

Overview of IBM System Storage - Subsystem Device Driver Path Control Module (SDDPCM)

Evaluation guide version 1.0

This white paper provides a brief introduction to the IBM® System Storage® Subsystem Device Driver Path Control Module (SDDPCM). The paper explains the SDDPCM driver in 2.6.8.0 release in detail and also describes the installation and uninstallation of SDDPCM using the command-line interface (CLI).

Introduction

SDDPCM is a loadable path control module for supported storage devices to supply path management functions and error-recovery algorithms. When the supported storage devices are configured as Multipath I/O (MPIO) devices, SDDPCM is loaded as part of the IBM AIX® MPIO Fibre Channel Protocol (FCP) device driver during the configuration. The AIX MPIO-capable device driver with the supported storage device's SDDPCM module enhances data availability and I/O load balancing.

AIX MPIO-capable device drivers automatically discover, configure, and make available every storage device path. SDDPCM manages the paths to provide:

- High availability and load balancing of storage I/O
- Automatic path-failover.
- Concurrent download of supported storage devices licensed machine code.
- Prevention of a single-point-failure

About this white paper

The purpose of this paper is to provide a thorough understanding of SDDPCM driver and its CLI. This paper provides a self-guided, hands-on evaluation of SDDPCM for storage administrators and IT professionals and guides them through the different features provided by the driver and how it can be used to improve the multipathing to their storage systems.

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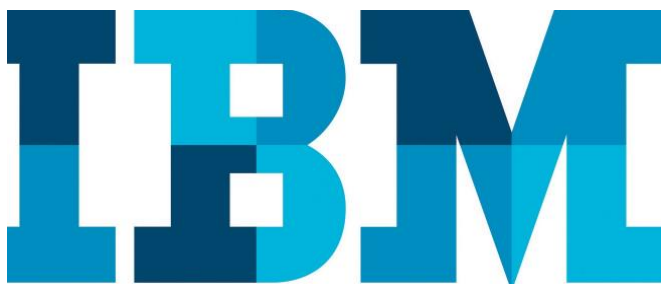
Overview

Challenge

Versions earlier to SDDPCM 2.6.8.0 did not support NPIV, and therefore, unable to support features using NPIV-based Fibre Channel initiator.

Solution

IBM SDDPCM version 2.6.8.0 brings the much-needed feature of NPIV enablement for supported storage devices and enhances data availability and load balancing when installed as part of IBM AIX MPIO.



The paper also describes how to get started with the tool and perform installation and upgrade procedures.

This paper is intended to provide an overview of the steps required to successfully use SDDPCM. This is not meant to be a substitute for product documentation and recommends users to refer to the product documentation, *IBM Knowledge Center* and *CLI Guides* of SDDPCM for more details at ibm.com/support/knowledgecenter/STPVGU_7.7.0/com.ibm.storage.svc.console.770.doc/svc_ichome_770.html.

Assumptions

The following assumptions are considered while writing this white paper.

- Virtual disks are exported from storage to the AIX server.
- The storage area network (SAN) is configured according to the product documentation and the infrastructure (AIX platform) is ready to support the SDDPCM installation and view the results.
- The user has the basic understanding and awareness of SDDPCM.

The following table summarizes the abbreviations or terminologies mentioned in this paper.

SVC and Storwize terminology	Brief description
SAN storage virtualization	Process of taking an external (possibly third-party) storage controller under the control of SVC or Storwize by exporting it to existing SVC or Storwize systems to be used for creating pools of storage for the purpose of presenting them to the hosts or applications as logical units (LUs)
iSCSI	A protocol standard by Internet Engineering Task Force (IETF) designed to interconnect SCSI devices using the TCP/IP protocol. It is described in detail in the RFC 3720 at: https://www.ietf.org/rfc/rfc3720.txt
SAN	Storage area network
NAS	Network-attached storage
FC	Fibre Channel
FCoE	Fibre Channel over Ethernet
IBM SDDPCM	IBM Subsystem Device Driver Path Control Module
IOPS	Input/Output operations per second
SVC/IBM SAN Volume Controller	Unless explicitly specified, a general term that is used to describe all applicable SVC platforms – IBM SVC (CG8, CF8), IBM Storwize V7000, Storwize V5000, Storwize V3700, Storwize V9000, and IBM PureFlex® System – storage nodes

Table 1: Terminology and description

What is supported in SDDPCM?

