	✓	✓
sec2 err_cnts 0-60 clear	✓	✓
sec2 err_cnts 36-67 clear	✓	✓
sec2 err_cnts <PHY_ID> clear	0-67	0-67
sec2 err_cnts 0-35 read	✓	✓
sec2 err_cnts 0-60 read	✓	✓
sec2 err_cnts 36-67 read	✓	✓
sec2 err_cnts <PHY_ID> read	0-67	0-67
sec2 phyinfo *(page 159)*	✓	✓
sec2 phyinfo buffer *(page 160)*	✓	✓
sec2 qinfo	✓	✓
sec2 show phys *(page 161)*	✓	✓
sec2 show threads	✓	✓
sec2 status sas_link	✓	✓
sec2 status sas_phy	✓	✓

RCLI Command String	Ultrastar® Data60	Ultrastar Data102
sec2 tx_para_get<0-67>	✓	✓
show ac *(page 162)* show actuator show actuators	✓	✓
show autosync	✓	✓
show cable	✓	✓
show devices	✓	✓
show drives *(page 163)*	✓	✓
show drives high	✓	✓
show drives low	✓	✓
show dual *(page 163)*	✓	✓
show enc *(page 164)*	✓	✓
show fw	✓	✓
show gpio	✓	✓
show io	✓	✓
show host resets	✓	✓
show hosts *(page 165)*	✓	✓
show le show led show leds	✓	✓
show monitor	✓	✓
show phys *(page 165)*	✓	✓
show sensor *(page 166)* show sn show sensors	✓	✓
show ses *(page 166)*	✓	✓
show thermon	✓	✓

RCLI Command String	Ultrastar® Data60	Ultrastar Data102
show threads	✓	✓
show vpd *(page 167)*	✓	✓
status sas_link	✓	✓
status sas_phy	✓	✓
tx_para_get	✓	✓
vpd set *(page 167)*	✓	✓
zonecfg *(page 168)*	✓	✓
zonecfg disable	✓	✓

Table 18: EOL Products

RCLI Command String	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
clear err_cnts	✓	✗	✓	✓
debug dump	✓	✗	✓	✓
err_cnts 0-35 clear	✓	✗	✓	✓
err_cnts 0-47 clear	✓	✗	✗	✓
err_cnts 0-60 clear	✗	✗	✗	✗
err_cnts 36-67 clear	✓	✗	✗	✗
err_cnts <PHY_ID> clear	0-67	✗	0-35	0-47
err_cnts 0-35 read	✓	✗	✓	✓
err_cnts 0-47 read	✓	✗	✗	✓
err_cnts 0-60 read	✗	✗	✗	✗
err_cnts 36-67 read	✓	✗	✗	✗

RCLI Command String	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`err_cnts <PHY_ID> read`	0-67	✗	0-35	0-47
`gpio`	✓	✗	✓	✓
`help`	✓	✗	✓	✓
`i2c scan`	✓	✗	✓	✓
`iom gpio`	✗	✗	✗	✗
`phyinfo` *(page 156)*	✓	✗	✓	✓
`phyinfo buffer` *(page 156)*	✓	✗	✓	✓
`qinfo`	✓	✗	✓	✓
`read err_cnts`	✓	✗	✓	✓
`rmt debug dump`	✓	✗	✗	✗
`rmt err_cnts 0-35 clear`	✓	✗	✗	✗
`rmt err_cnts 36-67 clear`	✓	✗	✗	✗
`rmt err_cnts <PHY_ID> clear`	0-67	✗	✗	✗
`rmt err_cnts 0-35 read`	✓	✗	✗	✗
`rmt err_cnts 36-67 read`	✓	✗	✗	✗
`rmt err_cnts <PHY_ID> read`	0-67	✗	✗	✗
`rmt phyinfo`	✓	✗	✗	✗
`rmt phyinfo buffer`	✓	✗	✗	✗
`rmt qinfo`	✓	✗	✗	✗
`rmt show phys`	✓	✗	✗	✗
`rmt show threads`	✓	✗	✗	✗

RCLI Command String	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
rmt status sas_phy	✓	✗	✗	✗
sec1 debug dump	✗	✗	✓	✓
sec1 err_cnts 0-35 clear	✗	✗	✓	✓
sec1 err_cnts 0-60 clear	✗	✗	✗	✓
sec1 err_cnts 36-67 clear	✗	✗	✗	✓
sec1 err_cnts <PHY_ID> clear	✗	✗	0-35	0-67
sec1 err_cnts 0-35 read	✗	✗	✓	✓
sec1 err_cnts 0-60 read	✗	✗	✗	✓
sec1 err_cnts 36-67 read	✗	✗	✗	✓
sec1 err_cnts <PHY_ID> read	✗	✗	0-35	0-67
sec1 phyinfo *(page 157)*	✗	✗	✓	✓
sec1 phyinfo buffer *(page 158)*	✗	✗	✓	✓
sec1 qinfo	✗	✗	✓	✓
sec1 show phys *(page 161)*	✗	✗	✓	✓
sec1 show threads	✗	✗	✓	✓
sec1 status sas_link	✗	✗	✗	✓
sec1 status sas_phy	✗	✗	✓	✓
sec1 tx_para_get<0-67>	✗	✗	✗	✓
sec2 debug dump	✗	✗	✓	✓
sec2 err_cnts 0-35 clear	✗	✗	✓	✓
sec2 err_cnts 0-60 clear	✗	✗	✗	✓

RCLI Command String	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
sec2 err_cnts 36-67 clear	✗	✗	✗	✓
sec2 err_cnts <PHY_ID> clear	✗	✗	0-35	0-67
sec2 err_cnts 0-35 read	✗	✗	✓	✓
sec2 err_cnts 0-60 read	✗	✗	✗	✓
sec2 err_cnts 36-67 read	✗	✗	✗	✓
sec2 err_cnts <PHY_ID> read	✗	✗	0-35	0-67
sec2 phyinfo *(page 159)*	✗	✗	✓	✓
sec2 phyinfo buffer *(page 160)*	✗	✗	✓	✓
sec2 qinfo	✗	✗	✓	✓
sec2 show phys *(page 161)*	✗	✗	✓	✓
sec2 show threads	✗	✗	✓	✓
sec2 status sas_link	✗	✗	✗	✓
sec2 status sas_phy	✗	✗	✗	✓
sec2 tx_para_get<0-67>	✗	✗	✗	✓
show ac *(page 162)* show actuator show actuators	✓	✗	✓	✓
show autosync	✗	✗	✗	✗
show cable	✗	✗	✗	✓
show devices	✓	✗	✓	✓
show drives *(page 163)*	✓	✗	✓	✓
show drives high	✓	✗	✓	✓
show drives low	✓	✗	✓	✓

RCLI Command String	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
show dual *(page 163)*	✗	✗	✓	✓
show enc *(page 164)*	✗	✗	✓	✓
show fw	✓	✗	✓	✓
show gpio	✓	✗	✓	✓
show io	✓	✗	✓	✓
show host resets	✗	✗	✗	✓
show hosts *(page 165)*	✓	✗	✓	✓
show le show led show leds	✓	✗	✓	✓
show monitor	✗	✗	✗	✓
show phys *(page 165)*	✓	✗	✓	✓
show sensor *(page 166)* show sn show sensors	✓	✗	✓	✓
show ses *(page 166)*	✓	✗	✓	✓
show thermon	✓	✗	✓	✓
show threads	✓	✗	✓	✓
show vpd *(page 167)*	✗	✗	✓	✓
status sas_link	✗	✗	✗	✓
status sas_phy	✓	✗	✓	✓
tx_para_get	✓	✗	✓	✓
vpd set *(page 167)*	✓	✗	✓	✓
zonecfg *(page 168)*	✗	✗	✓	✓

RCLI Command String	Storage Enclosure Basic	4U60 G1 Storage Enclosure	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`zonecfg disable`	✗	✗	✓	✗

3.7.1 rcli phyinfo

The `wddcs <device> rcli phyinfo` command is used to display the primary SAS Expander PHY information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli phyinfo` command to display the primary SAS Expander PHY information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli phyinfo
```

```
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Device: <device>
Phy Type Link Route SAS                Change  Zone    Zone  Conn  Conn
 Conn
ID       Rate Attr  Address            Count   Group   Info  Type  Elem
 Phy
                                                                   Index
 Link
-------------------------------------------------------------------------
0   ---  ---    T   ---                0x00    0x08    0x04  0x05  0x66
 0x03
1   ---  ---    T   ---                0x00    0x08    0x04  0x05  0x66
 0x03
2   ---  ---    T   ---                0x00    0x08    0x04  0x05  0x66
 0x03
3   ---  ---    T   ---                0x00    0x08    0x04  0x05  0x66
 0x03
4   End  12G    T   0x500605b00e7b00d0  0x02    0x09    0x04  0x05  0x6e
 0x03
5   End  12G    T   0x500605b00e7b00d0  0x02    0x09    0x04  0x05  0x6e
 0x03
6   End  12G    T   0x500605b00e7b00d0  0x02    0x09    0x04  0x05  0x6e
 0x03
7   End  12G    T   0x500605b00e7b00d0  0x02    0x09    0x04  0x05  0x6e
 0x03
8   ---  ---    T   ---                0x00    0x0a    0x04  0x05  0x6f
 0x03
9   ---  ---    T   ---                0x00    0x0a    0x04  0x05  0x6f
 0x03
10  ---  ---    T   ---                0x00    0x0a    0x04  0x05  0x6f
 0x03
...
```

3.7.2 rcli "phyinfo buffer"

The `wddcs <device> rcli "phyinfo buffer"` command is used to display the primary SAS expander PHY info buffer information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "phyinfo buffer"` command to display the primary SAS expander PHY info buffer information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "phyinfo buffer"
```

```
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Device: <device>
PHY  Link  Drv    Buffer  SAS     SAS     SATA    SATA    Conn  Conn  OAF
 Snoop
ID   Rate  Link   Enable  Buffer  Buffer  Buffer  Buffer  Mgmt  Mgmt  Early
 TMF
           Rate           3G      6G      3G      6G      3/6G  12G   Accept

-------------------------------------------------------------------------
0    ---   ---    -       -       *       *       *       *     *     -
 -
1    ---   ---    -       -       *       *       *       *     *     -
 -
2    ---   ---    -       -       *       *       *       *     *     -
 -
3    ---   ---    -       -       *       *       *       *     *     -
 -
4    12G   12G    -       -       *       *       *       *     *     -
 -
5    12G   12G    -       -       *       *       *       *     *     -
 -
6    12G   12G    -       -       *       *       *       *     *     -
 -
7    12G   12G    -       -       *       *       *       *     *     -
 -
8    ---   ---    -       -       *       *       *       *     *     -
 -
9    ---   ---    -       -       *       *       *       *     *     -
 -
10   ---   ---    -       -       *       *       *       *     *     -
 -
...
```

3.7.3 rcli "sec1 phyinfo"

The `wddcs <device> rcli "sec1 phyinfo"` command is used to display the secondary SAS expander 1 PHY information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "sec1 phyinfo"` command to display the secondary SAS expander 1 PHY information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "sec1 phyinfo"
```

```
wddcs v4.2.2.0
```

```
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Device: <device>
Phy Type Link Route SAS                 Change  Zone    Zone  Conn  Conn
 Conn
ID       Rate Attr  Address             Count   Group   Info  Type  Elem
 Phy
                                                                    Index
 Link
-------------------------------------------------------------------------
0   ---  ---    T   ---                 0x00    0x38    0x04  0x20  0x2a
 0x00
1   ---  ---    T   ---                 0x00    0x3a    0x04  0x20  0x2c
 0x00
2   ---  ---    T   ---                 0x00    0x43    0x04  0x20  0x35
 0x00
3   ---  ---    T   ---                 0x00    0x44    0x04  0x20  0x36
 0x00
4   ---  ---    T   ---                 0x00    0x45    0x04  0x20  0x37
 0x00
5   ---  ---    T   ---                 0x00    0x46    0x04  0x20  0x38
 0x00
6   ---  ---    T   ---                 0x00    0x47    0x04  0x20  0x39
 0x00
7   ---  ---    T   ---                 0x00    0x48    0x04  0x20  0x3a
 0x00
8   ---  ---    T   ---                 0x00    0x49    0x04  0x20  0x3b
 0x00
9   ---  ---    T   ---                 0x00    0x4a    0x04  0x20  0x3c
 0x00
10  ---  ---    T   ---                 0x00    0x4b    0x04  0x20  0x3d
 0x00
...
```

3.7.4 rcli "sec1 phyinfo buffer"

The `wddcs <device> rcli "sec1 phyinfo buffer"` command is used to display the secondary SAS expander 1 PHY info buffer information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "sec1 phyinfo buffer"` command to display the secondary SAS expander 1 PHY info buffer information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "sec1 phyinfo buffer"
```

```
wddcs v4.2.2.0
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Device: <device>
PHY  Link  Drv    Buffer  SAS     SAS     SATA    SATA    Conn  Conn  OAF
 Snoop
ID   Rate  Link   Enable  Buffer  Buffer  Buffer  Buffer  Mgmt  Mgmt  Early
 TMF
           Rate           3G      6G      3G      6G      3/6G  12G   Accept
```

```
--------------------------------------------------------------------------------
0    ---   ---    -       -       *       *       *       *     *     -
 -
1    ---   ---    -       -       *       *       *       *     *     -
 -
2    ---   ---    -       -       *       *       *       *     *     -
 -
3    ---   ---    -       -       *       *       *       *     *     -
 -
4    ---   ---    -       -       *       *       *       *     *     -
 -
5    ---   ---    -       -       *       *       *       *     *     -
 -
6    ---   ---    -       -       *       *       *       *     *     -
 -
7    ---   ---    -       -       *       *       *       *     *     -
 -
8    ---   ---    -       -       *       *       *       *     *     -
 -
9    ---   ---    -       -       *       *       *       *     *     -
 -
10   ---   ---    -       -       *       *       *       *     *     -
 -
...
```

3.7.5 rcli "sec2 phyinfo"

The `wddcs <device> rcli "sec2 phyinfo"` command is used to display the secondary SAS expander 2 PHY information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "sec2 phyinfo"` command to display the secondary SAS expander 2 PHY information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "sec2 phyinfo"
```

```
wddcs v4.2.2.0
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Device: <device>
Phy Type Link Route SAS                 Change  Zone    Zone  Conn  Conn
 Conn
ID       Rate Attr  Address             Count   Group   Info  Type  Elem
 Phy
                                                                    Index
 Link
--------------------------------------------------------------------------------
0   End  12G    T   0x5000cca25306eadd  0x02    0x0e    0x04  0x20  0x00
 0x00
1   End  12G    T   0x5000cca25306859d  0x02    0x0f    0x04  0x20  0x01
 0x00
2   End  12G    T   0x5000cca253068459  0x02    0x10    0x04  0x20  0x02
 0x00
3   End  12G    T   0x5000cca253068569  0x02    0x11    0x04  0x20  0x03
 0x00
```

```
4   End  12G    T   0x5000cca253068581  0x02    0x12    0x04  0x20  0x04
 0x00
5   End  12G    T   0x5000cca2532b9751  0x02    0x13    0x04  0x20  0x05
 0x00
6   End  12G    T   0x5000cca25306873d  0x02    0x14    0x04  0x20  0x06
 0x00
7   End  12G    T   0x5000cca25307011d  0x02    0x15    0x04  0x20  0x07
 0x00
8   End  12G    T   0x5000cca253068411  0x02    0x16    0x04  0x20  0x08
 0x00
9   End  12G    T   0x5000cca2530684b1  0x02    0x17    0x04  0x20  0x09
 0x00
10  End  12G    T   0x5000cca2530702f9  0x02    0x18    0x04  0x20  0x0a
 0x00
...
```

3.7.6 rcli "sec2 phyinfo buffer"

The `wddcs <device> rcli "sec2 phyinfo buffer"` command is used to display the secondary SAS expander 2 PHY info buffer information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "sec2 phyinfo buffer"` command to display the secondary SAS expander 2 PHY info buffer information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "sec2 phyinfo buffer"
```

```
wddcs v4.2.2.0
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Device: <device>
PHY  Link  Drv    Buffer  SAS     SAS     SATA    SATA    Conn  Conn  OAF
 Snoop
ID   Rate  Link   Enable  Buffer  Buffer  Buffer  Buffer  Mgmt  Mgmt  Early
 TMF
           Rate           3G      6G      3G      6G      3/6G  12G   Accept

-------------------------------------------------------------------------------
0    12G   12G    -       -       *       *       *       *     *     -
 -
1    12G   12G    -       -       *       *       *       *     *     -
 -
2    12G   12G    -       -       *       *       *       *     *     -
 -
3    12G   12G    -       -       *       *       *       *     *     -
 -
4    12G   12G    -       -       *       *       *       *     *     -
 -
5    12G   12G    -       -       *       *       *       *     *     -
 -
6    12G   12G    -       -       *       *       *       *     *     -
 -
7    12G   12G    -       -       *       *       *       *     *     -
 -
```

```
8    12G   12G    -       -       *       *       *       *     *     -
 -
9    12G   12G    -       -       *       *       *       *     *     -
 -
10   12G   12G    -       -       *       *       *       *     *     -
 -
...
```

3.7.7 rcli "sec1 show phys"

The `wddcs <device> rcli "sec1 show phys"` command is used to display the PHY information of the secondary SAS expander 1 for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "sec1 show phys"` command to display the PHY information of the secondary SAS expander 1 for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "sec1 show phys"
```

```
wddcs v4.2.2.0
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Device: <device>

A Sec 1 Expander PHYs
 Id  Type  SAS                Rate   Local      Remote   1.5G  3G  6G 12G
-------------------------------------------------------------------------
  0 : DRV Disabled                  C0FF0000                *   *   *   *
  1 : DRV Disabled                  C0FF0000                *   *   *   *
  2 : DRV Disabled                  C0FF0000                *   *   *   *
  3 : DRV Disabled                  C0FF0000                *   *   *   *
 ...
 39 : DRV 5000CCA25306EC05   12G    C0FF0000   80FF0001   *   *   *   *
 40 : DRV 5000CCA2530684AD   12G    C0FF0000   80FF0001   *   *   *   *
 41 : DRV 5000CCA25306EA45    6G    C0FC0000   80FF0001   *   *   *
 42 : DRV 5000CCA25306F0A1    6G    C0FC0000   80FF0001   *   *   *
 43 : DRV 5000CCA253068705   12G    C0FF0000   80FF0001   *   *   *   *
 ...
```

3.7.8 rcli "sec2 show phys"

The `wddcs <device> rcli "sec2 show phys"` command is used to display the PHY information of the secondary SAS expander 2 for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "sec2 show phys"` command to display the PHY information of the secondary SAS expander 2 for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "sec2 show phys"
```

```
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Device: <device>
```

```
A Sec 2 Expander PHYs
 Id  Type  SAS                Rate   Local      Remote   1.5G  3G  6G 12G
-------------------------------------------------------------------------
  0 : DRV 5000CCA25306EADD   12G    C0FF0000   80FF0001   *   *   *   *
  1 : DRV 5000CCA25306859D   12G    C0FF0000   80FF0001   *   *   *   *
  2 : DRV 5000CCA253068459   12G    C0FF0000   80FF0001   *   *   *   *
  3 : DRV 5000CCA253068569   12G    C0FF0000   80FF0001   *   *   *   *
  4 : DRV 5000CCA253068581   12G    C0FF0000   80FF0001   *   *   *   *
  5 : DRV 5000CCA2532B9751   12G    C0FF0000   80FF0001   *   *   *   *
  6 : DRV 5000CCA25306873D   12G    C0FF0000   80FF0001   *   *   *   *
  7 : DRV 5000CCA25307011D   12G    C0FF0000   80FF0001   *   *   *   *
  8 : DRV 5000CCA253068411   12G    C0FF0000   80FF0001   *   *   *   *
  9 : DRV 5000CCA2530684B1   12G    C0FF0000   80FF0001   *   *   *   *
 10 : DRV 5000CCA2530702F9   12G    C0FF0000   80FF0001   *   *   *   *
 ...
```

3.7.9 rcli "show ac"

The `wddcs <device> rcli "show ac"` command is used to display the PWM information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show ac"` command to display the PWM information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show ac"
```

```
wddcs v4.2.2.0
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Device: <device>
 ac:pwmEnc          = 54 % (Enclosure Fan PWM)
 ac:pwmIom          = 42 % (IOM Fan PWM)
 ac:pwmPsuA         = 0 % (PSU A Fan PWM)
 ac:pwmPsuB         = 0 % (PSU B Fan PWM)
```

Note: For Ultrastar® Data60, Ultrastar Serv60+8, and Ultrastar Data102 enclosures, if the IOM fan's PWM is less than (<) 50%, the PSU PWMs will display 0%. If the the IOM fan's PWM is greater than (>) 50%, the PSU PWMs will match the IOM fan's PWM up to a maximum of 85%.

3.7.10 rcli "show cable"

The `wddcs <device> rcli "show cable"` command is used to display the host cable information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show cable"` command to display the host cable information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show cable"
```

```
wddcs v4.2.2.0
```

```
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Device: <device>
Cable status: 00
Host  0(-): Not installed
Host  1(-): OK  , ZG:09 LEN: 3m, FCI Electronics, 10117949-3030LF
Host  2(-): Not installed
Host  3(-): Not installed
Host  4(-): Not installed
Host  5(-): Not installed
Host  6(-): Not installed
Host  7(-): OK  , ZG:09 LEN: 3m, FCI Electronics, 10117949-3030LF
Host  8(-): Not installed
Host  9(-): Not installed
Host 10(-): Not installed
Host 11(-): Not installed
```

3.7.11 rcli "show drives"

The `wddcs <device> rcli "show drives"` command is used to display the drive information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show drives"` command to display the drive information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show drives"
```

```
wddcs v4.2.2.0
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Device: <device>

Slot  SAS Addr         State    Vendor   Product          FW   Serial
-------------------------------------------------------------------------------
 0   : 5000CCA25306EADD On -Rdy  HGST HUH721212AL4204 C3D0 8DG3TXZD
 1   : 5000CCA25306859D On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L5YD
 2   : 5000CCA253068459 On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L3AD
 3   : 5000CCA253068569 On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L5JD
 4   : 5000CCA253068581 On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L5RD
 5   : 5000CCA2532B9751 On -Rdy  HGST HUH721212AL5200 A3D0 8DGSZ5LH
 6   : 5000CCA25306873D On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L99D
 7   : 5000CCA25307011D On -Rdy  HGST HUH721212AL4204 C3D0 8DG3VDXD
 8   : 5000CCA253068411 On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L2SD
 9   : 5000CCA2530684B1 On -Rdy  HGST HUH721212AL4204 C3D0 8DG3L41D
 10  : 5000CCA2530702F9 On -Rdy  HGST HUH721212AL4204 C3D0 8DG3VJSD
...
```

3.7.12 rcli "show dual"

The `wddcs <device> rcli "show dual"` command is used to display the dual IOM status information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show dual"` command to display the dual IOM status information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show dual"
```

```
wddcs v4.2.2.0
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Device: <device>
dualCompatStatus: DUAL_IOM_COMPATIBLE
DualEnabled     : True
IomInit         : True
linkAlive       : True
otherpresent    : True
isSynched       : True
Slot            : A
XO Status       : XO_STS_IS_XO
isThisActive    : True
isOtherActive   : True
```

3.7.13 rcli "show enc"

