

Using the NVSM CLI

NVIDIA DGX-2 servers running DGX OS version 4.0.1 or later should come with NVSM pre-installed.

NVSM CLI communicates with the privileged NVSM API server, so NVSM CLI requires superuser privileges to run. All examples given in this guide are prefixed with the `sudo` command.

Using the NVSM CLI Interactively

Starting an interactive session

The command “`sudo nvsm`” will start an NVSM CLI interactive session.

```
user@dgx-2:~$ sudo nvsm
[sudo] password for user:
nvsm->
```

Once at the “`nvsm->`” prompt, the user can enter NVSM CLI commands to view and manage the DGX system.

Example command

One such command is “`show fans`”, which prints the state of all fans known to NVSM.

```
nvsm-> show fans
/chassis/localhost/thermal/fans/FAN10_F
Properties:
  Status_State = Enabled
  Status_Health = OK
  Name = FAN10_F
  MemberId = 19
  ReadingUnits = RPM
  LowerThresholdNonCritical = 5046.000
  Reading = 9802 RPM
  LowerThresholdCritical = 3596.000
  ...
/chassis/localhost/thermal/fans/PDB_FAN4
Properties:
  Status_State = Enabled
  Status_Health = OK
  Name = PDB_FAN4
  MemberId = 23
  ReadingUnits = RPM
  LowerThresholdNonCritical = 11900.000
  Reading = 14076 RPM
  LowerThresholdCritical = 10744.000
nvsm->
```

Leaving an interactive session

To leave the NVSM CLI interactive session, use the “exit” command.

```
nvsm-> exit
user@dgx2:~$
```

Using the NVSM CLI Non-Interactively

Any NVSM CLI command can be invoked from the system shell, without starting an NVSM CLI interactive session. To do this, simply append the desired NVSM CLI command to the “sudo nvsm” command. The “show fans” command given above can be invoked directly from the system shell as follows.

```
user@dgx2:~$ sudo nvsm show fans
/chassis/localhost/thermal/fans/FAN10_F
Properties:
  Status_State = Enabled
  Status_Health = OK
  Name = FAN10_F
  MemberId = 19
  ReadingUnits = RPM
  LowerThresholdNonCritical = 5046.000
  Reading = 9802 RPM
  LowerThresholdCritical = 3596.000
...
/chassis/localhost/thermal/fans/PDB_FAN4
Properties:
  Status_State = Enabled
  Status_Health = OK
  Name = PDB_FAN4
  MemberId = 23
  ReadingUnits = RPM
  LowerThresholdNonCritical = 11900.000
  Reading = 14076 RPM
  LowerThresholdCritical = 10744.000
user@dgx2:~$
```

The output of some NVSM commands can be too large to fit on one screen, it is sometimes useful to pipe this output to a paging utility such as “less”.

```
user@dgx2:~$ sudo nvsm show fans | less
```

Throughout this chapter, examples are given for both interactive and non-interactive NVSM CLI use cases. Note that these interactive and non-interactive examples are interchangeable.

Getting Help

Apart from the NVSM CLI User Guide (this document), there are many sources for finding additional help for NVSM CLI and the related NVSM tools.

nvsm “man” Page

A man page for NVSM CLI is included on DGX systems with NVSM installed. The user can view this man page by invoking the “man nvsm” command.

```
user@dgx2:~$ man nvsm
```

nvsm -help/-h Flag

By passing the `-help` or `-h` flag, the `nvsm` command will display a help message that is similar to “`man nvsm`”. The help message can also be invoked through “`nvsm --help`”. It shows a description, `nvsm` command verbs, options and a few examples

Example output:

```
user@dgxa100:~$ sudo nvsm --help
Run 'sudo nvsm [command] -h' for a command-specific help message
NVSM(1)                                     NVSM CLI                                     NVSM(1)

NAME
nvsm - NVSM CLI Documentation

User Guide: https://docs.nvidia.com/datacenter/nvsm/latest/pdf/nvsm-user-guide.pdf

SYNOPSIS
nvsm [help] [--color WHEN] [-i] [--log-level LEVEL] [--] [<command>]

DESCRIPTION
nvsm(1), also known as NVSM CLI, is a command-line interface for System Management
on
NVIDIA DGX systems. Internally, NVSM CLI is a client of the NVSM (NVIDIA System
Management)
API server, which is facilitated by the nvsm(1) daemon.

Invoking the nvsm(1) command without any arguments will start an NVSM CLI
interactive session.

Alternatively, by passing commands as part of the [<command>] argument, NVSM CLI
can be run
in a non-interactive mode.

Note: nvsm must be run with root privileges.

NVSM COMMANDS
nvsm show [-h, --help] [-level LEVEL] [-display CATEGORIES] [-all] [target] [where]
:
    Display information about devices and other entities managed by NVSM

nvsm cd [-h, --help] [target]:
    Change the working target address used by NVSM verbs

nvsm set [-h, --help] [target] :
    Change the value of NVSM target properties

nvsm start [-h, --help] [-noblock] [-force] [-quiet] [-timeout TIMEOUT] [target] :
    Start a job managed by NVSM

nvsm dump health [-h, --help] [-o OUTPUT] [-t, -tags "tag1,tag2"]
    [-tfp, -tar_file_path "/x/y/path"] [-tfn, -tar_file_name "name.tar.xz"] :
    Generates a health report file

nvsm stress-test [--usage, -h, --help] [-force] [-no-prompt] [<test>] [DURATION] :
    NVIDIA System Management Stress Testing

nvsm lock [-h, --help] [target] :
    Enable locking of SED

nvsm create [-h, --help] [target] :
    The create command is used to generate new resources on demand

OPTIONS
--color WHEN
    Control colorization of output. Possible values for WHEN are "always", "never",
or "auto".
    Default value is "auto".

-i, --interactive
    When this option is given, run in interactive mode. The default is automatic.
```

```
--log-level LEVEL
    Set the output logging level. Possible values for LEVEL are "debug", "info",
"warning",
    "error", and "critical". The default value is "warning".
```

EXAMPLES

```
sudo nvsm help
    Display the help message for NVSM CLI

sudo nvsm show -h
    Display the help message for the NVSM show command

sudo nvsm show gpus
    Display information for all GPUs in the system.

sudo nvsm
    Run nvsm in interactive mode

sudo nvsm show versions
    Display system version properties

sudo nvsm update firmware
    Run through the steps of selecting a firmware update container on the local DGX
system,
    and running it to update the firmware on the system. This requires that you have
already
    loaded the container onto the DGX system.

sudo nvsm dump health
    Produce a health report file suitable for attaching to support tickets.
```

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Help for NVSM CLI Commands

Each NVSM command verb within the NVSM CLI interactive session, such as `show`, `cd`, `set`, `start`, `dump health`, `stress-test`, `lock` and `create` recognizes a “`-h`” or “`--help`” flag that describes the NVSM command and its arguments. These commands also have their own man pages, which can be invoked, for example, using “`man nvsm_show`”.

The help messages show the description, NVSM command nouns (or sub commands), options and examples.

Example output:

```
user@dgxa100:~$ sudo nvsm show -h
NVSM_SHOW(1)                               NVSM CLI                               NVSM_SHOW(1)

NAME
    nvsm_show - NVSM SHOW CLI Documentation

SYNOPSIS
    nvsm show [-h, --help] [-level LEVEL] [-display CATEGORIES] [-all] [target] [where]

DESCRIPTION
    Show is used to display information about system components. It displays
information
    about devices and other entities managed by NVSM

OPTIONS
    --help, -h
        show this help message and exit

    -level LEVEL, -l LEVEL
        Specify the target depth level to which the show command will traverse the
target hierarchy.
        The default value for LEVEL is 1, which means "the current target only".

    -display CATEGORIES, -d CATEGORIES
        Select the categories of information displayed about the given target.
        Valid values for CATEGORIES are 'associations', 'targets', 'properties',
'verbs',
        and 'all'. The default value for CATEGORY is 'all'. Multiple values can be
specified by separating those values with colon. Sub-arguments for
properties
        are supported which are separated by comma with parenthesis as optional.

    -all, -a
        Show data that are normally hidden. This includes OEM properties and OEM
targets
        unique to NVSM.

    target The target address of the Managed Element to show. The target address can be
relative
        to the current working target, or it can be absolute. Simple globbing to
select multiple
        Managed Elements is also possible.

    where Using this argument, targets can be filtered based on the value of their
properties.
        This can be used to quickly find targets with interesting properties.
Currently this
        supports '==' and '!= operations, which mean 'equal' and 'not equal'
respectively.
        UNIX-style wildcards using '*' are also supported.

COMMANDS
    show alerts
        Display warnings and critical alerts for all subsystems

    show drives
        Display the storage drives

    show versions
        Display system version properties

    show fans
        Display information for all the fans in the system.
```

```
show firmware
    Walk through steps of selecting a firmware update container on the local DGX
system,
    and run it to show the firmware versions installed on system. This requires
that you
        have already loaded the container onto the DGX system.

update firmware
    Walk through steps of selecting a firmware update container on the local
DGX system,
        and run it to update the firmware on system. This requires that you have
already loaded
            the container onto the DGX system.

show gpus
    Display information for all GPUs in the system

show health
    Display overall system health

show memory
    Display information for all installed DIMMs

show networkadapters
    Display information for the physical network adapters

show networkdevicefunctions
    Display information for the PCIe functions for a given network adapter

show networkinterfaces
    Display information for each logical network adapter on the system.

show networkports
    Display information for the network ports of a given networkadapter

show nvswitches
    Display information for all the NVSwitch interconnects in the system.

show policy
    Display alert policies for subsystems

show power
    Display information for all power supply units (PSUs) in the system.

show processors
    Display information for all processors in the system.

show storage
    Display storage related information

show temperature
    Display temperature information for all sensors in the system

show volumes
    Show storage volumes

show powermode
    Display the current system power mode

show led
    Lists values for available system LED status. Includes u.2 NVME,
Chassis/Blade LED
        status(on applicable platforms) disable exporters
```

```
Disable NVSM metric collection data
```

```
show controllers
    List applicable controllers properties. Applicable for SAS storage
controller in dgx1,
    and M.2 and U.2 NVMe controller properties for other platforms.
```

EXAMPLES

```
sudo nvsm show -h
    Display the help message for the NVSM show command
```

```
sudo nvsm show health -h
    Display the help message for the NVSM show health command
```

```
sudo nvsm show gpus
    Display information for all GPUs in the system.
```

```
sudo nvsm show versions
    Display system version properties
```

```
sudo nvsm show storage
    View all storage-related information
```

```
sudo nvsm show processors
    Information for all CPUs installed on the system
```

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NVSM_SHOW(1)

When a wrong command is entered, the CLI prompts the user to check the specified help message.

```
:~$ sudo nvsm show wrong_command
ERROR:nvsm:Target address "wrong_command" does not exist
Run: 'sudo nvsm show --help' for more options
```

Setting DGX H100 BMC Redfish Password

In DGX H100, Redfish services in BMC can be accessed using the BMC Redfish host IP address, which is termed the **Host Interface**. NVSM deployed on the Host OS communicates over Host Interface with the BMC Redfish services for the system data.