The following features are supported in SDDPCM:

- Support for 32-bit and 64-bit kernels
- Support for four types of reserve policies:
 - No reserve policy
 - Exclusive host access single path policy
 - Persistent reserve exclusive host policy
 - Persistent reserve shared host access policy
- Support for four path-selection algorithms:
This algorithm is supported only with IBM System Storage SAN Volume Controller (SVC) device models.
 - Failover
 - Round robin
 - Load balancing
 - Load balancing port
- Automatic failed paths reclamation by healthchecker
- Support of failback error-recovery mechanism
- Support of Fibre Channel dynamic device tracking for all SAN Volume Controller devices
- Support SAN boot device on MPIO-supported storage devices
- Support for external supported MPIO storage devices as the primary or secondary dump device
- Support storage devices multipath devices as system paging space
- Support SDDPCM server daemon enhanced path health check function
- Support for a maximum of 65536 logical unit numbers (LUNs) for SDDPCM version 2.6.5.0 or later on an AIX system with sufficient resources to handle higher number of LUNs. For earlier versions of SDDPCM, a maximum of 1200 LUNs are supported.
- Dynamically add paths or adapters
- Dynamically remove paths or adapters
- Dynamically change the device path selection algorithm
- Dynamically change the device hc_interval
- Dynamically enable or disable the device health check function
- Dynamically change the device hc_mode
- Reserve last path of a device in OPEN mode
- Support the **Essutil** product engineering tool in the SDDPCM `pcmpath` command line program
- Support for N_Port ID Virtualization (NPIV) for SVC
- Support for Live Partition Mobility (LPM) environment in IBM Power® servers.
For information about LPM, see ibm.com/redbooks/abstracts/sg247460.html
- Support IBM GPFS™ in AIX 5.2 TL06 (or later), 5.3 TL02 (or later), and AIX 6.1.

- Support Virtual I/O Server (VIOS) with AIX 5.3 or later and AIX 6.1.
Note: This support does not include IBM System Storage DS5000™, DS4000®, and DS3950 storage devices.
- Support for *non disruptive volume move* feature of SVC. Refer to *Latest Multipath Subsystem Device Driver User's Guide* at: ibm.com/support/docview.wss?uid=ssg1S7000303
Note: This support is only available on SDDPCM 2.6.4.0 (or later) on AIX.
- Support for workload partitions (WPAR) and versioned WPAR for AIX. For information about WPAR, see publib.boulder.ibm.com/infocenter/aix/v6r1/topic/com.ibm.aix.wpar/wpar-kickoff.htm
- Support for stretched cluster environment of SVC. For information about stretched clusters, see pic.dhe.ibm.com/infocenter/svc/ic/topic/com.ibm.storage.svc.console.720.doc/svc_stretchedclusteroverview.html
Note: This support is only available on SDDPCM 2.6.5.0 (or later) on AIX.

Note: You can refer to chapter 2 of the Subsystem Device Driver (SDD) user guide for more information about these features at: ibm.com/support/docview.wss?uid=ssg1S7000303

Hardware and software requirements

You must install the hardware and software components listed in this section to ensure that SDDPCM installs and operates successfully.

