Solaris Host Utilities

ONTAP SAN Host Utilities

NetApp
January 26, 2026

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Solaris Host Utilities Release Notes

The Solaris Host Utilities release notes describe new features, enhancements, known issues, limitations, and important cautions related to configuring and managing your specific Solaris host with your ONTAP storage system.

For specific information about the operating system versions and updates that the Host Utilities support, see the Interoperability Matrix Tool.

What's new in Solaris Host Utilities 8.0

- Solaris Host Utilities 8.0 introduces the `disksort:false` and `cache-nonvolatile:true` parameter settings. These parameters suppress constant sync calls from the host. The sync calls impact performance and aren't required because ONTAP doesn't have volatile cache. For more information, see Cache Flush Behavior for Flash and NVRAM Storage Devices.
- Solaris Host Utilities 8.0 supports automated updates for FC drivers. The FC drivers that bind the parameters for Solaris 11.4 use SCSI disks. For more information, see the Oracle Support Doc ID 2595926.1.

Known issues and limitations

You should be aware of the following known issues and limitations that might impact performance on your specific host.

Bug ID	Affects version	Title	Description
	Solaris Host Utilities 8.0		The Solaris Host Utilities 8.0 release only supports Solaris 11.4 with SPARC and x86 platforms. For Solaris 11.3 and earlier versions, you need to use the Solaris Host Utilities 6.2.
1385189	Solaris 11.4	Solaris 11.4 FC driver binding changes required in HUK 6.2	Solaris 11.4 and HUK recommendations: FC driver binding is changed from `ssd(4D)` to `sd(4D)`. Move configuration that you have in `ssd.conf` to `sd.conf` as mentioned in Oracle (Doc ID 2595926.1). The behavior varies across newly installed Solaris 11.4 systems and systems upgraded from 11.3 or lower versions.

+
NetApp Bugs Online provides complete information for most known issues, including suggested workarounds where possible. Some keyword combinations and bug types that you might want to use include the following:

- FCP General: Displays FC and host bus adapter (HBA) bugs that are not associated with a specific host.
- FCP - Solaris

What's next

Learn about installing Solaris Host Utilities

Install Solaris Host Utilities

Install Solaris Host Utilities 8.0 for ONTAP storage

The Solaris Host Utilities help you manage ONTAP storage attached to a Solaris host and assist technical support with gathering configuration data.

The Solaris Host Utilities support the following Solaris environments and transport protocols. These are the primary supported environments:

- The native OS with Oracle Solaris I/O Multipathing (MPxIO) and either the FC or iSCSI protocol on a system using either a SPARC or x86/64 processor.
- Veritas Dynamic Multipathing (DMP) with the FC or iSCSI protocol on a system using a SPARC processor.

Solaris Host Utilities 8.0 support the Solaris 11.4 series.

Before you begin

Verify that your iSCSI, FC, or FCoE configuration is supported. You can use the Interoperability Matrix Tool to verify your configuration.

Steps

1. Log in to your host as root.
2. Download a copy of the compressed file containing the Host Utilities from the NetApp Support Site to a directory on your host.

   SPARC CPU

   ```
   netapp_solaris_host_utilities_8_0_sparc.tar.gz
   ```

   x86/x64 CPU

   ```
   netapp_solaris_host_utilities_8_0_amd.tar.gz
   ```

3. Go to the directory on your host containing the download.
4. Unzip the file using the `gunzip` command, and then extract the file using `tar -xvf`:

   ```
   gunzip netapp_solaris_host_utilities_8_0_sparc.tar.gz
   ```

   ```
   tar -xvf netapp_solaris_host_utilities_8_0_sparc.tar
   ```

5. Add the packages that you extracted from the tar file to your host:

```
pkgadd
```

   The packages are added to the `/opt/NTAP/SANToolkit/bin` directory.

   The following example uses the `pkgadd` command to install the Solaris installation package:

```
pkgadd -d ./NTAPSANTool.pkg
```

6. Confirm that the toolkit was successfully installed by using the following command to the installed path:

```
pkgchk
```

