

Sun Enterprise Server Alternate Pathing 2.1 Reference Manual

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NAME	Intro – AP administration
DESCRIPTION	This section describes commands, scripts, and programs executed in the Alternate Pathing environment.
ap(1M)	alternate pathing
ap_daemon(1M)	alternate pathing daemon
ap_reboot_host(1M)	fast boot alternate path
ap_ssp_daemon(1M)	AP SSP daemon
apboot(1M)	set up system files for boot meta-disk
apcheck(1M)	determine accessibility of a meta-disk
apconfig(1M)	display and manage AP configuration
apdb(1M)	manage AP database
apdisk(1M)	manage disk pathgroups
apinst(1M)	identify disk host adapter instances, /dev/dsk targets
apnet(1M)	manage network pathgroups
apssp(1M)	client of AP SSP daemon

NAME	ap – alternate pathing
DESCRIPTION	Alternate Pathing (AP) enables you to define and control alternate physical paths to peripheral devices. If a path to a device becomes unavailable, your Sun server can use an alternate path.
SEE ALSO	<i>Sun Enterprise Server Alternate Pathing User's Guide</i>

NAME	ap_daemon – alternate pathing daemon
SYNOPSIS	ap_daemon
DESCRIPTION	/usr/sbin/ap_daemon is an RPC program that provides the interface to the Alternate Pathing (AP) driver.
Configuration Information	<p>The ap_daemon RPC program name is AP_SVR, its RPC program number is 300473, and its underlying protocol is TCP. It is invoked as an inetd server via the TCP transport. The UID required for access to the daemon is ssp. This UID can be a non-login UID.</p> <p>The entry for the daemon in the /etc/inetd.conf file is:</p> <pre>300473/1 tli rpc/tcp wait root /usr/sbin/ap_daemon ap_daemon</pre>
SEE ALSO	<i>Sun Enterprise Server Alternate Pathing User's Guide</i> apconfig(1M) , apdb(1M) , apdisk(1M) , apnet(1M)

NAME	ap_reboot_host – fast boot alternate path
SYNOPSIS	ap_reboot_host
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	Caution: Do not execute ap_reboot_host on the command line; it is intended for use only by other commands. SSSPOPT/bin/ap_reboot_host is executed when a boot failure is detected. It determines the boot path of the previous boot and attempts to restart the host from an alternate path if one is available.

NAME	ap_ssp_daemon – AP SSP daemon
SYNOPSIS	ap_ssp_daemon
AVAILABILITY	Sun Enterprise 10000 servers only. This command is executed in the SSP environment.
DESCRIPTION	<p>SSSPOPT/bin/ap_ssp_daemon is an RPC program that maintains an SSP-based file that contains Alternate Pathing (AP) information for the boot disks. This file is updated automatically by ap_daemon(1M).</p> <p>ap_ssp_daemon provides its information to apssp(1M), which then passes it to ap_reboot_host(1M). The SSP program apssp(1M) provides the interface to ap_ssp_daemon.</p> <p>The daemon's only clients are apssp(1M) and ap_daemon(1M). apssp(1M) provides a way to access the information the daemon keeps. ap_daemon(1M) updates the information.</p>
SEE ALSO	ap_daemon(1M) , ap_reboot_host(1M) , apssp(1M)

NAME	apboot – set up system files for boot meta-disk
SYNOPSIS	apboot [-n] [-k <i>system-name</i>] [-v <i>vfstab-name</i>] <i>device</i> apboot [-m <i>metadevice-name</i>] apboot [-u <i>metadevice-name</i>]
DESCRIPTION	Use <code>/usr/sbin/apboot</code> to edit <code>/etc/vfstab</code> and <code>/etc/system</code> to make the system bootable from either the boot disk file systems on an AP meta-disk or the boot disk file systems on a disk device that is not alternately pathed; or to allow AP to coherently manage a mirrored boot device when both that boot device and its mirror are under AP control.
OPTIONS	-n Print what would be done without actually doing it. -k <i>system-name</i> Edit <i>system-name</i> instead of the default <code>/etc/system</code> file. -v <i>vfstab-name</i> Edit <i>vfstab-name</i> instead of the default <code>/etc/vfstab</code> table of file system defaults. -m <i>metadevice-name</i> Enable boot mirror support for the specified AP meta-device. -u <i>metadevice-name</i> Disable boot mirror support for the specified AP meta-device.
EXAMPLES	apboot mc3t0d0 Edits <code>/etc/system</code> and <code>/etc/vfstab</code> to specify that the boot disk file systems are now on meta-disk <code>mc3t0d0</code> . apboot c3t0d0 Edits <code>/etc/system</code> and <code>/etc/vfstab</code> to specify that the boot disk file systems are now under the physical path <code>/dev/dsk/c3t0d0</code> . apboot mc3t0d0 apboot -m mc1t0d1 These commands edit <code>/etc/system</code> and <code>/etc/vfstab</code> to specify that the boot disk file systems are now on meta-disk <code>mc3t0d0</code> , with a mirror on <code>mc1t0d1</code> . apboot -u mc1t0d1 Disables AP support for the mirror device created in the previous example.
FILES	<code>/etc/system</code> kernel patch file <code>/etc/vfstab</code> table of file system defaults
SEE ALSO	<code>system(4)</code> , <code>vfstab(4)</code> in <i>man Pages(4): File Formats of the SunOS Reference Manual</i>