Hardware requirements

The following hardware components are needed:

- Supported storage devices (FCP and SAS devices only)
- One or more switches, if the supported storage devices is not direct-attached
- Host system
- Fibre Channel adapters or serial-attached SCSI adapters, and cables

Software requirements

The following software components are needed to install SDDPCM:

- AIX 5.2 TL10 (or later), AIX 5.3 TL08 (or later), or AIX 6.1 TL02 (or later), AIX 7.1, AIX 7.2 operating system, with all the latest PTFs.
Note: Refer to the Readme file of the SDDPCM level that you plan to install for the required AIX TL for that level.
- If your attached storage is SAN Volume Controller version 4.2.1.6 or later and you require SAN Volume Controller authorized program analysis report (APAR) IC55826, you must install SDDPCM 2.2.0.3 or later with the required AIX TL and APAR. Refer to the Readme file of the SDDPCM level that you plan to install for the required AIX TL and APARs.

- Fibre Channel device drivers or serial-attached SCSI drivers
- One of the following installation packages:
 - devices.sddpcm.52.rte (version 2.5.1.0 or later)
 - devices.sddpcm.53.rte (version 2.5.1.0 or later)
 - devices.sddpcm.61.rte (version 2.5.1.0 or later)
 - devices.sddpcm.71.rte
 - devices.sddpcm.72.rte (version 2.6.7.0 or later)
- Supported storage devices:
 - devices.fcp.disk.ibm.mpio.rte (version 1.0.0.21 or later versions of 1.x.x.x) host attachment package for SDDPCM (version 2.x.x.x or earlier versions)
 - devices.fcp.disk.ibm.mpio.rte (version 2.0.0.1 or later versions) host attachment package for SDDPCM (version 3.0.0.0 or later versions)
 - devices.sas.disk.ibm.mpio.rte (version 1.0.0.0 or later versions) host attachment package for SDDPCM

Download and setup

You can download the SDDPCM latest version for free directly from: ibm.com/support/docview.wss?uid=ssg1S4001363 and install it on any AIX system. The package is available as a .rte file, which can be installed directly.

```
devices.sddpcm.52.rte.tar
devices.sddpcm.53.rte.tar
devices.sddpcm.61.rte.tar
devices.sddpcm.71.rte.tar
devices.sddpcm.72.rte.tar
```

Figure 1: SDDPCM .rte files

Installing SDDPCM from the downloaded code

Perform the following steps to install SDDPCM from the downloaded code:

1. Download code from the following website that is appropriate for your system: ibm.com/support/docview.wss?uid=ssg1S4001363
2. Move the downloaded files to the /usr/sys/inst.images directory.
3. Change directory to the /usr/sys/inst.images directory.
4. Extract the downloaded file: for example, extract -xvf devices.sddpcm.53.rte.tar (You do not need to perform this step if file is not compressed).
5. Update the .toc file. For example:

```
pwd
rm -i .toc
inutoc .
grep -i sdd .toc
```

This command should reflect the newer SDDPCM code version that will be updated.

- From the CLI, enter `smitty install` and press **Enter** to go directly to the installation panels. The Install and Update Software menu is displayed.

- Select **Install Software** and press Enter.
- Type . to indicate the current directory and press Enter.
- Select **Software to Install** and press F4. The Software to Install panel is displayed.
- Select the **devices.sddpcm.52.rte**, **devices.sddpcm.53.rte**, or **devices.sddpcm.61.rte,sddpcm.71.rte,sddpcm.72.rte** package, based on the OS level.
- Press Enter. The **Install and Update from LATEST Available Software** panel is displayed with the name of the software that you selected to install.
- Check the default option settings to ensure that they are what you need.
- Press Enter to install. System Management Interface Tool (SMIT) responds with the following message:
ARE YOU SURE??
Continuing may delete information you may want to keep.
This is your last chance to stop before continuing.
- Press Enter to continue. The installation process can take several minutes to complete.
- When the installation is complete, press F10 to exit from SMIT.
Note: Host attachment is a prerequisite for the installation of the SDDPCM driver. Driver installation will fail if the host attachment is not installed. Both can be installed together as well.