The Redfish host interface is a secured communication channel. As a prerequisite, BMC credentials with minimal read type access is set up in the Host OS before making any communication with the BMC Redfish services via NVSM.

The following NVSM commands sets up the BMC credentials for NVSM consumption in Host OS:

```
# nvsm set -bmccred    (or)    # nvsm set --bmccredentials
```

```
$ sudo nvsm set -bmccred
BMC credentials entered will be encrypted and stored.
Enter BMC username: admin
Enter BMC password:
Re Enter BMC password:
Entered credentials stored successfully.
```

Credentials get encrypted and stored on the Host.

Examining System Health

The most basic functionality of NVSM CLI is examination of system state. NVSM CLI provides a “show” command for this purpose.

Because NVSM CLI is modeled after the SMASH CLP, the output of the NVSM CLI “show” command should be familiar to users of BMC command line interfaces.

List of Basic Commands

The following table lists the basic commands (primarily “show”). Detailed use of these commands are explained in subsequent sections of the document.

Note

On DGX Station, the following are the only commands supported.

- `nvsm show health`
- `nvsm dump health`

Global Commands	Descriptions
<code>\$ sudo nvsm show alerts</code>	Displays warnings and critical alerts for all subsystems
<code>\$ sudo nvsm show policy</code>	Displays alert policies for subsystems
<code>\$ sudo nvsm show versions</code>	Displays system version properties

Health Commands	Descriptions
\$ sudo nvsm show health	Displays overall system health
\$ sudo nvsm dump health	Generates a health report file

Storage Commands	Descriptions
\$ sudo nvsm show storage	Displays all storage-related information
\$ sudo nvsm show drives	Displays the storage drives
\$ sudo nvsm show controllers	Display the storage controllers
\$ sudo nvsm show volumes	Displays the storage volumes

GPU Commands	Descriptions
\$ sudo nvsm show gpus	Displays information for all GPUs in the system.

Processor Commands	Descriptions
\$ sudo nvsm show processors	Displays information for all CPUs in the system
\$ sudo nvsm show cpus	Alias for “show processors”

Memory Commands	Descriptions
\$ sudo nvsm show memory	Displays information for all installed DIMMs
\$ sudo nvsm show dimms	Alias for “show memory”

Thermal Commands	Descriptions
\$ sudo nvsm show fans	Displays information for all the fans in the system.
\$ sudo nvsm show temperatures	Displays temperature information for all sensors in the system
\$ sudo nvsm show temps	Alias for “show temperatures”

Network Commands	Descriptions
\$ sudo nvsm show networkadapters	Displays information for the physical network adapters
\$ sudo nvsm show networkinterfaces	Displays information for the logical network interfaces
\$ sudo nvsm show networkports	Displays information for the network ports of a given network adapter
\$ sudo nvsm show networkdevicefunctions	Displays information for the PCIe functions for a given network adapter

Power Commands	Descriptions
\$ sudo nvsm show power	Displays information for all power supply units (PSUs) in the system.
\$ sudo nvsm show powermode	Display the current system power mode
\$ sudo nvsm show psus	Alias for “show power”

NVSwitch Commands	Descriptions
\$ sudo nvsm show nvswitches	Displays information for all the NVSwitch interconnects in the system.

Firmware Commands	Descriptions
\$ sudo nvsm show firmware	Guides you through the steps of selecting a firmware update container on your local DGX system, and running it to show the firmware versions installed on the system. This requires that you have already loaded the container onto the DGX system.
\$ sudo nvsm update firmware	Guides you through the steps of selecting a firmware update container on your local DGX system, and running it to update the firmware on the system. This requires that you have already loaded the container onto the DGX system.

Show Health

The “show health” command can be used to quickly assess overall system health.

```
user@dgx-2:~$ sudo nvsm show health
```

Example output:

```
...
Checks
-----Verify installed DIMM memory sticks.....
HealthyNumber of logical CPU cores [96].....
HealthyGPU link speed [0000:39:00.0][8GT/s].....
HealthyGPU link width [0000:39:00.0][x16].....
Healthy
...
Health Summary
-----
205 out of 205 checks are Healthy
Overall system status is Healthy
```

If any system health problems are found, this will be reflected in the health summary at the bottom of the “show health” output”. Detailed information on health checks performed will appear above.

Dump Health

The “dump health” command produces a health report file suitable for attaching to support tickets.

```
user@dgx-2:~$ sudo nvsm dump health
```

Example output:

```
Writing output to /tmp/nvsm-health-dgx-1-20180907085048.tar.xzDone.
```

The file produced by “dump health” is a familiar compressed tar archive, and its contents can be examined by using the “tar” command as shown in the following example.

```
user@dgx-2:~$ cd /tmp
user@dgx-2:/tmp$ sudo tar xlf nvsm-health-dgx-1-20180907085048.tar.xz
user@dgx-2:/tmp$ sudo ls ./nvsm-health-dgx-1-20180907085048
date          java      nvsyinfo_commands  sos_reports
df            last      nvsyinfo_log.txt   sos_strings
dmidecode     lib       proc                sys
etc           lsb-release ps                  uname
free          lsmod     pstree               uptime
hostname      lsof      route               usr
initctl       lspci    run                 var
installed-debs mount    sos_commands     version.txt
ip_addr       netstat   sos_logs            vgdisplay
```

The option `-qkd` or `--quick_dump` can be used to collect the health report more quickly, at the cost of higher CPU/memory consumption.

```
# nvsm dump health -qkd
```

Show Versions

The `nvsm show versions` command displays hardware components on board, along with their firmware versions. It also shows the installed version of NVSM, Datacenter GPU Manager, and OS among others.

```
user@dgxa100:~$ sudo nvsm show versions
```

After installing NVSM, the command `sudo nvsm show versions` will take approximately three minutes to run.

Example output:

```
initializing NVSM Core...

/versions
Properties:
  dgx-release = 5.1.0
  nvidia-driver = 470.57.01
  cuda-driver = 11.4
  os-release = Ubuntu 20.04.2 LTS (Focal Fossa)
  kernel = 5.4.0-77-generic
  nvidia-container-runtime-docker = 3.4.0-1
  docker-ce = 20.10.7
  platform = DGXA100
  nvsm = 21.07.12-5-g9775e940-dirty
  mlnx-ofed = MLNX_OFED_LINUX-5.4-1.0.3.0:
  datacenter-gpu-manager = 1:2.2.9
  datacenter-gpu-manager-fabricmanager = 470.57.01-1
  sBIOS = 1.03
  vBIOS-GPU-0 = 92.00.45.00.06
  vBIOS-GPU-1 = 92.00.45.00.06
  vBIOS-GPU-2 = 92.00.45.00.06
  vBIOS-GPU-3 = 92.00.45.00.06
  vBIOS-GPU-4 = 92.00.45.00.06
  vBIOS-GPU-5 = 92.00.45.00.06
  vBIOS-GPU-6 = 92.00.45.00.06
  vBIOS-GPU-7 = 92.00.45.00.06
  BMC = 0.14.17
  CEC-BMC-1 = 03.28
  CEC-Delta-2 = 04.00
  PSU-0 Chassis-1 = 01.05.01.05.01.05
  PSU-1 Chassis-1 = 01.05.01.05.01.05
  PSU-2 Chassis-1 = 01.05.01.05.01.05
  PSU-3 Chassis-1 = 01.05.01.05.01.05
  PSU-4 Chassis-1 = 01.05.01.05.01.05
  PSU-5 Chassis-1 = 01.07.01.05.01.06
  MB-FPGA = 0.01.03
  MID-FPGA = 0.01.03
  NvSwitch-0 = 92.10.18.00.02
  NvSwitch-1 = 92.10.18.00.02
  NvSwitch-2 = 92.10.18.00.02
  NvSwitch-3 = 92.10.18.00.02
  NvSwitch-4 = 92.10.18.00.02
  NvSwitch-5 = 92.10.18.00.02
  SSD-nvme0 (S/N S4YPNE0MB00495) System-1 = EPK9CB5Q
  SSD-nvme1 (S/N S436NA0M510827) System-1 = EDA7602Q
  SSD-nvme2 (S/N S436NA0M510817) System-1 = EDA7602Q
  SSD-nvme3 (S/N S4YPNE0MB01307) System-1 = EPK9CB5Q
  SSD-nvme4 (S/N S4YPNE0MC01447) System-1 = EPK9CB5Q
```

Show Storage

NVSM CLI provides a “show storage” command to view all storage-related information. This command can be invoked from the command line as follows.

```
user@dgx-2:~$ sudo nvsm show storage
```

The following NVSM commands also show storage-related information.

```
> user@dgx-2:~$ sudo nvsm show drives
```

```
> user@dgx-2:~$ sudo nvsm show volumes
```

```
> user@dgx-2:~$ sudo nvsm show controllers
```

```
> user@dgx-2:~$ sudo nvsm show led
```

Within an NVSM CLI interactive session, the CLI targets related to storage are located under the /systems/localhost/storage/1 target.

```
user@dgx2:~$ sudo nvsm
nvsm-> cd /systems/localhost/storage/
nvsm(/systems/localhost/storage/)--> show
```

Example output:

```
/systems/localhost/storage/
Properties:
  DriveCount = 10
  Volumes = [ md0, md1, nvme0n1p1, nvme1n1p1 ]
Targets:
  alerts
  drives
  policy
  volumes
Verbs:
  cd
  show
```

Show Storage Alerts

Storage alerts are generated when the DSHM monitoring daemon detects a storage-related problem and attempts to alert the user (via email or otherwise). Past storage alerts can be viewed within an NVSM CLI interactive session under the /systems/localhost/storage/1/alerts target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /systems/localhost/storage/alerts
nvsm(/systems/localhost/storage/alerts)--> show
```

Example output:

```
/systems/localhost/storage/alerts
Targets:
  alert0
  alert1
Verbs:
  cd
  show
```

In this example listing, there appear to be two storage alerts associated with this system. The contents of these alerts can be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/storage/alerts)-> show alert1
```

```
/systems/localhost/storage/alerts/alert1
Properties:
  system_name = dgx-2
  message_details = EFI System Partition 1 is corrupted
  nvme0n1p1
    component_id = nvme0n1p1
    description = Storage sub-system is reporting an error
    event_time = 2018-07-14 12:51:19
    recommended_action =
      1. Please run nvsyinfo
      2. Please open a case with NVIDIA Enterprise Support at this address
      https://nvid.nvidia.com/enterpriselogin
      3. Attach this notification and the nvsyinfo log file from /tmp/nvsyinfo-
  XYZ*
    alert_id = NV-VOL-03
    system_serial = productserial
    message = System entered degraded mode, storage sub-system is reporting an error
    severity = Warning
Verbs:
  cd
  show
```

The message seen in this alert suggests a possible EFI partition corruption, which is an error condition that might adversely affect this system’s ability to boot. Note that the text seen here reflects the exact message that the user would have seen when this alert was generated.

Possible categories for storage alerts are given in the table below.