The `wddcs <device> rcli "show enc"` command is used to display the enclosure information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show enc"` command to display the enclosure information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show enc"
```

```
wddcs v4.2.2.0
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Device: <device>

Enclosure Information (IOM A)
-------------------------------------------------
  ENCL CONFIG : 4U102
  PARTNUM     : Encl:1ES0294-1A
  SERIAL      : USCSJ04017EA0001
  IOM A
    PARTNUM   : 1EB0246
    SERIAL    : THCLS03517EL0052
    FW(PRI)   : <version>
    FW(SEC1)  : <version>
    FW(SEC2)  : <version>
    FW(OOBM)  : <version>
    MAC       : 00:0C:CA:05:00:16
    IP ADDR   : 10.202.237.141
  IOM B
    PARTNUM   : 1EB0246-B2
    SERIAL    : THCLS03517EL0091
    FW(PRI)   : <version>
    FW(SEC1)  : <version>
    FW(SEC2)  : <version>
```

```
    FW(OOBM)  : <version>
    MAC       : 00:0C:CA:04:00:5B
    IP ADDR   : 10.202.237.183
```

3.7.14 rcli "show hosts"

The `wddcs <device> rcli "show hosts"` command is used to display the host information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show hosts"` command to display the host information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show hosts"
```

```
wddcs v4.2.2.0
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Device: <device>

Host 00(x----------------): Not Connected
Host 01(x----------------): Not Connected
Host 02(x----------------): Not Connected
Host 03(x----------------): Not Connected
Host 04(x500605B00E7B00D1,12G): Ready
Host 05(x500605B00E7B00D1,12G): Ready
Host 06(x500605B00E7B00D1,12G): Ready
Host 07(x500605B00E7B00D1,12G): Ready
Host 08(x----------------): Not Connected
Host 09(x----------------): Not Connected
Host 10(x----------------): Not Connected
Host 11(x----------------): Not Connected
Host 12(x----------------): Not Connected
Host 13(x----------------): Not Connected
Host 14(x----------------): Not Connected
Host 15(x----------------): Not Connected
Host 16(x----------------): Not Connected
Host 17(x----------------): Not Connected
Host 18(x----------------): Not Connected
Host 19(x----------------): Not Connected
Host 20(x----------------): Not Connected
Host 21(x----------------): Not Connected
Host 22(x----------------): Not Connected
Host 23(x----------------): Not Connected
```

3.7.15 rcli "show phys"

The `wddcs <device> rcli "show phys"` command is used to display the PHY information of the primary SAS expander for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show phys"` command to display the PHY information of the primary SAS expander for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show phys"
```

```
wddcs v4.2.2.0
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Device: <device>

A Pri   Expander PHYs
 Id  Type  SAS               Rate   Local      Remote   1.5G  3G  6G 12G
-------------------------------------------------------------------------
  0 : HST                          C0FF0000              *   *   *   *
  1 : HST                          C0FF0000              *   *   *   *
  2 : HST                          C0FF0000              *   *   *   *
  3 : HST                          C0FF0000              *   *   *   *
  4 : HST 500605B00E7B00D1   12G   C0FF0000   803F0001   *   *   *   *
  5 : HST 500605B00E7B00D1   12G   C0FF0000   803F0001   *   *   *   *
  6 : HST 500605B00E7B00D1   12G   C0FF0000   803F0001   *   *   *   *
  7 : HST 500605B00E7B00D1   12G   C0FF0000   803F0001   *   *   *   *
  8 : HST                          C0FF0000              *   *   *   *
  9 : HST                          C0FF0000              *   *   *   *
 10 : HST                          C0FF0000              *   *   *   *
 ...
```

3.7.16 rcli "show sensor"

The `wddcs <device> rcli "show sensor"` command is used to display the sensor information from a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show sensor"` command to display the sensor information from a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show sensor"
```

```
wddcs v4.2.2.0
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Device: <device>
 sn:tmpSlot000        =     28 Deg C   (TEMP SLOT 000)
 sn:tmpSlot001        =     27 Deg C   (TEMP SLOT 001)
 sn:tmpSlot002        =     28 Deg C   (TEMP SLOT 002)
 sn:tmpSlot003        =     28 Deg C   (TEMP SLOT 003)
 sn:tmpSlot004        =     28 Deg C   (TEMP SLOT 004)
 sn:tmpSlot005        =     28 Deg C   (TEMP SLOT 005)
 sn:tmpSlot006        =     27 Deg C   (TEMP SLOT 006)
 sn:tmpSlot007        =     27 Deg C   (TEMP SLOT 007)
 sn:tmpSlot008        =     28 Deg C   (TEMP SLOT 008)
 sn:tmpSlot009        =     27 Deg C   (TEMP SLOT 009)
 ...
```

3.7.17 rcli "show ses"

The `wddcs <device> rcli "show ses"` command is used to display the SES information for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli "show ses"` command to display the SES information for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show ses"
```

```
wddcs v4.2.2.0
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Device: <device>

|Status|
Online
Zoning: Disabled

|Identification|
Vendor: HGST
Product: H4102-J
SerialNum: USCSJ04017EA0006
FwRev: <version>

|SES Status|
CONN HOST 01: Not Installed()
CONN HOST 02: Not Installed()
CONN HOST 03: Not Installed()
CONN HOST 04: Not Installed()
CONN HOST 05: Not Installed()
CONN HOST 07: Not Installed()
CONN HOST 08: Not Installed()
CONN HOST 09: Not Installed()
CONN HOST 10: Not Installed()
CONN HOST 11: Not Installed()
```

3.7.18 rcli "show vpd"

The `wddcs <device> rcli "show vpd"` command is used to display vital product data for a single SEP device within an enclosure that supports RCLI commands.

Note: The `wddcs <device> rcli "vpd set"` command accomplishes the same purpose.

Step 1: Use the `wddcs <device> rcli "show vpd"` command to display vital product data for a single SEP device within an enclosure that supports RCLI commands. For example:

```
wddcs <device> rcli "show vpd"
```

```
wddcs v4.2.2.0
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Device: <device>
    Encl:Type         = x01
    Encl:PartNum      = '1ES0255-06'
    Encl:SerialNum    = 'USCSJ03717EB0001'
    Encl:ProductName  = 'H4102-J'
```

```
    Encl:Vendor       = 'HGST'
    Encl:BdCustomer   = ''
    Encl:SASAddr      = x5000CCAB04000600
    Encl:Config       = x5A00000000000000
    Encl:Nickname     = ''
    Encl:BdPartNum    = '1EB0227-A1'
    Encl:BdSerialNum  = 'THCLS03217EK001A'
    Encl:DrvStateBits = x76
    IomA:BdName       = ''
    IomA:BdSerialNum  = 'THCLS03517EL00AB'
    IomA:BdPartNum    = '1EB0246'
    IomA:BdCustomer   = ''
    IomA:MACAddr      = 8:'0000000CCA05001B'
    IomB:BdName       = ''
    IomB:BdSerialNum  = 'THCLS03517EL000A'
    IomB:BdPartNum    = '1EB0246'
    IomB:BdCustomer   = ''
    IomB:MACAddr      = 8:'0000000CCA05001A'
    MainBB:BdName       = 'BB60'
    MainBB:BdSerialNum  = 'THCLS05117EJ0002'
    MainBB:BdPartNum    = '1EB1032-30'
    AuxBB:BdName       = 'BB42'
    AuxBB:BdSerialNum  = 'THCLS05117EH0004'
    AuxBB:BdPartNum    = '1EB1034-30'
```

3.7.19 rcli zonecfg

The `wddcs <device> rcli zonecfg` command is used to determine the zoning configuration for a single SEP device within an enclosure that supports RCLI commands.

Step 1: Use the `wddcs <device> rcli zonecfg` command to determine the zoning configuration for a single SEP device within an enclosure that supports RCLI commands.

If zoning is **disabled**, the output will be as follows:

```
wddcs <device> rcli zonecfg
```

```
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Device: <device>
Zoning (Disabled)
```

If zoning is **enabled**, the output will be as follows:

```
wddcs <device> rcli zonecfg
```

```
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Device: <device>
Zoning (Enabled)
Host    : Slots
------------------------
  Host <host#> : <slot#>-<slot#>
  Host <host#> : <slot#>-<slot#>
  Host <host#> : <slot#>-<slot#>
```

```
Host <host#> : <slot#>-<slot#>
Host <host#> : <slot#>-<slot#>
Host <host#> : <slot#>-<slot#>
```

3.8 rcli (Ultrastar Data60 & Data102 3000)

The `wddcs <device> rcli <command string>` command is used to capture detailed data about WD enclosures and their components. The commands in this section—with the exception of `help`—were introduced with the Ultrastar Data60 3000 and Ultrastar Data102 3000 Series and only apply to these platforms.

Usage

The following example demonstrates the correct syntax for the `wddcs <device> rcli <command string>` command:

- `rcli <command string>`

Options

The procedures in this section provide examples of using various command strings:

- `<command string>` can be any of the commands allowed by the enclosure firmware.

Note: Commands that are not supported on these enclosures will report as `not supported`. For example:

```
wddcs <device> rcli <command string>
```

```
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Device: <device>
rcli cmd: <command string>
This command is not supported on this platform
```

Platform Support

Platform support for the `wddcs <device> rcli <command string>` command and options are listed in the following table. Click the linked command strings—where applicable—to view an example of that string used in conjunction with the `wddcs rcli` command.

Note: The commands in this section apply only to the Ultrastar Data60 3000 and Ultrastar Data102 3000 Series platforms.

Attention: The following `rcli` command prefixes are **not** supported for single IOM configurations of Ultrastar Data102 3000 Series: `drv1a`, `drv1b`, `drv2a`, `drv2b`, `hema`, `hemb`, `remote`.

Table 19: Ultrastar Data102 3000 Series

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv1 debug dump	✓	✓
drv1 err_cnts 0-75 read	✓	✓
drv1 gpio	✓	✓
drv1 i2c scan	✓	✓
drv1 phyinfo *(page 182)*	✓	✓
drv1 phyinfo buffer *(page 185)*	✓	✓
drv1 show ac *(page 188)*	✓	✓
drv1 show actuator	✓	✓
drv1 show actuators	✓	✓
drv1 show devices	✓	✓
drv1 show drive	✓	✓
drv1 show drives *(page 189)*	✓	✓
drv1 show dual *(page 191)*	✓	✓
drv1 show enc *(page 191)*	✓	✓
drv1 show fw	✓	✓
drv1 show gpio	✓	✓
drv1 show iomupdate	✓	✓
drv1 show le	✓	✓
drv1 show led	✓	✓
drv1 show leds	✓	✓
drv1 show monitor	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv1 show phys *(page 192)*	✓	✓
drv1 show sensor *(page 194)*	✓	✓
drv1 show ses *(page 196)*	✓	✓
drv1 show slots	✓	✓
drv1 show sn	✓	✓
drv1 show thermon	✓	✓
drv1 status sas_link	✓	✓
drv1 tx_para_get 0-75	✓	✓
drv1a debug dump	✓	✓
drv1a err_cnts 0-75 clear	✓	✓
drv1a err_cnts 0-75 read	✓	✓
drv1a gpio	✓	✓
drv1a i2c scan	✓	✓
drv1a phyinfo	✓	✓
drv1a phyinfo buffer	✓	✓
drv1a qinfo	✓	✓
drv1a show ac	✓	✓
drv1a show actuator	✓	✓
drv1a show actuators	✓	✓
drv1a show devices	✓	✓
drv1a show drive	✓	✓
drv1a show drives	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv1a show dual	✓	✓
drv1a show enc	✓	✓
drv1a show fw	✓	✓
drv1a show gpio	✓	✓
drv1a show iomupdate	✓	✓
drv1a show le	✓	✓
drv1a show led	✓	✓
drv1a show leds	✓	✓
drv1a show monitor	✓	✓
drv1a show phys	✓	✓
drv1a show sensor	✓	✓
drv1a show ses	✓	✓
drv1a show slots	✓	✓
drv1a show sn	✓	✓
drv1a show thermon	✓	✓
drv1a show threads	✓	✓
drv1a status sas_link	✓	✓
drv1a status sas_phy	✓	✓
drv1a tx_para_get 0-75	✓	✓
drv1a zonecfg	✓	✓
drv1b debug dump	✓	✓
drv1b err_cnts 0-75 clear	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv1b err_cnts 0-75 read	✓	✓
drv1b gpio	✓	✓
drv1b i2c scan	✓	✓
drv1b phyinfo	✓	✓
drv1b phyinfo buffer	✓	✓
drv1b qinfo	✓	✓
drv1b show ac	✓	✓
drv1b show actuator	✓	✓
drv1b show actuators	✓	✓
drv1b show devices	✓	✓
drv1b show drive	✓	✓
drv1b show drives	✓	✓
drv1b show dual	✓	✓
drv1b show enc	✓	✓
drv1b show fw	✓	✓
drv1b show gpio	✓	✓
drv1b show iomupdate	✓	✓
drv1b show le	✓	✓
drv1b show led	✓	✓
drv1b show leds	✓	✓
drv1b show monitor	✓	✓
drv1b show phys	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv1b show sensor	✓	✓
drv1b show ses	✓	✓
drv1b show slots	✓	✓
drv1b show sn	✓	✓
drv1b show thermon	✓	✓
drv1b show threads	✓	✓
drv1b status sas_link	✓	✓
drv1b status sas_phy	✓	✓
drv1b tx_para_get 0-75	✓	✓
drv2 debug dump	✗	✓
drv2 err_cnts 0-75 read	✗	✓
drv2 gpio	✗	✓
drv2 phyinfo *(page 197)*	✗	✓
drv2 phyinfo buffer *(page 200)*	✗	✓
drv2 show devices	✗	✓
drv2 show enc	✗	✓
drv2 show fw	✗	✓
drv2 show iomupdate	✗	✓
drv2 show phys *(page 203)*	✗	✓
drv2 status sas_link	✗	✓
drv2 status sas_phy	✗	✓
drv2 tx_para_get 0-75	✗	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv2a debug dump	✗	✓
drv2a err_cnts 0-75 clear	✗	✓
drv2a err_cnts 0-75 read	✗	✓
drv2a gpio	✗	✓
drv2a phyinfo	✗	✓
drv2a phyinfo buffer	✗	✓
drv2a qinfo	✗	✓
drv2a show devices	✗	✓
drv2a show enc	✗	✓
drv2a show fw	✗	✓
drv2a show iomupdate	✗	✓
drv2a show phys	✗	✓
drv2a show threads	✗	✓
drv2a status sas_link	✗	✓
drv2a status sas_phy	✗	✓
drv2a tx_para_get 0-75	✗	✓
drv2a zonecfg	✗	✓
drv2b debug dump	✗	✓
drv2b err_cnts 0-75 clear	✗	✓
drv2b err_cnts 0-75 read	✗	✓
drv2b gpio	✗	✓
drv2b phyinfo	✗	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
drv2b phyinfo buffer	✗	✓
drv2b qinfo	✗	✓
drv2b show devices	✗	✓
drv2b show enc	✗	✓
drv2b show fw	✗	✓
drv2b show iomupdate	✗	✓
drv2b show phys	✗	✓
drv2b show threads	✗	✓
drv2b status sas_link	✗	✓
drv2b status sas_phy	✗	✓
drv2b tx_para_get 0-75	✗	✓
drv2b zonecfg	✗	✓
help	✓	✓
hem debug dump	✓	✓
hem err_cnts 0-55 clear	✓	✓
hem err_cnts 0-55 read	✓	✓
hem gpio	✓	✓
hem i2c scan	✓	✓
hem phyinfo *(page 209)*	✓	✓
hem phyinfo buffer *(page 212)*	✓	✓
hem show devices	✓	✓
hem show dual	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
hem show enc	✓	✓
hem show fw	✓	✓
hem show host resets	✓	✓
hem show hosts *(page 214)*	✓	✓
hem show iomupdate	✓	✓
hem show phys *(page 215)*	✓	✓
hem status sas_link	✓	✓
hem tx_para_get 0-55	✓	✓
hema debug dump	✓	✓
hema err_cnts 0-55 clear	✓	✓
hema err_cnts 0-55 read	✓	✓
hema gpio	✓	✓
hema i2c scan	✓	✓
hema phyinfo	✓	✓
hema phyinfo buffer	✓	✓
hema qinfo	✓	✓
hema show devices	✓	✓
hema show dual	✓	✓
hema show enc	✓	✓
hema show fw	✓	✓
hema show host resets	✓	✓
hema show hosts *(page 205)*	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
hema show iomupdate	✓	✓
hema show phys *(page 206)*	✓	✓
hema show threads	✓	✓
hema status sas_link	✓	✓
hema status sas_phy	✓	✓
hema tx_para_get 0-55	✓	✓
hema zonecfg	✓	✓
hemb debug dump	✓	✓
hemb err_cnts 0-55 clear	✓	✓
hemb err_cnts 0-55 read	✓	✓
hemb gpio	✓	✓
hemb i2c scan	✓	✓
hemb phyinfo	✓	✓
hemb phyinfo buffer	✓	✓
hemb qinfo	✓	✓
hemb show devices	✓	✓
hemb show dual	✓	✓
hemb show enc	✓	✓
hemb show fw	✓	✓
hemb show host resets	✓	✓
hemb show hosts *(page 207)*	✓	✓
hemb show iomupdate	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
`hemb show phys` *(page 208)*	✓	✓
`hemb show threads`	✓	✓
`hemb status sas_link`	✓	✓
`hemb status sas_phy`	✓	✓
`hemb tx_para_get 0-55`	✓	✓
`hemb zonecfg`	✓	✓
`progfpga show`	✓	✓
`remote clear err_cnts`	✓	✓
`remote drv1 debug dump`	✓	✓
`remote drv1 err_cnts 0-75 clear`	✓	✓
`remote drv1 err_cnts 0-75 read`	✓	✓
`remote drv1 gpio`	✓	✓
`remote drv1 i2c scan`	✓	✓
`remote drv1 phyinfo`	✓	✓
`remote drv1 phyinfo buffer`	✓	✓
`remote drv1 qinfo`	✓	✓
`remote drv1 show ac`	✓	✓
`remote drv1 show actuator`	✓	✓
`remote drv1 show actuators`	✓	✓
`remote drv1 show devices`	✓	✓
`remote drv1 show drive`	✓	✓
`remote drv1 show drives`	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
remote drv1 show dual	✓	✓
remote drv1 show enc	✓	✓
remote drv1 show fw	✓	✓
remote drv1 show gpio	✓	✓
remote drv1 show iomupdate	✓	✓
remote drv1 show le	✓	✓
remote drv1 show led	✓	✓
remote drv1 show leds	✓	✓
remote drv1 show monitor	✓	✓
remote drv1 show phys	✓	✓
remote drv1 show sensor	✓	✓
remote drv1 show ses	✓	✓
remote drv1 show slots	✓	✓
remote drv1 show sn	✓	✓
remote drv1 show thermon	✓	✓
remote drv1 show threads	✓	✓
remote drv1 status sas_link	✓	✓
remote drv1 status sas_phy	✓	✓
remote drv1 tx_para_get 0-75	✓	✓
remote drv1 zonecfg	✓	✓
remote drv2 debug dump	✗	✓
remote drv2 err_cnts 0-75 clear	✗	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
remote drv2 err_cnts 0-75 read	✗	✓
remote drv2 gpio	✗	✓
remote drv2 phyinfo	✗	✓
remote drv2 phyinfo buffer	✗	✓
remote drv2 qinfo	✗	✓
remote drv2 show devices	✗	✓
remote drv2 show enc	✗	✓
remote drv2 show fw	✗	✓
remote drv2 show iomupdate	✗	✓
remote drv2 show phys	✗	✓
remote drv2 show threads	✗	✓
remote drv2 status sas_link	✗	✓
remote drv2 status sas_phy	✗	✓
remote drv2 tx_para_get 0-75	✗	✓
remote drv2 zonecfg	✗	✓
remote hem debug dump	✓	✓
remote hem err_cnts 0-55 clear	✓	✓
remote hem err_cnts 0-55 read	✓	✓
remote hem gpio	✓	✓
remote hem i2c scan	✓	✓
remote hem phyinfo	✓	✓
remote hem phyinfo buffer	✓	✓

RCLI Command String	Ultrastar Data60 3000 Series	Ultrastar Data102 3000 Series
`remote hem qinfo`	✓	✓
`remote hem show devices`	✓	✓
`remote hem show dual`	✓	✓
`remote hem show enc`	✓	✓
`remote hem show fw`	✓	✓
`remote hem show host resets`	✓	✓
`remote hem show hosts`	✓	✓
`remote hem show iomupdate`	✓	✓
`remote hem show phys`	✓	✓
`remote hem show threads`	✓	✓
`remote hem status sas_link`	✓	✓
`remote hem status sas_phy`	✓	✓
`remote hem tx_para_get 0-55`	✓	✓
`remote hem zonecfg`	✓	✓
`remote read err-cnts`	✓	✓

3.8.1 rcli "drv1 phyinfo"

The `wddcs <device> rcli "drv1 phyinfo"` command is used to display the DRV1 SAS expander PHY information for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 phyinfo"` command to display the DRV1 SAS expander PHY information. For example:

```
wddcs <device> rcli "drv1 phyinfo"
```

```
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Device: <device>
```

```
Phy Type Link Route Sas                 Chg  Zone Zone Conn Conn Conn Phy
 Sas  Sata Spin Dcm  Ch   Dcm  Dws  Hot  Com  Com  Com  Dcm
Id       Rate Attr  Address             Cnt  Grp  Info Type Elem Phy  Rdy
 Rdy  Rdy  Up   Rdy  Mask Act  Lost Plug Wake Init Sas  Neg
                                                          Indx Link
        Hold                     Tout               Fail
-------------------------------------------------------------------------
0   End* 12G    T   0x5000cca2c24b5481  0x04 0x0c 0x05 0x20 0x33 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
1   End* 12G    T   0x5000cca2c24feead  0x04 0x0c 0x05 0x20 0x34 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
2   End* 12G    T   0x5000cca2c24d34e5  0x04 0x0c 0x05 0x20 0x35 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
3   End* 12G    T   0x5000cca2c24d3711  0x04 0x0c 0x05 0x20 0x36 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
4   End* 12G    T   0x5000cca2c24ce4f9  0x04 0x0c 0x05 0x20 0x37 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
5   End* 12G    T   0x5000cca2c24d3001  0x04 0x0c 0x05 0x20 0x38 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
6   End* 12G    T   0x5000cca2c24d27dd  0x04 0x0c 0x05 0x20 0x39 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
7   End* 12G    T   0x5000cca2c248f499  0x04 0x0c 0x05 0x20 0x3a 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
8   End* 12G    T   0x5000cca2c24d3099  0x04 0x0c 0x05 0x20 0x3b 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
9   End* 12G    T   0x5000cca2c24e8e05  0x04 0x0c 0x05 0x20 0x3c 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
10  End* 12G    T   0x5000cca2c249dbf5  0x04 0x0c 0x05 0x20 0x3d 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
11  End* 12G    T   0x5000cca2c24d3335  0x04 0x0c 0x05 0x20 0x3e 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
12  End* 12G    T   0x5000cca2c24d323d  0x04 0x0c 0x05 0x20 0x3f 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
13  End* 12G    T   0x5000cca2c24d3131  0x04 0x0c 0x05 0x20 0x40 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
14  End* 12G    T   0x5000cca2c24b1a95  0x04 0x0c 0x05 0x20 0x41 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
15  End* 12G    T   0x5000cca2c24d36ad  0x04 0x0c 0x05 0x20 0x42 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
16  End* 12G    T   0x5000cca2c24ce4d9  0x04 0x0c 0x05 0x20 0x43 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
17  End* 12G    T   0x5000cca2c24c2689  0x01 0x0d 0x05 0x20 0x44 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
18  End* 12G    T   0x5000cca2c24ce521  0x01 0x0d 0x05 0x20 0x45 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
19  End* 12G    T   0x5000cca2c24d3459  0x01 0x0d 0x05 0x20 0x46 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
20  End* 12G    T   0x5000cca2c246886d  0x01 0x0d 0x05 0x20 0x47 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
21  End* 12G    T   0x5000cca2c251166d  0x01 0x0d 0x05 0x20 0x48 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
22  End* 12G    T   0x5000cca2c24d70c9  0x01 0x0d 0x05 0x20 0x49 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
23  End* 12G    T   0x5000cca2c24d7061  0x01 0x0d 0x05 0x20 0x4a 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
24  End* 12G    T   0x5000cca2c24d2859  0x01 0x0d 0x05 0x20 0x4b 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
25  End* 12G    T   0x5000cca2c24cf521  0x01 0x0d 0x05 0x20 0x4c 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
```