Updating SDDPCM

Complete the following SMIT steps to update the SDDPCM package on your system:

1. Log in as the root user.
2. Type `smitty install_update` and press Enter to go directly to the installation panels. The Install and Update Software menu is displayed.
3. Select **Install Software** and press Enter.
4. Press F4 to display the INPUT Device/Directory for Software panel.
5. Select either a CD drive that you are using for the installation or a local directory where the packages reside; for example, `/dev/cd0`, and press Enter.
6. Press Enter again. The Install Software panel is displayed.
7. Select **Software to Install** and press F4. The Software to Install panel is displayed.
8. Select the base package or the PTF package that you want to install.
9. Press Enter. The **Install and Update from LATEST Available Software** panel is displayed with the name of the software that you selected to install.
10. If you only want to apply the PTF, select **Commit software Updates?** and press Tab to change the entry to *no*. The default setting is to commit the PTF. If you specify *no* to **Commit software Updates?**, ensure that you specify *yes* to **Save Replaced Files?**.
11. Check the other default settings to ensure that display the options you need.
12. Press Enter to install. SMIT responds with the following message:

```
+-----+
-----+
|ARE YOU SURE?? |
|Continuing may delete information you may want
to keep. |
|This is your last chance to stop before
continuing. |
+-----+
-----+
```

13. Press Enter to continue. The installation process can take several minutes to complete.
14. When the installation is complete, press F10 to exit SMIT.
15. Unmount the CD-ROM file system and remove the compact disc.

Uninstalling SDDPCM

Before you remove the SDDPCM package from your AIX host system, all supported storage devices must be unconfigured and removed from your host system, or migrated to the AIX default path control module. The SDDPCM server daemon must be stopped. After all the supported storage devices are removed or migrated to the AIX default MPIO and the SDDPCM server daemon (pcmsrv) is stopped, complete the following steps to remove the SDDPCM software package:

1. Enter `smitty deinstall` from your CLI to go directly to the Remove Installed Software panel.
2. Press F4 in the **SOFTWARE name** field to display a list of packages and press the F7 key to select the package to uninstall.
3. Press Tab in the **PREVIEW Only?** field to toggle between **Yes** and **No**. Select **No** to remove the software package from your AIX host system.
Note: If you select **Yes**, the process stops at this point and previews what you are removing. The results of your precheck are displayed without removing the software. If the state for any supported storage MPIO device is either **Available** or **Defined**, the process fails.
4. Select **No** for the remaining fields on this panel.
5. Press Enter. SMIT responds with the following message:
ARE YOU SURE??
Continuing may delete information you may want to keep.
This is your last chance to stop before continuing.
6. Press Enter to begin the removal process. This might take a few minutes.
7. When the process is complete, the SDDPCM software package and the supported storage device host attachment for SDDPCM are removed from your system.

Command-line interface

SDDPCM provides commands that you can use to display the status of adapters that are used to access managed devices, display the status of devices that the device driver manages, or map supported storage MPIO devices or paths to a supported storage device location. You can also set individual path conditions either to online or offline, set all paths that are connected to an adapter either to online or offline, or set all paths that are connected to a supported storage device port or ports to online or offline.

This section explains the commands used to perform these tasks.

pcmpath query version

The `pcmpath query version` command displays the version of the SDDDSM that is installed.

- **Syntax:** `pcmpath query version`

```
bash-3.2# pcmpath query version
SDDPCM VERSION 2.6.8.0 (devices.sddpcm.71.rte)
```

Figure 2: Output of the `pcmpath query version` command

pcmpath query device

The `pcmpath query device` command displays information about a single device, a range of devices, a specific model of supported storage devices, or all devices. If you do not enter a device number, information about all the devices is displayed. You can also specify a device model when you query a device.