NAME	apcheck – determine accessibility of a meta-disk
SYNOPSIS	apcheck <i>special</i>
DESCRIPTION	Caution: Do not execute apcheck on the command line; it is intended for use only by other commands, or by authorized service providers. /sbin/apcheck ascertains whether a meta-disk is usable. If it is able to locate dual paths, apcheck exits with a zero status; if not, it exits with a non-zero status.
OPTION	<i>special</i> represents the device node to be checked. This device node may reside under /dev/ap/dsk or /dev/ap/rdisk .

NAME	apconfig – display and manage AP configuration
SYNOPSIS	<pre> apconfig -D apconfig -F apconfig -N [-u] apconfig -P meta_network_intrfc -a new_phys_path apconfig -P primary_path -a new_phys_path apconfig -R apconfig -S [-u] </pre>
DESCRIPTION	The <code>/usr/sbin/apconfig</code> command displays and helps you manage the Alternate Pathing (AP) system configuration.
OPTIONS	<p>-D Display location and status information for all known copies of the host database.</p> <p>-F Force the state (attached or detached) of every committed pathgroup alternate to match the physical state of the system. Use this option if the two states differ. It refreshes the Dynamic Reconfiguration (DR) flags for every disk I/O port and physical network interface defined for all committed pathgroups.</p> <p>-N [-u] Display network AP information only. For each pathgroup, apconfig -N displays the meta-network interface and the corresponding physical network interfaces.</p> <p>If you specify the -u option, apconfig displays uncommitted pathgroup information only. If you do not specify the -u option, apconfig displays committed pathgroup information only. See Letters after names and paths, below.</p> <p>-P meta_ntwrk_intrfc -a new_phys_path Switch to the new physical path specified by -a for the meta-network specified by -P.</p> <p>-P primary_path -a new_phys_path Switch to the new physical path specified by -a for the primary path specified by -P.</p> <p>-R Rebuild the meta-disk device nodes in <code>/dev/ap/dsk</code> and <code>/dev/ap/rdsk</code>. apconfig creates links to <code>/devices</code> for all committed disk pathgroups in the database.</p> <p>Note: You must execute drvconfig -i ap_dmd before you can execute apconfig -R. See drvconfig(1M) and ap_dmd(7).</p> <p>-S [-u] Display alternate pathing information for disk pathgroups only. (S stands for SCSI.) For each pathgroup, apconfig shows the names for the meta-disk, its physical devices, and the disk I/O ports through which</p>

each physical device is accessed.

If you specify the **-u** option, **apconfig** displays only uncommitted path-group information. Otherwise, it displays only committed pathgroup information. See **Letters after names and paths**, below.

Letters after names and paths

When you specify **-N** or **-S**, one or more of the following letters may be displayed after each meta-network or meta-disk name:

- D** Marked for deletion. The meta-disk or meta-network remains in the database and continues to be used by AP until a commit is done. See **apdb(1M)**.
- U** Uncommitted. Note that you cannot use a meta-disk or meta-network until a commit has been done.
- R** Marked for use as a root device. **-S** only.
- M** Marked as the mirror for a boot device. **-S** only.
- X** The physical paths for this meta-disk lead to different disks (i.e., different SSA's). **-S** only.

When you specify **-N** or **-S**, one or more of the following letters may be displayed after each physical network name or disk I/O port name:

- A** The active alternate. To select another interface, use the **-P** and **-a** options.
- DR** Marked as being drained by Dynamic Reconfiguration. A switch cannot be made to a device path in this state. See the *Sun Enterprise Server Alternate Pathing User's Guide*.
- DE** Marked as detached by Dynamic Reconfiguration.
- P** The primary path. The primary path cannot be changed.
- T** Path has been tried as active.
- O** Marked as offline. See **apdisk(1M)** and **apnet(1M)**.