```
26  End* 12G    T   0x5000cca2c24d32a1  0x01 0x0d 0x05 0x20 0x4d 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
27  End* 12G    T   0x5000cca2a6025889  0x01 0x0d 0x05 0x20 0x4e 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
28  End* 12G    T   0x5000cca2c24bf37d  0x01 0x0d 0x05 0x20 0x4f 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
29  End* 12G    T   0x5000cca2c24ce381  0x01 0x0d 0x05 0x20 0x50 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
30  End* 12G    T   0x5000cca2c24d3111  0x01 0x0d 0x05 0x20 0x51 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
31  End* 12G    T   0x5000cca2c24d31d1  0x01 0x0d 0x05 0x20 0x52 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
32  End* 12G    T   0x5000cca2c24955f1  0x01 0x0d 0x05 0x20 0x53 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
33  End* 12G    T   0x5000cca2c24754f5  0x01 0x0d 0x05 0x20 0x54 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
34  End* 12G    T   0x5000cca2c24c9e09  0x01 0x0d 0x05 0x20 0x55 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
35  End* 12G    T   0x5000cca2c24ceefd  0x01 0x0d 0x05 0x20 0x56 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
36  End* 12G    T   0x5000cca2c24b19c9  0x01 0x0d 0x05 0x20 0x57 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
37  End* 12G    T   0x5000cca2c24482c5  0x01 0x0d 0x05 0x20 0x58 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
38  End* 12G    T   0x5000cca2c24ce3f5  0x01 0x0d 0x05 0x20 0x59 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
39  End* 12G    T   0x5000cca2c24d2fb1  0x01 0x0d 0x05 0x20 0x5a 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
40  End* 12G    T   0x5000cca2c24d3241  0x01 0x0d 0x05 0x20 0x5b 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
41  End* 12G    T   0x5000cca2c24f2a99  0x01 0x0d 0x05 0x20 0x5c 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
42  End* 12G    T   0x5000cca2c24531bd  0x01 0x0d 0x05 0x20 0x5d 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
43  End* 12G    T   0x5000cca2c24c2681  0x01 0x0d 0x05 0x20 0x5e 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
44  End* 12G    T   0x5000cca2c24d36e9  0x01 0x0d 0x05 0x20 0x5f 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
45  End* 12G    T   0x5000cca2c24c9d8d  0x01 0x0d 0x05 0x20 0x60 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
46  End* 12G    T   0x5000cca2c24b1929  0x01 0x0d 0x05 0x20 0x61 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
47  End* 12G    T   0x5000cca2c24b5625  0x01 0x0d 0x05 0x20 0x62 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
48  End* 12G    T   0x5000cca2c24ce879  0x01 0x0d 0x05 0x20 0x63 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
49  End* 12G    T   0x5000cca2c24c267d  0x01 0x0d 0x05 0x20 0x64 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
50  End* 12G    T   0x5000cca2c24d547d  0x01 0x0d 0x05 0x20 0x65 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
51  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
52  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
53  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
54  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
```

```
55  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
56  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
57  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
58  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
59  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
60  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
61  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
62  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
63  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
64  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
65  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
66  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
67  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
68  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
69  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
70  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
71  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
72  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
73  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
74  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
75  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
```

3.8.2 rcli "drv1 phyinfo buffer"

The `wddcs <device> rcli "drv1 phyinfo buffer"` command is used to display the DRV1 SAS expander PHY buffer information for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 phyinfo buffer"` command to display the DRV1 SAS expander PHY buffer information. For example:

```
wddcs <device> rcli "drv1 phyinfo buffer"
```

```
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Device: <device>
```

```
PHY  Link  Drv    Buffer  SAS     SAS     SAS     SATA    SATA    Conn
 Conn  OAF    Snoop
ID   Rate  Link   Enable  Buffer  Buffer  Buffer  Buffer  Buffer  Mgmt
 Mgmt  Early  TMF
           Rate           3G      6G      12G     3G      6G      3/6/12G
 24G   Accept
-------------------------------------------------------------------------------
0    12G   12G    -       -       *       -       -       *       -       -
    -      -
1    12G   12G    -       -       *       -       -       *       -       -
    -      -
2    12G   12G    -       -       *       -       -       *       -       -
    -      -
3    12G   12G    -       -       *       -       -       *       -       -
    -      -
4    12G   12G    -       -       *       -       -       *       -       -
    -      -
5    12G   12G    -       -       *       -       -       *       -       -
    -      -
6    12G   12G    -       -       *       -       -       *       -       -
    -      -
7    12G   12G    -       -       *       -       -       *       -       -
    -      -
8    12G   12G    -       -       *       -       -       *       -       -
    -      -
9    12G   12G    -       -       *       -       -       *       -       -
    -      -
10   12G   12G    -       -       *       -       -       *       -       -
    -      -
11   12G   12G    -       -       *       -       -       *       -       -
    -      -
12   12G   12G    -       -       *       -       -       *       -       -
    -      -
13   12G   12G    -       -       *       -       -       *       -       -
    -      -
14   12G   12G    -       -       *       -       -       *       -       -
    -      -
15   12G   12G    -       -       *       -       -       *       -       -
    -      -
16   12G   12G    -       -       *       -       -       *       -       -
    -      -
17   12G   12G    -       -       *       -       -       *       -       -
    -      -
18   12G   12G    -       -       *       -       -       *       -       -
    -      -
19   12G   12G    -       -       *       -       -       *       -       -
    -      -
20   12G   12G    -       -       *       -       -       *       -       -
    -      -
21   12G   12G    -       -       *       -       -       *       -       -
    -      -
22   12G   12G    -       -       *       -       -       *       -       -
    -      -
23   12G   12G    -       -       *       -       -       *       -       -
    -      -
24   12G   12G    -       -       *       -       -       *       -       -
    -      -
25   12G   12G    -       -       *       -       -       *       -       -
    -      -
```

```
26   12G   12G     -       -       *       -       -       *       -       -
     -     -
27   12G   12G     -       -       *       -       -       *       -       -
     -     -
28   12G   12G     -       -       *       -       -       *       -       -
     -     -
29   12G   12G     -       -       *       -       -       *       -       -
     -     -
30   12G   12G     -       -       *       -       -       *       -       -
     -     -
31   12G   12G     -       -       *       -       -       *       -       -
     -     -
32   12G   12G     -       -       *       -       -       *       -       -
     -     -
33   12G   12G     -       -       *       -       -       *       -       -
     -     -
34   12G   12G     -       -       *       -       -       *       -       -
     -     -
35   12G   12G     -       -       *       -       -       *       -       -
     -     -
36   12G   12G     -       -       *       -       -       *       -       -
     -     -
37   12G   12G     -       -       *       -       -       *       -       -
     -     -
38   12G   12G     -       -       *       -       -       *       -       -
     -     -
39   12G   12G     -       -       *       -       -       *       -       -
     -     -
40   12G   12G     -       -       *       -       -       *       -       -
     -     -
41   12G   12G     -       -       *       -       -       *       -       -
     -     -
42   12G   12G     -       -       *       -       -       *       -       -
     -     -
43   12G   12G     -       -       *       -       -       *       -       -
     -     -
44   12G   12G     -       -       *       -       -       *       -       -
     -     -
45   12G   12G     -       -       *       -       -       *       -       -
     -     -
46   12G   12G     -       -       *       -       -       *       -       -
     -     -
47   12G   12G     -       -       *       -       -       *       -       -
     -     -
48   12G   12G     -       -       *       -       -       *       -       -
     -     -
49   12G   12G     -       -       *       -       -       *       -       -
     -     -
50   12G   12G     -       -       *       -       -       *       -       -
     -     -
51   12G   12G     -       -       *       -       -       *       -       -
     -     -
52   12G   12G     -       -       *       -       -       *       -       -
     -     -
53   12G   12G     -       -       *       -       -       *       -       -
     -     -
54   12G   12G     -       -       *       -       -       *       -       -
     -     -
```

```
55   12G   12G    -       -       *       -       -       *       -       -
    -       -
56   12G   12G    -       -       *       -       -       *       -       -
    -       -
57   12G   12G    -       -       *       -       -       *       -       -
    -       -
58   12G   12G    -       -       *       -       -       *       -       -
    -       -
59   12G   12G    -       -       *       -       -       *       -       -
    -       -
60   12G   12G    -       -       *       -       -       *       -       -
    -       -
61   ---   ---    -       -       *       -       -       *       -       -
    -       -
62   ---   ---    -       -       *       -       -       *       -       -
    -       -
63   ---   ---    -       -       *       -       -       *       -       -
    -       -
64   ---   ---    -       -       *       -       -       *       -       -
    -       -
65   ---   ---    -       -       *       -       -       *       -       -
    -       -
66   ---   ---    -       -       *       -       -       *       -       -
    -       -
67   ---   ---    -       -       *       -       -       *       -       -
    -       -
68   ---   ---    -       -       *       -       -       *       -       -
    -       -
69   ---   ---    -       -       *       -       -       *       -       -
    -       -
70   ---   ---    -       -       *       -       -       *       -       -
    -       -
71   ---   ---    -       -       *       -       -       *       -       -
    -       -
72   ---   ---    -       -       *       -       -       *       -       -
    -       -
73   ---   ---    -       -       *       -       -       *       -       -
    -       -
74   ---   ---    -       -       *       -       -       *       -       -
    -       -
75   ---   ---    -       -       *       -       -       *       -       -
    -       -
```

3.8.3 rcli "drv1 show ac"

The `wddcs <device> rcli "drv1 show ac"` command is used to display the PWM information for a SEP device on compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show ac"` command to display the PWM information for a SEP device. For example:

```
wddcs <device> rcli "drv1 show ac"
```

```
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Device: <device>
```

```
ac:pwmEnc          = 43 % (Enclosure Fan PWM)
ac:pwmIom          = 35 % (IOM Fan PWM)
ac:pwmPsuA         = 0 % (PSU A Fan PWM)
ac:pwmPsuB         = 0 % (PSU B Fan PWM)
```

3.8.4 rcli "drv1 show drives"

The `wddcs <device> rcli "drv1 show drives"` command is used to display the drive/slot info attached to both DRV1 and DRV2 SAS expanders of compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show drives"` command to display the drive/slot info attached to both DRV1 and DRV2 SAS expanders. For example:

```
wddcs <device> rcli "drv1 show drives"
```

```
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Device: <device>

Slot:DRV  SAS Addr         State    Vendor   Product     FW   Serial
-------------------------------------------------------------------------
 0  :2    5000CCA2C24D358D On -Rdy  WDC W7218A520ORA018T A822 21310BGA9T
 1  :2    5000CCA2C24D551D On -Rdy  WDC W7218A520ORA018T A822 21310BJEGT
 2  :2    5000CCA2C24D27CD On -Rdy  WDC W7218A520ORA018T A822 21310BEDXT
 3  :2    5000CCA284D718A5 On -Rdy  WDC W7218A520ORA018T A822 21300U94VJ
 4  :2    5000CCA2C24D3685 On -Rdy  WDC W7218A520ORA018T A822 21310BGD9T
 5  :2    5000CCA2C24CE49D On -Rdy  WDC W7218A520ORA018T A822 21310B8Y6T
 6  :2    5000CCA2A605B069 On -Rdy  WDC WUH721818AL5201 B820 4ZG33ZTV
 7  :2    5000CCA2C24D27F1 On -Rdy  WDC W7218A520ORA018T A822 21310BEE6T
 8  :2    5000CCA2C24D310D On -Rdy  WDC W7218A520ORA018T A822 21310BG10T
 9  :2    5000CCA2C24B5449 On -Rdy  WDC W7218A520ORA018T A822 21310AE8RT
 10 :2    5000CCA2C2406731 On -Rdy  WDC W7218A520ORA018T A822 213104E02T
 11 :2    5000CCA2C24D2881 On -Rdy  WDC W7218A520ORA018T A822 21310BEGBT
 12 :2    5000CCA2C24B5D85 On -Rdy  WDC W7218A520ORA018T A822 21310AEWTT
 13 :2    5000CCA2C24CE03D On -Rdy  WDC W7218A520ORA018T A822 21310B8N5T
 14 :2    5000CCA2C248EF41 On -Rdy  WDC W7218A520ORA018T A822 2131093G3T
 15 :2    5000CCA2C246FD3D On -Rdy  WDC W7218A520ORA018T A822 21310818YT
 16 :2    5000CCA2C2468BC5 On -Rdy  WDC W7218A520ORA018T A822 213107TRPT
 17 :2    5000CCA2C24D32C5 On -Rdy  WDC W7218A520ORA018T A822 21310BG4KT
 18 :2    5000CCA2C233F3E5 On -Rdy  WDC W7218A520ORA018T A822 21310XKRVT
 19 :2    5000CCA2C24CE375 On -Rdy  WDC W7218A520ORA018T A822 21310B8VUT
 20 :2    5000CCA2C24D371D On -Rdy  WDC W7218A520ORA018T A822 21310BGEJT
 21 :2    5000CCA2C23CD9E9 On -Rdy  WDC W7218A520ORA018T A822 213002GEVT
 22 :2    5000CCA2C235972D On -Rdy  WDC W7218A520ORA018T A822 21310YGNGT
 23 :2    5000CCA2C2468DF5 On -Rdy  WDC W7218A520ORA018T A822 213107TW6T
 24 :2    5000CCA2C24D2789 On -Rdy  WDC W7218A520ORA018T A822 21310BEDBT
 25 :2    5000CCA2C24B5D3D On -Rdy  WDC W7218A520ORA018T A822 21310AEW6T
 26 :2    5000CCA2C24D32A5 On -Rdy  WDC W7218A520ORA018T A822 21310BG49T
 27 :2    5000CCA2C23A40AD On -Rdy  WDC W7218A520ORA018T A822 21310114GT
 28 :2    5000CCA2C24CA095 On -Rdy  WDC W7218A520ORA018T A822 21310B4DST
 29 :2    5000CCA2C24C25B1 On -Rdy  WDC W7218A520ORA018T A822 21310AW71T
 30 :2    5000CCA2C24B197D On -Rdy  WDC W7218A520ORA018T A822 21310A9BAT
 31 :2    5000CCA2C24E8EFD On -Rdy  WDC W7218A520ORA018T A822 21310D6AGT
 32 :2    5000CCA2C23C5F89 On -Rdy  WDC W7218A520ORA018T A822 213002696T
 33 :2    5000CCA2C24C286D On -Rdy  WDC W7218A520ORA018T A822 21310AWDPT
 34 :2    5000CCA2C2406691 On -Rdy  WDC W7218A520ORA018T A822 213104DYTT
```

```
 35 :2    5000CCA2C24D361D On -Rdy  WDC W7218A520ORA018T A822 21310BGBGT
 36 :2    5000CCA2C24D2851 On -Rdy  WDC W7218A520ORA018T A822 21310BEEZT
 37 :2    5000CCA2C247FEC5 On -Rdy  WDC W7218A520ORA018T A822 213108LEMT
 38 :2    5000CCA2C24B536D On -Rdy  WDC W7218A520ORA018T A822 21310AE6YT
 39 :2    5000CCA2C24D27B5 On -Rdy  WDC W7218A520ORA018T A822 21310BEDRT
 40 :2    5000CCA2C24C27C9 On -Rdy  WDC W7218A520ORA018T A822 21310AWBBT
 41 :2    5000CCA2C24B5D41 On -Rdy  WDC W7218A520ORA018T A822 21310AEW7T
 42 :1    5000CCA2C24B5481 On -Rdy  WDC W7218A520ORA018T A822 21310AE95T
 43 :2    5000CCA2C2409601 On -Rdy  WDC W7218A520ORA018T A822 213004J3RT
 44 :2    5000CCA2C24CE4D5 On -Rdy  WDC W7218A520ORA018T A822 21310B8YNT
 45 :2    5000CCA2C24D316D On -Rdy  WDC W7218A520ORA018T A822 21310BG1TT
 46 :2    5000CCA2C24CF17D On -Rdy  WDC W7218A520ORA018T A822 21310B9TTT
 47 :2    5000CCA2C24CDE29 On -Rdy  WDC W7218A520ORA018T A822 21310B8HWT
 48 :2    5000CCA2C24CA059 On -Rdy  WDC W7218A520ORA018T A822 21310B4D8T
 49 :2    5000CCA2C24D709D On -Rdy  WDC W7218A520ORA018T A822 21310BL87T
 50 :2    5000CCA2C244990D On -Rdy  WDC W7218A520ORA018T A822 213006RJ2T
 51 :2    5000CCA2C24CE491 On -Rdy  WDC W7218A520ORA018T A822 21310B8Y3T
 52 :1    5000CCA2C24FEEAD On -Rdy  WDC W7218A520ORA018T A822 21310DYSJT
 53 :1    5000CCA2C24D34E5 On -Rdy  WDC W7218A520ORA018T A822 21310BG8YT
 54 :1    5000CCA2C24D3711 On -Rdy  WDC W7218A520ORA018T A822 21310BGEET
 55 :1    5000CCA2C24CE4F9 On -Rdy  WDC W7218A520ORA018T A822 21310B8YYT
 56 :1    5000CCA2C24D3001 On -Rdy  WDC W7218A520ORA018T A822 21310BEYVT
 57 :1    5000CCA2C24D27DD On -Rdy  WDC W7218A520ORA018T A822 21310BEE1T
 58 :1    5000CCA2C248F499 On -Rdy  WDC W7218A520ORA018T A822 2131093U4T
 59 :1    5000CCA2C24D3099 On -Rdy  WDC W7218A520ORA018T A822 21310BG02T
 60 :1    5000CCA2C24E8E05 On -Rdy  WDC W7218A520ORA018T A822 21310D68GT
 61 :1    5000CCA2C249DBF5 On -Rdy  WDC W7218A520ORA018T A822 213109M6TT
 62 :1    5000CCA2C24D3335 On -Rdy  WDC W7218A520ORA018T A822 21310BG5GT
 63 :1    5000CCA2C24D323D On -Rdy  WDC W7218A520ORA018T A822 21310BG3GT
 64 :1    5000CCA2C24D3131 On -Rdy  WDC W7218A520ORA018T A822 21310BG19T
 65 :1    5000CCA2C24B1A95 On -Rdy  WDC W7218A520ORA018T A822 21310A9ELT
 66 :1    5000CCA2C24D36AD On -Rdy  WDC W7218A520ORA018T A822 21310BGDMT
 67 :1    5000CCA2C24CE4D9 On -Rdy  WDC W7218A520ORA018T A822 21310B8YPT
 68 :1    5000CCA2C24C2689 On -Rdy  WDC W7218A520ORA018T A822 21310AW8TT
 69 :1    5000CCA2C24CE521 On -Rdy  WDC W7218A520ORA018T A822 21310B8Z8T
 70 :1    5000CCA2C24D3459 On -Rdy  WDC W7218A520ORA018T A822 21310BG7UT
 71 :1    5000CCA2C246886D On -Rdy  WDC W7218A520ORA018T A822 213007THTT
 72 :1    5000CCA2C251166D On -Rdy  WDC W7218A520ORA018T A822 21310ELG3T
 73 :1    5000CCA2C24D70C9 On -Rdy  WDC W7218A520ORA018T A822 21310BL8LT
 74 :1    5000CCA2C24D7061 On -Rdy  WDC W7218A520ORA018T A822 21310BL7ST
 75 :1    5000CCA2C24D2859 On -Rdy  WDC W7218A520ORA018T A822 21310BEG1T
 76 :1    5000CCA2C24CF521 On -Rdy  WDC W7218A520ORA018T A822 21310BA19T
 77 :1    5000CCA2C24D32A1 On -Rdy  WDC W7218A520ORA018T A822 21310BG48T
 78 :1    5000CCA2A6025889 On -Rdy  WDC WUH721818AL5201 B820 4ZG18ZUV
 79 :1    5000CCA2C24BF37D On -Rdy  WDC W7218A520ORA018T A822 21310ASWDT
 80 :1    5000CCA2C24CE381 On -Rdy  WDC W7218A520ORA018T A822 21310B8VXT
 81 :1    5000CCA2C24D3111 On -Rdy  WDC W7218A520ORA018T A822 21310BG11T
 82 :1    5000CCA2C24D31D1 On -Rdy  WDC W7218A520ORA018T A822 21310BG2LT
 83 :1    5000CCA2C24955F1 On -Rdy  WDC W7218A520ORA018T A822 213109A93T
 84 :1    5000CCA2C24754F5 On -Rdy  WDC W7218A520ORA018T A822 213108741T
 85 :1    5000CCA2C24C9E09 On -Rdy  WDC W7218A520ORA018T A822 21310B47HT
 86 :1    5000CCA2C24CEEFD On -Rdy  WDC W7218A520ORA018T A822 21310B9MMT
 87 :1    5000CCA2C24B19C9 On -Rdy  WDC W7218A520ORA018T A822 21310A9BYT
 88 :1    5000CCA2C24482C5 On -Rdy  WDC W7218A520ORA018T A822 213006P12T
 89 :1    5000CCA2C24CE3F5 On -Rdy  WDC W7218A520ORA018T A822 21310B8WVT
 90 :1    5000CCA2C24D2FB1 On -Rdy  WDC W7218A520ORA018T A822 21310BEY6T
 91 :1    5000CCA2C24D3241 On -Rdy  WDC W7218A520ORA018T A822 21310BG3HT
 92 :1    5000CCA2C24F2A99 On -Rdy  WDC W7218A520ORA018T A822 21310DJPRT
 93 :1    5000CCA2C24531BD On -Rdy  WDC W7218A520ORA018T A822 2131071P9T
```

```
 94 :1    5000CCA2C24C2681 On -Rdy  WDC W7218A520ORA018T A822 21310AW8RT
 95 :1    5000CCA2C24D36E9 On -Rdy  WDC W7218A520ORA018T A822 21310BGE3T
 96 :1    5000CCA2C24C9D8D On -Rdy  WDC W7218A520ORA018T A822 21310B46HT
 97 :1    5000CCA2C24B1929 On -Rdy  WDC W7218A520ORA018T A822 21310A9ANT
 98 :1    5000CCA2C24B5625 On -Rdy  WDC W7218A520ORA018T A822 21310AEDKT
 99 :1    5000CCA2C24CE879 On -Rdy  WDC W7218A520ORA018T A822 21310B965T
 100:1    5000CCA2C24C267D On -Rdy  WDC W7218A520ORA018T A822 21310AW8PT
 101:1    5000CCA2C24D547D On -Rdy  WDC W7218A520ORA018T A822 21310BJD5T
```

3.8.5 rcli "drv1 show dual"

The `wddcs <device> rcli "drv1 show dual"` command is used to display the dual IOM status info of compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show dual"` command to display the dual IOM status info. For example:

```
wddcs <device> rcli "drv1 show dual"
```

```
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Device: <device>
dualCompatStatus: DUAL_IOM_COMPATIBLE
DualEnabled     : True
IomInit         : True
linkAlive       : True
otherpresent    : True
isSynched       : True
Slot            : A
XO Status       : XO_STS_IS_NXO
isThisActive    : True
isOtherActive   : True
```

3.8.6 rcli "drv1 show enc"

The `wddcs <device> rcli "drv1 show enc"` command is used to display the enclosure, HEM, and IOM info of compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show enc"` command to display the enclosure, HEM, and IOM info. For example:

```
wddcs <device> rcli "drv1 show enc"
```

```
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Device: <device>

Enclosure Information (IOM A)
  ENCL
    CONFIG    : UD102
    PARTNUM   : A214-000039-000-01
    SERIAL    : USCOS01723MB000B
```

```
HEM A
  PARTNUM   : 1EAxxx-xx
  SERIAL    : USxxxxxxxxxxxx
  FW HEM    : 2000-098

IOM A
  PARTNUM   : A214-000038-000-01
  SERIAL    : USCOS01723MC001E
  FW DRV1   : 2000-098
  FW DRV2   : 2000-098
  FW OOBM   : 3.0.51
  MAC       : 00:0C:CA:08:0A:09
  IP ADDR   : Not Provided

HEM B
  PARTNUM   : 1EAxxx-xx
  SERIAL    : USxxxxxxxxxxxx
  FW HEM    : 2000-098

IOM B
  PARTNUM   : 1EAxxx-xx
  SERIAL    : USxxxxxxxxxxxx
  FW DRV1   : 2000-098
  FW DRV2   : 2000-098
  FW OOBM   : 3.0.51
  MAC       : 00:0C:CA:08:09:F5
  IP ADDR   : 10.202.222.132
```

3.8.7 rcli "drv1 show phys"

The `wddcs <device> rcli "drv1 show phys"` command is used to display the PHY information of the DRV1 SAS expander for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show phys"` command to display the PHY information of the DRV1 SAS expander. For example:

```
wddcs <device> rcli "drv1
                show phys"
```

```
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Device: <device>

DRV1 Expander PHYs
 Id  Type  SAS               Rate  Buffering
------------------------------------------------------------------------------
  0 : DRV 5000CCA2C24B5481     12G   None
  1 : DRV 5000CCA2C24FEEAD     12G   None
  2 : DRV 5000CCA2C24D34E5     12G   None
  3 : DRV 5000CCA2C24D3711     12G   None
  4 : DRV 5000CCA2C24CE4F9     12G   None
  5 : DRV 5000CCA2C24D3001     12G   None
  6 : DRV 5000CCA2C24D27DD     12G   None
  7 : DRV 5000CCA2C248F499     12G   None
  8 : DRV 5000CCA2C24D3099     12G   None
```

```
 9 : DRV 5000CCA2C24E8E05     12G   None
10 : DRV 5000CCA2C249DBF5     12G   None
11 : DRV 5000CCA2C24D3335     12G   None
12 : DRV 5000CCA2C24D323D     12G   None
13 : DRV 5000CCA2C24D3131     12G   None
14 : DRV 5000CCA2C24B1A95     12G   None
15 : DRV 5000CCA2C24D36AD     12G   None
16 : DRV 5000CCA2C24CE4D9     12G   None
17 : DRV 5000CCA2C24C2689     12G   None
18 : DRV 5000CCA2C24CE521     12G   None
19 : DRV 5000CCA2C24D3459     12G   None
20 : DRV 5000CCA2C246886D     12G   None
21 : DRV 5000CCA2C251166D     12G   None
22 : DRV 5000CCA2C24D70C9     12G   None
23 : DRV 5000CCA2C24D7061     12G   None
24 : DRV 5000CCA2C24D2859     12G   None
25 : DRV 5000CCA2C24CF521     12G   None
26 : DRV 5000CCA2C24D32A1     12G   None
27 : DRV 5000CCA2A6025889     12G   None
28 : DRV 5000CCA2C24BF37D     12G   None
29 : DRV 5000CCA2C24CE381     12G   None
30 : DRV 5000CCA2C24D3111     12G   None
31 : DRV 5000CCA2C24D31D1     12G   None
32 : DRV 5000CCA2C24955F1     12G   None
33 : DRV 5000CCA2C24754F5     12G   None
34 : DRV 5000CCA2C24C9E09     12G   None
35 : DRV 5000CCA2C24CEEFD     12G   None
36 : DRV 5000CCA2C24B19C9     12G   None
37 : DRV 5000CCA2C24482C5     12G   None
38 : DRV 5000CCA2C24CE3F5     12G   None
39 : DRV 5000CCA2C24D2FB1     12G   None
40 : DRV 5000CCA2C24D3241     12G   None
41 : DRV 5000CCA2C24F2A99     12G   None
42 : DRV 5000CCA2C24531BD     12G   None
43 : DRV 5000CCA2C24C2681     12G   None
44 : DRV 5000CCA2C24D36E9     12G   None
45 : DRV 5000CCA2C24C9D8D     12G   None
46 : DRV 5000CCA2C24B1929     12G   None
47 : DRV 5000CCA2C24B5625     12G   None
48 : DRV 5000CCA2C24CE879     12G   None
49 : DRV 5000CCA2C24C267D     12G   None
50 : DRV 5000CCA2C24D547D     12G   None
51 : INT 5000CCAB05440B37     12G   None
52 : INT 5000CCAB05440B37     12G   None
53 : INT 5000CCAB05440B37     12G   None
54 : INT 5000CCAB05440B37     12G   None
55 : INT 5000CCAB05440B37     12G   None
56 : INT 5000CCAB05440B37     12G   None
57 : INT 5000CCAB05440B37     12G   None
58 : INT 5000CCAB05440B37     12G   None
59 : INT 5000CCAB05440B37     12G   None
60 : INT 5000CCAB05440B37     12G   None
61 : N/C Disabled
62 : N/C Disabled
63 : N/C Disabled
64 : N/C Disabled
65 : N/C Disabled
66 : N/C Disabled
67 : N/C Disabled
```

```
 68 : N/C Disabled
 69 : N/C Disabled
 70 : N/C Disabled
 71 : N/C Disabled
 72 : N/C Disabled
 73 : N/C Disabled
 74 : N/C Disabled
 75 : N/C Disabled
 76 : VRT 5000CCAB05440B3F   SMP Target
 77 : VRT 5000CCAB05440B3E   SSP Target
 78 : VRT 5000CCAB05440B3D   SSP Initiator
 79 : N/C Not Used
```

3.8.8 rcli "drv1 show sensor"

The `wddcs <device> rcli "drv1 show sensor"` command is used to display information for all sensors accesible via the DRV1 SAS expander for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show sensor"` command to display information for all sensors accesible via the DRV1 SAS expander. For example:

```
wddcs <device> rcli "drv1
                show sensor"
```

```
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Device: <device>
 TEMP SLOT 000    (tmpSlot000)       30 DegC
 TEMP SLOT 001    (tmpSlot001)       30 DegC
 TEMP SLOT 002    (tmpSlot002)       30 DegC
 TEMP SLOT 003    (tmpSlot003)       30 DegC
 TEMP SLOT 004    (tmpSlot004)       29 DegC
 TEMP SLOT 005    (tmpSlot005)       29 DegC
 TEMP SLOT 006    (tmpSlot006)       29 DegC
 TEMP SLOT 007    (tmpSlot007)       29 DegC
 TEMP SLOT 008    (tmpSlot008)       30 DegC
 TEMP SLOT 009    (tmpSlot009)       29 DegC
 TEMP SLOT 010    (tmpSlot010)       29 DegC
 TEMP SLOT 011    (tmpSlot011)       30 DegC
 TEMP SLOT 012    (tmpSlot012)       30 DegC
 TEMP SLOT 013    (tmpSlot013)       30 DegC
 TEMP SLOT 014    (tmpSlot014)       34 DegC
 TEMP SLOT 015    (tmpSlot015)       36 DegC
 TEMP SLOT 016    (tmpSlot016)       36 DegC
 TEMP SLOT 017    (tmpSlot017)       36 DegC
 TEMP SLOT 018    (tmpSlot018)       36 DegC
 TEMP SLOT 019    (tmpSlot019)       35 DegC
 TEMP SLOT 020    (tmpSlot020)       35 DegC
 TEMP SLOT 021    (tmpSlot021)       34 DegC
 TEMP SLOT 022    (tmpSlot022)       35 DegC
 TEMP SLOT 023    (tmpSlot023)       35 DegC
 TEMP SLOT 024    (tmpSlot024)       35 DegC
 TEMP SLOT 025    (tmpSlot025)       36 DegC
 TEMP SLOT 026    (tmpSlot026)       35 DegC
 TEMP SLOT 027    (tmpSlot027)       34 DegC
 TEMP SLOT 028    (tmpSlot028)       37 DegC
```

```
TEMP SLOT 029    (tmpSlot029)       40 DegC
TEMP SLOT 030    (tmpSlot030)       41 DegC
TEMP SLOT 031    (tmpSlot031)       41 DegC
TEMP SLOT 032    (tmpSlot032)       41 DegC
TEMP SLOT 033    (tmpSlot033)       41 DegC
TEMP SLOT 034    (tmpSlot034)       39 DegC
TEMP SLOT 035    (tmpSlot035)       39 DegC
TEMP SLOT 036    (tmpSlot036)       41 DegC
TEMP SLOT 037    (tmpSlot037)       41 DegC
TEMP SLOT 038    (tmpSlot038)       41 DegC
TEMP SLOT 039    (tmpSlot039)       41 DegC
TEMP SLOT 040    (tmpSlot040)       40 DegC
TEMP SLOT 041    (tmpSlot041)       38 DegC
TEMP SLOT 042    (tmpSlot042)       39 DegC
TEMP SLOT 043    (tmpSlot043)       43 DegC
TEMP SLOT 044    (tmpSlot044)       45 DegC
TEMP SLOT 045    (tmpSlot045)       46 DegC
TEMP SLOT 046    (tmpSlot046)       46 DegC
TEMP SLOT 047    (tmpSlot047)       43 DegC
TEMP SLOT 048    (tmpSlot048)       42 DegC
TEMP SLOT 049    (tmpSlot049)       45 DegC
TEMP SLOT 050    (tmpSlot050)       45 DegC
TEMP SLOT 051    (tmpSlot051)       45 DegC
TEMP SLOT 052    (tmpSlot052)       43 DegC
TEMP SLOT 053    (tmpSlot053)       39 DegC
TEMP SLOT 054    (tmpSlot054)       40 DegC
TEMP SLOT 055    (tmpSlot055)       39 DegC
TEMP SLOT 056    (tmpSlot056)       39 DegC
TEMP SLOT 057    (tmpSlot057)       39 DegC
TEMP SLOT 058    (tmpSlot058)       38 DegC
TEMP SLOT 059    (tmpSlot059)       36 DegC
TEMP SLOT 060    (tmpSlot060)       35 DegC
TEMP SLOT 061    (tmpSlot061)       37 DegC
TEMP SLOT 062    (tmpSlot062)       39 DegC
TEMP SLOT 063    (tmpSlot063)       40 DegC
TEMP SLOT 064    (tmpSlot064)       40 DegC
TEMP SLOT 065    (tmpSlot065)       41 DegC
TEMP SLOT 066    (tmpSlot066)       43 DegC
TEMP SLOT 067    (tmpSlot067)       44 DegC
TEMP SLOT 068    (tmpSlot068)       44 DegC
TEMP SLOT 069    (tmpSlot069)       44 DegC
TEMP SLOT 070    (tmpSlot070)       45 DegC
TEMP SLOT 071    (tmpSlot071)       42 DegC
TEMP SLOT 072    (tmpSlot072)       41 DegC
TEMP SLOT 073    (tmpSlot073)       44 DegC
TEMP SLOT 074    (tmpSlot074)       45 DegC
TEMP SLOT 075    (tmpSlot075)       45 DegC
TEMP SLOT 076    (tmpSlot076)       45 DegC
TEMP SLOT 077    (tmpSlot077)       44 DegC
TEMP SLOT 078    (tmpSlot078)       44 DegC
TEMP SLOT 079    (tmpSlot079)       46 DegC
TEMP SLOT 080    (tmpSlot080)       47 DegC
TEMP SLOT 081    (tmpSlot081)       48 DegC
TEMP SLOT 082    (tmpSlot082)       47 DegC
TEMP SLOT 083    (tmpSlot083)       45 DegC
TEMP SLOT 084    (tmpSlot084)       43 DegC
TEMP SLOT 085    (tmpSlot085)       46 DegC
TEMP SLOT 086    (tmpSlot086)       47 DegC
TEMP SLOT 087    (tmpSlot087)       47 DegC
```

```
TEMP SLOT 088    (tmpSlot088)       47 DegC
TEMP SLOT 089    (tmpSlot089)       46 DegC
TEMP SLOT 090    (tmpSlot090)       43 DegC
TEMP SLOT 091    (tmpSlot091)       45 DegC
TEMP SLOT 092    (tmpSlot092)       47 DegC
TEMP SLOT 093    (tmpSlot093)       48 DegC
TEMP SLOT 094    (tmpSlot094)       48 DegC
TEMP SLOT 095    (tmpSlot095)       47 DegC
TEMP SLOT 096    (tmpSlot096)       44 DegC
TEMP SLOT 097    (tmpSlot097)       46 DegC
TEMP SLOT 098    (tmpSlot098)       47 DegC
TEMP SLOT 099    (tmpSlot099)       46 DegC
TEMP SLOT 100    (tmpSlot100)       45 DegC
TEMP SLOT 101    (tmpSlot101)       44 DegC
TEMP BB 60 T1    (tmpBB60t1)        33 DegC
TEMP BB 60 T2    (tmpBB60t2)        34 DegC
TEMP BB 42 T1    (tmpBB42t1)        21 DegC
TEMP BB 42 T2    (tmpBB42t2)        21 DegC
TEMP HEM A DIE   (tmpHemADie)       43 DegC
TEMP DRV1 A DIE  (tmpDrv1ADie)      68 DegC
TEMP DRV2 A DIE  (tmpDrv2ADie)      65 DegC
TEMP HEM B DIE   (tmpHemBDie)       42 DegC
TEMP DRV1 B DIE  (tmpDrv1BDie)      70 DegC
TEMP DRV2 B DIE  (tmpDrv2BDie)      69 DegC
TEMP IOM A 5V    (tmpIomA5V)        53 DegC
TEMP IOM B 5V    (tmpIomB5V)        51 DegC
TEMP PSU A AMB   (tmpPsuAAmb)       47 DegC
TEMP PSU A HOT   (tmpPsuAHot)       54 DegC
TEMP PSU A PRI   (tmpPsuAPri)       62 DegC
TEMP PSU B AMB   (tmpPsuBAmb)       43 DegC
TEMP PSU B HOT   (tmpPsuBHot)       55 DegC
TEMP PSU B PRI   (tmpPsuBPri)       61 DegC
VOLT VIN PSU A   (voltVinPsuA)  203500 mV
VOLT VOUT PSU A  (voltVoutPsuA)  12552 mV
VOLT VIN PSU B   (voltVinPsuB)  204250 mV
VOLT VOUT PSU B  (voltVoutPsuB)  12546 mV
VOLT IOM A 5V    (voltIomA5v)     5056 mV
VOLT IOM B 5V    (voltIomB5v)     5068 mV
CURR IN PSU A    (currInPsuA)     2039 mA
CURR OUT PSU A   (currOutPsuA)   30468 mA
CURR IN PSU B    (currInPsuB)     2101 mA
CURR OUT PSU B   (currOutPsuB)   30281 mA
CURR IOM A 5V    (currIomA5v)    28000 mA
CURR IOM B 5V    (currIomB5v)    18250 mA
FAN ENC 1        (rpmEnc1)        7865 RPM
FAN ENC 2        (rpmEnc2)        7875 RPM
FAN ENC 3        (rpmEnc3)        7905 RPM
FAN ENC 4        (rpmEnc4)        7880 RPM
FAN IOM 1        (rpmIom1)       10505 RPM
FAN IOM 2        (rpmIom2)        9280 RPM
FAN PSU A        (rpmPsuA)        8896 RPM
FAN PSU B        (rpmPsuB)        8032 RPM
```

3.8.9 rcli "drv1 show ses"

The `wddcs <device> rcli "drv1 show ses"` command is used to display SES information for a SEP device on compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv1 show ses"` command to display SES information for a SEP device. For example:

```
wddcs <device> rcli "drv1 show ses"
```

```
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Device: <device>

|Status|
Online
Zoning:G2 Zoning 34x2 Config

|Identification|
Vendor:WDC
Product:UData102
SerialNum:USCOS01723MB000B
FwRev:2000-098
Secure Boot: Disabled
FwFeatures: Single-Tenant, Secure FW(DISABLED), OOBM(ENABLED),
 analyze_4_7.xml:4_7

|SES Status|
CONN HOST A6:Not Installed()
CONN HOST B6:Not Installed()
```

3.8.10 rcli "drv2 phyinfo"

The `wddcs <device> rcli "drv2 phyinfo"` command is used to display the DRV2 SAS expander PHY information for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv2 phyinfo"` command to display the DRV2 SAS expander PHY information. For example:

```
wddcs <device> rcli "drv2 phyinfo"
```

```
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Device: <device>
Phy Type Link Route Sas                 Chg  Zone Zone Conn Conn Conn Phy
 Sas  Sata Spin Dcm  Ch   Dcm  Dws  Hot  Com  Com  Com  Dcm
Id       Rate Attr  Address            Cnt  Grp  Info Type Elem Phy  Rdy
 Rdy  Rdy  Up   Rdy  Mask Act  Lost Plug Wake Init Sas  Neg
                                                          Indx Link
        Hold                    Tout               Fail
-------------------------------------------------------------------------
0   End* 12G    T   0x5000cca2c24d358d  0x01 0x0b 0x05 0x20 0x00 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
1   End* 12G    T   0x5000cca2c24d551d  0x01 0x0b 0x05 0x20 0x01 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
```

```
2   End* 12G    T   0x5000cca2c24d27cd  0x01 0x0b 0x05 0x20 0x02 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
3   End* 12G    T   0x5000cca284d718a5  0x01 0x0b 0x05 0x20 0x03 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
4   End* 12G    T   0x5000cca2c24d3685  0x01 0x0b 0x05 0x20 0x04 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
5   End* 12G    T   0x5000cca2c24ce49d  0x01 0x0b 0x05 0x20 0x05 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
6   End* 12G    T   0x5000cca2a605b069  0x01 0x0b 0x05 0x20 0x06 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
7   End* 12G    T   0x5000cca2c24d27f1  0x01 0x0b 0x05 0x20 0x07 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
8   End* 12G    T   0x5000cca2c24d310d  0x01 0x0b 0x05 0x20 0x08 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
9   End* 12G    T   0x5000cca2c24b5449  0x01 0x0b 0x05 0x20 0x09 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
10  End* 12G    T   0x5000cca2c2406731  0x01 0x0b 0x05 0x20 0x0a 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
11  End* 12G    T   0x5000cca2c24d2881  0x01 0x0b 0x05 0x20 0x0b 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
12  End* 12G    T   0x5000cca2c24b5d85  0x01 0x0b 0x05 0x20 0x0c 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
13  End* 12G    T   0x5000cca2c24ce03d  0x01 0x0b 0x05 0x20 0x0d 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
14  End* 12G    T   0x5000cca2c248ef41  0x01 0x0b 0x05 0x20 0x0e 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
15  End* 12G    T   0x5000cca2c246fd3d  0x01 0x0b 0x05 0x20 0x0f 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
16  End* 12G    T   0x5000cca2c2468bc5  0x01 0x0b 0x05 0x20 0x10 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
17  End* 12G    T   0x5000cca2c24d32c5  0x01 0x0b 0x05 0x20 0x11 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
18  End* 12G    T   0x5000cca2c233f3e5  0x01 0x0b 0x05 0x20 0x12 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
19  End* 12G    T   0x5000cca2c24ce375  0x01 0x0b 0x05 0x20 0x13 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
20  End* 12G    T   0x5000cca2c24d371d  0x01 0x0b 0x05 0x20 0x14 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
21  End* 12G    T   0x5000cca2c23cd9e9  0x01 0x0b 0x05 0x20 0x15 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
22  End* 12G    T   0x5000cca2c235972d  0x01 0x0b 0x05 0x20 0x16 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
23  End* 12G    T   0x5000cca2c2468df5  0x01 0x0b 0x05 0x20 0x17 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
24  End* 12G    T   0x5000cca2c24d2789  0x01 0x0b 0x05 0x20 0x18 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
25  End* 12G    T   0x5000cca2c24b5d3d  0x01 0x0b 0x05 0x20 0x19 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
26  End* 12G    T   0x5000cca2c24d32a5  0x01 0x0b 0x05 0x20 0x1a 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
27  End* 12G    T   0x5000cca2c23a40ad  0x01 0x0b 0x05 0x20 0x1b 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
28  End* 12G    T   0x5000cca2c24ca095  0x01 0x0b 0x05 0x20 0x1c 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
29  End* 12G    T   0x5000cca2c24c25b1  0x01 0x0b 0x05 0x20 0x1d 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
30  End* 12G    T   0x5000cca2c24b197d  0x01 0x0b 0x05 0x20 0x1e 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
```

```
31  End* 12G    T   0x5000cca2c24e8efd  0x01 0x0b 0x05 0x20 0x1f 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
32  End* 12G    T   0x5000cca2c23c5f89  0x01 0x0b 0x05 0x20 0x20 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
33  End* 12G    T   0x5000cca2c24c286d  0x01 0x0b 0x05 0x20 0x21 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
34  End* 12G    T   0x5000cca2c2406691  0x04 0x0c 0x05 0x20 0x22 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
35  End* 12G    T   0x5000cca2c24d361d  0x04 0x0c 0x05 0x20 0x23 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
36  End* 12G    T   0x5000cca2c24d2851  0x04 0x0c 0x05 0x20 0x24 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
37  End* 12G    T   0x5000cca2c247fec5  0x04 0x0c 0x05 0x20 0x25 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
38  End* 12G    T   0x5000cca2c24b536d  0x04 0x0c 0x05 0x20 0x26 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
39  End* 12G    T   0x5000cca2c24d27b5  0x04 0x0c 0x05 0x20 0x27 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
40  End* 12G    T   0x5000cca2c24c27c9  0x04 0x0c 0x05 0x20 0x28 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
41  End* 12G    T   0x5000cca2c24b5d41  0x04 0x0c 0x05 0x20 0x29 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
42  End* 12G    T   0x5000cca2c2409601  0x04 0x0c 0x05 0x20 0x2a 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
43  End* 12G    T   0x5000cca2c24ce4d5  0x04 0x0c 0x05 0x20 0x2b 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
44  End* 12G    T   0x5000cca2c24d316d  0x04 0x0c 0x05 0x20 0x2c 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
45  End* 12G    T   0x5000cca2c24cf17d  0x04 0x0c 0x05 0x20 0x2d 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
46  End* 12G    T   0x5000cca2c24cde29  0x04 0x0c 0x05 0x20 0x2e 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
47  End* 12G    T   0x5000cca2c24ca059  0x04 0x0c 0x05 0x20 0x2f 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
48  End* 12G    T   0x5000cca2c24d709d  0x04 0x0c 0x05 0x20 0x30 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
49  End* 12G    T   0x5000cca2c244990d  0x04 0x0c 0x05 0x20 0x31 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
50  End* 12G    T   0x5000cca2c24ce491  0x04 0x0c 0x05 0x20 0x32 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
51  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
52  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
53  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
54  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
55  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
56  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
57  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
58  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
59  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
```