- **Syntax:** `pcmpath query device <device number>`

```
DEV#: 3 DEVICE NAME: hdisk4 TYPE: 2145 ALGORITHM: Load Balance
SERIAL: 6005076801A70546980000000000000B
=====
Path#      Adapter/Path Name      State   Mode     Select   Errors
0          fscsi2/path0           OPEN    NORMAL   0         0
1          fscsi2/path1           OPEN    NORMAL   0         0
2*         fscsi2/path2           OPEN    NORMAL   0         0
3*         fscsi2/path3           OPEN    NORMAL   0         0
4          fscsi3/path4           OPEN    NORMAL   0         0
5          fscsi3/path5           OPEN    NORMAL   0         0
6*         fscsi3/path6           OPEN    NORMAL   0         0
7*         fscsi3/path7           OPEN    NORMAL   0         0
```

Figure 3: Output of the `pcmpath query device` command

pcmpath query adapter

The `pcmpath query adapter` command displays information about a single adapter or all adapters.

- **Syntax:** `pcmpath query adapter <adapter number>`

```
bash-3.2# pcmpath query adapter
Total Dual Active and Active/Asymmetric Adapters : 2
Adpt#   Name      State   Mode           Select   Errors   Paths   Active
  0   fscsi2   NORMAL ACTIVE           0         0        4        4
  1   fscsi3   NORMAL ACTIVE           0         0        4        4
```

Figure 4: Output of the `pcmpath query adapter` command

pcmpath query devstats

The `pcmpath query devstats` command displays performance information for a single Subsystem Device Driver (SDD) device, a range of devices, a specific model of supported storage devices, or all SDD devices. If you do not enter a device number, information about all the devices is displayed.

- **Syntax:** `pcmpath query devstats <device number>`

```
bash-3.2# pcmpath query devstats 3
DEV#:   3  DEVICE NAME: hdisk4
=====
                Total Read  Total Write  Active Read  Active Write  Maximum
I/O:                968      39347         0           0           16
SECTOR:            86541     2862764         0           0       2098
Transfer Size:    <= 512     <= 4k     <= 16K     <= 64K     > 64K
                  807       34239         0           43       5226
```

Figure 5: Output of the `pcmpath query devstats` command

pcmpath query adaptstats

The `pcmpath query adaptstats` command displays performance information for all Fibre Channel adapters that are attached to the SDD devices. If you do not enter an adapter number, information about all the adapters is displayed.

- **Syntax:** `pcmpath query adaptstats <adapter number>`

```
bash-3.2# datapath query adaptstats

Total Dual Active and Active/Asymmetric Adapters : 2

Adapter #: 0
=====
                Total Read  Total Write  Active Read  Active Write  Maximum
I/O:              554         19716         0           0           8
SECTOR:          43312         1437315        0           0          1074

Adapter #: 1
=====
                Total Read  Total Write  Active Read  Active Write  Maximum
I/O:              414         19631         0           0           8
SECTOR:          43229         1425449        0           0          1074
```

Figure 6: Output of the `pcmpath query adaptstats` command

pcmpath query wwpn

The `pcmpath query wwpn` command displays the worldwide port name (WWPN) of the host Fibre Channel adapters.

- **Syntax:** `pcmpath query wwpn`

```
bash-3.2# pcmpath query wwpn
Adapter Name      PortWWN
fscsi0            10000000C9977A98
fscsi1            10000000C9977A99
fscsi2            10000000C997829C
fscsi3            10000000C997829D
```

Figure 7: Output of the `pcmpath query wwpn` command

pcmpath clear device count

The `pcmpath clear device count` command dynamically sets the select counter or error counter to zero.

- **Syntax:** `pcmpath clear device <device_number> count <error/all>`

In the command, `error` clears only the error counter of the SDD PATH device or range of devices specified while `all` clears both the select counter and the error counter of the SDD PATH device or devices in the specified range.

```
bash-3.2# pcmpath clear device 3 count error
Success: error counter reset
bash-3.2# pcmpath clear device 3 count all
Success: all counter reset
```

Figure 8: Output of the `pcmpath clear device count` command

pcmpath set adapter

The `pcmpath set adapter` command sets all the SDD PATH device paths attached to an adapter to either online or offline. SDD reserves the last path

of an SDD PATH device. If all accessible paths to an SDD PATH device are attached to one adapter, the offline option will fail.