Alert ID	Severity	Details
NV-DRIVE-01	Critical	Drive missing
NV-DRIVE-07	Warning	System has unsupported drive
NV-DRIVE-09	Warning	Unsupported SED drive configuration
NV-DRIVE-10	Critical	Unsupported volume encryption configuration
NV-DRIVE-11	Warning	M.2 firmware version mismatch
NV-VOL-01	Critical	RAID-0 corruption observed
NV-VOL-02	Critical	RAID-1 corruption observed
NV-VOL-03	Warning	EFI System Partition 1 corruption observed
NV-VOL-04	Warning	EFI System Partition 2 corruption observed
NV-CONTROLLER-01	Warning	Controller is reporting an error
NV-CONTROLLER-02	Warning	Storage controller is reporting PHY error
NV-CONTROLLER-03	Warning	Controller set at lower than expected speed
NV-CONTROLLER-04	Critical	Controller is reporting an error
NV-CONTROLLER-05	Critical	Controller is reporting an error
NV-CONTROLLER-06	Critical	Controller is reporting an error
NV-CONTROLLER-07	Critical	LEDStatus for controller needs to be cleared

Show Storage Drives

Within an NVSM CLI interactive session, each storage drive on the system is represented by a target under the /systems/localhost/storage/drives target. A listing of drives can be obtained as follows.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /systems/localhost/storage/drives
nvsm(/systems/localhost/storage/drives)-> show
```

Example output:

```
/systems/localhost/storage/drives
Targets:
nvme0n1
nvme1n1
nvme2n1
nvme3n1
nvme4n1
nvme5n1
nvme6n1
nvme7n1
nvme8n1
nvme9n1
Verbs:
cd
show
```

Details for any particular drive can be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/storage/drives)-> show nvme2n1
```

```
/systems/localhost/storage/drives/nvme2n1
Properties:
  Capacity = 3840755982336
  BlockSizeBytes = 7501476528
  SerialNumber = 18141C244707
  PartNumber = N/A
  Model = Micron_9200_MTFDHAL3T8TCT
  Revision = 100007C0
  Manufacturer = Micron Technology Inc
  Status_State = Enabled
  Status_Health = OK
  Name = Non-Volatile Memory Express
  MediaType = SSD
  IndicatorLED = N/A
  EncryptionStatus = N/A
  HotSpareType = N/A
  Protocol = NVMe
  NegotiatedSpeedsGbs = 0
  Id = 2
Verbs:
  cd
  show
```

Show Storage Volumes

Within an NVSM CLI interactive session, each storage volume on the system is represented by a target under the /systems/localhost/storage/volumes target. A listing of volumes can be obtained as follows.

```
user@dgx-2:~$ sudo nvsm
nvsmnvsm-> cd /systems/localhost/storage/volumes
nvsm(/systems/localhost/storage/volumes)-> show
```

Example output:

```
/systems/localhost/storage/volumes
Targets:
  md0
  md1
  nvme0n1p1
  nvme1n1p1
Verbs:
  cd
  show
```

Details for any particular volume can be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/storage/volumes)-> show md0
```

```
/systems/localhost/storage/volumes/md0P
roperties:
    Status_State = Enabled
    Status_Health = OK
    Name = md0
    Encrypted = False
    VolumeType = RAID-1
    Drives = [ nvme0n1, nvme1n1 ]
    CapacityBytes = 893.6G
    Id = md0
Verbs:
    cd
    show
```

Show GPUs

Information for all GPUs installed on the system can be viewed invoking the “show gpus” command as follows.

```
user@dgx-2:~$ sudo nvsm show gpus
```

Within an NVSM CLI interactive session, the same information can be accessed under the /systems/localhost/gpus CLI target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /systems/localhost/gpus
nvsm(/systems/localhost/gpus)-> show
```

Example output:

```
/systems/localhost/gpus
```

```
Targets:
```

```
0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15
```

```
Verbs:
```

```
cd  
show
```

Details for any particular GPU can also be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/gpus)-> show 6  
/systems/localhost/gpus/6  
Properties:  
    Inventory_ModelName = Tesla V100-SXM3-32GB  
    Inventory_UUID = GPU-4c653056-0d6e-df7d-19c0-4663d6745b97  
    Inventory_SerialNumber = 0332318503073  
    Inventory_PCIeDeviceId = 1DB810DE  
    Inventory_PCIeSubSystemId = 12AB10DE  
    Inventory_BrandName = Tesla  
    Inventory_PartNumber = 699-2G504-0200-000  
Verbs:  
    cd  
    show
```

Showing Individual GPUs

Details for any particular GPU can also be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/gpus)-> show GPU6
/systems/localhost/gpus/GPU6
Properties:
  Inventory_ModelName = Tesla V100-SXM3-32GB
  Inventory_UUID = GPU-4c653056-0d6e-df7d-19c0-4663d6745b97
  Inventory_SerialNumber = 0332318503073
  Inventory_PCIEDeviceId = 1DB810DE
  Inventory_PCIESubSystemId = 12AB10DE
  Inventory_BrandName = Tesla
  Inventory_PartNumber = 699-2G504-0200-000
  Specifications_MaxPCIeGen = 3
  Specifications_MaxPCIeLinkWidth = 16x
  Specifications_MaxSpeeds_GraphicsClock = 1597 MHz
  Specifications_MaxSpeeds_MemClock = 958 MHz
  Specifications_MaxSpeeds_SMClock = 1597 MHz
  Specifications_MaxSpeeds_VideoClock = 1432 MHz
  Connections_PCIEGen = 3
  Connections_PCIELinkWidth = 16x
  Connections_PCIELocation = 00000000:34:00.0
  Power_PowerDraw = 50.95 W
  Stats_ErrorStats_ECCMode = Enabled
  Stats_FrameBufferMemoryUsage_Free = 32510 MiB
  Stats_FrameBufferMemoryUsage_Total = 32510 MiB
  Stats_FrameBufferMemoryUsage_Used = 0 MiB
  Stats_PCIERxThroughput = 0 KB/s
  Stats_PCIETxThroughput = 0 KB/s
  Stats_PerformanceState = P0
  Stats_UtilDecoder = 0 %
  Stats_UtilEncoder = 0 %
  Stats_UtilGPU = 0 %
  Stats_UtilMemory = 0 %
  Status_Health = OK
Verbs:
  cd
  show
```

Identifying GPU Health Incidents

Explain the benefits of the task, the purpose of the task, who should perform the task, and when to perform the task in 50 words or fewer.

NVSM uses NVIDIA Data Center GPU Manager (DCGM) to continuously monitor GPU health, and reports GPU health issues as “GPU health incidents”. Whenever GPU health incidents are present, NVSM indicates this state in the “`Status_HealthRollup`” property of the `/systems/localhost/gpus` CLI target.

“`Status_HealthRollup`” captures the overall health of all GPUs in the system in a single value. Check the “`Status_HealthRollup`” property before checking other properties when checking for GPU health incidents.

To check for GPU health incidents, do the following,

1. Display the “Properties” section of GPU health

```
~$ sudo nvsm
nvsm-> cd /systems/localhost/gpus
nvsm(/systems/localhost/gpus)-> show -display properties
```

A system with a GPU-related issue might report the following.

```
Properties:
  Status_HealthRollup = Critical
  Status_Health = OK
```

The “`Status_Health = OK`” property in this example indicates that NVSM did not find any system-level problems, such as missing drivers or incorrect device file permissions.

The “`Status_HealthRollup = Critical`” property indicates that at least one GPU in this system is exhibiting a “Critical” health incident.

2. To find this GPU, issue the following command to list the health status for each GPU..

```
~$ sudo nvsm
nvsm-> show -display properties=*health /systems/localhost/gpus/*
```

The GPU with the health incidents will be reported as in the following example for GPU14.

```
/systems/localhost/gpus/GPU14
Properties:
  Status_Health = Critica
```

3. Issue the following command to show the detailed health information for a particular GPU (GPU14 in this example).

```
nvsm-> cd /systems/localhost/gpus
nvsm(/systems/localhost/gpus)-> show -level all GPU14/health
```

The output shows all the incidents involving that particular GPU.

```
/systems/localhost/gpus/GPU14/health
Properties:
  Health = Critical
Targets:
  incident0
Verbs:
  cd
  show/systems/localhost/gpus/GPU2/health/incident0
Properties:
  Message = GPU 14's NvLink link 2 is currently down.
  Health = Critical
  System = NVLink
Verbs:
  cd
  show
```

The output in this example narrows down the scope to a specific incident (or incidents) on a specific GPU. DCGM will monitor for a variety of GPU conditions, so check “ [Status_HealthRollup](#) ” using NVSM CLI to understand each incident.

Show Processors

Information for all CPUs installed on the system can be viewed using the “show processors” command.

```
user@dgx-2$ sudo nvsm show processors
```

From within an NVSM CLI interactive session, the same information is available under the /systems/localhost/processors target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /systems/localhost/processors
nvsm(/systems/localhost/processors)-> show
```

Example output:

```
/systems/localhost/processors
Targets:
  CPU0
  CPU1
  alerts
  policy
Verbs:
  cd
  show
```

Details for any particular CPU can be viewed using the “show” command.

For example:

```
nvsm(/systems/localhost/processors)-> show CPU0/systems/localhost/processors/CPU0
Properties:
  Id = CPU0
  InstructionSet = x86-64
  Manufacturer = Intel(R) Corporation
  MaxSpeedMHz = 3600
  Model = Intel(R) Xeon(R) Platinum 8168 CPU @ 2.70GHz
  Name = Central Processor
  ProcessorArchitecture = x86
  ProcessorId_EffectiveFamily = 6
  ProcessorId_EffectiveModel = 85
  ProcessorId_IdentificationRegisters = 0xBFEBFBFF00050654
  ProcessorId_Step = 4
  ProcessorId_VendorId = GenuineIntel
  ProcessorType = CPU
  Socket = CPU 0
  Status_Health = OK
  Status_State = Enabled
  TotalCores = 24
  TotalThreads = 48
Verbs:
  cd
  show
```

Show Processor Alerts

Processor alerts are generated when the DSHM monitoring daemon detects a CPU Internal Error (IERR) or Thermal Trip and attempts to alert the user (via email or otherwise). Past processor alerts can be viewed within an NVSM CLI interactive session under the /systems/localhost/processors/alerts target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /systems/localhost/processors/alerts
nvsm(/systems/localhost/processors/alerts)-> show
```

Example output:

```
/systems/localhost/processors/alerts
Targets:
  alert0
  alert1
  alert2
Verbs:
  cd
  show
```

This example listing appears to show three processor alerts associated with this system. The contents of these alerts can be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/processors/alerts)-> show alert2
```

```
/systems/localhost/processors/alerts/alert2
Properties:
    system_name = xpl-bu-06
    component_id = CPU0
    description = CPU is reporting an error.
    event_time = 2018-07-18T16:42:20.580050
    recommended_action =
        1. Please run nvsyinfo
        2. Please open a case with NVIDIA Enterprise Support at this address
           https://nvid.nvidia.com/enterpriselogin
        3. Attach this notification and the nvsyinfo log file from /tmp/nvsyinfo-XYZ*
    severity = Critical
    alert_id = NV-CPU-02
    system_serial = To be filled by O.E.M.
    message = System entered degraded mode, CPU0 is reporting an error.
    message_details = CPU Thermtrip has occurred, processor socket temperature
                      exceeded the thermal specifications of the component.
Verbs:
    cd
    show
```

Possible categories for processor alerts are given in the table below.

Alert ID	Severity	Details
NV-CPU-01	Critical	An unrecoverable CPU Internal error has occurred.
NV-CPU-02	Critical	CPU Thermtrip has occurred, processor socket temperature exceeded the thermal specifications of the component.

Show Memory

Information for all system memory (i.e. all DIMMs installed near the CPU, not including GPU memory) can be viewed using the “show memory” command.