```
60  Exp  12G    T   0x5000ccab05440b37  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
61  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
62  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
63  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
64  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
65  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
66  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
67  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
68  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
69  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
70  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
71  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
72  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
73  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
74  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
75  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
```

3.8.11 rcli "drv2 phyinfo buffer"

The `wddcs <device> rcli "drv2 phyinfo buffer"` command is used to display the DRV2 SAS expander PHY buffer information for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv2 phyinfo buffer"` command to display the DRV2 SAS expander PHY buffer information. For example:

```
wddcs <device> rcli "drv2 phyinfo buffer"
```

```
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Device: <device>
PHY  Link  Drv    Buffer  SAS     SAS     SAS     SATA    SATA    Conn
 Conn  OAF    Snoop
ID   Rate  Link   Enable  Buffer  Buffer  Buffer  Buffer  Buffer  Mgmt
 Mgmt  Early  TMF
           Rate           3G      6G      12G     3G      6G      3/6/12G
 24G   Accept
--------------------------------------------------------------------------------
0    12G   12G    -       -       *       -       -       *       -        -
    -      -
```

```
1    12G   12G   -     -     *     -     -     *     -     -
     -     -
2    12G   12G   -     -     *     -     -     *     -     -
     -     -
3    12G   12G   -     -     *     -     -     *     -     -
     -     -
4    12G   12G   -     -     *     -     -     *     -     -
     -     -
5    12G   12G   -     -     *     -     -     *     -     -
     -     -
6    12G   12G   -     -     *     -     -     *     -     -
     -     -
7    12G   12G   -     -     *     -     -     *     -     -
     -     -
8    12G   12G   -     -     *     -     -     *     -     -
     -     -
9    12G   12G   -     -     *     -     -     *     -     -
     -     -
10   12G   12G   -     -     *     -     -     *     -     -
     -     -
11   12G   12G   -     -     *     -     -     *     -     -
     -     -
12   12G   12G   -     -     *     -     -     *     -     -
     -     -
13   12G   12G   -     -     *     -     -     *     -     -
     -     -
14   12G   12G   -     -     *     -     -     *     -     -
     -     -
15   12G   12G   -     -     *     -     -     *     -     -
     -     -
16   12G   12G   -     -     *     -     -     *     -     -
     -     -
17   12G   12G   -     -     *     -     -     *     -     -
     -     -
18   12G   12G   -     -     *     -     -     *     -     -
     -     -
19   12G   12G   -     -     *     -     -     *     -     -
     -     -
20   12G   12G   -     -     *     -     -     *     -     -
     -     -
21   12G   12G   -     -     *     -     -     *     -     -
     -     -
22   12G   12G   -     -     *     -     -     *     -     -
     -     -
23   12G   12G   -     -     *     -     -     *     -     -
     -     -
24   12G   12G   -     -     *     -     -     *     -     -
     -     -
25   12G   12G   -     -     *     -     -     *     -     -
     -     -
26   12G   12G   -     -     *     -     -     *     -     -
     -     -
27   12G   12G   -     -     *     -     -     *     -     -
     -     -
28   12G   12G   -     -     *     -     -     *     -     -
     -     -
29   12G   12G   -     -     *     -     -     *     -     -
     -     -
```

```
30   12G   12G     -       -       *       -       -       *       -       -
     -     -
31   12G   12G     -       -       *       -       -       *       -       -
     -     -
32   12G   12G     -       -       *       -       -       *       -       -
     -     -
33   12G   12G     -       -       *       -       -       *       -       -
     -     -
34   12G   12G     -       -       *       -       -       *       -       -
     -     -
35   12G   12G     -       -       *       -       -       *       -       -
     -     -
36   12G   12G     -       -       *       -       -       *       -       -
     -     -
37   12G   12G     -       -       *       -       -       *       -       -
     -     -
38   12G   12G     -       -       *       -       -       *       -       -
     -     -
39   12G   12G     -       -       *       -       -       *       -       -
     -     -
40   12G   12G     -       -       *       -       -       *       -       -
     -     -
41   12G   12G     -       -       *       -       -       *       -       -
     -     -
42   12G   12G     -       -       *       -       -       *       -       -
     -     -
43   12G   12G     -       -       *       -       -       *       -       -
     -     -
44   12G   12G     -       -       *       -       -       *       -       -
     -     -
45   12G   12G     -       -       *       -       -       *       -       -
     -     -
46   12G   12G     -       -       *       -       -       *       -       -
     -     -
47   12G   12G     -       -       *       -       -       *       -       -
     -     -
48   12G   12G     -       -       *       -       -       *       -       -
     -     -
49   12G   12G     -       -       *       -       -       *       -       -
     -     -
50   12G   12G     -       -       *       -       -       *       -       -
     -     -
51   12G   12G     -       -       *       -       -       *       -       -
     -     -
52   12G   12G     -       -       *       -       -       *       -       -
     -     -
53   12G   12G     -       -       *       -       -       *       -       -
     -     -
54   12G   12G     -       -       *       -       -       *       -       -
     -     -
55   12G   12G     -       -       *       -       -       *       -       -
     -     -
56   12G   12G     -       -       *       -       -       *       -       -
     -     -
57   12G   12G     -       -       *       -       -       *       -       -
     -     -
58   12G   12G     -       -       *       -       -       *       -       -
     -     -
```

```
59   12G   12G    -       -       *       -       -       *       -       -
    -       -
60   12G   12G    -       -       *       -       -       *       -       -
    -       -
61   ---   ---    -       -       *       -       -       *       -       -
    -       -
62   ---   ---    -       -       *       -       -       *       -       -
    -       -
63   ---   ---    -       -       *       -       -       *       -       -
    -       -
64   ---   ---    -       -       *       -       -       *       -       -
    -       -
65   ---   ---    -       -       *       -       -       *       -       -
    -       -
66   ---   ---    -       -       *       -       -       *       -       -
    -       -
67   ---   ---    -       -       *       -       -       *       -       -
    -       -
68   ---   ---    -       -       *       -       -       *       -       -
    -       -
69   ---   ---    -       -       *       -       -       *       -       -
    -       -
70   ---   ---    -       -       *       -       -       *       -       -
    -       -
71   ---   ---    -       -       *       -       -       *       -       -
    -       -
72   ---   ---    -       -       *       -       -       *       -       -
    -       -
73   ---   ---    -       -       *       -       -       *       -       -
    -       -
74   ---   ---    -       -       *       -       -       *       -       -
    -       -
75   ---   ---    -       -       *       -       -       *       -       -
    -       -
```

3.8.12 rcli "drv2 show phys"

The `wddcs <device> rcli "drv2 show phys"` command is used to display the PHY information of the DRV2 SAS expander for compatible platforms.

Step 1: Use the `wddcs <device> rcli "drv2 show phys"` command to display the PHY information of the DRV2 SAS expander. For example:

```
wddcs <device> rcli "drv2 show phys"
```

```
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Device: <device>

DRV2 Expander PHYs
 Id  Type  SAS                Rate  Buffering
------------------------------------------------------------------------------
  0 : DRV 5000CCA2C24D358D     12G   None
  1 : DRV 5000CCA2C24D551D     12G   None
  2 : DRV 5000CCA2C24D27CD     12G   None
  3 : DRV 5000CCA284D718A5     12G   None
```

```
 4 : DRV 5000CCA2C24D3685     12G   None
 5 : DRV 5000CCA2C24CE49D     12G   None
 6 : DRV 5000CCA2A605B069     12G   None
 7 : DRV 5000CCA2C24D27F1     12G   None
 8 : DRV 5000CCA2C24D310D     12G   None
 9 : DRV 5000CCA2C24B5449     12G   None
10 : DRV 5000CCA2C2406731     12G   None
11 : DRV 5000CCA2C24D2881     12G   None
12 : DRV 5000CCA2C24B5D85     12G   None
13 : DRV 5000CCA2C24CE03D     12G   None
14 : DRV 5000CCA2C248EF41     12G   None
15 : DRV 5000CCA2C246FD3D     12G   None
16 : DRV 5000CCA2C2468BC5     12G   None
17 : DRV 5000CCA2C24D32C5     12G   None
18 : DRV 5000CCA2C233F3E5     12G   None
19 : DRV 5000CCA2C24CE375     12G   None
20 : DRV 5000CCA2C24D371D     12G   None
21 : DRV 5000CCA2C23CD9E9     12G   None
22 : DRV 5000CCA2C235972D     12G   None
23 : DRV 5000CCA2C2468DF5     12G   None
24 : DRV 5000CCA2C24D2789     12G   None
25 : DRV 5000CCA2C24B5D3D     12G   None
26 : DRV 5000CCA2C24D32A5     12G   None
27 : DRV 5000CCA2C23A40AD     12G   None
28 : DRV 5000CCA2C24CA095     12G   None
29 : DRV 5000CCA2C24C25B1     12G   None
30 : DRV 5000CCA2C24B197D     12G   None
31 : DRV 5000CCA2C24E8EFD     12G   None
32 : DRV 5000CCA2C23C5F89     12G   None
33 : DRV 5000CCA2C24C286D     12G   None
34 : DRV 5000CCA2C2406691     12G   None
35 : DRV 5000CCA2C24D361D     12G   None
36 : DRV 5000CCA2C24D2851     12G   None
37 : DRV 5000CCA2C247FEC5     12G   None
38 : DRV 5000CCA2C24B536D     12G   None
39 : DRV 5000CCA2C24D27B5     12G   None
40 : DRV 5000CCA2C24C27C9     12G   None
41 : DRV 5000CCA2C24B5D41     12G   None
42 : DRV 5000CCA2C2409601     12G   None
43 : DRV 5000CCA2C24CE4D5     12G   None
44 : DRV 5000CCA2C24D316D     12G   None
45 : DRV 5000CCA2C24CF17D     12G   None
46 : DRV 5000CCA2C24CDE29     12G   None
47 : DRV 5000CCA2C24CA059     12G   None
48 : DRV 5000CCA2C24D709D     12G   None
49 : DRV 5000CCA2C244990D     12G   None
50 : DRV 5000CCA2C24CE491     12G   None
51 : INT 5000CCAB05440B37     12G   None
52 : INT 5000CCAB05440B37     12G   None
53 : INT 5000CCAB05440B37     12G   None
54 : INT 5000CCAB05440B37     12G   None
55 : INT 5000CCAB05440B37     12G   None
56 : INT 5000CCAB05440B37     12G   None
57 : INT 5000CCAB05440B37     12G   None
58 : INT 5000CCAB05440B37     12G   None
59 : INT 5000CCAB05440B37     12G   None
60 : INT 5000CCAB05440B37     12G   None
61 : N/C Disabled
62 : N/C Disabled
```

```
 63 : N/C Disabled
 64 : N/C Disabled
 65 : N/C Disabled
 66 : N/C Disabled
 67 : N/C Disabled
 68 : N/C Disabled
 69 : N/C Disabled
 70 : N/C Disabled
 71 : N/C Disabled
 72 : N/C Disabled
 73 : N/C Disabled
 74 : N/C Disabled
 75 : N/C Disabled
 76 : VRT 5000CCAB05440B7F   SMP Target
 77 : VRT 5000CCAB05440B7E   SSP Target
 78 : VRT 5000CCAB05440B7D   SSP Initiator
 79 : N/C Not Used
```

3.8.13 rcli "hema show hosts"

The `wddcs <device> rcli "hema show hosts"` command is used to display the host connection information for HEM A on supported platforms.

Step 1: Use the `wddcs <device> rcli "hema show hosts"` command to display the host connection information for HEM A. For example:

```
wddcs <device> rcli "hema show hosts"
```

```
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Device: <device>

CONN HOST A1 : OK, Cable(-): ZG:08 LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY  0 :   12G : 0x500062B211A5C148 : Ready
  PHY  1 :   12G : 0x500062B211A5C148 : Ready
  PHY  2 :   12G : 0x500062B211A5C148 : Ready
  PHY  3 :   12G : 0x500062B211A5C148 : Ready

CONN HOST A2 : OK, Cable(-): ZG:08 LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY  4 :   12G : 0x500062B211A5C148 : Ready
  PHY  5 :   12G : 0x500062B211A5C148 : Ready
  PHY  6 :   12G : 0x500062B211A5C148 : Ready
  PHY  7 :   12G : 0x500062B211A5C148 : Ready

CONN HOST A3 : OK, Cable(-): ZG:09 LEN: 2m, Amphenol, 601760005 ( 3G 6G 12G )
  PHY  8 :   12G : 0x500062B2095F7840 : Ready
  PHY  9 :   12G : 0x500062B2095F7840 : Ready
  PHY 10 :   12G : 0x500062B2095F7840 : Ready
  PHY 11 :   12G : 0x500062B2095F7840 : Ready

CONN HOST A4 : OK, Cable(-): ZG:09 LEN: 2m, Amphenol, 601760006 ( 3G 6G )
  PHY 12 :   12G : 0x500062B2095F7840 : Ready
  PHY 13 :   12G : 0x500062B2095F7840 : Ready
  PHY 14 :   12G : 0x500062B2095F7840 : Ready
```

```
  PHY 15 :   12G : 0x500062B2095F7840 : Ready

CONN HOST A5 : OK, Cable(-): ZG:0A LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY 16 :   12G : 0x500062B211A505C0 : Ready
  PHY 17 :   12G : 0x500062B211A505C0 : Ready
  PHY 18 :   12G : 0x500062B211A505C0 : Ready
  PHY 19 :   12G : 0x500062B211A505C0 : Ready

CONN HOST A6 : Not Installed
  PHY 20 :       : ------------------ : No Link
  PHY 21 :       : ------------------ : No Link
  PHY 22 :       : ------------------ : No Link
  PHY 23 :       : ------------------ : No Link
```

3.8.14 rcli "hema show phys"

The `wddcs <device> rcli "hema show phys"` command is used to display the PHY information for HEM A for supported platforms.

Step 1: Use the `wddcs <device> rcli "hema show phys"` command to display the PHY information for HEM A. For example:

```
wddcs <device> rcli "hema show phys"
```

```
wddcs v4.2.2.0
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Device: <device>

HEM Expander PHYs
 Id  Type  SAS               Rate  Buffering
------------------------------------------------------------------------------
  0 : HST 500062B211A5C148     12G   None
  1 : HST 500062B211A5C148     12G   None
  2 : HST 500062B211A5C148     12G   None
  3 : HST 500062B211A5C148     12G   None
  4 : HST 500062B211A5C148     12G   None
  5 : HST 500062B211A5C148     12G   None
  6 : HST 500062B211A5C148     12G   None
  7 : HST 500062B211A5C148     12G   None
  8 : HST 500062B2095F7840     12G   None
  9 : HST 500062B2095F7840     12G   None
 10 : HST 500062B2095F7840     12G   None
 11 : HST 500062B2095F7840     12G   None
 12 : HST 500062B2095F7840     12G   None
 13 : HST 500062B2095F7840     12G   None
 14 : HST 500062B2095F7840     12G   None
 15 : HST 500062B2095F7840     12G   None
 16 : HST 500062B211A505C0     12G   None
 17 : HST 500062B211A505C0     12G   None
 18 : HST 500062B211A505C0     12G   None
 19 : HST 500062B211A505C0     12G   None
 20 : HST
 21 : HST
 22 : HST
 23 : HST
```

```
 24 : INT 5000CCAB05440B3F     12G   None
 25 : INT 5000CCAB05440B3F     12G   None
 26 : INT 5000CCAB05440B3F     12G   None
 27 : INT 5000CCAB05440B3F     12G   None
 28 : INT 5000CCAB05440B3F     12G   None
 29 : INT 5000CCAB05440B3F     12G   None
 30 : INT 5000CCAB05440B3F     12G   None
 31 : INT 5000CCAB05440B3F     12G   None
 32 : INT 5000CCAB05440B3F     12G   None
 33 : INT 5000CCAB05440B3F     12G   None
 34 : INT 5000CCAB05440B7F     12G   None
 35 : INT 5000CCAB05440B7F     12G   None
 36 : INT 5000CCAB05440B7F     12G   None
 37 : INT 5000CCAB05440B7F     12G   None
 38 : INT 5000CCAB05440B7F     12G   None
 39 : INT 5000CCAB05440B7F     12G   None
 40 : INT 5000CCAB05440B7F     12G   None
 41 : INT 5000CCAB05440B7F     12G   None
 42 : INT 5000CCAB05440B7F     12G   None
 43 : INT 5000CCAB05440B7F     12G   None
 44 : IOC 5000CCAB05440B77     12G   None
 45 : IOC 5000CCAB05440B77     12G   None
 46 : N/C Disabled
 47 : N/C Disabled
 48 : N/C Disabled
 49 : N/C Disabled
 50 : N/C Disabled
 51 : N/C Disabled
 52 : N/C Disabled
 53 : N/C Disabled
 54 : N/C Disabled
 55 : N/C Disabled
 56 : VRT 5000CCAB05440B37   SMP Target
 57 : VRT 5000CCAB05440B36   SSP Target
 58 : VRT 5000CCAB05440B35   SSP Initiator
 59 : N/C Not Used
```

3.8.15 rcli "hemb show hosts"

The `wddcs <device> rcli "hemb show hosts"` command is used to display the host connection information for HEM B on supported platforms.

Step 1: Use the `wddcs <device> rcli "hemb show hosts"` command to display the host connection information for HEM B. For example:

```
wddcs <device> rcli "hemb show hosts"
```

```
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Device: <device>

CONN HOST B1 : OK, Cable(-): ZG:08 LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY  0 :   12G : 0x500062B211A5C140 : Ready
  PHY  1 :   12G : 0x500062B211A5C140 : Ready
  PHY  2 :   12G : 0x500062B211A5C140 : Ready
```

```
  PHY  3 :   12G : 0x500062B211A5C140 : Ready

CONN HOST B2 : OK, Cable(-): ZG:08 LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY  4 :   12G : 0x500062B211A5C140 : Ready
  PHY  5 :   12G : 0x500062B211A5C140 : Ready
  PHY  6 :   12G : 0x500062B211A5C140 : Ready
  PHY  7 :   12G : 0x500062B211A5C140 : Ready

CONN HOST B3 : OK, Cable(-): ZG:09 LEN: 2m, Amphenol, 601760006 ( 3G 6G 12G )
  PHY  8 :   12G : 0x500062B2095F7848 : Ready
  PHY  9 :   12G : 0x500062B2095F7848 : Ready
  PHY 10 :   12G : 0x500062B2095F7848 : Ready
  PHY 11 :   12G : 0x500062B2095F7848 : Ready

CONN HOST B4 : OK, Cable(-): ZG:09 LEN: 2m, Amphenol, 601760006 ( 3G 6G 12G )
  PHY 12 :   12G : 0x500062B2095F7848 : Ready
  PHY 13 :   12G : 0x500062B2095F7848 : Ready
  PHY 14 :   12G : 0x500062B2095F7848 : Ready
  PHY 15 :   12G : 0x500062B2095F7848 : Ready

CONN HOST B5 : OK, Cable(-): ZG:0A LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY 16 :   12G : 0x500062B211A505C1 : Ready
  PHY 17 :   12G : 0x500062B211A505C1 : Ready
  PHY 18 :   12G : 0x500062B211A505C1 : Ready
  PHY 19 :   12G : 0x500062B211A505C1 : Ready

CONN HOST B6 : Not Installed
  PHY 20 :       : ------------------ : No Link
  PHY 21 :       : ------------------ : No Link
  PHY 22 :       : ------------------ : No Link
  PHY 23 :       : ------------------ : No Link
```

3.8.16 rcli "hemb show phys"

The `wddcs <device> rcli "hemb show phys"` command is used to display the PHY information for HEM B for supported platforms.

Step 1: Use the `wddcs <device> rcli "hemb show phys"` command to display the PHY information for HEM B. For example:

```
wddcs <device> rcli "hemb show phys"
```

```
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Device: <device>

HEM Expander PHYs
 Id  Type  SAS               Rate  Buffering
------------------------------------------------------------------------------
  0 : HST 500062B211A5C140     12G   None
  1 : HST 500062B211A5C140     12G   None
  2 : HST 500062B211A5C140     12G   None
  3 : HST 500062B211A5C140     12G   None
  4 : HST 500062B211A5C140     12G   None
```

```
 5 : HST 500062B211A5C140     12G   None
 6 : HST 500062B211A5C140     12G   None
 7 : HST 500062B211A5C140     12G   None
 8 : HST 500062B2095F7848     12G   None
 9 : HST 500062B2095F7848     12G   None
10 : HST 500062B2095F7848     12G   None
11 : HST 500062B2095F7848     12G   None
12 : HST 500062B2095F7848     12G   None
13 : HST 500062B2095F7848     12G   None
14 : HST 500062B2095F7848     12G   None
15 : HST 500062B2095F7848     12G   None
16 : HST 500062B211A505C1     12G   None
17 : HST 500062B211A505C1     12G   None
18 : HST 500062B211A505C1     12G   None
19 : HST 500062B211A505C1     12G   None
20 : HST
21 : HST
22 : HST
23 : HST
24 : INT 5000CCAB05440B3B     12G   None
25 : INT 5000CCAB05440B3B     12G   None
26 : INT 5000CCAB05440B3B     12G   None
27 : INT 5000CCAB05440B3B     12G   None
28 : INT 5000CCAB05440B3B     12G   None
29 : INT 5000CCAB05440B3B     12G   None
30 : INT 5000CCAB05440B3B     12G   None
31 : INT 5000CCAB05440B3B     12G   None
32 : INT 5000CCAB05440B3B     12G   None
33 : INT 5000CCAB05440B3B     12G   None
34 : INT 5000CCAB05440B7B     12G   None
35 : INT 5000CCAB05440B7B     12G   None
36 : INT 5000CCAB05440B7B     12G   None
37 : INT 5000CCAB05440B7B     12G   None
38 : INT 5000CCAB05440B7B     12G   None
39 : INT 5000CCAB05440B7B     12G   None
40 : INT 5000CCAB05440B7B     12G   None
41 : INT 5000CCAB05440B7B     12G   None
42 : INT 5000CCAB05440B7B     12G   None
43 : INT 5000CCAB05440B7B     12G   None
44 : IOC 5000CCAB05440B37     12G   None
45 : IOC 5000CCAB05440B37     12G   None
46 : N/C Disabled
47 : N/C Disabled
48 : N/C Disabled
49 : N/C Disabled
50 : N/C Disabled
51 : N/C Disabled
52 : N/C Disabled
53 : N/C Disabled
54 : N/C Disabled
55 : N/C Disabled
56 : VRT 5000CCAB05440B77   SMP Target
57 : VRT 5000CCAB05440B76   SSP Target
58 : VRT 5000CCAB05440B75   SSP Initiator
59 : N/C Not Used
```

3.8.17 rcli "hem phyinfo"

The `wddcs <device> rcli "hem phyinfo"` command is used to display the HEM SAS expander PHY information for compatible platforms.

Step 1: Use the `wddcs <device> rcli "hem phyinfo"` command to display the HEM SAS expander PHY information. For example:

```
wddcs <device> rcli "hem phyinfo"
```

```
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Device: <device>
Phy Type Link Route Sas                 Chg  Zone Zone Conn Conn Conn Phy
 Sas  Sata Spin Dcm  Ch   Dcm  Dws  Hot  Com  Com  Com  Dcm
Id       Rate Attr  Address            Cnt  Grp  Info Type Elem Phy  Rdy
 Rdy  Rdy  Up   Rdy  Mask Act  Lost Plug Wake Init Sas  Neg
                                                          Indx Link
        Hold                    Tout               Fail
-------------------------------------------------------------------------
0   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
1   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
2   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
3   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
4   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
5   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
6   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
7   End  12G    T   0x500062b211a5c148  0x0b 0x08 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
8   End  12G    T   0x500062b2095f7840  0x01 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
9   End  12G    T   0x500062b2095f7840  0x01 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
10  End  12G    T   0x500062b2095f7840  0x02 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
11  End  12G    T   0x500062b2095f7840  0x02 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
12  End  12G    T   0x500062b2095f7840  0x02 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
13  End  12G    T   0x500062b2095f7840  0x02 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
14  End  12G    T   0x500062b2095f7840  0x02 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
15  End  12G    T   0x500062b2095f7840  0x02 0x09 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x01 0x01 0x00
16  End  12G    T   0x500062b211a505c0  0x01 0x0a 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
17  End  12G    T   0x500062b211a505c0  0x01 0x0a 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
```

```
18  End  12G    T   0x500062b211a505c0  0x01 0x0a 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
19  End  12G    T   0x500062b211a505c0  0x01 0x0a 0x05 0x05 0x6a 0x03 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
20  ---  ---    T   ---                 0x00 0x0a 0x05 0x05 0x6a 0x03 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
21  ---  ---    T   ---                 0x00 0x0a 0x05 0x05 0x6a 0x03 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
22  ---  ---    T   ---                 0x00 0x0a 0x05 0x05 0x6a 0x03 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
23  ---  ---    T   ---                 0x00 0x0a 0x05 0x05 0x6a 0x03 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
24  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
25  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
26  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
27  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
28  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
29  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
30  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
31  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
32  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
33  Exp  12G    T   0x5000ccab05440b3f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
34  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
35  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
36  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
37  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
38  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
39  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
40  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
41  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
42  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
43  Exp  12G    T   0x5000ccab05440b7f  0x02 0x01 0x37 0x12 0x00 0x09 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
44  Exp  12G    T   0x5000ccab05440b77  0x02 0x01 0x37 0x20 0x20 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
45  Exp  12G    T   0x5000ccab05440b77  0x02 0x01 0x37 0x20 0x21 0x00 0x01
 0x01 0x00 0x00 ---- ---- ---- 0x01 0x00 0x01 0x00 0x01 0x00
46  ---  ---    T   ---                 0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
```

```
47  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
48  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
49  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
50  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
51  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
52  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
53  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
54  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
55  ---  ---    T   ---                0x00 0x00 0x05 0x00 0x00 0x00 0x00
 0x00 0x00 0x00 ---- ---- ---- 0x00 0x00 0x01 0x00 0x00 0x00
```

3.8.18 rcli "hem phyinfo buffer"

The `wddcs <device> rcli "hem phyinfo buffer"` command is used to display the HEM SAS expander PHY buffer information for compatible platforms.

Step 1: Use the `wddcs <device> rcli "hem phyinfo buffer"` command to display the HEM SAS expander PHY buffer information. For example:

```
wddcs <device> rcli "hem phyinfo buffer"
```

```
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Device: <device>
PHY  Link  Drv    Buffer  SAS     SAS     SAS     SATA    SATA    Conn
 Conn  OAF    Snoop
ID   Rate  Link   Enable  Buffer  Buffer  Buffer  Buffer  Buffer  Mgmt
 Mgmt  Early  TMF
           Rate           3G      6G      12G     3G      6G      3/6/12G
 24G   Accept
-------------------------------------------------------------------------------
0    12G   12G    -       -       *       -       -       *       -        -
    -      -
1    12G   12G    -       -       *       -       -       *       -        -
    -      -
2    12G   12G    -       -       *       -       -       *       -        -
    -      -
3    12G   12G    -       -       *       -       -       *       -        -
    -      -
4    12G   12G    -       -       *       -       -       *       -        -
    -      -
5    12G   12G    -       -       *       -       -       *       -        -
    -      -
6    12G   12G    -       -       *       -       -       *       -        -
    -      -
7    12G   12G    -       -       *       -       -       *       -        -
    -      -
```

```
8    12G   12G    -       -       *       -       -       *       -       -
     -     -
9    12G   12G    -       -       *       -       -       *       -       -
     -     -
10   12G   12G    -       -       *       -       -       *       -       -
     -     -
11   12G   12G    -       -       *       -       -       *       -       -
     -     -
12   12G   12G    -       -       *       -       -       *       -       -
     -     -
13   12G   12G    -       -       *       -       -       *       -       -
     -     -
14   12G   12G    -       -       *       -       -       *       -       -
     -     -
15   12G   12G    -       -       *       -       -       *       -       -
     -     -
16   12G   12G    -       -       *       -       -       *       -       -
     -     -
17   12G   12G    -       -       *       -       -       *       -       -
     -     -
18   12G   12G    -       -       *       -       -       *       -       -
     -     -
19   12G   12G    -       -       *       -       -       *       -       -
     -     -
20   ---   ---    -       -       *       -       -       *       -       -
     -     -
21   ---   ---    -       -       *       -       -       *       -       -
     -     -
22   ---   ---    -       -       *       -       -       *       -       -
     -     -
23   ---   ---    -       -       *       -       -       *       -       -
     -     -
24   12G   12G    -       -       *       -       -       *       -       -
     -     -
25   12G   12G    -       -       *       -       -       *       -       -
     -     -
26   12G   12G    -       -       *       -       -       *       -       -
     -     -
27   12G   12G    -       -       *       -       -       *       -       -
     -     -
28   12G   12G    -       -       *       -       -       *       -       -
     -     -
29   12G   12G    -       -       *       -       -       *       -       -
     -     -
30   12G   12G    -       -       *       -       -       *       -       -
     -     -
31   12G   12G    -       -       *       -       -       *       -       -
     -     -
32   12G   12G    -       -       *       -       -       *       -       -
     -     -
33   12G   12G    -       -       *       -       -       *       -       -
     -     -
34   12G   12G    -       -       *       -       -       *       -       -
     -     -
35   12G   12G    -       -       *       -       -       *       -       -
     -     -
36   12G   12G    -       -       *       -       -       *       -       -
     -     -
```

```
37   12G   12G    -       -       *       -       -       *       -       -
    -       -
38   12G   12G    -       -       *       -       -       *       -       -
    -       -
39   12G   12G    -       -       *       -       -       *       -       -
    -       -
40   12G   12G    -       -       *       -       -       *       -       -
    -       -
41   12G   12G    -       -       *       -       -       *       -       -
    -       -
42   12G   12G    -       -       *       -       -       *       -       -
    -       -
43   12G   12G    -       -       *       -       -       *       -       -
    -       -
44   12G   12G    -       -       *       -       -       *       -       -
    -       -
45   12G   12G    -       -       *       -       -       *       -       -
    -       -
46   ---   ---    -       -       *       -       -       *       -       -
    -       -
47   ---   ---    -       -       *       -       -       *       -       -
    -       -
48   ---   ---    -       -       *       -       -       *       -       -
    -       -
49   ---   ---    -       -       *       -       -       *       -       -
    -       -
50   ---   ---    -       -       *       -       -       *       -       -
    -       -
51   ---   ---    -       -       *       -       -       *       -       -
    -       -
52   ---   ---    -       -       *       -       -       *       -       -
    -       -
53   ---   ---    -       -       *       -       -       *       -       -
    -       -
54   ---   ---    -       -       *       -       -       *       -       -
    -       -
55   ---   ---    -       -       *       -       -       *       -       -
    -       -
```

3.8.19 rcli "hem show hosts"

The `wddcs <device> rcli "hem show hosts"` command is used to display the host connection information for HEM A and HEM B on supported platforms.

Step 1: Use the `wddcs <device> rcli "hem show hosts"` command to display the host connection information for HEM A and HEM B. For example:

```
wddcs <device> rcli "hem show hosts"
```

```
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Device: <device>

CONN HOST A1 : OK, Cable(-): ZG:08 LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY  0 :   12G : 0x500062B211A5C148 : Ready
```

```
  PHY  1 :   12G : 0x500062B211A5C148 : Ready
  PHY  2 :   12G : 0x500062B211A5C148 : Ready
  PHY  3 :   12G : 0x500062B211A5C148 : Ready

CONN HOST A2 : OK, Cable(-): ZG:08 LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY  4 :   12G : 0x500062B211A5C148 : Ready
  PHY  5 :   12G : 0x500062B211A5C148 : Ready
  PHY  6 :   12G : 0x500062B211A5C148 : Ready
  PHY  7 :   12G : 0x500062B211A5C148 : Ready

CONN HOST A3 : OK, Cable(-): ZG:09 LEN: 2m, Amphenol, 601760005 ( 3G 6G 12G )
  PHY  8 :   12G : 0x500062B2095F7840 : Ready
  PHY  9 :   12G : 0x500062B2095F7840 : Ready
  PHY 10 :   12G : 0x500062B2095F7840 : Ready
  PHY 11 :   12G : 0x500062B2095F7840 : Ready

CONN HOST A4 : OK, Cable(-): ZG:09 LEN: 2m, Amphenol, 601760006 ( 3G 6G )
  PHY 12 :   12G : 0x500062B2095F7840 : Ready
  PHY 13 :   12G : 0x500062B2095F7840 : Ready
  PHY 14 :   12G : 0x500062B2095F7840 : Ready
  PHY 15 :   12G : 0x500062B2095F7840 : Ready

CONN HOST A5 : OK, Cable(-): ZG:0A LEN: 2m, Molex Inc., 1110751002 ( 3G 6G
 12G )
  PHY 16 :   12G : 0x500062B211A505C0 : Ready
  PHY 17 :   12G : 0x500062B211A505C0 : Ready
  PHY 18 :   12G : 0x500062B211A505C0 : Ready
  PHY 19 :   12G : 0x500062B211A505C0 : Ready

CONN HOST A6 : Not Installed
  PHY 20 :       : ------------------ : No Link
  PHY 21 :       : ------------------ : No Link
  PHY 22 :       : ------------------ : No Link
  PHY 23 :       : ------------------ : No Link
```

3.8.20 rcli "hem show phys"

The `wddcs <device> rcli "hem show phys"` command is used to display the PHY information for HEM A and HEM B for supported platforms.

Step 1: Use the `wddcs <device> rcli "hem show phys"` command to display the PHY information for HEM A and HEM B. For example:

```
wddcs <device> rcli "hem show phys"
```

```
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Device: <device>

HEM Expander PHYs
 Id  Type  SAS               Rate  Buffering
------------------------------------------------------------------------------
  0 : HST 500062B211A5C148     12G   None
  1 : HST 500062B211A5C148     12G   None
  2 : HST 500062B211A5C148     12G   None
```

```
 3 : HST 500062B211A5C148     12G   None
 4 : HST 500062B211A5C148     12G   None
 5 : HST 500062B211A5C148     12G   None
 6 : HST 500062B211A5C148     12G   None
 7 : HST 500062B211A5C148     12G   None
 8 : HST 500062B2095F7840     12G   None
 9 : HST 500062B2095F7840     12G   None
10 : HST 500062B2095F7840     12G   None
11 : HST 500062B2095F7840     12G   None
12 : HST 500062B2095F7840     12G   None
13 : HST 500062B2095F7840     12G   None
14 : HST 500062B2095F7840     12G   None
15 : HST 500062B2095F7840     12G   None
16 : HST 500062B211A505C0     12G   None
17 : HST 500062B211A505C0     12G   None
18 : HST 500062B211A505C0     12G   None
19 : HST 500062B211A505C0     12G   None
20 : HST
21 : HST
22 : HST
23 : HST
24 : INT 5000CCAB05440B3F     12G   None
25 : INT 5000CCAB05440B3F     12G   None
26 : INT 5000CCAB05440B3F     12G   None
27 : INT 5000CCAB05440B3F     12G   None
28 : INT 5000CCAB05440B3F     12G   None
29 : INT 5000CCAB05440B3F     12G   None
30 : INT 5000CCAB05440B3F     12G   None
31 : INT 5000CCAB05440B3F     12G   None
32 : INT 5000CCAB05440B3F     12G   None
33 : INT 5000CCAB05440B3F     12G   None
34 : INT 5000CCAB05440B7F     12G   None
35 : INT 5000CCAB05440B7F     12G   None
36 : INT 5000CCAB05440B7F     12G   None
37 : INT 5000CCAB05440B7F     12G   None
38 : INT 5000CCAB05440B7F     12G   None
39 : INT 5000CCAB05440B7F     12G   None
40 : INT 5000CCAB05440B7F     12G   None
41 : INT 5000CCAB05440B7F     12G   None
42 : INT 5000CCAB05440B7F     12G   None
43 : INT 5000CCAB05440B7F     12G   None
44 : IOC 5000CCAB05440B77     12G   None
45 : IOC 5000CCAB05440B77     12G   None
46 : N/C Disabled
47 : N/C Disabled
48 : N/C Disabled
49 : N/C Disabled
50 : N/C Disabled
51 : N/C Disabled
52 : N/C Disabled
53 : N/C Disabled
54 : N/C Disabled
55 : N/C Disabled
56 : VRT 5000CCAB05440B37   SMP Target
57 : VRT 5000CCAB05440B36   SSP Target
58 : VRT 5000CCAB05440B35   SSP Initiator
59 : N/C Not Used
```

3.9 show

The `wddcs show` command is used to scan for SEP devices within WD enclosures and display their product or device information.

Options

The following sections provide instructions for using each of these command options:

- `show` scans for all enclosure products and displays the device handle, product description, serial number, firmware revision, and product name
- `show handles` displays connected drives with slot number, serial number, capacity, port address, expander, and OS device handle name
- `-j` formats response as JSON

Platform Support

The `wddcs show` command and options are supported on the following platforms:

Table 20: Current Products

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`show`	✓	✓	✓	✓	✗	✗	✗
`show handles`	✓	✓	✓	✓	✗	✗	✗

Table 21: EOL Products

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`show`	✓	✓	✓	✓	✓
`show handles`	✗	✗	✗	✓	✓

3.9.1 show

The `wddcs show` command is used to scan for all SEP devices within WD enclosures and display the following information:

- SEP device handle
- Product ID
- Serial number
- Firmware version
- Product name

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
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Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
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{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

3.9.2 show handles

The `wddcs show handles` command is used to scan for all connected drives and display the following information:

- Slot number
- Serial number
- Capacity
- Port address
- Expander
- Expander PHY ID

- OS device handle
- Drive firmware version
- Drive model

Note: The ouput will only include information for WD enclosures.

Step 1: Use the `wddcs show handles` command to display the device information:

Linux Example:

```
wddcs show handles
```

```
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Scanning for drives to collect data from. Please wait...

Device: /dev/sg1

  Enclosure IOM        : A
  Enclosure SAS Address: 5000CCAB0411323C

  Slot  SN          Cap(GB)  Port Address      Expander            PhyId
 Drive Handles         Firmware  Model
  ------------------------------------------------------------------------
     0  2MGMX1BB    18000    5000CCA2B424314D  2:5000CCAB0411327F  0      /
dev/sddw /dev/sg130  C680      WUH721818AL5204
     1  2MGL463B    18000    5000CCA2B420F9BD  2:5000CCAB0411327F  1      /
dev/sddx /dev/sg131  C680      WUH721818AL5204
     2  2MGLV3RB    18000    5000CCA2B42242ED  2:5000CCAB0411327F  2      /
dev/sdea /dev/sg134  C680      WUH721818AL5204
     3  2MGLV4GB    18000    5000CCA2B4224349  2:5000CCAB0411327F  3      /
dev/sdeb /dev/sg135  C680      WUH721818AL5204
     4  2MGLV45B    18000    5000CCA2B4224325  2:5000CCAB0411327F  4      /
dev/sdec /dev/sg136  C680      WUH721818AL5204
     5  2MGM1V3B    18000    5000CCA2B422A7DD  2:5000CCAB0411327F  5      /
dev/sdee /dev/sg138  C680      WUH721818AL5204
    ...
```

Windows Example:

```
wddcs show handles
```

```
wddcs v4.2.2.0
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Scanning for drives to collect data from. Please wait...

Device: <device>

  Enclosure IOM        : A
  Enclosure SAS Address: 5000CCAB0300C09E

  Slot  SN          Cap(GB)  NAA WWID          Expander            PhyId
 Drive Handle  Firmware  Model
  ------------------------------------------------------------------------
```

```
    0  NCGKYB7Z    6001     5000CCA24D20A220  1:5000CCAB0300C0BF  23     PD1
          C907      HUS726060AL4214
    1  2EG5Y6ER    8001     5000CCA23B0ACDFC  1:5000CCAB0300C0BF  22     PD2
          AD05      HUH728080AL4200
    2  NCGKXEXZ    6001     5000CCA24D209468  1:5000CCAB0300C0BF  17     PD3
          C907      HUS726060AL4214
    3  NCGKXL4Z    6001     5000CCA24D209674  1:5000CCAB0300C0BF  12     PD4
          C907      HUS726060AL4214
    4  NCGKXE6Z    6001     5000CCA24D209410  1:5000CCAB0300C0BF  8      PD5
          C907      HUS726060AL4214
    5  NCGKXHLZ    6001     5000CCA24D209538  1:5000CCAB0300C0BF  6      PD6
          C907      HUS726060AL4214
    6  NCGKXL7Z    6001     5000CCA24D209680  1:5000CCAB0300C0BF  1      PD7
          C907      HUS726060AL4214
    7  NCGKXUDZ    6001     5000CCA24D2099F8  2:5000CCAB0300C0DF  27     PD8
          C907      HUS726060AL4214
    8  NCGKXMYZ    6001     5000CCA24D209754  2:5000CCAB0300C0DF  25     PD9
          C907      HUS726060AL4214
    9  NCGKYSJZ    6001     5000CCA24D20A814  2:5000CCAB0300C0DF  17
PD10          C907      HUS726060AL4214
   10  NCGKYVTZ    6001     5000CCA24D20A9A8  2:5000CCAB0300C0DF  13
PD11          C907      HUS726060AL4214
   ...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show handles -j
```

```
wddcs v4.2.2.0
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{
    "wddcs": {
        "application": {
            "name": "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device": "/dev/sg15",
                "error": "Operation not supported on this product"
            },
            {
                "device": "/dev/sg2",
                "enclosureIom": "A",
                "enclosureSasAddress": "5000CCAB040C303C",
                "media": [
                    {
                        "slot":    "0",
                        "serialNumber":    "8DGN1RWH",
                        "portAddress":    "5000CCA2532477C9",
                        "expander":    "1:5000CCAB040C303F",
                        "driveHandle":    ""
                    },
                    {
                        ...
                    }
                ]
```

```
            },
            {
                ...
            }
        ]
    }
}
```

b. To limit the results to a single device, include the device handle:

```
wddcs <device> show handles
```

3.10 version

The `wddcs version` command is used to print the version of the installed WDDCS Tool and its modules.

Step 1: Use the `wddcs version` command to print the version of the installed WDDCS Tool and its modules:

```
wddcs version
```

```
wddcs v4.2.2.0
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 MODULE          VERSION     HASH
 ------          -------     ----
 wddcs           4.2.2.0     b56c2c61d630f78195209102bf05451e09291ced
 yadl            2.11.3      3a5d9977bc048d1904ef1a6a243ee1a1b6b7602c
 yextata         2.3.5       eeafb2436792d3361379a645bc4068f84350c52e
 yextnvme        10.0.0      58ccb10b86ef31549e2dafb54b1767d7ed3e2d8b
 yextscsi        2.7.1       14a58a338cf097d1c59dc4d2f81395c3a215bde7
 yextses         1.10.0      0a739a2f4b1105361ffc56a1df4d2cd6befed6d1
 cutils          2.1.0       a7503822feeb01d1a46e59ff91d45039378b7801
```

3.11 zone

The `wddcs zone` command—along with its options—is used to configure zoning for certain WD enclosures with FW version 2030-026 and later.

Options

The following sections provide instructions for using each of these command options:

- `config=<value>` – configures zone setting to the given value:
  - A value of `0` disables zoning
  - The values of `1` through `3` enable a pre-defined zoning configuration. See your platform's User Guide for more information about each pre-defined zoning configuration.
- `file=<file>` – sends a binary zone configuration file to the IOM. See File-Based Zoning *(page 226)* for more information about file-based zoning.
- `status` – displays the current zone configuration setting

Platform Support

The `wddcs zone` command and options are supported on the following platforms:

Table 22: Current Products

Command	Ultrastar® Data60	Ultrastar Data60 3000 Series	Ultrastar Data102	Ultrastar Data102 3000 Series	OpenFlex™ Data24	OpenFlex Data24 3200	OpenFlex Data24 4000
`zone config=0` (disable)	✓	✗	✓	✗	✗	✗	✗
`zone config=1`	✓	✗	✓	✗	✗	✗	✗
`zone config=2`	✓	✗	✓	✗	✗	✗	✗
`zone config=3`	✓	✗	✓	✗	✗	✗	✗
`zone file=<file>`	✓	✓	✓	✓	✗	✗	✗
`zone status`	✓	✓	✓	✓	✗	✗	✗

Table 23: EOL Products

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`zone config=0` (disable)	✗	✗	✗	✗	✗
`zone config=1`	✗	✗	✗	✗	✗

Command	Storage Enclosure Basic	4U60 G1 Storage Enclosure	2U24 Flash Storage Platform	4U60 G2 Storage Enclosure	Ultrastar Serv60+8
`zone config=2`	⊗	⊗	⊗	⊗	⊗
`zone config=3`	⊗	⊗	⊗	⊗	⊗
`zone file=<file>`	⊗	⊗	⊗	⊗	⊗
`zone status`	⊗	⊗	⊗	⊗	⊗

Note: For unsupported enclosures, the `wddcs zone` command will return `Operation not supported on this product`.

3.11.1 zone config (enable zoning)

The `wddcs <device> zone config` command—with the values of `1` through `3`—is used to enable zoning for a single device within supported WD enclosures. For more information about each pre-defined zoning configuration, see your platform's User Guide.

Caution: Zone configuration should only be performed during a maintenance window, when the system is not in production.

Step 1: Use the `wddcs <device> zone config` command with the values of `1` - `3` to enable zoning:

```
wddcs <device> zone config=1
```

```
wddcs v4.2.2.0
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Device: <device>
This zoning administration activity is designed to take place while the JBOD/
F
platform is offline and not in production. The IOM in question will go
 offline
for a short period of time while the predefined zoning configuration is
 applied.
If you want proceed with changing the zoning configuration, press 'Y' or 'y':
 y

Setting zones to pre-configured value of 1 to SAS address 5000CCAB050E753C...
Zoning has been enabled to configuration type 1
```

Step 2: Repeat the `wddcs <device> zone config` command to enable zoning for the second device.

3.11.2 zone config (disable zoning)

The `wddcs <device> zone config` command—with a value of `0`—is used to disable zoning for a single device within supported WD enclosures.

Caution: Zone configuration should only be performed during a maintenance window, when the system is not in production.

Step 1: Use the `wddcs <device> zone config` command with a value of `0` to disable zoning:

```
wddcs <device> zone config=0
```

```
wddcs v4.2.2.0
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Device: <device>
This zoning administration activity is designed to take place while the JBOD/
F
platform is offline and not in production. The IOM in question will go
 offline
for a short period of time while the predefined zoning configuration is
 applied.
If you want proceed with changing the zoning configuration, press 'Y' or
 'y':
```

Step 2: Enter `Y` or `y` to proceed with the zoning configuration change:

```
y
```

```
Setting zones to pre-configured value of 0 to SAS address 5000CCAB0411323C...
Zoning has been disabled.
```

3.11.3 zone file

The `wddcs <device> zone file=<file>` command is used to send a binary zone configuration file to a single IOM/SEP device. For more information on file-based zoning and options for disabling it, see File-Based Zoning *(page 226)*.

Caution: Zone configuration should only be performed during a maintenance window, when the system is not in production.

Note: For products with a dual-IOM configuration, the file only needs to be sent to one IOM. Once activated, both IOMs will have the same zoning configuration.

Tip: For information about obtaining and using zoning files, please see the *File-Based Zoning* section of your platform's User Guide.

Step 1: Use the `wddcs <device> zone file=<file>` command to send a binary zone configuration file to a single IOM/SEP device:

If the zoning file **is not** compatible with the enclosure, the user will be notified:

```
wddcs <device> zone file=<file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
ERROR: The file is not compatible with this product
```

If the file **is** compatible, the command will produce the following output:

```
wddcs <device> zone file=<file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
CAUTION: This command will send a T10 zoning configuration to the IOM in
question and activate the configuration by resetting the IOM.