- **Syntax:** `pcmpath set adapter <adapter number> <online /offline> <aa/ap>>`

```
bash-3.2# pcmpath set adapter 0 offline aa
Success: set adapter 0 to offline

Adpt#   Name   State   Mode           Select   Errors   Paths   Active
  0   fscsi2  FAILED  OFFLINE        0         0       4       0
bash-3.2# pcmpath set adapter 0 online aa
Success: set adapter 0 to online

Adpt#   Name   State   Mode           Select   Errors   Paths   Active
  0   fscsi2  NORMAL  ACTIVE         0         0       4       4
```

Figure 9: Output of the `pcmpath set adapter` command

pcmpath set device path

The `pcmpath set device path` command sets the path of an SDD PATH device either to online or offline. You cannot remove the last path to an SDD PATH device from service. This prevents a data access failure from occurring. This command can be entered even when the SDD PATH device is closed.

- **Syntax:** `pcmpath set device <device number> path <path number> <online/offline>`

```
bash-3.2# pcmpath set device 3 path 2 offline
Success: set device 3 path 2 to offline

DEV#:    3  DEVICE NAME: hdisk4  TYPE: 2145  ALGORITHM: Load Balance
SERIAL:  6005076801A705469800000000000000B
=====
Path#    Adapter/Path Name      State   Mode     Select   Errors
  0      fscsi2/path0           OPEN    NORMAL   0        0
  1      fscsi2/path1           OPEN    NORMAL   0        0
  2*     fscsi2/path2           OPEN    OFFLINE  0        0
  3*     fscsi2/path3           OPEN    NORMAL   0        0
  4      fscsi3/path4           OPEN    NORMAL   0        0
  5      fscsi3/path5           OPEN    NORMAL   0        0
  6*     fscsi3/path6           OPEN    NORMAL   0        0
  7*     fscsi3/path7           OPEN    NORMAL   0        0
```

Figure 10: Output of the `pcmpath set device path` command

pcmpath set device algorithm

The `pcmpath set device algorithm` command dynamically changes the path selection policy per SDD PATH device.

- **Syntax:** `pcmpath set device <device number> algorithm <policy name>`

In this command, the policy name can be one of the following options available:

- `rr` – round robin
- `fo` – failover (no load balance)
- `lb` – load balancing
- `lbp` – load balancing ports

```
bash-3.2# pccpath set device 3 algorithm rr
bash-3.2# pccpath query device 3

DEV#: 3 DEVICE NAME: hdisk4 TYPE: 2145 ALGORITHM: Round Robin
SERIAL: 6005076801A70546980000000000000B
=====
Path# Adapter/Path Name State Mode Select Errors
0 fscsi2/path0 OPEN NORMAL 0 0
1 fscsi2/path1 OPEN NORMAL 0 0
2* fscsi2/path2 OPEN NORMAL 0 0
3* fscsi2/path3 OPEN NORMAL 0 0
4 fscsi3/path4 OPEN NORMAL 0 0
5 fscsi3/path5 OPEN NORMAL 0 0
6* fscsi3/path6 OPEN NORMAL 0 0
7* fscsi3/path7 OPEN NORMAL 0 0
```

Figure 11: Output of the `pccpath set device algorithm` command

pccpath query port

The `pccpath query port` command displays information about a single target port or all target ports that are attached to SDDPCM-configured MPIO devices.

- **Syntax:** `pccpath query port`

```
bash-3.2# pccpath query port

Active TargetPorts :4

Port# Wwpn State Mode Select Errors Paths Active
0 500507680120a8d3 NORMAL ACTIVE 0 0 2 2
1 500507680110a8d3 NORMAL ACTIVE 0 0 2 2
2 500507680120a22f NORMAL ACTIVE 0 0 2 2
3 500507680110a22f NORMAL ACTIVE 0 0 2 2
```

Figure 12: Output of the `pccpath query port` command

pccpath query portstats

The `pccpath query portstats` command displays performance information about a single target port or all target ports that are attached to SDDPCM-configured MPIO devices. If you do not enter a device number, information about all devices is displayed. `Portstats` will work only when algorithm is set to `lbp`.