```
user@dgx-2:~$ sudo nvsm show memory
```

From within an NVSM CLI interactive session, system memory information is accessible under the /systems/localhost/memory target.

```
lab@xpl-dvt-42:~$ sudo nvsm
nvsm-> cd /systems/localhost/memory
nvsm(/systems/localhost/memory)-> show
```

Example output:

```
/systems/localhost/memory
```

```
Targets:
```

```
CPU0_DIMM_A1
CPU0_DIMM_A2
CPU0_DIMM_B1
CPU0_DIMM_B2
CPU0_DIMM_C1
CPU0_DIMM_C2
CPU0_DIMM_D1
CPU0_DIMM_D2
CPU0_DIMM_E1
CPU0_DIMM_E2
CPU0_DIMM_F1
CPU0_DIMM_F2
CPU1_DIMM_G1
CPU1_DIMM_G2
CPU1_DIMM_H1
CPU1_DIMM_H2
CPU1_DIMM_I1
CPU1_DIMM_I2
CPU1_DIMM_J1
CPU1_DIMM_J2
CPU1_DIMM_K1
CPU1_DIMM_K2
CPU1_DIMM_L1
CPU1_DIMM_L2
alerts    policy
```

```
Verbs:
```

```
cd
show
```

Details for any particular memory DIMM can be viewed using the “show” command.

For example:

```
nvsm(/systems/localhost/memory)-> show CPU2_DIMM_B1
```

```
/systems/localhost/memory/CPU2_DIMM_B1
Properties:
  CapacityMiB = 65536
  DataWidthBits = 64
  Description = DIMM DDR4 Synchronous
  Id = CPU2_DIMM_B1
  Name = Memory Instance
  OperatingSpeedMhz = 2666
  PartNumber = 72ASS8G72LZ-2G6B2
  SerialNumber = 1CD83000
  Status_Health = OK
  Status_State = Enabled
  VendorId = Micron
Verbs:
  cd
  show
```

Show Memory Alerts

On DGX systems with a Baseboard Management Controller (BMC), the BMC will monitor DIMMs for correctable and uncorrectable errors. Whenever memory error counts cross a certain threshold (as determined by SBIOS), a memory alert is generated by the DSHM daemon in an attempt to notify the user (via email or otherwise).

Past memory alerts are accessible from an NVSM CLI interactive session under the /systems/localhost/memory/alerts target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /systems/localhost/memory/alerts
nvsm(/systems/localhost/memory/alerts)-> show
```

Example output:

```
/systems/localhost/memory/alerts
Targets:
  alert0
Verbs:
  cd
  show
```

This example listing appears to show one memory alert associated with this system. The contents of this alert can be viewed with the “show” command.

For example:

```
nvsm(/systems/localhost/memory/alerts)-> show alert0
```

```
/systems/localhost/memory/alerts/alert0
Properties:
  system_name = xpl-bu-06
  component_id = CPU1_DIMM_A2
  description = DIMM is reporting an error.
  event_time = 2018-07-18T16:48:09.906572
  recommended_action =
    1. Please run nvsysinfo
    2. Please open a case with NVIDIA Enterprise Support at this address
      https://nvid.nvidia.com/enterpriselogin
    3. Attach this notification and the nvsysinfo log file from /tmp/nvsysinfo-XYZ*
  severity = Critical
  alert_id = NV-DIMM-01
  system_serial = To be filled by O.E.M.
  message = System entered degraded mode, CPU1_DIMM_A2 is reporting an error.
  message_details = Uncorrectable error is reported.

Verbs:
  cd
  show
```

Possible categories for memory alerts are given in the table below.

Alert Type	Severity	Details
NV-DIMM-01	Critical	Uncorrectable error is reported.

Show Fans and Temperature

NVSM CLI provides a “show fans” command to display information for each fan on the system.

```
~$ sudo nvsm show fans
```

Likewise, NVSM CLI provides a “show temperatures” command to display temperature information for each temperature sensor known to NVSM.

```
~$ sudo nvsm show temperatures
```

Within an NVSM CLI interactive session, targets related to fans and temperature are located under the /chassis/localhost/thermal target.

```
~$ sudo nvsm
nvsm-> cd /chassis/localhost/thermal
nvsm(/chassis/localhost/thermal)-> show
```

Example output:

```
/chassis/localhost/thermal
Targets:
  alerts
  fans
  policy
  temperatures
Verbs:
  cd
  show
```

Show Thermal Alerts

The DSHM daemon monitors fan speed and temperature sensors. When the values of these sensors violate certain threshold criteria, DSHM generates a thermal alert in an attempt to notify the user (via email or otherwise).

Past thermal alerts can be viewed in an NVSM CLI interactive session under the /chassis/localhost/thermal/alerts target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /chassis/localhost/thermal/alerts
nvsm(/chassis/localhost/thermal/alerts)-> show
```

Example output:

```
/chassis/localhost/thermal/alerts
Targets:
  alert0
Verbs:
  cd
  show
```

This example listing appears to show one thermal alert associated with this system. The contents of this alert can be viewed with the “show” command.

For example:

```

nvsm(/chassis/localhost/thermal/alerts)-> show alert0
/chassis/localhost/thermal/alerts/alert0
Properties:
  system_name = system-name
  component_id = FAN1_R
  description = Fan Module is reporting an error.
  event_time = 2018-07-12T15:12:22.076814
  recommended_action =
    1. Please run nvsyinfo
    2. Please open a case with NVIDIA Enterprise Support at this address
https://nvid.nvidia.com/enterpriselogin      3. Attach this notification and the
nvsyinfo log file from /tmp/nvsyinfo-XYZ*
  severity = Critical
  alert_id = NV-FAN-01
  system_serial = To be filled by O.E.M.
  message = System entered degraded mode, FAN1_R is reporting an error.
  message_details = Fan speed reading has fallen below the expected speed setting.
Verbs: cd show

```

From the message in this alert, it appears that one of the rear fans is broken in this system. This is the exact message that the user would have received at the time this alert was generated, assuming alert notifications were enabled.

Possible categories for thermal-related (fan and temperature) alerts are given in the table below.

Alert ID	Severity	Details
NV-FAN-01	Critical	Fan speed reading has fallen below the expected speed setting.
NV-FAN-02	Critical	Fan readings are inaccessible.
NV-PDB-01	Critical	Operating temperature exceeds the thermal specifications of the component.

Show Fans

Within an NVSM CLI interactive session, each fan on the system is represented by a target under the /chassis/localhost/thermal/fans target. The “show” command can be used to obtain a listing of fans on the system.

```
user@dgx-2:~$ sudo nvsm
```

```
nvsm-> cd /chassis/localhost/thermal/fans
```

```
nvsm(/chassis/localhost/thermal/fans)-> show
```

Example output:

```
/chassis/localhost/thermal/fans
```

Targets:

```
FAN10_F  
FAN10_R  
FAN1_F  
FAN1_R  
FAN2_F  
FAN2_R  
FAN3_F  
FAN3_R  
FAN4_F  
FAN4_R  
FAN5_F  
FAN5_R  
FAN6_F  
FAN6_R  
FAN7_F  
FAN7_R  
FAN8_F  
FAN8_R  
FAN9_F  
FAN9_R  
PDB_FAN1  
PDB_FAN2  
PDB_FAN3  
PDB_FAN4
```

Verbs:

```
cd  
show
```

Again using the “show” command, the details for any given fan can be obtained as follows.

For example:

```
nvsm(/chassis/localhost/thermal/fans)-> show PDB_FAN2  
/chassis/localhost/thermal/fans/PDB_FAN2
```

Properties:

```
Status_State = Enabled  
Status_Health = OK  
Name = PDB_FAN2  
MemberId = 21  
ReadingUnits = RPM  
LowerThresholdNonCritical = 11900.000  
Reading = 13804 RPM  
LowerThresholdCritical = 10744.000
```

Verbs:

```
cd  
show
```

Show Temperatures

Each temperature sensor known to NVSM is represented as a target under the /chassis/localhost/thermal/temperatures target. A listing of temperature sensors on the system can be obtained using the following commands.

```
nvsm(/chassis/localhost/thermal/temperatures)-> show
```

Example output:

```
/chassis/localhost/thermal/temperatures
Targets:
  PDB1
  PDB2
Verbs:
  cd
  show
```

As with fans, the details for any temperature sensor can be viewed with the “show” command.

For example:

```
nvsm(/chassis/localhost/thermal/temperatures)-> show PDB2
/chassis/localhost/thermal/temperatures/PDB2
Properties:
  Status_State = Enabled
  Status_Health = OK
  Name = PDB2
  PhysicalContext = PDB
  MemberId = 1
  ReadingCelsius = 20 degrees C
  UpperThresholdNonCritical = 127.000
  SensorNumber = 66h
  UpperThresholdCritical = 127.000
Verbs:
  cd
  show
```

Show Power Supplies

NVSM CLI provides a “show power” command to display information for all power supplies present on the system.

```
user@dgx-2:~$ sudo nvsm show power
```

From an NVSM CLI interactive session, power supply information can be found under the /chassis/localhost/power target.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /chassis/localhost/power
nvsm(/chassis/localhost/power)-> show
```

Example output:

```
/chassis/localhost/power
Targets:
PSU1
PSU2
PSU3
PSU4
PSU5
PSU6
alerts    policyVerbs:    cd    show
```

Details for any particular power supply can be viewed using the “show” command as follows.

For example:

```
nvsm(/chassis/localhost/power)-> show PSU4
```

```
/chassis/localhost/power/PSU4
Properties:
Status_State = Present
Status_Health = OK
LastPowerOutputWatts = 442
Name = PSU4
SerialNumber = DTHTCD18240
MemberId = 3
PowerSupplyType = AC
Model = ECD16010081
Manufacturer = Delta
Verbs:
cd
show
```

Show Power Alerts

The DSHM daemon monitors PSU status. When the PSU status is not Ok, DSHM generates a power alert in an attempt to notify the user (via email or otherwise).

