



AIX and PowerVM/VIOS

ONTAP SAN Host

NetApp
May 12, 2021

Table of Contents

AIX and PowerVM/VIOS 1
 Using IBM AIX 7.2 and/or PowerVM (VIOS 3.1) with NetApp ONTAP..... 1

AIX and PowerVM/VIOS

Using IBM AIX 7.2 and/or PowerVM (VIOS 3.1) with NetApp ONTAP

Installing the AIX/VIOS Host Utilities

You must install the AIX Host Utilities Kit while using AIX MPIO with NetApp ONTAP Storage.

You can download the compressed file containing the Host Utilities software packages from the NetApp Support Site. After you have the file, you must uncompress it to get the two software packages you need to install the Host Utilities.

Steps

1. Login to your host.
 - On an AIX host, log in as **root**.
 - On a PowerVM host, log in as **padmin**, and then enter the `oem_setup_env` command to become root.
2. Download a copy of the compressed file containing the Host Utilities from NetApp Support Site to a directory on your host.
3. Go to the directory containing the download.
4. Uncompress the file and extract the SAN Toolkit software package.

```
zcat ntap_aix_host_utilities_6.0.tar.Z | tar -xvf -
```

The following directory is created when you uncompress the file: `ntap_aix_host_utilities_6.0`. This directory will have one of the following subdirectories: `MPIO`, `NON_MPIO`, or `SAN_Tool_Kit`

5. Install the AIX MPIO:

```
installp -aXYd /var/tmp/ntap_aix_host_utilities_6.0/MPIO  
NetApp.MPIO_Host_Utilities_Kit
```

6. Install the SAN Toolkit:

```
installp -aXYd /var/tmp/ntap_aix_host_utilities_6.0/SAN_Tool_Kit  
NetApp.SAN_toolkit
```

7. Reboot the host.

SAN Toolkit

The toolkit is installed automatically when you install the NetApp Host Utilities package. This kit provides the `sanlun` utility, which helps you manage LUNs and HBAs. The `sanlun` command returns information about the LUNs mapped to your host, multipathing, and information necessary to create initiator groups.

Example

In the following example, the `sanlun lun show` command returns LUN information.

```
#sanlun lun show

controller(7mode) /
vserver(Cmode)     lun-pathname    device      host      lun
mode              filename      adapter     protocol  size
-----
-----
data_vserver      /vol/vol1/lun1    hdisk0      fcs0      FCP      60g
C
data_vserver      /vol/vol2/lun2    hdisk0      fcs0      FCP      20g
C
data_vserver      /vol/vol3/lun3    hdisk11     fcs0      FCP      20g
C
data_vserver      /vol/vol4/lun4    hdisk14     fcs0      FCP      20g
C
```

SAN Booting

Before you begin

If you decide to use SAN booting, it must be supported by your configuration. You can use the [NetApp Interoperability Matrix Tool](#) to verify that your OS, HBA, HBA firmware and the HBA boot BIOS, and ONTAP version are supported.

SAN booting is the process of setting up a SAN-attached disk (a LUN) as a boot device for an AIX/PowerVM host. You can set up a SAN boot LUN to work in an AIX MPIO environment that is running the AIX Host Utilities with either the FC or FCoE protocol. The method you use for creating a SAN boot LUN and installing a new OS image on it in an AIX MPIO environment can vary, depending on which protocol you are using.

Multipathing

Multipathing allows you to configure multiple network paths between the host and storage system. If one path fails, traffic continues on the remaining paths. The AIX and PowerVM environments of the Host Utilities use AIX's native multipathing solution (MPIO).

For AIX, Path Control Module (PCM) is responsible for controlling multiple paths. PCM is a storage vendor supplied code that handles path management. This gets installed and enabled as part of the Host Utilities installation.

Non-ASA Configuration

For non-ASA configuration there should be two groups of paths with different priorities. The paths with the higher priorities are Active/Optimized, meaning they are serviced by the controller where the aggregate is located. The paths with the lower priorities are active but are non-optimized because they are served from a different controller. The non-optimized paths are only used when no optimized paths are available.