Show example output

```
# pkgchk -l -p /opt/NTAP/SANToolkit

Pathname: /opt/NTAP/SANToolkit
Type: directory
Expected mode: 0755
Expected owner: root
Expected group: sys
Referenced by the following packages: NTAPSANTool
Current status: installed

# ls -alR /opt/NTAP/SANToolkit
/opt/NTAP/SANToolkit:
total 1038
drwxr-xr-x   3 root     sys            4 Mar  7 13:11 .
drwxr-xr-x   3 root     sys            3 Mar  7 13:11 ..
drwxr-xr-x   2 root     sys            6 Mar 17 18:32 bin
-r-xr-xr-x   1 root     sys       432666 Dec 31 13:23 NOTICES.PDF

/opt/NTAP/SANToolkit/bin:
total 3350
drwxr-xr-x   2 root     sys            6 Mar 17 18:32 .
drwxr-xr-x   3 root     sys            4 Mar  7 13:11 ..
-r-xr-xr-x   1 root     sys      1297000 Feb  7 22:22 host_config
-r-xr-xr-x   1 root     root         996 Mar 17 18:32 san_version
-r-xr-xr-x   1 root     sys       309700 Feb  7 22:22 sanlun
-r-xr-xr-x   1 root     sys          677 Feb  7 22:22 vidpid.dat

# cd /usr/share/man/man1; ls -al host_config.1 sanlun.1
-r-xr-xr-x   1 root     sys        12266 Feb  7 22:22 host_config.1
-r-xr-xr-x   1 root     sys         9044 Feb  7 22:22 sanlun.1
```

7. Configure the host parameters for your "MPxIO" or "Veritas DMP" environment by using the `/opt/NTAP/SANToolkit/bin/host_config` command with the multipath stack from the command reference:

   ```
   /opt/NTAP/SANToolkit/bin/host_config -setup -protocol fcp|iscsi|mixed
   -multipath mpxio|dmp|non [-noalua] [-mcc 60|90|120]
   ```

For example, if your setup is…	Use the command…
FCP with multipath as MPxIO	`#/opt/NTAP/SANToolkit/bin/host_config -setup -protocol fcp -multipath mpxio` For information on the configuration changes for SnapMirror active sync, see the Knowledge Base article Solaris Host support recommended settings in SnapMirror active sync (formerly SM-BC) configuration.
FCP with multipath as DMP	`#/opt/NTAP/SANToolkit/bin/host_config -setup -protocol fcp -multipath dmp`
FCP on MetroCluster with multipath as MPxIO, and the All Paths Down value is set to 120s. (This is the recommended setting for MetroCluster configurations).	`#/opt/NTAP/SANToolkit/bin/host_config -setup -protocol fcp -multipath mpxio -mcc 120` For more information, see the Knowledge Base article Solaris host support considerations in a MetroCluster configuration.

8. Reboot the host.

   The Host Utilities load the following NetApp recommended timeout parameter settings for ONTAP LUNs.

   Show example

```
#prtconf -v |grep NETAPP
   value='NETAPP  LUN' +
   physical-block-size:4096,
   retries-busy:30,
   retries-reset:30,
   retries-notready:300,
   retries-timeout:10,
   throttle-max:64,
   throttle-min:8,
   disksort:false,
   cache-nonvolatile:true'
```

9. Verify the Host Utilities installation:

```
sanlun version
```

What's next?

Learn about the SAN Toolkit.

Install Solaris Host Utilities 6.2 for ONTAP storage

The Solaris Host Utilities help you manage ONTAP storage attached to a Solaris host and assist technical support with gathering configuration data.

The Solaris Host Utilities support several Solaris environments and multiple transport protocols. These are the primary Solaris Host Utilities environments:

- The native OS with MPxIO and either the Fibre Channel (FC) or iSCSI protocol on a system using either a SPARC processor or an x86/64 processor.
- Veritas Dynamic Multipathing (DMP) with either the FC or iSCSI protocol on a system using a SPARC processor, or the iSCSI protocol on a system using an x86/64 processor.

The Solaris Host Utilities 6.2 support the following Solaris series:

- Solaris 11.x
- Solaris 10.x

Before you begin

Verify that your iSCSI, FC, or FCoE configuration is supported. You can use the Interoperability Matrix Tool to verify your configuration.

Steps

1. Log in to your host as root.
2. Download a copy of the compressed file containing the Host Utilities from the NetApp Support Site to a directory on your Solaris host:

   SPARC CPU

   ```
   netapp_solaris_host_utilities_6_2_sparc.tar.gz
   ```

   x86/x64 CPU

   ```
   netapp_solaris_host_utilities_6_2_amd.tar.gz
   ```

3. Go to the directory on your Solaris host containing the download.
4. Unzip the file using the `gunzip` command:

   ```
   gunzip netapp_solaris_host_utilities_6_2_sparc.tar.gz
   ```

5. Extract the file using the `tar xvf` command:

```
tar xvf netapp_solaris_host_utilities_6_2_sparc.tar
```

6. Add the packages that you extracted from tar file to your host

```
pkgadd
```

The packages are added to the `/opt/NTAP/SANToolkit/bin` directory.