Prior power alerts can be viewed under the /chassis/localhost/power/alerts target of an NVSM CLI interactive session.

```
user@dgx-2:~$ sudo nvsm
nvsm-> cd /chassis/localhost/power/alerts
nvsm(/chassis/localhost/power/alerts)-> show
```

Example output:

```
/chassis/localhost/power/alerts
Targets:
alert0
alert1
alert2
alert3
alert4
Verbs:
cd
show
```

This example listing shows a system with five prior power alerts. The details for any one of these alerts can be viewed using the “show” command.

For example:

```
nvsm(/chassis/localhost/power/alerts)-> show alert4
/chassis/localhost/power/alerts/alert4
Properties:
system_name = system-name
component_id = PSU4
description = PSU is reporting an error.
event_time = 2018-07-18T16:01:27.462005
recommended_action =
    1. Please run nvsyinfo
    2. Please open a case with NVIDIA Enterprise Support at this address
https://nvid.nvidia.com/enterpriselogin
    3. Attach this notification and the nvsyinfo log file from /tmp/nvsyinfo-XYZ*
severity = Warning
alert_id = NV-PSU-05
system_serial = To be filled by O.E.M.
message = System entered degraded mode, PSU4 is reporting an error.
message_details = PSU is missing
Verbs:
cd
show
```

Possible categories for power alerts are given in the table below.

Alert ID	Severity	Details
NV-PSU-01	Critical	Power supply module has failed.
NV-PSU-02	Warning	Detected predictive failure of the Power supply module.
NV-PSU-03	Critical	Input to the Power supply module is missing.
NV-PSU-04	Critical	Input voltage is out of range for the Power Supply Module.
NV-PSU-05	Warning	PSU is missing

Show Network Adapters

NVSM CLI provides a `show networkadapters` command to display information for each physical network adapter in the chassis.

```
~$ sudo nvsm show networkadapters
```

Within an NVSM CLI interactive session, targets related to network adapters are located under the `/chassis/localhost/NetworkAdapters` target.

```
~$ sudo nvsm
nvsm-> cd /chassis/localhost/NetworkAdapters
nvsm(/chassis/localhost/NetworkAdapters)-> show
```

Display a List of Muted Adapters

To display a list of the muted adapters, run the following command:

```
$ sudo nvsm show /chassis/localhost/NetworkAdapters/policy
/chassis/localhost/NetworkAdapters/policy
Properties:
mute_monitoring = <NOT_SET>
mute_notification = <NOT_SET>
```

Show Network Ports

NVSM CLI provides a `show networkports` command to display information for each physical network port in the chassis.

```
~$ sudo nvsm show networkports
```

Within an NVSM CLI interactive session, targets related to network adapters are located under the /chassis/localhost/NetworkAdapter/<id>/NetworkPort target, where <id> is one of the network adapter IDs displayed from the [nvsm show networkadapters](#) command.

```
~$ sudo nvsm
nvsm-> cd /chassis/localhost/NetworkAdapters/<id>/NetworkPorts
nvsm(/chassis/localhost/NetworkAdapters/<id>/NetworkPorts)-> show
```

Show Network Device Functions

NVSM CLI provides a [show networkdevicefunctions](#) command to display information for each network adapter-centric PCIe function in the chassis.

```
~$ sudo nvsm show networkdevicefunctions
```

Within an NVSM CLI interactive session, targets related to network device functions are located under the [/chassis/localhost/NetworkAdapter/<id>/NetworkDeviceFunctions](#) target, where <id> is one of the network adapter IDs displayed from the [nvsm show networkadapters](#) command.

```
~$ sudo nvsm
nvsm-> cd /chassis/localhost/NetworkAdapters/<id>/NetworkDeviceFunctions
nvsm(/chassis/localhost/NetworkAdapters/<id>/NetworkDeviceFunctions)-> show
```

Display a List of Interfaces

Run the following command:

```
$ sudo nvsm show /chassis/localhost/NetworkAdapters
/chassis/localhost/NetworkAdapters
Targets:
PCI0000_0c_00
PCI0000_12_00
PCI0000_4b_00
PCI0000_54_00
PCI0000_8d_00
PCI0000_94_00
PCI0000_ba_00
PCI0000_cc_00
PCI0000_e1_00
PCI0000_e2_00
```

Show Network Interfaces

NVSM CLI provides a `show networkinterfaces` command to display information for each logical network adapter on the system.

```
~$ sudo nvsm show networkinterfaces
```

In an NVSM CLI interactive session, targets related to network adapters are located under the `/system/localhost/networkinterfaces` target.

```
~$ sudo nvsm
nvsm-> cd /system/localhost/NetworkInterfaces
nvsm(/system/localhost/NetworkInterfaces)-> show
```

Add an Interface to the Mute Notifications

Here is an example of a command you can run to add an interface to the mute notifications:

```
$ sudo nvsm set chassis/localhost/NetworkAdapters/policy
mute_notification=PCI0000_0c_00,PCI0000_12_00
```

Examining Software Health

NVSM monitor software health services helps to identify and troubleshoot the system issues which exist at various levels in the software layer. Software layer refers to the installed packages, services and configurations part of the operating system deployed on DGX servers.

Software health service can be displayed using the following command:

```
sudo nvsm show health --software_health
```

Or

```
sudo nvsm show health -swh
```

Example output:

Info

TimeStamp: Mon Jan 29 03:30:03 UTC 2024
Nvsm Version: 23.12.01
Product Name: DGXA100
Serial Number: <serial number>
Host Name: <hostname>

Checks

Checking DGX OS packages/services

Version Compatibility:

Check nvidia-driver, nvidia-utils, libnvidia-compute..... Healthy
nvidia-driver:535.129.3 nvidia-utils:535.129.3 libnvidia-compute:535.129.3
Check nvidia-driver & nvidia-fabricmanager..... Healthy
nvidia-driver:535.129.3 nvidia-fabricmanager:535.129.3
Check nvidia-driver & libnvidia-nscq..... Healthy
nvidia-driver:535.129.3 libnvidia-nscq:535.129.3

Service check:

Check nvsm(nvsm.service)..... Healthy
Check persisted manager(nvidia-persisted.service)..... Healthy
Check fabric manager(nvidia-fabricmanager.service)..... Healthy
Check mig manager(nvidia-mig-manager.service)..... Healthy
Check nvidia acs disable(nvidia-acss-disable.service)..... Healthy
Check nvidia Mellanox Config(nvidia-mlnx-config.service)..... Healthy
Check dcgm(nvidia-dcgm.service)..... Healthy

Packages check:

Check dgx-release..... Healthy
Check base packages..... Healthy
Check upgrade related packages DGX.....

Informational

Package nvidia-peer-memory not installed.

Platform specific checks:

Check Nvidia built kernel being used..... Healthy
linux-nvidia:5.15.0
Check packages in hold state.....

Informational

Package dgx-a100-system-configurations is in hold state.
Package dgx-a100-system-tools-extra is in hold state.
Package dgx-a100-system-tools is in hold state.

dgx-a100-system-configurations:23.3.-1 dgx-a100-system-tools-extra:22.12.-1
dgx-a100-system-tools:22.12.-1

Check ubuntu upgrade readiness..... Healthy
ubuntu-release-upgrader-core:22.4.17

Check Kernel Params..... Healthy
Check libnvidia-ml.so.1 linked to the installed driver..... Healthy
nvidia-driver:535.129.3

Check nvidia driver installed via .run file..... Healthy
Check if nvidia-driver is DKMS installed..... Healthy

Check package version consistency..... Healthy
Check dgx-release and dgx-os version..... Healthy

dgx-release:6.1.0

Check nvidia-driver version installed is loaded..... Healthy
nvidia-driver:535.129.3

Check for any partial upgrade in the system..... Healthy
Check MAX_ACC_OUT_READ value set right..... Healthy

Check for key ring validity..... Healthy

Version support matrix check:

Check DGX AX00 matrix..... Healthy

Proxy configuration check:

Check apt proxy configuration..... Healthy

```

No proxy configuration found.

Package repository configuration check:
  Check dgx repository..... Healthy
  Check nvidia hpc sdk repository..... Healthy
    Configuration /etc/apt/preferences.d/hpc-sdk-repo not present.
  Check cuda compute repository..... Healthy

Informational
  Conflicting configuration
    deb [signed-by=/usr/share/keyrings/cuda-archive-keyring.gpg
      https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2004/x86_64/ /
      found in the file /etc/apt/sources.list.d/cuda-ubuntu2004-x86_64.list .

  Check apt update..... Healthy
  Check jammy-updates/dgx priority set to highest..... Healthy
  Check jammy/dgx priority set to highest..... Healthy
  Check jammy/common priority set to highest..... Healthy
  Check jammy-updates/common priority set to highest..... Healthy

Checking Container infrastructure packages/services
-----
Version Compatibility:
  Check libnvidia-container-tools & nvidia-container-toolkit..... Healthy
    libnvidia-container-tools:1.14.3 nvidia-container-toolkit:1.14.3
  Check nvidia-container-toolkit-base & libnvidia-container-tools..... Healthy
    nvidia-container-toolkit-base:1.14.3 libnvidia-container-tools:1.14.3
  Check libnvidia-container1 & libnvidia-container-tools..... Healthy
    libnvidia-container1:1.14.3 libnvidia-container-tools:1.14.3

Service check:
  Check Docker services(docker.service)..... Healthy
  Check Containerd services(containerd.service)..... Healthy

Packages check:
  Check base Packages..... Healthy

File configuration checks:
  Check docker configuration..... Healthy

Informational
  Config default-runtime:nvidia not found in file /etc/docker/daemon.json
    gpus will not get enabled on containers.
  Check container configuration..... Healthy

Informational
  Config default_runtime_name = "nvidia" not found in file
  /etc/containerd/config.toml
    gpus will not get enabled on containers.

Health Summary
-----
39 out of 44 checks are healthy
0 out of 44 checks are unhealthy
0 out of 44 checks are unknown
5 out of 44 checks are informational

100.0% [=====]
Status: Healthy

```

Software health services formats the output as explained below.

Software Health Domains

Domains represent a collection of checks which belong to the same system category.
 Software health services checks the following domains:

- › DGX OS packages/services
- › Container infrastructure packages/services
- › Kubernetes packages/services, if installed
- › Slurm packages/services, if installed

Software Health Checks

Checks, which are constituents of a Domain are categorized as given below:

Index	Checks	Description
1	Version Compatibility	Checks in this category verifies the version compatibility between different software packages.
2	Service check	Checks in this category verifies the state and status of different essential software services.
3	Packages check	Checks in this category verifies the deployment state of essential software packages expected for the platform.
4	Platform specific checks	Checks in this category are specific to a platform or domain. These checks verify various system parameters of the system.
5	Version support matrix check	Checks in this category verifies the deployment of a package and the corresponding version of the package.
6	Proxy configuration check	Checks whether the proxy configuration settings made on the system are in the right state.

Index	Checks	Description
7	Package repository configuration check	Checks in this category checks the repository settings and the required settings to perform a software update.
8	File configuration checks	Checks the given configuration file and its related contents are set as expected.

System Monitoring Configuration

NVSM provides a DSHM service that monitors the state of the DGX system.

NVSM CLI can be used to interact with the DSHM system monitoring service via the NVSM API server.