This zoning administration activity is designed to take place while the JBOD/
F platform is offline and not in production. The IOM in question
will go offline for a short period of time while the zoning configuration is
 activated
If you still prefer to continue with this method, press 'Y' or 'y':
```

The user is notified that the IOM will go offline and is prompted to confirm the action.

Step 2: Enter `Y` or `y` to proceed:

```
y
```

```
Sent 1 segment(s)
Waiting for completion: 5 second(s) - Status 0x00
Waited the maximum limit of 5 seconds
Configuration file was downloaded and activated successfully
```

3.11.3.1 File-Based Zoning

Zoning configurations via standard methods (i.e. OOBM, sg_senddiag, SMP, and the WDDCS Tool `zone config` command) are stored on the expanders and will not be retained if the IOM is replaced. File-based zoning is a method of configuring zoning on an enclosure using a binary configuration file provided by Western Digital Engineering. The file is downloaded to the enclosure, and the zoning configuration is stored on the baseboard, where it both enables the file-based zoning feature and configures the default zoning of the enclousre. Any newly installed IOM will then automatically use the zoning configuration stored on the baseboard.

Caution: If zoning is later reconfigured using another standard method (i.e. OOBM, sg_senddiag, SMP, or the WDDCS Tool `zone config` command), that configuration will only last while the IOM is installed. If the IOM is replaced, the enclosure will read and enable the default configuration from its baseboard. This behavior will continue as long as the file-based zoning feature is enabled.

Zoning Files

Zoning files are available through the Western Digital Enterprise Support Center (https://portal.wdc.com/Support/s/) for each of the predefined zoning configurations described in your platform's User Guide. To request a custom zoning configuration file, please open a support case through the Western Digital Enterprise Support Center.

Disabling File-Based Zoning

"Disabling file-based zoning" may mean one of two distinct options, both of which can be accomplished using the `zone file command`:

- **Disabling zoning using the file-based feature** – This involves downloading and activating a binary file (`...Disabled.bin`) that sets the enclosure zoning to configuration 0, thereby "disabling" zoning while keeping the file-based zoning feature enabled.
- **Disabling the file-based zoning feature itself** – This involves downloading and activating a binary file (`...Clear_Config.bin`) that disables the file-based zoning feature and any file-based zoning configuration.

Attention: `Clear_Config` files are not available for Ultrastar Data102 3000 Series. Ultrastar Data102 3000 Series utilizes `.fwdl` zoning files.

3.11.4 zone status

The `wddcs <device> zone status` command is used to display the zone configuration status of a single IOM/SEP device.

Step 1: Use the `wddcs <device> zone status` command to display the zone configuration status of a single IOM/SEP device:

If zoning is disabled, the output will be as follows:

```
wddcs <device> zone status
```

```
wddcs v4.2.2.0
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Device: <device>
Zoning (Disabled)
```

If zoning is enabled, the output will be similar to the folloiwng:

```
wddcs <device> zone status
```

```
wddcs v4.2.2.0
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Device: <device>
Zoning (Enabled)
 Host    : Slots
------------------------
  Host 0 : 0-33
  Host 1 : 0-33
  Host 2 : 34-67
  Host 3 : 34-67
```

```
Host 4 : 68-101
Host 5 : 68-101
```

Note: Actual output may vary, depending on the zone configuration and other factors.

Firmware Upgrade Processes

The recommended firmware upgrade process depends on several factors. This section provides guidance on choosing the correct process and instructions for performing the upgrade.

In This Chapter:

4.1 Choosing the Correct Firmware Upgrade Process

The recommended firmware upgrade process varies, depending on the following factors:

- The platform/product type
- The number of IOMs/ESMs
- Whether or not the enclosure will be taken offline by the upgrade
- Whether a manual or automatic process is needed
    - The manual upgrade process, where possible, allows the host OS and/or HBA to handle the failover more gracefully than the automatic process.

Based on these factors, use the following table to determine which firmware upgrade process is applicable. Then click the link in the right-hand column to view instructions for that process.

Table 24: Firmware Upgrade Processes

Enclosure	# of IOMs/ ESMs	Offline/ Online	Manual/ Automatic	Process Link
Ultrastar Data102	2	On	Manual	Two IOMs, Online, Manual *(page 231)*
	2	Off	Automatic	Two IOMs, Offline, Automatic *(page 236)*
	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*
Ultrastar Data102 3000 Series	2	On	Manual	Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with Two IOMs, Online, Manual *(page 245)*
	2	Off	Automatic	Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with Two IOMs, Offline, Automatic *(page 248)*
	1	Off	Automatic	Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with One IOM, Offline, Automatic *(page 251)*
Ultrastar® Data60	2	On	Manual	Two IOMs, Online, Manual *(page 231)*
	2	Off	Automatic	Two IOMs, Offline, Automatic *(page 236)*
	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*

Enclosure	# of IOMs/ ESMs	Offline/ Online	Manual/ Automatic	Process Link
Ultrastar Data60 3000 Series	2	On	Manual	Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with Two IOMs, Online, Manual *(page 245)*
	2	Off	Automatic	Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with Two IOMs, Offline, Automatic *(page 248)*
	1	Off	Automatic	Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with One IOM, Offline, Automatic *(page 251)*
Ultrastar Serv60+8	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*
4U60 G2 Storage Enclosure	2	Off	Automatic	Two IOMs, Offline, Automatic *(page 236)*
	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*
4U60 G1 Storage Enclosure	2	On	Automatic	Two IOMs, Online, Automatic *(page 242)*
	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*
2U24 Flash Storage Platform	2	On	Automatic	Two IOMs, Online, Automatic *(page 242)*
	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*
Storage Enclosure Basic	1	Off	Automatic	One IOM, Offline, Automatic *(page 239)*
OpenFlex™ Data24	2	On | Off	Manual	Firmware Upgrade for OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 *(page 254)*
OpenFlex Data24 3200	2	On | Off	Manual	Firmware Upgrade for OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 *(page 254)*
OpenFlex Data24 4000	2	On | Off	Manual	Firmware Upgrade for OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 *(page 254)*

4.2 Two IOMs, Online, Manual

This firmware upgrade process is appropriate for the following enclosures:

- Ultrastar Data102 or Ultrastar® Data60
- Two IOMs
- Will remain online (in use)
- Require a manual firmware reset

Note: For enclosures with limited availability for maintenance operations, the `wddcs <device> fw download <file>` and `wddcs <device> fw reset` operations may be performed at separate times instead of the combined `wddcs <device> fw download_reset <file>` operation described here.

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
```

```
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Note: For Ultrastar Data102 and Ultrastar® Data60 enclosures, it is only necessary to update firmware on one SEP device; the other will be updated automatically.

Important: Do not unzip the tar.gz firmware bundle (for Ultrastar Data102 and Ultrastar® Data60 enclosures) before issuing the `wddcs <device> fw download_reset <file>` command.

Step 3: Use the `wddcs <device> fw download_reset <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently reset the IOMs for that device. For example:

```
wddcs <device> fw download_reset <file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the reset process...

Please ensure both paths to each drive are available before proceeding
with the reset of the remote IOM to ensure that at least one path to each
 drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

Note: The output for the Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series platform will **not** include the following text:

```
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.
```

The WDDCS Tool notifies the user that the remote IOM will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
The remote IOM has been reset

Please ensure both paths to each drive are available before proceeding
with the reset of the local IOM to ensure that at least one path to each drive
```

```
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

The WDDCS Tool notifies the user that the remote IOM was reset and that the local IOM will go offline.

Step 5 : Enter `Y` or `y` to proceed:

```
y
```

```
The local IOM has been reset

IOM was reset successfully
```

The WDDCS Tool notifies the user that the local IOM was reset.

Step 6 : Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
```

```
}
```

Step 7 : Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.3 Two IOMs, Offline, Automatic

This firmware upgrade process is appropriate for the following enclosures:

- Ultrastar Data102, Ultrastar® Data60, or 4U60 G2 Storage Enclosure
- Two IOMs
- Will be taken offline
- Require an automatic firmware activation

Note: For enclosures with limited availability for maintenance operations, the `wddcs <device> fw download <file>` and `wddcs <device> fw activate` operations may be performed at separate times instead of the combined `wddcs <device> fw download_activate <file>` operation described here.

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
```

```
    }
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Important: Do not unzip the tar.gz firmware bundle (for Ultrastar Data102 and Ultrastar® Data60 enclosures) before issuing the `wddcs <device> fw download_activate <file>` command.

Step 3: Use the `wddcs <device> fw download_activate <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently activate the downloaded firmware. For example:

```
wddcs <device> fw download_activate <file>
```

```
wddcs v4.2.2.0
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Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the IOM or enclosure will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
Firmware activation command was sent successfully
```

Step 5: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
```

```
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 6: Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.4 One IOM, Offline, Automatic

This firmware upgrade process is appropriate for the following enclosures:

- Ultrastar Data102, Ultrastar® Data60, Ultrastar Serv60+8, 4U60 G2 Storage Enclosure, 4U60 G1 Storage Enclosure, 2U24 Flash Storage Platform, and Storage Enclosure Basic
- One IOM
- Will be taken offline
- Require an automatic firmware activation

Note: For enclosures with limited availability for maintenance operations, the `wddcs <device> fw download <file>` and `wddcs <device> fw activate` operations may be performed at separate times instead of the combined `wddcs <device> fw download_activate <file>` operation described here.

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
```

```
        ]
    }
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Important: Do not unzip the tar.gz firmware bundle (for Ultrastar Data102, Ultrastar® Data60, and Ultrastar Serv60+8 enclosures) before issuing the `wddcs <device> fw download_activate <file>` command.

Step 3: Use the `wddcs <device> fw download_activate <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently activate the downloaded firmware. For example:

```
wddcs <device> fw download_activate <file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the IOM or enclosure will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
Firmware activation command was sent successfully
```

Step 5: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
```

```
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 6 : Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.5 Two IOMs, Online, Automatic

This firmware upgrade process is appropriate for the following enclosures:

- 4U60 G1 Storage Enclosure or 2U24 Flash Storage Platform
  - For these products, each IOM requires its own download/activate process.
- Two IOMs
- Will remain online (in use)
- Require an automatic firmware activation

Note: For enclosures with limited availability for maintenance operations, the `wddcs <device> fw download <file>` and `wddcs <device> fw activate` operations may be performed at separate times instead of the combined `wddcs <device> fw download_activate <file>` operation described here.

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
```

```
            }
        ]
    }
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Step 3: Use the `wddcs <device> fw download_activate <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently activate the downloaded firmware. For example:

```
wddcs <device> fw download_activate <file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the IOM or enclosure will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
Firmware activation command was sent successfully
```

Step 5: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>
```

```
...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 6 : Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.6 Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with Two IOMs, Online, Manual

This firmware upgrade process is appropriate for the following enclosures:

- Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series
- Two IOMs
- Will remain online (in use)
- Require a manual firmware reset

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Note: For the Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series enclosures, it is only necessary to update firmware on one SEP device; the other will be updated automatically.

Step 3: Use the `wddcs <device> fw download_reset <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently reset the IOMs for that device. For example:

```
wddcs <device> fw download_reset <file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the reset process...

Please ensure both paths to each drive are available before proceeding
with the reset of the remote IOM to ensure that at least one path to each
 drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

Note: The output for the Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series platform will **not** include the following text:

```
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.
```

The WDDCS Tool notifies the user that the remote IOM will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
The remote IOM has been reset

Please ensure both paths to each drive are available before proceeding
with the reset of the local IOM to ensure that at least one path to each drive
will be available during the IOM reset to activate firmware.
The IOM will go offline for a period of time while the update is finalized.
Press 'Y' or 'y' when ready to continue:
```

The WDDCS Tool notifies the user that the remote IOM was reset and that the local IOM will go offline.

Step 5: Enter `Y` or `y` to proceed:

```
y
```

```
The local IOM has been reset

IOM was reset successfully
```

The WDDCS Tool notifies the user that the local IOM was reset.

Step 6: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 7: Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.7 Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with Two IOMs, Offline, Automatic

This firmware upgrade process is appropriate for the following enclosures:

- Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series
- Two IOMs
- Will be taken offline
- Require an automatic firmware activation

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Note: For the Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series enclosure, it is only necessary to update firmware on one SEP device; the other will be updated automatically.

Step 3: Use the `wddcs <device> fw download_activate <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently activate the downloaded firmware. For example:

```
wddcs <device> fw download_activate <file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the IOM or enclosure will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
Firmware activation command was sent successfully
```

Step 5: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>
```

```
...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 6 : Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.8 Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series with One IOM, Offline, Automatic

This firmware upgrade process is appropriate for the following enclosures:

- Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series
- One IOM
- Will be taken offline
- Require an automatic firmware activation

Step 1: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>

...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 2: Identify the SEP device requiring FW upgrade, and note its firmware version prior to the upgrade; this will be used to confirm a successful upgrade at the end of the process.

Note: For the Ultrastar Data60 3000 Series and Ultrastar Data102 3000 Series enclosures, it is only necessary to update firmware on one SEP device; the other will be updated automatically.

Step 3: Use the `wddcs <device> fw download_activate <file>` command to perform a firmware download to a single device within a WD enclosure and subsequently activate the downloaded firmware. For example:

```
wddcs <device> fw download_activate <file>
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Sent <#> segment(s)
Download has finished to the SEP, please wait.
The completion status will be checked after 15 minutes.

Download status complete (0x11)
Firmware was downloaded successfully
Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.

If the platform configuration is based on dual IOMs, the IOM(s) in question
will go offline for a period of time while the update is finalized.
If the platform configuration is based on a single IOM, the enclosure
will go offline for a period of time while the update is finalized.

If you still prefer to continue with this method, press 'Y' or 'y':
```

The WDDCS Tool notifies the user that the IOM or enclosure will go offline.

Step 4: Enter `Y` or `y` to proceed:

```
y
```

```
Firmware activation command was sent successfully
```

Step 5: Use the `wddcs show` command to scan for all SEP devices within WD enclosures and display the product information:

```
wddcs show
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serial_number>
    firmware: <version>
    name    : <product_name>
```

```
...
```

a. To view the response in JSON format, use the `-j` option:

```
wddcs show -j
```

```
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

{
    "wddcs": {
        "application": {
            "name":    "wddcs",
            "version": "4.2.2.0"
        },
        "results": [
            {
                "device":   "<device>",
                "product":  "<product>",
                "serial":   "<serial_number>",
                "firmware": "<version>",
                "name":     "<product_name>"
            }, {
                ...
            }
        ]
    }
}
```

Step 6 : Identify the SEP device that received a FW upgrade, and confirm the new firmware version.

4.9 Firmware Upgrade for OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000

This firmware upgrade procedure is only appropriate for the OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 platforms.

Caution: This procedure will update FW on a single IOM at a time. If the enclosure will remain online during the FW upgrade, ensure that both paths to each drive are enabled (multipath), to avoid any disruptions to I/O.

Note: This procedure assumes that the IP addresses of the OpenFlex™ Data24 IOMs are known beforehand.

Step 1: Use the `wddcs http=<ipv4> fw download_activate=<file>` command to download the given FW file to the first IOM at the given IP address, and activate the FW on that IOM. Replace `<file>` with the filepath and filename of the FW. For example:

```
wddcs http=10.20.30.40 fw download_activate=./bundle_fw-mh4.0.x-8.signed
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Slot #: 1

File upload started
|-- Upload completed: 77140 KB
Firmware update started
|-- Operation completed in 146 seconds

Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.
The enclosure will go offline for a period of time while the update is
 finalized.

To continue with the activation now, press 'Y' or 'y':
```

The user is prompted to indicate whether or not to continue with the activation. Activation will cause the IOM to go offline for a perid of time. If the enclosure will remain online during this FW upgrade, ensure that both paths to each drive are enabled (multipath) before proceeding.

Step 2: Enter `Y` or `y`.

```
To continue with the activation now, press 'Y' or 'y': y

Firmware activation started
|-- Operation completed in 15 seconds
Firmware was uploaded and activation command was sent successfully.
```

Step 3 : After the first IOM comes back online, use the `wddcs http=<ipv4> fw download_activate=<file>` command again to download and activate the FW on the second IOM at the given IP address. For example:

```
wddcs http=50.60.70.80 fw download_activate=./bundle_fw-mh4.0.x-8.signed
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Slot #: 2

File upload started
|-- Upload completed: 77140 KB
Firmware update started
|-- Operation completed in 146 seconds

Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.
The enclosure will go offline for a period of time while the update is
 finalized.

To continue with the activation now, press 'Y' or 'y':
```

Step 4 : Enter `Y` or `y` to continue with the activation.

```
To continue with the activation now, press 'Y' or 'y': y

Firmware activation started
|-- Operation completed in 15 seconds
Firmware was uploaded and activation command was sent successfully.
```

Result: When the second IOM comes online, the FW upgrade procedure is complete.

4.10 In-Band Firmware Upgrade for OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000

This firmware upgrade procedure is only appropriate for the OpenFlex™ Data24, OpenFlex Data24 3200, and OpenFlex Data24 4000 platforms using an in-band connection.

Caution: This procedure will update FW on a single IOM at a time. If the enclosure will remain online during the FW upgrade, ensure that both paths to each drive are enabled (multipath), to avoid any disruptions to I/O.

Note: This procedure assumes that the IP addresses of the OpenFlex™ Data24 IOMs are known beforehand.

Step 1: Use the `wddcs http=<In-Band IP> user=<username> pass=<password> ssl fw download_activate=<file>` command to download the given FW file to the first IOM at the given IP address, and activate the FW on that IOM. Replace `<file>` with the filepath and filename of the FW. For example:

```
wddcs http=<In-Band IP> user=<username> pass=<password> slot=<n> ssl fw
 download_activate=<file>
v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: openflex-data24-3200-usalp03522qa0001
Slot #: 1

File upload started
|-- Upload completed: 70540 KB
Firmware update started
|-- Operation completed in 119 seconds

Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.
The enclosure will go offline for a period of time while the update is
 finalized.

To continue with the activation now, press 'Y' or 'y':
```

The user is prompted to indicate whether or not to continue with the activation. Activation will cause the IOM to go offline for a perid of time. If the enclosure will remain online during this FW upgrade, ensure that both paths to each drive are enabled (multipath) before proceeding.

Step 2: Enter `Y` or `y`.

```
To continue with the activation now, press 'Y' or 'y': y

Firmware activation started
|-- Operation completed in 18 seconds
Firmware was uploaded and activation command was sent successfully.
```

Step 3 : After the first IOM comes back online, use the `wddcs http=<ipv4> fw download_activate=<file>` command again to download and activate the FW on the second IOM at the given IP address. For example:

```
wddcs http=<In-Band IP> user=<username> pass=<password> slot=<n> ssl fw
 download_activate=<file>
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: openflex-data24-3200-usalp03522qa0001
Slot #: 2

File upload started
|-- Upload completed: 70540 KB
Firmware update started
|-- Operation completed in 114 seconds

Starting the activation process...

This method of firmware activation will be disruptive.
Please consider activating firmware offline to avoid any disruptions to I/O.
The enclosure will go offline for a period of time while the update is
 finalized.

To continue with the activation now, press 'Y' or 'y':
```

Step 4 : Enter `Y` or `y` to continue with the activation.

```
To continue with the activation now, press 'Y' or 'y': y

Firmware activation started
|-- Operation completed in 18 seconds
Firmware was uploaded and activation command was sent successfully.
```

Result: When the second IOM comes online, the FW upgrade procedure is complete.

Uninstallation

The WDDCS Tool may be uninstalled from Windows Server, Debian, Ubutnu, RHEL, and CentOS operating systems, or via targ.gz. The following sections provide uninstallation instructions for each package.

In This Chapter:

5.1 Uninstalling from Debian/Ubuntu

Follow these steps to uninstall the WDDCS Tool from Debian/Ubuntu operating systems.

Step 1: Use the `dpkg -l` command to verify the presence of the WDDCS Tool package.

```
# dpkg -l | grep -i wddcs
ii  wddcs    <version>    amd64    Western Digital tool to support products
 from Data Center System.
```

Step 2: Use the `dpkg -r` command to uninstall the DEB package:

```
# dpkg -r wddcs
(Reading database ... 527031 files and directories currently installed.)
Removing wddcs (<version>) ...
```

Step 3: Use the `dpkg -l` command again to verify the removal of the WDDCS Tool package.

