IBM

Guide to selecting a multipathing path control module for AIX or VIOS

Skill Level: Introductory

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This guide will assist a client in making the decision on identifying and deciding on which path control module to use in their AIX environment. The major functions for path control or multipathing are discussed and compared.

Introduction

When determining the path control module to use for AIX and VIOS multi-path I/O supported devices, there are two choices the system administrator and storage administrator can make. One choice is the SDDPCM (Subsystem Device Path Control Module), and the other choice is the AIX default MPIOPCM (Multipathing Input/Output Path Control Module.)

The SDDPCM product is provided by most IBM storage products for subsequent installation on the various server operating systems that the device supports. The AIX and VIOS default MPIO (AIXPCM) is provided as an integrated part of the base VIOS POWERVM firmware and AIX operating system product distribution.

In this document, the term *SDDPCM* is used to refer to the Subsystem Device Path Control Module, and *AIXPCM* is used for both the AIX and VIOS default MPIO module. The term *PCM* is used when path control modules are being discussed generically.

From a high level viewpoint, the SDDPCM provides many common functions and interfaces across various operating systems as an additional downloadable software entity for most IBM storage devices. The AIXPCM is a fully integrated component in

the AIX and VIOS licensed program product and provides integrated device support for the AIX/VIOS environment. This allows existing AIX/VIOS device and upper level commands to be used regardless of the storage device. Both IBM and some non-IBM storage devices are supported. Depending on your environment and mix of vendor products and server/storage support alignment responsibilities, one PCM over the other may be a better choice for you.

This article provides an understanding of the capabilities of them both.

Operating system integration and product considerations

The AIXPCM is included as part of the base AIX and VIOS licensed program product on the IBM System p platform. This enables a tighter integration of software levels in terms of coexistence of various software and device firmware levels, as there is one less part to integrate in the environment. The AIXPCM update levels are provided and are updated and migrated as a mainline part of all the normal AIX and VIOS service strategy and upgrade/migration paths. Thus, by simply upgrading either VIOS or AIX, the AIXPCM is automatically updated to the appropriate level without the need to install any additional modules or filesets.

The SDDPCM is an add-on software entity and has its own update strategy and process for obtaining fixes. The customer must manage coexistence levels between both the mix of devices, operating system levels and VIOS levels. SDDPCM is not a licensed program product. The customer also has additional responsibilities in performing operating system migrations in an SDDPCM environment.

The AIXPCM provides full fileset level APAR tracking, AIX software Vital Product Database command support, and formal PTFs as part of the AIX and VIOS licensed program products. SDDPCM provides a list of items fixed in the software entity release documentation, full replacement file sets, and additional scripts.

Supported devices

The SDDPCM software entity is provided for specific IBM devices and is referenced by the particular device support statement. The supported devices differ between AIX and POWERVM VIOS, as well.

AIXPCM supports all devices that the AIX operating system and VIOS POWERVM firmware support, including selected third-party devices.

Path selection algorithm options

Both PCMs provide Fail Over and Round Robin algorithms.

The SDDPCM provides additional algorithms called Load Balancing and Load Balancing Port. These algorithms take into account load statistics based on the

number of currently outstanding I/O operations of the server adapters in selecting the next path for an I/O operation. In the case of Load Balancing and in the case of Load Balancing Port, it also incorporates target port I/O statistics, as well.

While AIXPCM doesn't offer a "load balancing" attribute, load balancing using the AIXPCM can be accomplished through a "round_robin" algorithm, combined with user-customizable path priorities.

The default option for SDDPCM is Load Balance. The default option for AIXPCM is Fail Over.

SDDPCM allows for dynamic selection of path selection algorithm options, while the AIXPCM requires each hdisk be reconfigured for a new path selection algorithm to take affect.

Dynamic path configuration capabilities

Both PCMs provide for the ability to add paths to a device dynamically, dynamically remove or replace physical adapters, and support AIX and VIOS fibre channel dynamic device tracking.

Both PCMs provide an automated means of reclaiming failed paths of opened devices via kernel processes. In addition, SDDPCM provides a health check daemon to provide an automated method of reclaiming failed paths to a closed device. AIXPCM has a path health checker built into its functionality to reclaim failed paths automatically. Both PCMs provide user-customizable health check intervals.

Clustered license program product support

Both PCMs provide support of POWERHA and GPFS clustered software products.

Device reservation policy

Both PCMs provide the same device reservation policy capabilities.

SAN boot support, dump device and paging support

Both PCMs support booting from SAN. Upon installation of AIX, the AIXPCM will be the PCM for the boot devices. If SDDPCM is desired to be used for the boot device, another restart of the system is required after installation of the SDDPCM software. If NIM installation is used and the SDDPCM software is included in the NIM repository environment, then the second restart is not required.

Both PCMs allow for any MPIO device to be used as a paging device and a dump device.

Persistent reserve utilities

The SDDPCM provides a robust set of persistent reserve utilities for examining and managing persistent reserves on devices.

Enhanced device utilities for SDDPCM supported devices

The SDDPCM provides enhanced utilities (pcmpath commands) to show mappings from adapters, paths, devices, as well as performance and error statistics than can be useful in SAN management for those supported devices.

Performance and error statistics when using the AIXPCM are gathered via standard performance monitoring tools which ship with AIX, such as iostat and fcstat.

Conclusion

This guide described the relevant features of the AIXPCM and the SDDPCM path control modules in a compare and contrast fashion. Reading this guide and using the provided product documentation for both of these path control modules allows a system administrator the ability to make an informed decision on which multipathing solution to use in their environment.

Resources

Learn

- See the IBM System Storage Multipath Subsystem Device Driver User's Guide to learn how to install and configure the IBM System Storage Multipath Subsystem Device Driver Path Control Module (SDDPCM).

- The AIX Version 6.1 Operating System and Device Management Guide provides users and system administrators with device driver information.

- The System Storage Interoperation Center (SSIC) provides detailed interoperability and interoperation matrix information.

Discuss

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  - AIX Forum for developers

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About the author

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Michael Browne is an IBM chief test engineer responsible for testing all server and storage platforms. Some of his areas of expertise are in systems design, SAN implementation, systems management and systems testing.