Configuring Email Alerts

In order to receive the Alerts generated by DSHM through email, configure the Email settings in the global policy using NVSM CLI. User shall receive email whenever a new alert gets generated. The sender address, recipient address(es), SMTP server IP address and SMTP server Port number must be configured according to the SMTP server settings hosted by the user.

Email configuration properties

Property	Description
email_sender	<p>Sender email address</p> <p>Must be a valid email address, otherwise no emails will be sent.</p> <p>[sender@domain.com]</p>
email_recipients	<p>List of recipients to which the email shall be sent</p> <p>[user1@domain.com,user2@domain.com]</p>

Property	Description
email_smtp_server_name	SMTP server name that the user wants to use for relaying email [smtp.domain.com]
email_smtp_server_port	Port Number used by the SMTP server for providing SMTP relay service. Numeric value

The following examples illustrate how to configure email settings in global policy using NVSM CLI.

```
user@dgx-2:~$sudo nvsm set /policy email_sender=dgx-admin@nvidia.com
```

```
user@dgx-2:~$sudo nvsm set /policy email_smtp_server_name=smtpserver.nvidia.com
```

```
user@dgx-2:~$sudo nvsm set /policy email_recipients=jdoe@nvidia.com,jdeer@nvidia.com
```

```
user@dgx-2:~$sudo nvsm set /policy email_smtp_server_port=465
```

Generating a Test Alert for Email

From within an NVSM CLI interactive session, a user may generate a test alert in order to trigger an SMTP instance and receive an email notification.

Creating a Test Alert

NVSM CLI provides a “ `create testalert` ” command to generate a dummy alert that will trigger any SMTP or Call Home defined notification. Within an NVSM CLI interactive session, this basic command generates a dummy alert with default `component_`id = Test0`` and `severity = Warning` .

```
~$ sudo nvsm create testalert
```

To configure the Severity and Component of a test alert, issue the following:

```
~$ sudo nvsm create testalert <component_id> <severity>
```

Example of generating a dummy alert with `component_id = Email1` and `severity = Critical`:

```
~$ sudo nvsm create testalert Email1 Critical
```

Clearing a Test Alert

NVSM CLI also provides a “`clear testalert`” command to dismiss a generated dummy alert. Within an NVSM CLI interactive session, this basic command will clear any test alert with `component_id=Test0`, even if there are multiple such alerts.

```
~$ sudo nvsm clear testalert
```

To specify which test alert to dismiss, issue the following:

```
~$ sudo nvsm clear testalert <component_id>
```

Showing a Test Alert

To display all generated test alerts, the NVSM CLI provides a “`show testalerts`” command

```
~$ sudo nvsm show testalerts
```

Example output:

```
/systems/localhost/testalerts/alert0
```

Properties:

```
system_name = system-name5
message_details = Dummy Test
component_id = Test0
description = No component is reporting an error. This is a test.
event_time = 2021-08-04T15:55:46.926710484-07:00
recommended_action = Please run 'sudo nvsm clear testalert' to dismiss this alert.
alert_id = NV-TEST-01
system_serial = To be filled by O.E.M.
message = Test Alert.
severity = Warning
clear_time = -
hidden = false
type = TestAlerts
```

Understanding System Monitoring Policies

From within an NVSM CLI interactive session, system monitor policy settings are accessible under the following targets.

CLI Target	Description
/policy	Global NVSM monitoring policy, such as email settings for alert notifications.
/systems/localhost/gpus/policy	
/systems/localhost/memory/policy	NVSM policy for monitoring DIMM correctable and uncorrectable errors.
/systems/localhost/processors/policy	NVSM policy for monitoring CPU machine-check exceptions (MCE)
/systems/localhost/storage/policy	NVSM policy for monitoring storage drives and volumes
/chassis/policy	
/chassis/localhost/thermal/policy	NVSM policy for monitoring fan speed and temperature as reported by the baseboard management controller (BMC)
/chassis/localhost/power/policy	NVSM policy for monitoring power supply voltages as reported by the BMC

CLI Target	Description
/chassis/localhost/NetworkAdapters/policy	NVSM policy for monitoring the physical network adapters
/chassis/localhost/NetworkAdapters/<ETH x >/NetworkPorts/policy	NVSM policy for monitoring the network ports for the specified Ethernet network adapter
<IB y >/NetworkPorts/policy	NVSM policy for monitoring the network ports for the specified InfiniBand network adapter
<ETH x >/NetworkDeviceFunctions/policy	NVSM policy for monitoring the PCIe functions for the specified Ethernet network adapter
<IB y >/NetworkDeviceFunctions/policy	NVSM policy for monitoring the PCIe functions for the specified InfiniBand network adapter

Global Monitoring Policy

Global monitoring policy is represented by the /policy target of NVSM CLI.

```
user@dgx-2:~$ sudo nvsm show /policy
```

Example output:

```
/policy
Properties:
  email_sender = NVIDIA DSHM Service
  email_smtp_server_name = smtp.example.com
  email_recipients = jdoe@nvidia.com, jdeer@nvidia.com
  email_smtp_server_port = 465
Verbs:
  cd
  set
  show
```

The properties for global monitoring policy are described in the table below.

Property	Description
email_sender	Sender email address [sender@domain.com]
email_recipients	List of recipients to which the email shall be sent [user1@domain.com , user2@domain.com]
email_smtp_server_name	SMTP server name that the user wants to use for relaying email [smtp.domain.com]
email_smtp_server_port	Port Number used by the SMTP server for providing SMTP relay service. Numeric value

Memory Monitoring Policy

Memory monitoring policy is represented by the /systems/localhost/memory/policy target of NVSM CLI.

```
user@dgx-2:~$ sudo nvsm show /systems/localhost/memory/policy
```

Example output:

```
/systems/localhost/memory/policy
Properties:
  mute_notification = <NOT_SET>
  mute_monitoring = <NOT_SET>

Verbs:
  cd
  set
  show
```

The properties for memory monitoring policy are described in the table below.

Property	Syntax	Description
mute_notification	List of comma separated DIMM IDs Example: CPU1_DIMM_A1,CPU2_DIMM_F2	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated DIMM IDs Example: CPU1_DIMM_A1,CPU2_DIMM_F2	Health monitoring is suppressed for devices in the list.

Processor Monitoring Policy

Processor monitoring policy is represented by the /systems/localhost/processors/policy target of NVSM CLI.

```
user@dgx-2:~$ sudo nvsm show /systems/localhost/processors/policy
```

Example output:

```
/systems/localhost/processors/policy
Properties:
  mute_notification = <NOT_SET>
  mute_monitoring = <NOT_SET>

Verbs:
  cd
  set
  show
```

The properties for processor monitoring policy are described in the table below.

Property	Syntax	Description
mute_notification	List of comma separated CPU IDs. Example: CPU0,CPU1	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated CPU IDs Example: CPU0,CPU1	Health monitoring is suppressed for devices in the list.

Storage Monitoring Policy

Storage monitoring policy is represented by the /systems/localhost/storage/1/policy target of NVSM CLI.

```
user@dgx-2:~$ sudo nvsm show /systems/localhost/storage/policy
```

Example output:

```
/systems/localhost/storage/policy
Properties:
  volume_mute_monitoring = <NOT_SET>
  volume_poll_interval = 10
  drive_mute_monitoring = <NOT_SET>
  drive_mute_notification = <NOT_SET>
  drive_poll_interval = 10
  volume_mute_notification = <NOT_SET>
Verbs:
  cd
  set
  show
```

The properties for storage monitoring policy are described in the table below.

Property	Syntax	Description
drive_mute_notification	List of comma separated drive slots Example: 0, 1 etc	Email alert notification is suppressed for drives in the list.
drive_mute_monitoring	List of comma separated drive slots Example: 0, 1 etc	Health monitoring is suppressed for drives in the list.
drive_poll_interval	Positive integer	DSHM checks the health of the drives periodically. By default, this polling occurs every 10 seconds. The poll interval can be configured through this property.

Property	Syntax	Description
volume_mute_notification	List of comma separated volume identifier Example: md0, md1 etc	Email alert notification is suppressed for volumes in the list
volume_mute_monitoring	List of comma separated volume identifier Example: md0, md1 etc	Health monitoring is suppressed for volumes in the list
volume_poll_interval	Positive integer	DSHM checks the health of the volumes periodically. By default, this polling occurs every 10 seconds. The poll interval can be configured through this property.

Storage volumes are identified by NVSM uniquely by their associated UUID. The mute monitoring for volume resources will hence use UUID instead of volume name. This is required for NVSM versions greater than 21.09.

Steps to identify the UUID of a volume to be set in mute monitoring and notification are listed below.

1. To get the list of volumes in the server run the below command:

```
# nvsm show volumes
```

```
# nvsm show volumes

/systems/localhost/storage/volumes/md0
Properties:
  CapacityBytes = 1918641373184
  Encrypted = False
  Id = md0
  Name = md0
  Status_Health = OK
  Status_State = Enabled
  VolumeType = Mirrored
```

2. To find the UUID of a particular volume, run the below command. The command lists properties which contain the UUID for the volume with the name md0:

```
# mdadm --detail /dev/{volume name}
```

```
# mdadm --detail /dev/md0
/dev/md0:
      Version : 1.2
Creation Time : Tue Feb 23 18:04:37 2021
      Raid Level : raid1
      Array Size : 1873673216 (1786.87 GiB 1918.64 GB)
      Used Dev Size : 1873673216 (1786.87 GiB 1918.64 GB)
      Raid Devices : 2
      Total Devices : 2
      Persistence : Superblock is persistent

      Intent Bitmap : Internal

      Update Time : Tue Apr 11 08:13:48 2023
          State : active
      Active Devices : 2
      Working Devices : 2
      Failed Devices : 0
      Spare Devices : 0

      Consistency Policy : bitmap

          Name : dgx-20-04:0
          UUID : 3568aa82:dc3da8ac:5c17ea13:b04cf894
          Events : 78460

      Number  Major  Minor  RaidDevice State
          0      259      5        0    active sync   /dev/nvme2n1p2
          1      259     15        1    active sync   /dev/nvme3n1p2
```

3. Run the below command to set the UUID for mute monitoring:

```
# nvsm set /systems/localhost/storage/policy volume_mute_monitoring=<UUID>
```

```
# nvsm set /systems/localhost/storage/policy  
volume_mute_monitoring=3568aa82:dc3da8ac:5c17ea13:b04cf894
```

4. Run the below command to set the UUID for mute notification:

```
# nvsm set /systems/localhost/storage/policy volume_mute_notification=<UUID>
```

```
# nvsm set /systems/localhost/storage/policy  
volume_mute_notification=3568aa82:dc3da8ac:5c17ea13:b04cf894
```

5. Run the below command to verify that the policies were correctly set:

```
# nvsm show /systems/localhost/storage/policy
```

```
# nvsm show /systems/localhost/storage/policy  
/systems/localhost/storage/policy  
Properties:  
    controller_mute_monitoring = <NOT_SET>  
    controller_mute_notification = <NOT_SET>  
    controller_poll_interval = 60  
    drive_mute_monitoring = <NOT_SET>  
    drive_mute_notification = <NOT_SET>  
    drive_poll_interval = 60  
    volume_mute_monitoring = 3568aa82:dc3da8ac:5c17ea13:b04cf894  
    volume_mute_notification = 3568aa82:dc3da8ac:5c17ea13:b04cf894  
    volume_poll_interval = 60  
Targets:  
Verbs:  
    cd  
    set  
    show
```

Thermal Monitoring Policy

Thermal monitoring policy (for fan speed and temperature) is represented by the /chassis/localhost/thermal/policy target of NVSM CLI.

```
user@dgx-2:~$ sudo nvsm show /chassis/localhost/thermal/policy
```

Example output:

```
/chassis/localhost/thermal/policy
Properties:
  fan_mute_notification = <NOT_SET>
  pdb_mute_monitoring = <NOT_SET>
  fan_mute_monitoring = <NOT_SET>
  pdb_mute_notification = <NOT_SET>
Verbs:
  cd
  set
  show
```

The properties for thermal monitoring policy are described in the table below.