```
# dpkg -l | grep -i wddcs
#
```

5.2 Uninstalling from RHEL/CentOS/SLES

Follow these steps to uninstall the WDDCS Tool from Red Hat Enterprise Linux (RHEL), CentOS, or SUSE Linux Enterprise Server (SLES) operating systems with the RPM Package Manager (RPM).

Step 1: Verify that the RPM package is installed:

```
# rpm -qa | grep -i wddcs
wddcs-<version>.x86_64
```

Step 2: Remove the RPM package:

```
# rpm -e wddcs-<version>.x86_64
```

Step 3: Repeat the `grep` command to verify that the RPM package has been removed (i.e. the filename is not returned):

```
# rpm -qa | grep -i wddcs
#
```

5.3 Uninstalling via tar.gz

Follow these steps to uninstall the WDDCS Tool via tar.gz.

Step 1: Navigate to the directory to where the tar.gz files were installed. For example:

```
# cd /home/wddcs
```

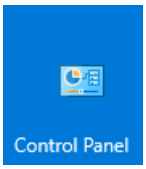
Step 2: From that directory, use the `rm -r` command to remove the installed directory and files:

```
# rm -r wddcs-<version>-1.x86_64
```

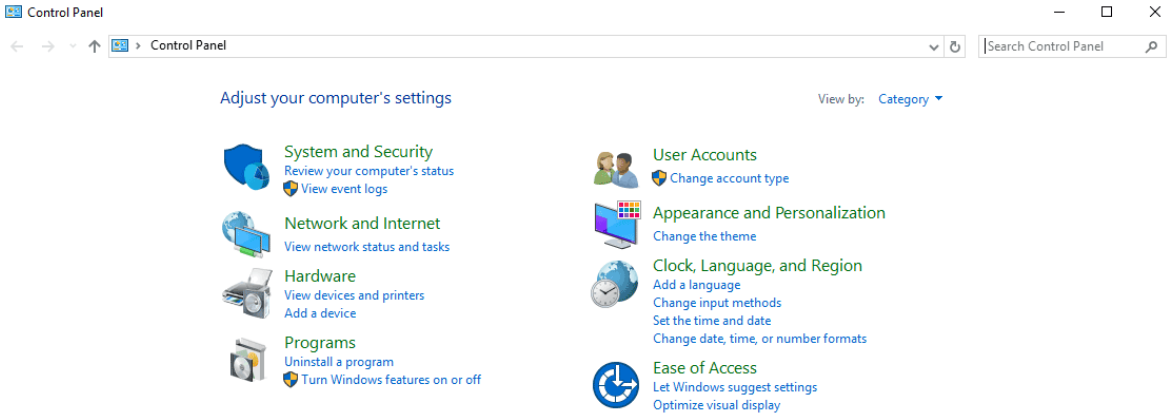
5.4 Uninstalling from Windows Server

Follow these steps to uninstall the WDDCS Tool from Windows Server operating systems.

Step 1: From the **Start Menu**, select the **Control Panel** icon:



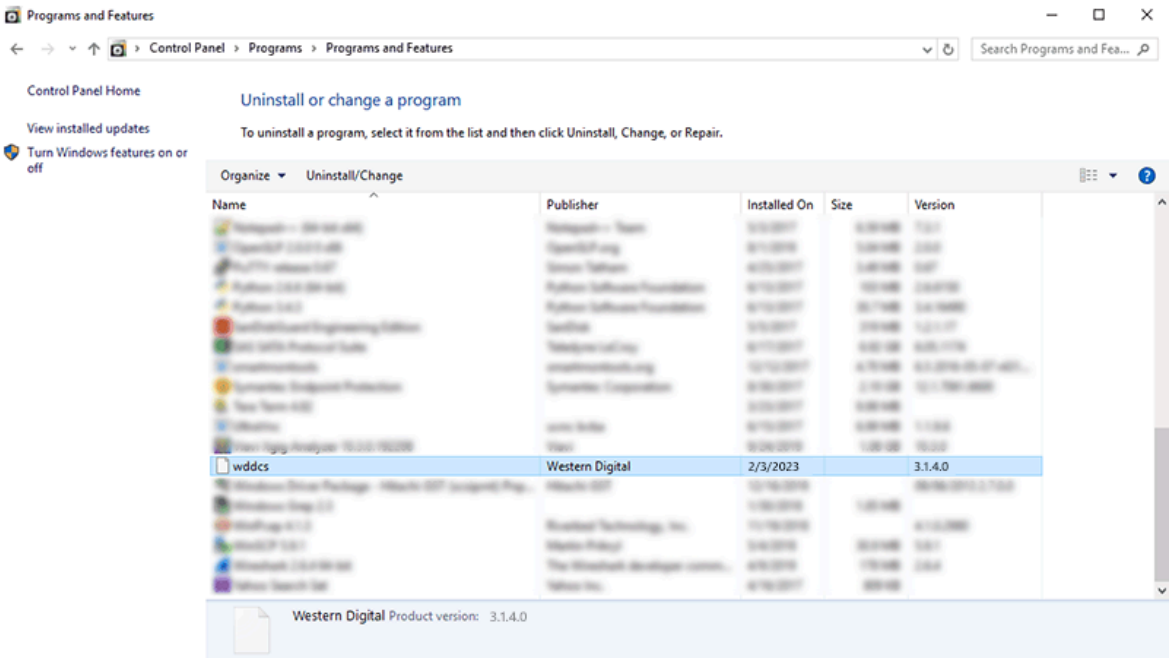
The **Control Panel** window appears:



Step 2: Under the **Programs** section, click the link for **Uninstall a program**.

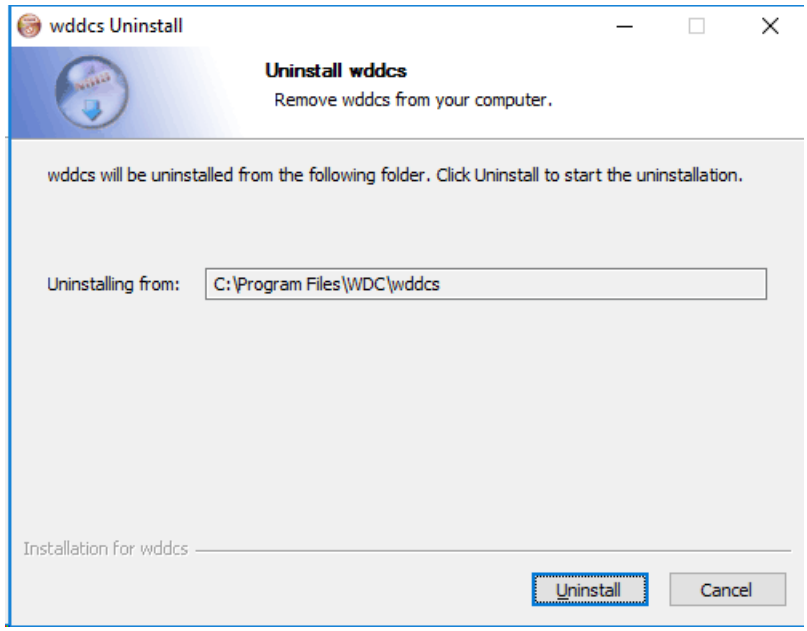
The **Programs and Features** window appears.

Step 3: Scroll down the list of installed programs and find the WDDCS Tool:



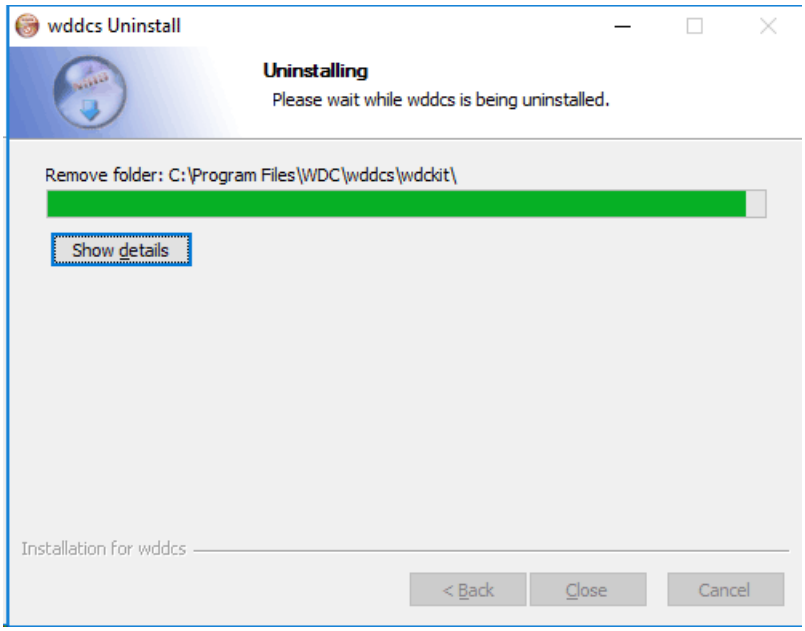
Step 4: With the WDDCS Tool selected, right-click and choose **Uninstall/Change** from the tooltip.

A **wddcs Uninstall** dialog box appears, notifying the user of the directory from which the WDDCS Tool will be uninstalled:

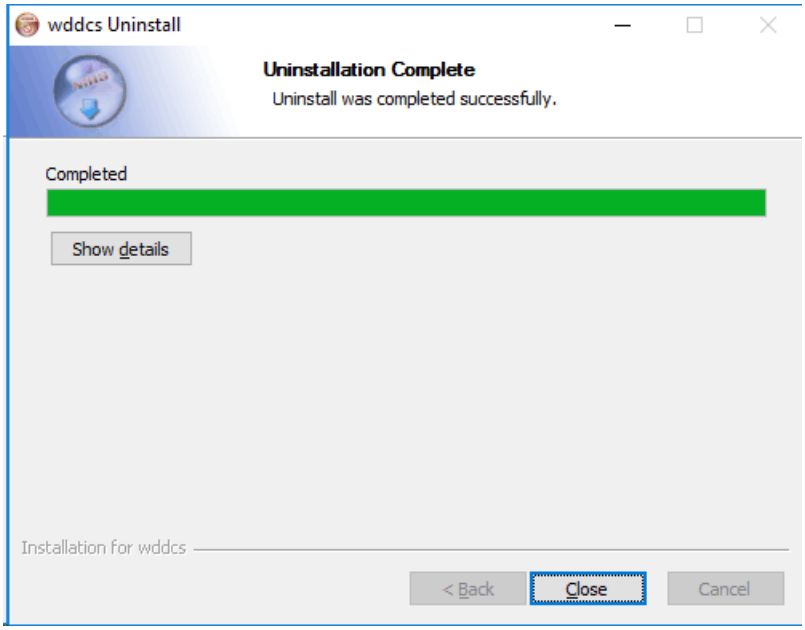


Step 5: Click the **Uninstall** button.

The **wddcs Uninstall** window updates, showing that the WDDCS Tool is being uninstalled:



After a few seconds, the **wddcs Uninstall** window updates again, showing that the uninstallation is complete:



Step 6 : Click the **Close** button.

5.5 Uninstalling from FreeBSD tar.gz

Follow these steps to uninstall the WDDCS Tool from the FreeBSD operating system.

Step 1: Use the `ls` command to verify the presence of the WDDCS Tool package.

```
# ls
wddcs_dev-freebsd64-4.2.2.0.zip  wddcs-freebsd64-4.2.2.0  wddcs-
freebsd64-4.2.2.0.tar.gz  wddcs-freebsd64-4.2.2.0.zip
```

Step 2: Use the `rm -rf` command to uninstall the FreeBSD package.

```
rm -rf wddcs-freebsd64-4.2.2.0
```

Step 3: Use the `ls` command again to verify the removal of the WDDCS Tool package.

```
wddcs_dev-freebsd64-4.2.2.0.zip  wddcs-freebsd64-4.2.2.0.tar.gz  wddcs-
freebsd64-4.2.2.0.zip
```

5.6 Uninstalling from FreeBSD Packages

Follow these steps to uninstall the WDDCS Tool from the FreeBSD operating system.

Step 1: Use the `ls` command to verify the presence of the WDDCS Tool package.

```
# ls
wddcs-4.2.2.0.pkg
```

Step 2: Use the `pkg remove` command to uninstall the FreeBSD packages.

```
pkg remove wddcs
Checking integrity... done (0 conflicting)
Deinstallation has been requested for the following 1 packages (of 0 packages
 in the universe):

Installed packages to be REMOVED:
     wddcs: 4.2.2.0
Number of packages to be removed: 1

The operation will free 9 MiB.

Proceed with deinstalling packages? [y/N]:
```

Step 3: Enter `Y` or `y` to proceed:

```
y
[1/1] Deinstalling wddcs-4.2.2.0...
[1/1] Deleting files for wddcs-4.2.2.0: 100%
```

The WDDCS Tool notifies the user that the FreeBSD package has been installed.

Step 4: Use the `ls` command again to verify the removal of the WDDCS Tool package.

Appendices

In This Chapter:

6.1 clear/set Zoned Command Examples

This section uses the `wddcs diag` command examples to provide information related the **All Zoned** and **Ranged Zoned** scenarios. The set-slot Zoned examples are the same concept as the clear to save space and time.

The following command sequences are available to display what the end user could expect to see if T10 Zoning is in place and "all" slots or a range of slots are used. The HBA(s) in question may not have access to some or all slots within the specified range. If this is the case, the commands will not make the changes and the range will have to be adjusted.

6.1.1 diag clear-slot=all ident (Zoned)

The `wddcs diag clear-slot=all ident` command attempts to set all array device slot ident bit values to 0 for the enclosure. The diag clear-slot ident option applies to theUltrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs iom` command to determine the device handles for each IOM in the enclosure:

```
wddcs iom
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Dual IOM operation
IOM A

Device: <device>
Dual IOM operation
IOM B

...
```

Note: For a given enclosure, the end user only needs to use one IOM handle. A handle for IOM A or IOM B will be sufficient.

Step 3: Use the `wddcs <device> zone status` command to verify that the enclosure is zoned:

Note: This example utilizes predefined zone config 1.

```
wddcs <device> zone status
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: /dev/sg1
Zoning (Enabled)
 Host    : Slots
------------------------
  Host 0 : 0-16
  Host 1 : 17-33
  Host 2 : 34-50
  Host 3 : 51-67
  Host 4 : 68-84
  Host 5 : 85-101
```

Step 4: Use the `wddcs <device> diag show-slot=all` command to display the current state of a valid array device slot within the enclosure.

Note: Some slots display a "no access allowed" message. This means that HBA SAS Connector port accessing the enclosure SEP device being used to access the drive slots does not have permission to change them.

```
wddcs <device> diag show-slot=all
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 8 (no access allowed)
  ident : 0
  devoff: 1
Status for index 1
  code  : 8 (no access allowed)
  ident : 0
  devoff: 1
Status for index 2
  code  : 8 (no access allowed)
  ident : 0
  devoff: 1
.
.
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

```
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
Status for index 100
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 101
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
```

Step 5: Use the `wddcs <device> diag clear-slot=all ident` command to set the value of the ident bit to 0 within the enclosure.

```
wddcs <device> diag clear-slot=all
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Cannot change the value to slot 0 when status is "no access allowed"
No slots have been changed
```

Step 6: Use the `wddcs <device> diag show-slot=all` command to display the current state of a valid array device slot and devoff bit within the enclosure.

Note: No bits have been changed due to the "no access allowed" status.

```
wddcs <device> diag show-slot=all ident
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 8 (no access allowed)
  ident : 0
  devoff: 1
Status for index 1
  code  : 8 (no access allowed)
  ident : 0
  devoff: 1
Status for index 2
  code  : 8 (no access allowed)
  ident : 0
  devoff: 1
.
.
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
```

```
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
Status for index 100
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 101
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
```

Result: No bits have been changed due to the "no access allowed" status.

6.1.2 diag clear-slot=<range> ident (Zoned)

The `wddcs diag clear-slot=<range> ident` command attempts to set the specified slot range ident bit value to 0 for the enclosure. The diag clear-slot ident option applies to theUltrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs iom` command to determine the device handles for each IOM in the enclosure:

```
wddcs iom
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Dual IOM operation
IOM A

Device: <device>
Dual IOM operation
```

```
IOM B

...
```

Note: For a given enclosure, the end user only needs to use one IOM handle. A handle for IOM A or IOM B will be sufficient.

Step 3: Use the `wddcs <device> zone status` command to verify that the enclosure is zoned:

Note: This example utilizes predefined zone config 1 and will display slots 30-35.

```
wddcs <device> zone status
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: /dev/sg1
Zoning (Enabled)
 Host    : Slots
------------------------
  Host 0 : 0-16
  Host 1 : 17-33
  Host 2 : 34-50
  Host 3 : 51-67
  Host 4 : 68-84
  Host 5 : 85-101
```

Step 4: Use the `wddcs <device> diag show-slot=30-35` command to display the current state of a valid array device slot within the enclosure.

```
wddcs <device> diag show-slot=30-35
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 30
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 31
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 32
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 35
  code  : 1 (ok)
```

```
  ident : 0
  devoff: 0
```

Step 5: Use the `wddcs <device> diag clear-slot=30-36 ident` command to set the value of the ident bit to 0 within the enclosure.

```
wddcs <device> diag clear-slot=30-36 ident
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Cannot change the value to slot 0 when status is "no access allowed"
No slots have been changed
```

Note: This command fails due to trying to set bits to 0 that are already at 0. The range needs to be refined to the slots that are set to 1.

Step 6: Use the `wddcs <device> diag clear-slot=34-36 ident` command to set the value of the ident bit to 0 within the enclosure.

```
wddcs <device> diag show-slot=all
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Command to change the value to slots 34-36 was successful
```

Step 7: Use the `wddcs <device> diag show-slot=30-36` command to display the current state of a valid array device slot within the enclosure.

```
wddcs <device> diag show-slot=30-36
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 30
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 31
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 32
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

```
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Result: No bits have been changed due to the "no access allowed" status.

6.1.3 diag clear-slot=all devoff (Zoned)

The `wddcs diag clear-slot=all devoff` command attempts to set all array device slots devoff bit values to 0 for the enclosure. The diag clear-slot devoff option applies to theUltrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs iom` command to determine the device handles for each IOM in the enclosure:

```
wddcs iom
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Dual IOM operation
IOM A

Device: <device>
Dual IOM operation
IOM B

...
```

Note: For a given enclosure, the end user only needs to use one IOM handle. A handle for IOM A or IOM B will be sufficient.

Step 3: Use the `wddcs <device> zone status` command to verify that the enclosure is zoned:

Note: This example utilizes predefined zone config 1.

```
wddcs <device> zone status
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: /dev/sg1
Zoning (Enabled)
 Host    : Slots
------------------------
  Host 0 : 0-16
  Host 1 : 17-33
  Host 2 : 34-50
  Host 3 : 51-67
  Host 4 : 68-84
  Host 5 : 85-101
```

Step 4: Use the `wddcs <device> diag show-slot=all` command to display the current state of a valid array device slot within the enclosure.

```
wddcs <device> diag show-slot=all
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 1
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 2
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
.
.
.
Status for index 30
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 31
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 32
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

```
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
.
Status for index 99
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 100
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 101
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
```

Step 5: Use the `wddcs <device> diag clear-slot=all devoff` command to set the value of the devoff bit to 0 within the enclosure.

```
wddcs <device> diag show-slot=all devoff
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Cannot change the value to slot 0 when status is "no access allowed"
No slots have been changed
```

Step 6: Use the `wddcs <device> diag show-slot=all` command to display the current state of a valid array device slot within the enclosure.

```
wddcs <device> diag show-slot=all
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 0
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 1
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 2
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
.
.
```

```
.
Status for index 30
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 31
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 32
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
.
.
.
Status for index 99
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 100
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 101
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
```

Result: No bits have been changed due to the "no access allowed" status.

6.1.4 diag clear-slot=<range> devoff (Zoned)

The `wddcs diag clear-slot=<range> devoff` command attempts to set the specified slot range devoff bit values to 0 for the enclosure. The diag clear-slot devoff option applies to theUltrastar® Data60, Ultrastar Data60 3000 Series, Ultrastar Data102, and Ultrastar Data102 3000 Series platforms.

Step 1: Use the `wddcs show` command to determine the device handles for each IOM in the enclosure:

```
wddcs show
wddcs v4.2.2.0
```

```
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
    product : <product>
    serial  : <serialnumber>
    firmware: <version>
    name    : <productname>

...
```

Step 2: Use the `wddcs iom` command to determine the device handles for each IOM in the enclosure:

```
wddcs iom
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Dual IOM operation
IOM A

Device: <device>
Dual IOM operation
IOM B

...
```

Note: For a given enclosure, the end user only needs to use one IOM handle. A handle for IOM A or IOM B will be sufficient.

Step 3: Use the `wddcs <device> zone status` command to verify that the enclosure is zoned:

Note: This example utilizes predefined zone config 1 and will display slots 30-36.

```
wddcs <device> zone status
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates
Device: /dev/sg1
Zoning (Enabled)
 Host    : Slots
------------------------
  Host 0 : 0-16
  Host 1 : 17-33
  Host 2 : 34-50
  Host 3 : 51-67
  Host 4 : 68-84
  Host 5 : 85-101
```

Step 4: Use the `wddcs <device> diag show-slot=30-36` command to display the current state of a valid array device slot within the enclosure.

```
wddcs <device> diag show-slot=30-36
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Status for index 30
```

```
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 31
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 32
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Step 5: Use the `wddcs <device> diag clear-slot=30-36 devoff` command to set the value of the devoff bit to 0 within the enclosure.

```
wddcs <device> diag clear-slot=30-36 devoff
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>
Cannot change the value to slot 0 when status is "no access allowed"
No slots have been changed
```

Note: No bits have been changed due to the "no access allowed" status.

Step 6: Use the `wddcs <device> diag clear-slot=34-36` command to set the value of the devoff bit to 0 within the enclosure.

```
wddcs <device> diag clear-slot=34-36
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Command to change the value to slots 34-36 was successful
```

Note: This command fails due to trying to set the devoff bits to 0 that are already at 0. The range needs to be refined to the slots that it can access.

Step 7: Use the `wddcs <device> diag show-slot=30-36` command to display the current state of a valid array device slot within the enclosure.

```
wddcs <device> diag show-slot=30-36
wddcs v4.2.2.0
Copyright (c) 2019-2024 Western Digital Corporation or its affiliates

Device: <device>

Status for index 30
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 31
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 32
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 33
  code  : 8 (no access allowed)
  ident : 0
  devoff: 0
Status for index 34
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 35
  code  : 1 (ok)
  ident : 0
  devoff: 0
Status for index 36
  code  : 1 (ok)
  ident : 0
  devoff: 0
```

Result: The zoned array device range devoff bit value is now set to 0.

6.2 Glossary

The following acronyms, words, and terms are used throughout this document. Definitions are provided for reference.

Term	Definition
AC	Alternating Current
CLI	Command-Line Interface
DPKG	Debian Package
DRV	Drive Expander (e.g., DRV1 (drive expander 1) and DRV2 (drive expander 2)
Enclosure	A chassis with one or more I/O modules, PSUs, FANs, etc. that houses and controls the environment of the HDDs/SSDs inside of it.

Term	Definition
ESM	Enclosure Storage Manager. This is the I/O Canister for the enclosure. The ESM has LEDs for location, fault, and power. There are also SAS connectors on each ESM for server/host connectivity.
EULA	End User License Agreement
HBA	Host Bus Adapter
HEM	Host Expander Module
FW	Firmware
HDD	Hard Disk Drive
HGST	Hitachi Global Storage Technologies
IO Canister	Another name for an ESM
IOM	Input/Output Module. Another name for an ESM.
JBOD	Just a Bunch of Disks
JBOF	Just a Bunch of Flash
LED	Light Emitting Diode
NVMe	Non-Volatile Memory Express
OOBM	Out-of-Band Management
OS	Operating System
PSU	Power Supply Unit
PWM	Pulse-Width Modulation (method of controlling speed/RPM of system fans)
RHEL	Red Hat Enterprise Linux
RMT	Remote
RPM	Red Hat Package Manager
SAS	Serial Attached SCSI
SATA	Serial ATA
SCSI	Small Computer Systems Interface
SEP	SCSI Enclosure Processor
Server/Host	Hardware with an Operating System and HBA used to access the drives in the storage enclosure.
SEC1	Secondary SAS Expander 1
SEC2	Secondary SAS Expander 2
SES	SCSI Enclosure Services
SSD	Solid State Drive
VPD	Vital Product Data
WD	Western Digital