The following example uses the `pkgadd` command to install the Solaris installation package:

```
pkgadd -d ./NTAPSANTool.pkg
```

7. Confirm that the toolkit was successfully installed by using one of the following commands:

```
pkginfo
```

```
ls - al
```

Show example outputs

```
# ls -alR /opt/NTAP/SANToolkit
/opt/NTAP/SANToolkit:
total 1038
drwxr-xr-x   3 root     sys            4 Jul 22  2019 .
drwxr-xr-x   3 root     sys            3 Jul 22  2019 ..
drwxr-xr-x   2 root     sys            6 Jul 22  2019 bin
-r-xr-xr-x   1 root     sys       432666 Sep 13  2017 NOTICES.PDF

/opt/NTAP/SANToolkit/bin:
total 7962
drwxr-xr-x   2 root     sys            6 Jul 22  2019 .
drwxr-xr-x   3 root     sys            4 Jul 22  2019 ..
-r-xr-xr-x   1 root     sys      2308252 Sep 13  2017 host_config
-r-xr-xr-x   1 root     sys          995 Sep 13  2017 san_version
-r-xr-xr-x   1 root     sys      1669204 Sep 13  2017 sanlun
-r-xr-xr-x   1 root     sys          677 Sep 13  2017 vidpid.dat

# (cd /usr/share/man/man1; ls -al host_config.1 sanlun.1)
-r-xr-xr-x   1 root     sys        12266 Sep 13  2017 host_config.1
-r-xr-xr-x   1 root     sys         9044 Sep 13  2017 sanlun.1
```

8. Configure the host parameters for your MPxIO or Veritas DMP environment:

```
/opt/NTAP/SANToolkit/bin/host_config
```

9. Verify the installation:

```
sanlun version
```

What's next?

Learn about the SAN Toolkit.

Learn about the SAN Toolkit for ONTAP storage

Solaris Host Utilities is a NetApp host software that provides a command line toolkit on your Oracle Solaris host. The toolkit is installed when you install the NetApp Host Utilities package. This kit provides the `sanlun` utility which helps you manage LUNs and host bus adapters (HBAs). The `sanlun` command returns information about the LUNs mapped to your host, multipathing, and information necessary to create initiator groups.

The following example output shows the ONTAP LUN information returned for the `sanlun lun show` command:

Show example output

```
#sanlun lun show all
controller(7mode)/ device host lun
vserver(Cmode)                    lun-pathname       filename
adapter protocol size mode
--------------------------------------------------------------------------
------------------------------------------------------------
data_vserver                      /vol/vol1/lun1
/dev/rdsk/c0t600A098038304437522B4E694E49792Dd0s2 qlc3   FCP       10g
cDOT
data_vserver                      /vol/vol0/lun2
/dev/rdsk/c0t600A098038304437522B4E694E497938d0s2 qlc3   FCP       10g
cDOT
data_vserver                      /vol/vol2/lun3
/dev/rdsk/c0t600A098038304437522B4E694E497939d0s2 qlc3   FCP       10g
cDOT
data_vserver                      /vol/vol3/lun4
/dev/rdsk/c0t600A098038304437522B4E694E497941d0s2 qlc3   FCP       10g
cDOT
```

This toolkit is common across all Host Utilities configurations and protocols. As a result, all of the components don't apply to every configuration. Unused components don't affect your system performance.

What's next?

Learn about using the Solaris Host Utilities tool.

Use Solaris Host Utilities commands to verify ONTAP storage configuration

You can use the Solaris Host Utilities sample command reference for an end-to-end validation of the NetApp storage configuration using the Host Utilities tool.

List all host initiators mapped to host

You can retrieve a list of all host initiators mapped to a host.

```
sanlun fcp show adapter -v
```

8.0

Show example for Solaris Host Utilities 8.0

```
adapter name:      qlc0
WWPN:              2100f4e9d40fe3e0
WWNN:              2000f4e9d40fe3e0
driver name:       qlc
model:             7023303
model description: 7101674, Sun Storage 16Gb FC PCIe Universal HBA,
QLogic
serial number:     463916R+1912389772
hardware version:  Not Available
driver version:    230206-5.12
firmware version:  8.08.04
Number of ports:   1 of 2
port type:         Fabric
port state:        Operational
supported speed:   4 GBit/sec, 8 GBit/sec, 16 GBit/sec
negotiated speed:  16 GBit/sec
OS device name:    /dev/cfg/c4

adapter name:      qlc1
WWPN:              2100f4e9d40fe3e1
WWNN:              2000f4e9d40fe3e1
driver name:       qlc
model:             7023303
model description: 7101674, Sun Storage 16Gb FC PCIe Universal HBA,
QLogic
serial number:     463916R+1912389772
hardware version:  Not Available
driver version:    230206-5.12
firmware version:  8.08.04
Number of ports:   2 of 2
port type:         Fabric
port state:        Operational
supported speed:   4 GBit/sec, 8 GBit/sec, 16 GBit/sec
negotiated speed:  16 GBit/sec
OS device name:    /dev/cfg/c5
```