Property	Syntax	Description
fan_mute_notification	List of comma separated FAN IDs. Example: FAN2_R,FAN1_L,PDB_FAN2	Email alert notification is suppressed for devices in the list.
fan_mute_monitoring	List of comma separated FAN IDs Example: FAN6_F,PDB_FAN1	Health monitoring is suppressed for devices in the list.
pdb_mute_notification	List of comma separated PDB IDs. Example: PDB1,PDB2	Email alert notification is suppressed for devices in the list.
pdb_mute_monitoring	List of comma separated PDB IDs Example: PDB1	Health monitoring is suppressed for devices in the list.

Power Monitoring Policy

Power monitoring policy is represented by the /chassis/localhost/power/policy target of NVSM CLI.

```
user@dgx-2:~$ sudo nvsm show /chassis/localhost/power/policy
```

Example output:

```
/chassis/localhost/power/policy
Properties:
  mute_notification = <NOT_SET>
  mute_monitoring = <NOT_SET>

Verbs:
  cd
  set
  show
```

The properties for power monitoring policy are described in the table below.

Property	Syntax	Description
mute_notification	List of comma separated PSU IDs. Example: PSU4,PSU2	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated FAN IDs Example: PSU1,PSU4	Health monitoring is suppressed for devices in the list.

PCIe Monitoring Policy

Memory monitoring policy is represented by the /systems/localhost/pcie/policy target of NVSM CLI.

```
:~$ sudo nvsm show /systems/localhost/pcie/policy
```

Example output:

```
/systems/localhost/pcie/policy
Properties:
  mute_notification = <NOT_SET>
  mute_monitoring = <NOT_SET>

Verbs:
  cd
  set
  show
```

The properties for memory monitoring policy are described in the table below.

Property	Syntax	Description
mute_notification	List of comma separated PCIe IDs	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated PCIe IDs	Health monitoring is suppressed for devices in the list.

GPU Monitoring Policy

Memory monitoring policy is represented by the /systems/localhost/gpus/policy target of NVSM CLI.

```
:~$ sudo nvsm show /systems/localhost/gpus/policy
```

Example output:

```
/systems/localhost/gpus/policy
Properties:
  mute_notification = <NOT_SET>
  mute_monitoring = <NOT_SET>

Verbs:
  cd
  set
  show
```

The properties for memory monitoring policy are described in the table below.

Property	Syntax	Description
mute_notification	List of comma separated GPU IDs	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated GPU IDs	Health monitoring is suppressed for devices in the list.

Network Adapter Monitoring Policies

Network Adapter Policy

The physical network adapter monitoring policy is represented by the [/chassis/localhost/NetworkAdapters/policy](#) target of the NVSM CLI.

```
:~$ sudo nvsm show /chassis/localhost/NetworkAdapters/policy
```

Example output:

```
/chassis/localhost/NetworkAdapters/policy
Properties:
  mute_notification = <NOT_SET>
  mute_monitoring = <NOT_SET>
Verbs:
  cd
  set
  show
```

The properties are described in the following table.

Property	Syntax	Description
mute_notification	List of comma separated physical network adapter IDs.	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated physical network adapter IDs.	Health monitoring is suppressed for devices in the list.

The mute monitoring is assigned by using the Physical Adapter name and not the logical name. To get the physical adapter name use the command:

```
$ sudo nvsm show /chassis/localhost/NetworkAdapters
```

This command will display a list of target adapter names as shown below:

```
:~$:/etc/nvsm/platforms# sudo nvsm show /chassis/localhost/NetworkAdapters  
/chassis/localhost/NetworkAdapters  
Targets:  
PCI0000_0c_00  
PCI0000_12_00  
PCI0000_4b_00  
PCI0000_54_00  
PCI0000_8d_00  
PCI0000_94_00  
PCI0000_ba_00  
PCI0000_cc_00  
PCI0000_e1_00  
PCI0000_e2_00
```

Note

Use these adapter names to assign monitoring policies.

Here is an example that uses the `PCI0000_0c_00` network interface:

```
:~$ sudo nvsm show  
/chassis/localhost/NetworkAdapters/PCI0000_0c_00/NetworkPorts/policy
```

Example output:

```
/chassis/localhost/NetworkAdapters/PCI0000_0c_00/NetworkPorts/policy  
Properties:  
    mute_notification = <NOT_SET>  
    mute_monitoring = <NOT_SET>  
Verbs:  
    cd  
    set  
    show
```

The properties are described in the following table.

Property	Syntax	Description
mute_notification	List of comma separated physical network port IDs.	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated physical network port IDs	Health monitoring is suppressed for devices in the list.

The network devices functions monitoring policy is represented by the

`/chassis/localhost/NetworkAdapters/<network-id>/NetworkDeviceFunctions/policy` target of

NVSM CLI.

The following command uses the `PCI0000_0c_00` network port to demonstrate this command.

```
:~$ sudo nvsm show  
/chassis/localhost/NetworkAdapters/PCI0000_0c_00/NetworkDeviceFunctions/policy
```

Example output:

```
/chassis/localhost/NetworkAdapters/PCI0000_0c_00/NetworkDeviceFunctions/policy  
Properties:  
  mute_monitoring = <NOT_SET>  
  mute_notification = <NOT_SET>  
  rx_collision_threshold = 5  
  rx_crc_threshold = 5  
  tx_collision_threshold = 5  
Verbs:  
  cd  
  set  
  show
```

The properties are described in the following table.

Property	Syntax	Description
mute_notification	List of comma separated network-centric PCIe function IDs. Example: PSU4,PSU2	Email alert notification is suppressed for devices in the list.
mute_monitoring	List of comma separated network-centric PCIe function IDs. Example: PSU1,PSU4	Health monitoring is suppressed for devices in the list.
rx_collision_threshold	Positive integer	
rx_crc_threshold	Positive integer	
tx_collision_threshold	Positive integer	

Muting NetworkPort Link Down Alerts

By default, NVSM creates an NV-NET-01 alert for each network adapter if its link is down. If certain network adapters are not used, their alerts can be muted using the nvsm muteNIC command. When running the command without parameters, it displays the configuration for all network adapters.

Example output:

```
# sudo nvsm muteNIC
NIC      | Interface      | Status
ibp220s0 | PCI0000_dc_00 | muted
ibp41s0f1 | PCI0000_29_00 | muted
ibp94s0  | PCI0000_5e_00 | default
ibp64s0  | PCI0000_40_00 | default
ibp170s0f0| PCI0000_aa_00 | default
ibp79s0  | PCI0000_4f_00 | default
ens6f0   | PCI0000_82_00 | default
ibp24s0  | PCI0000_18_00 | default
ibp154s0 | PCI0000_9a_00 | default
eno3     | PCI0000_0b_00 | default
ibp41s0f0 | PCI0000_29_00 | default
ibp170s0f1| PCI0000_aa_00 | default
ens6f1   | PCI0000_82_00 | default
ibp192s0 | PCI0000_c0_00 | default
ibp206s0 | PCI0000_ce_00 | default
```

To mute the link down alerts on the specified network adapters, use the command:

```
sudo nvsm muteNIC <NIC1>=enable,<NIC2>=enable,...
```

For example:

```
sudo nvsm muteNIC ibp220s0=enable,ibp41s0f1=enable
```

To unmute the link down alerts on the specified network adapters, use the command:

```
sudo nvsm muteNIC <NIC1>=disable,<NIC2>=disable,...
```

For example:

```
sudo nvsm muteNIC ibp220s0=disable,ibp41s0f1=disable
```

Additionally, it is necessary to clear the alert database to see link down alerts again. Use the following command:

```
sudo nvsm_database_rotate.sh -d alert
```

This command stops NVSM, clears the alert database, and then restarts it.

Performing System Management Tasks

This section describes commands for accomplishing some system management tasks.

Rebuilding a RAID/ESP Array for Current NVSM

On DGX systems, cache drives are configured as a RAID 0 array by default. This volume is mounted to `/raid`. In the example below, it shows as `/dev/ md1`, but the name can be different depending on the OS naming schema and configuration.

Additionally for DGX systems with two NVMe OS drives, each OS drive have two partitions:

- › The second partitions are configured as a RAID 1 array with the operating system installed. In the examples below, it shows as `/dev/ md0`.
- › The first partition is known as the **EFI System Partition (ESP)**. NVSM monitors the content of this partition from both drives. If one of the ESP is corrupted, NVSM can be used to recover that partition from the healthy ESP.

Note

This is not a RAID array, because UEFI does not support booting from software raid volumes.

Viewing a Healthy RAID/ESP Volume

On a healthy system, the OS volume appears with `VolumeType = Mirrored` and `Status_Health = OK`. For example:

```
nvsm(/systems/localhost/storage)-> show volumes/md0

/systems/localhost/storage/volumes/md0
Properties:
  CapacityBytes = 1918641373184
  Encrypted = False
  Id = md0
  Name = md0
  Status_Health = OK
  Status_State = Enabled
  VolumeType = Mirrored
Targets:
Verbs:
  cd
  show
```

The cache volume appears with `VolumeType = NonRedundant` and `Status_Health = OK`.

For example:

```
nvsm-> cd /systems/localhost/storage
nvsm(/systems/localhost/storage)-> show volumes/	md1

/systems/localhost/storage/volumes/	md1
Properties:
  CapacityBytes = 30724962910208
  Encrypted = False
  Id = md1
  Name = md1
  Status_Health = OK
  Status_State = Enabled
  VolumeType = NonRedundant
Targets:
  encryption
Verbs:
  cd
  show
```

The ESP volume appears with `VolumeType = EFI` system partition and `Status_Health = OK`. The name of the ESP volume varies per system; you can use the command **nvsm show volumes** to list all volumes and look for `VolumeType = EFI` system partition.