Example

The following example displays the correct output for an ONTAP LUN with two Active/Optimized paths and two Active/Non-Optimized paths:

```
# sanlun lun show -p |grep -p hdisk78
      ONTAP Path:
vs_aix_clus:/vol/chataix_205p2_vol_en_1_7/jfs_205p2_lun_en
      LUN: 37
      LUN Size: 15g
      Host Device: hdisk78
      Mode: C
      Multipath Provider: AIX Native
      Multipathing Algorithm: round_robin
```

host	vserver	AIX	host	vserver	AIX MPIO
path	path	MPIO	adapter	LIF	path
state	type	path			priority
up	secondary	path0	fcs0	fc_aix_1	1
up	primary	path1	fcs0	fc_aix_2	1
up	primary	path2	fcs1	fc_aix_3	1
up	secondary	path3	fcs1	fc_aix_4	1

All SAN Array Configuration

In All SAN Array (ASA) configurations, all paths to a given Logical Unit (LUN) are active and optimized. This means I/O can be served through all paths at the same time, thereby enabling better performance.

Example

The following example displays the correct output for an ONTAP LUN:



All SAN Arrays (ASA) configurations are supported beginning in ONTAP 9.8 for AIX Hosts.

```

# sanlun lun show -p |grep -p hdisk78
      ONTAP Path:
vs_aix_clus:/vol/chataix_205p2_vol_en_1_7/jfs_205p2_lun_en
      LUN: 37
      LUN Size: 15g
      Host Device: hdisk78
      Mode: C
      Multipath Provider: AIX Native
      Multipathing Algorithm: round_robin
-----
host    vserver  AIX                               AIX MPIO
path    path     MPIO  host    vserver  path
state   type     path  adapter LIF      priority
-----
up      primary  path0  fcs0    fc_aix_1  1
up      primary  path1  fcs0    fc_aix_2  1
up      primary  path2  fcs1    fc_aix_3  1
up      primary  path3  fcs1    fc_aix_4  1

```

Recommended Settings

Following are some recommended parameter settings for NetApp ONTAP LUN's. The critical parameters for ONTAP LUN's are set automatically after installing the NetApp Host Utilities Kit.

Parameter	Environment	Value for AIX	Note
algorithm	MPIO	round_robin	Set by Host Utilities
hcheck_cmd	MPIO	inquiry	Set by Host Utilities
hcheck_interval	MPIO	30	Set by Host Utilities
hcheck_mode	MPIO	nonactive	Set by Host Utilities
lun_reset_spt	MPIO / non-MPIO	yes	Set by Host Utilities
max_transfer	MPIO / non-MPIO	FC LUNs: 0x100000 bytes	Set by Host Utilities
qfull_dly	MPIO / non-MPIO	2-second delay	Set by Host Utilities
queue_depth	MPIO / non-MPIO	64	Set by Host Utilities
reserve_policy	MPIO / non-MPIO	no_reserve	Set by Host Utilities
re_timeout (disk)	MPIO / non-MPIO	30 seconds	Uses OS Default values
dyntrk	MPIO / non-MPIO	Yes	Uses OS Default values
fc_err_recov	MPIO / non-MPIO	Fast_fail	Uses OS Default values
q_type	MPIO / non-MPIO	simple	Uses OS Default values
num_cmd_elems	MPIO / non-MPIO	1024 for AIX 3072 for VIOS	FC EN1B, FC EN1C

Parameter	Environment	Value for AIX	Note
num_cmd_elems	MPIO / non-MPIO	1024 for AIX	FC EN0G

Recommended Settings for MetroCluster

By default, the AIX operating system enforces a shorter I/O timeout if when no paths to a LUN are available. This might occur in configurations including single-switch SAN fabric and MetroCluster configurations that experience unplanned failovers. For additional information and recommended changes to default settings, please refer to [NetApp KB1001318](#)

Known Problems and Limitations

NetApp Bug ID	Title	Description	Partner ID
1307653	Seeing I/O issues on VIOS 3.1.1.10 during SFO faults and straight io	<p>On VIOS 3.1.1 IO failures may be seen on NPIV client disk which are backed by 16/32Gb FC adapters. Also, a vfchost driver may get into a state where it stops processing I/O requests from the client.</p> <p>Applying IBM APAR IJ22290 IBM APAR IJ23222 will fix the issue</p>	<p>:leveloffset: -1</p> <p>:leveloffset: -1</p> <p><<<</p> <p>Copyright Information</p> <p>Copyright © 2021 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.</p> <p>Software derived from copyrighted NetApp material is subject to the following license and disclaimer:</p> <p>THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT</p>