6.2

Show example for Solaris Host Utilities 6.2

```
adapter name:      qlc3
WWPN:              21000024ff17a301
WWNN:              20000024ff17a301
driver name:       qlc
model:             7335902
model description: 7115462, Oracle Storage Dual-Port 32 Gb Fibre
Channel PCIe HBA
serial number:     463916R+1720333838
hardware version:  Not Available
driver version:    210226-5.10
firmware version:  8.08.04
Number of ports:   1 of 2
port type:         Fabric
port state:        Operational
supported speed:   8 GBit/sec, 16 GBit/sec, 32 GBit/sec
negotiated speed:  32 GBit/sec
OS device name:    /dev/cfg/c7

adapter name:      qlc2
WWPN:              21000024ff17a300
WWNN:              20000024ff17a300
driver name:       qlc
model:             7335902
model description: 7115462, Oracle Storage Dual-Port 32 Gb Fibre
Channel PCIe HBA
serial number:     463916R+1720333838
hardware version:  Not Available
driver version:    210226-5.10
firmware version:  8.08.04
Number of ports:   2 of 2
port type:         Fabric
port state:        Operational
supported speed:   8 GBit/sec, 16 GBit/sec, 32 GBit/sec
negotiated speed:  16 GBit/sec
OS device name:    /dev/cfg/c6
```

List all LUNs mapped to host

You can retrieve a list of all LUNs mapped to a host.

```
sanlun lun show -p -v all
```

8.0

Show example for Solaris Host Utilities 8.0

```
ONTAP Path: sanboot_unix:/vol/test1/lun1
       LUN: 0
       LUN Size: 21g
       Host Device:
/dev/rdsk/c0t600A098038314B314E5D574632365A51d0s2
       Mode: C
       Multipath Provider: Sun Microsystems
       Multipath Policy: Native
```

6.2

Show example for Solaris Host Utilities 6.2

```
                    ONTAP Path: data_vserver:/vol1/lun1
                           LUN: 1
                      LUN Size: 10g
                   Host Device:
/dev/rdsk/c0t600A0980383044485A3F4E694E4F775Ad0s2
                          Mode: C
             Multipath Provider: Sun Microsystems
               Multipath Policy: Native
```

List all LUNs mapped to host from a given SVM/ List all attributes of a given LUN mapped to host

You can retrieve a list of all LUNs mapped to a host from a specific SVM.

```
sanlun lun show -p -v <svm_name>
```

8.0

Show example for Solaris Host Utilities 8.0

```
ONTAP Path: sanboot_unix:/vol/test1/lun1
       LUN: 0
       LUN Size: 20g
       Host Device:
/dev/rdsk/c0t600A098038314B314E5D574632365A51d0s2
       Mode: C
       Multipath Provider: Sun Microsystems
       Multipath Policy: Native
```

6.2

Show example for Solaris Host Utilities 6.2

```
ONTAP Path: sanboot_unix:/vol/sol_boot/sanboot_lun
                           LUN: 0
                      LUN Size: 180.0g
```

List ONTAP LUN attributes by host device filename

You can retrieve a list of all ONTAP LUN attributes by specifying a host device filename.

```
sanlun lun show all
```

8.0

Show example for Solaris Host Utilities 8.0

```
controller(7mode/E-Series)/
device
vserver(cDOT/FlashRay)       lun-pathname
filename
------------------------------------------------------------------------
-------------------------------------------
sanboot_unix                /vol/test1/lun1
/dev/rdsk/
c0t600A098038314B314E5D574632365A51d0s2

host adapter    protocol lun size   product
-------------------------------------------
qlc1            FCP      20g        cDOT
```

6.2

Show example for Solaris Host Utilities 6.2

```
controller(7mode/E-Series)/
device
vserver(cDOT/FlashRay)       lun-pathname
filename
------------------------------------------------------------------------
-------------------------------------------
sanboot_unix                 /vol/sol_193_boot/chatsol_193_sanboot
/dev/rdsk/c0t600A098038304437522B4E694E4A3043d0s2

host adapter    protocol lun size   product
-------------------------------------------
qlc3            FCP      180.0g     cDOT
```

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