Here's the example from DGX A100:

```
nvsm(/systems/localhost/storage)-> show volumes

...
/systems/localhost/storage/volumes/nvme2n1p1
Properties:
  CapacityBytes = 536870912
  Encrypted = False
  Id = nvme2n1p1
  Name = nvme2n1p1
  Status_Health = OK
  Status_State = Enabled
  VolumeType = EFI system partition

...
/systems/localhost/storage/volumes/nvme3n1p1
Properties:
  CapacityBytes = 536870912
  Encrypted = False
  Id = nvme3n1p1
  Name = nvme3n1p1
  Status_Health = OK
  Status_State = StandbyOffline
  VolumeType = EFI system partition

Targets:
Verbs:
  cd
  show
```

Viewing a Degraded RAID/ESP Volume

On a system with degraded OS volume, the md0 volume will appear with only one drive, with the following `Status_Health = Critical` message:

```
nvsm-> cd /systems/localhost/storage
nvsm(/systems/localhost/storage)-> show volumes/	md0

/systems/localhost/storage/volumes/	md0
Properties:
    CapacityBytes = 1918641373184
    Encrypted = False
    Id = md0
    Name = md0
    Status_Health = Critical
    Status_State = Enabled
    VolumeType = Mirrored
Targets:
Verbs:
    cd
    show
```

On a system with corrupted ESP, the volume will appear with the following

`Status_Health = Critical` and `Status_State = UnavailableOffline` messages:

```
nvsm-> cd /systems/localhost/storage
nvsm(/systems/localhost/storage)-> show volumes/nvme2n1p1

/systems/localhost/storage/volumes/nvme2n1p1
Properties:
    CapacityBytes = 536870912
    Encrypted = False
    Id = nvme2n1p1
    Name = nvme2n1p1
    Status_Health = Critical
    Status_State = UnavailableOffline
    VolumeType = EFI system partition
Targets:
Verbs:
    cd
    show
```

Rebuilding the RAID/ESP Volume

To rebuild the RAID/ESP volume, make sure that you have replaced failed NVMe drives.

The RAID rebuilding process should begin automatically upon turning on the system. If it does not start automatically, use NVSM CLI to manually rebuild the array as follows.

1. Start an NVSM CLI interactive session and switch to the storage target.

```
~$ sudo nvsm  
nvsm-> cd /systems/localhost/storage
```

2. Start the rebuilding process, and select which volumes to rebuild.

- **raid-1** for OS volume
- **raid-0** for cache volume
- **esp** for EFI system partition

For raid-1 volume, you also need to enter the replaced drive name.

Note

This is not the partition name. For example, use nvme3 instead of nvme3n1p2.

```
nvsm(/systems/localhost/storage)-> start volumes/rebuild  
  
PROMPT: In order to rebuild volume, volume type is required. Please  
specify the volume type to rebuild from options below.  
    raid-0: create raid-0 data volume  
    raid-1: rebuild OS boot and root volumes  
    esp:     find and replicate an empty EFI system partition  
  
Type of volume rebuild (CTRL-C to cancel): raid-1  
  
PROMPT: In order to rebuild this volume, a spare drive  
is required. Please specify the spare drive to  
use to rebuild RAID-1.  
  
Name of spare drive for RAID-1 rebuild (CTRL-C to cancel): nvme3  
  
WARNING: Once the rebuild process is started, the  
process cannot be stopped.  
  
Start RAID-1 rebuild? [y/n] y
```

3. After entering **y** at the prompt to start the RAID 1 rebuild, the “Initiating rebuild ...” message appears.

```
/systems/localhost/storage/volumes/rebuild started at 2023-04-10 Initiating RAID-1  
rebuild on volume md0...  
0.0% [ \ ]
```

4. After a few seconds, the “Rebuilding RAID-1 ...” message appears.

```
/systems/localhost/storage/volumes/rebuild started at 2023-04-10 08:22:58.910025  
Rebuilding RAID-1...  
31.0% [===== / ]
```

5. If this message remains at Initiating RAID-1 rebuild for more than 30 seconds, there is a problem with the rebuild process. Verify that the name of the replacement drive is correct and try again.

The RAID 1 rebuild process should take about 1 hour to complete.

For more detailed information on replacing a failed NVMe drive, see the [NVIDIA DGX-2 Service Manual](#) or [NVIDIA DGX A100 Service Manual](#).

Rebuilding a RAID 1 Array for Legacy NVSM (< 21.09)

For DGX systems with two NVMe OS drives configure as a RAID 1 array, the operating system is installed on volume `md0`. You can use NVSM CLI to view the health of the RAID volume and then rebuild the RAID array on two healthy drives.

Viewing a Healthy RAID Volume

On a healthy system, this volume appears with two drives and `Status_Health = OK`. For example:

```
nvsm-> cd /systems/localhost/storage
nvsm(/systems/localhost/storage)-> show volumes/	md0
/systems/localhost/storage/volumes/	md0
Properties:
    Status_State = Enabled
    Status_Health = OK
    Name = md0
    Encrypted = False
    VolumeType = RAID-1
    Drives = [ nvme0n1, nvme1n1 ]
    CapacityBytes = 893.6G
    Id = md0
Targets:
    rebuild
Verbs:
    cd
    show
```

Viewing a Degraded RAID Volume

On a system with degraded OS volume, the `md0` volume will appear with only one drive, with the following `Status_Health = Warning`, and `Status_State = Degraded` messages:

```
nvsm-> cd /systems/localhost/storage
nvsm(/systems/localhost/storage)-> show volumes/	md0
/systems/localhost/storage/volumes/	md0
Properties:
    Status_State = Degraded
    Status_Health = Warning
    Name = md0
    Encrypted = False
    VolumeType = RAID-1
    Drives = [ nvme1n1 ]
    CapacityBytes = 893.6G
    Id = md0Targets:
        rebuild
Verbs:
    cd
    show
```

In this situation, the OS volume is missing its parity drive.

Rebuilding the RAID 1 Volume

To rebuild the RAID array, make sure that you have installed a known good NVMe drive for the parity drive.

The RAID rebuilding process should begin automatically upon turning on the system. If it does not start automatically, use NVSM CLI to manually rebuild the array as follows.

1. Start an NVSM CLI interactive session and switch to the storage target.

```
$ sudo nvsm
nvsm-> cd /systems/localhost/storage
```

2. Start the rebuilding process and be ready to enter the device name of the replaced drive.

```
nvsm(/systems/localhost/storage)-> start volumes/	md0/rebuild
PROMPT: In order to rebuild this volume, a spare drive
        is required. Please specify the spare drive to use
        to rebuild md0.
Name of spare drive for md0 rebuild (CTRL-C to cancel): nvmeXn1
WARNING: Once the volume rebuild process is started, the
        process cannot be stopped.
Start RAID-1 rebuild on md0? [y/n] y
```

3. After entering **y** at the prompt to start the RAID 1 rebuild, the “Initiating rebuild ...” message appears.

```
/systems/localhost/storage/volumes/md0/rebuild started at 2018-10-12  
15:27:26.525187  
Initiating RAID-1 rebuild on volume md0...  
0.0% [ \ ]
```

After about 30 seconds, the **Rebuilding RAID-1 ...** message should appear.

```
/systems/localhost/storage/volumes/md0/rebuild started at 2018-10-12  
15:27:26.525187  
Rebuilding RAID-1 rebuild on volume md0...  
31.0% [===== / ]
```

If this message remains at **Initiating RAID-1 rebuild** for more than 30 seconds, there is a problem with the rebuild process. Verify that the name of the replacement drive is correct and try again.

The RAID 1 rebuild process should take about 1 hour to complete.

For more detailed information on replacing a failed NVMe OS drive, see the [NVIDIA DGX-2 Service Manual](#) or [NVIDIA DGX A100 Service Manual](#).

Setting MaxQ/MaxP on DGX-2 Systems

Beginning with DGX OS 4.0.5, you can set two GPU performance modes – MaxQ or MaxP.

Note

Support on DGX-2 systems requires BMC firmware version 1.04.03 or later. MaxQ/MaxP is not supported on DGX-2H systems.

MaxQ

- › Maximum efficiency mode
- › Allows two DGX-2 systems to be installed in racks that have a power budget of 18 kW.
- › Switch to MaxQ mode as follows.

```
$ sudo nvsm set powermode=maxq
```

The settings are preserved across reboots.

MaxP

- › Default mode for maximum performance

- › GPUs operate unconstrained up to the thermal design power (TDP) level.
In this setting, the maximum DGX-2 power consumption is 10 kW.
- › Provides reduced but better performance than MaxQ when only 3 or 4 PSUs are working.
- › If you switch to MaxQ mode, you can switch back to MaxP mode as follows:

```
$ sudo nvsm set powermode=maxp
```

The settings are preserved across reboots.

Performing a Stress Test

NVSM supports functionality to simultaneously stress various components (GPU, PCIe, DIMMs, Storage Drives, CPUs, Network Cards) of the system with large workloads. The stress-test will provide a summary at the end determining whether each stressed component passed the test or failed with some error. NVSM will also monitor various system metrics during the stress-test to provide a clearer picture of the kinds of computational loads imposed. This stress test can be invoked from the CLI.

Syntax:

```
$ sudo nvsm stress-test [--usage] [--force] [--no-prompt] [<test>...] [DURATION]
```

For help on running the test, issue the following.

```
$ sudo nvsm stress-test --usage
```

Example output for `sudo nvsm stress-test 60 --force`:

```
swqa@ubuntu-luna2:~$ sudo nvsm stress-test 60 --force
Initializing NVSM Core...
#####
NVSM STRESS #####
WARNING:
These stress tests are potentially disruptive and can interfere with other jobs you might be running.
Make sure to be running as few jobs as possible before proceeding.
(Pass --no-prompt option in command next time to suppress this prompt)
If running GPU Stress Test, expect test to take longer than countdown duration.
The NIC (network interface card) Stress Test is only available on DGX-1, DGX-2, and Luna Systems.
If it is run on non-supported platforms, results for this component will be blank.
```

```
Are you sure you want to proceed [y/n]? y
```

```
Stressing GPU : Multiplying matrices on GPUs
Stressing CPU : Multiplying matrices on CPUs
Stressing Memory : Mapping pages into memory
Stressing Storage : Performing disk I/O operations
Stressing Network Cards : Performing loopback bandwidth stress
```

```
Fetching stream progress from backend...
```

```
100% Complete...
```

GPU	PASS
CPU	PASS
Memory	PASS
Storage	PASS
PCIe	PASS
NIC	SKIPPED

Component	PreTest	Min	Max	Avg	Unit
GPU_TEMP	32.5	32.5	32.5	32.5	C
CPU_TEMP	52.5	52.5	52.5	52.5	C
MEM_TEMP	32.75	32.75	32.75	32.75	C
POWERDRAW	4134	4134	4134	4134	W
FANSPEED	6289.55	6289.55	6289.55	6289.55	RPM
GPU_LOAD	0	0	100.00	50.00	%
CPU_LOAD	36.89	36.89	36.89	36.89	%
MEM_LOAD	0.43	0.43	0.43	0.43	%
DISK_LOAD	0.12	0.12	0.12	0.12	%

```
Stress Test Log:/var/nvsmlog/nvsm/StressTestLog2021-08-03T01:52:22-04:00.nvsmlog
```