- **Syntax:** `pccpath query portstats`

```
bash-3.2# pcmpath query portstats

Port #: 0
=====
                Total Read  Total Write  Active Read  Active Write  Maximum
I/O:              0           0           0           0           0
SECTOR:           0           0           0           0           0

Port #: 1
=====
                Total Read  Total Write  Active Read  Active Write  Maximum
I/O:              0           0           0           0           0
SECTOR:           0           0           0           0           0
```

Figure 13: Output of the `pcmpath query portstats` command

```
bash-3.2# pcmpath query portstats 1

Port #: 1
=====
                Total Read  Total Write  Active Read  Active Write  Maximum
I/O:              0           0           0           0           0
SECTOR:           0           0           0           0           0
```

Figure 14: Detailed output of the `pcmpath query portstats` command

pcmpath open device n path n

The `pcmpath open device path` command dynamically opens a path that is in the invalid state. You can use this command to open an invalid path even when I/O is actively running on the devices.

- **Syntax:** `pcmpath open device <device number> path <path number>`

```
bash-3.2# pcmpath open device 3 path 2

Success: device 3 path 2 opened

DEV#: 3  DEVICE NAME: hdisk4  TYPE: 2145  ALGORITHM: Round Robin
SERIAL: 6005076801A705469800000000000000B
=====
Path#  Adapter/Path Name      State  Mode  Select  Errors
0      fscsi2/path0                OPEN  NORMAL  0       0
1      fscsi2/path1                OPEN  NORMAL  0       0
2*     fscsi2/path2                OPEN  NORMAL  0       0
3*     fscsi2/path3                OPEN  NORMAL  0       0
4      fscsi3/path4                OPEN  NORMAL  0       0
5      fscsi3/path5                OPEN  NORMAL  0       0
6*     fscsi3/path6                OPEN  NORMAL  0       0
7*     fscsi3/path7                OPEN  NORMAL  0       0
```

Figure 15: Detailed output of the `pcmpath open device n path n` command

sddpcmgetdata

The `sddgetdata.bat` script is used to collect the SDDDSM logs. Always collect these logs if you see any issue with multipathing.

- **Syntax:** `sddpcmgetdata`

```
bash-3.2# sddpcmgetdata
SDDPCM Debug data collected in file sddpcmdata_medusa.in.ibm.com_20160617_114108.tar.bz2
```

Figure 16: SDDDSM `sddpcmgetdata` command output

Summary

SDDPCM can be used as a multipath driver for AIX hosts that are using IBM storages. It has an easy CLI that can handle most of the user commands and fetch all the information required by the user. It understands the IBM storage very well compared to other multipathing drivers. Therefore, IBM recommends to use SDDPCM over other multipathing drivers. SDDPCM is an IBM multipath I/O solution based on AIX MPIIO technology. It supports a storage-redundant configuration environment for a host system. It also provides enhanced data availability, dynamic I/O load balancing across multiple paths, and automatic path failover protection as main features. SDDPCM also provides the dynamic I/O load-balancing feature. By distributing the I/O workload over multiple active paths, SDDPCM provides dynamic load balancing and eliminates data flow bottlenecks.

Resources

The following websites provide useful references to supplement the information contained in this paper:

- IBM Systems on PartnerWorld®
ibm.com/partnerworld/systems
- IBM Power Development Platform
ibm.com/partnerworld/pdp
- IBM Power Systems Knowledge Center
ibm.com/support/knowledgecenter/POWER8/p8hdx/POWER8welcome.htm
- IBM Redbooks®
ibm.com/redbooks

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