EXAMPLES Example 1

The following example displays all committed disk pathgroups in the AP database:

```
# apconfig -S
c6    pln0  A
c2    pln3  P
      metadiskname(s):
          mc2t5d0
          mc2t4d0  R
          mc2t3d0
          mc2t2d0
          mc2t1d0
          mc2t0d0
```

Example 2 The following example displays all uncommitted network pathgroups in the AP database.

```
# apconfig -N -u

meta-network:  mqe0  U
physical devices:
    qe1
    qe0      P A
```

Example 3 The following example switches the active alternate of the disk pathgroup for which the primary path is **pln1**. The new active alternate of that pathgroup is **pln0**.

```
# apconfig -P pln1 -a pln0
```

Example 4 The following example switches the active alternate of the network pathgroup identified by the meta-network interface **mqe0**. The new active alternate of that network pathgroup is **qe1**.

```
# apconfig -P mqe0 -a qe1
```

Example 5 The following example displays the location and status information of all known copies of the AP database.

```
# apconfig -D

path: /dev/rdisk/c3t3d0s1
major: 32
minor: 145
timestamp: Wed Sep 28 18:45:58 1994
checksum: 2636010350
default: yes
corrupt: no
inaccessible: no

path: /dev/rdisk/c3t3d0s6
major: 32
minor: 150
timestamp: Wed Sep 28 18:50:43 1994
checksum: 2636010350
default: no
synced: yes
corrupt: no
inaccessible: no
```

SEE ALSO

Sun Enterprise Server Alternate Pathing User's Guide

apdb(1M), **apdisk**(1M), **apnet**(1M), **ap_dmd**(7) in this reference manual

drvconfig(1M) in *man Pages(1M): System Administration Commands of the SunOS Reference Manual*

NAME	apdb – manage AP database
SYNOPSIS	apdb <i>-c raw_disk_slice</i> [<i>-k system_file</i>] [<i>-f</i>] apdb <i>-d raw_disk_slice</i> [<i>-k system_file</i>] [<i>-f</i>] apdb <i>-m major -n minor</i> [<i>-f</i>] apdb <i>-C</i> apdb <i>-Z</i>
DESCRIPTION	The <code>/usr/sbin/apdb</code> command helps you manage the AP database.
OPTIONS	<p><i>-c raw_disk_slice</i> Create a database copy on the specified raw disk slice. You can create up to 10 copies of the database. The minimum slice size is 300KBytes.</p> <p><i>-d raw_disk_slice</i> Delete a database copy from the specified raw disk slice.</p> <p><i>-f</i> Force deletion of the specified database. This option is required for creating the first copy of the database, and when deleting each of the last two copies of the database. If you try to delete a database copy without this option when fewer than two database copies exist, AP displays an error message.</p> <p><i>-k system_file</i> Patch the the database copy information to the kernel file <i>system_file</i>, rather than the default file, <code>/etc/system</code>.</p> <p><i>-m major -n minor</i> Remove a database copy by specifying its location as a major-minor pair. Use <i>-m</i> to specify the major and <i>-n</i> for the minor. This option pair is useful when there is no path to the database because the device no longer exists.</p> <p><i>-C</i> Commit all uncommitted entries within the database.</p> <p><i>-Z</i> Copy the database in memory to all database copies. Note that all database copies are in sync with memory and are automatically updated at system shutdown. <i>-Z</i> lets you update the database copies at your discretion.</p>
EXAMPLE	The following example creates a copy of the AP system database on <code>/dev/rdisk/c2t0d0s1</code> . <pre># apdb -c /dev/rdisk/c2t0d0s1</pre>
SEE ALSO	<i>Sun Enterprise Server Alternate Pathing User's Guide</i> apconfig (1M), apdisk (1M), apnet (1M)

NAME	apdisk – manage disk pathgroups
SYNOPSIS	apdisk -c -p <i>primary_path</i> -a <i>alternate_path</i> apdisk -d <i>primary_path</i> apdisk -z <i>primary_path</i> apdisk -f <i>io_port</i> apdisk -n <i>io_port</i> apdisk -u -p <i>primary_path</i> -a <i>alternate_path</i> apdisk -w <i>io_port</i>
DESCRIPTION	The <code>/usr/sbin/apdisk</code> command helps you manage disk pathgroups in the Alternate Pathing (AP) system.
OPTIONS	<p>-c -p <i>primary_path</i> -a <i>alternate_path</i> Create database entries for disks (i.e., a SPARCStorage Arrays) connected to two I/O ports. Give the I/O port names (e.g., pln0 and pln1) as the <i>primary_path</i> and <i>alternate_path</i>.</p> <p>-d <i>primary_path</i> Delete AP information for the specified disk pathgroup. If the existing information is uncommitted, apdisk removes it immediately. If the existing information is already committed, it is only marked for deletion and existing meta-devices continue to function until a commit is done, at which time the information is removed.</p> <p>-z <i>primary_path</i> Undelete AP information for the specified disk pathgroup. This option cancels a previous apdisk -d request that marked committed information for deletion.</p> <p>-f <i>io_port</i> Mark the I/O port as offline. Corresponding meta-disks can still be used if the other I/O port in the pathgroup is functioning properly. Note that you cannot mark an I/O port offline if it is currently the active alternate.</p> <p>-n <i>io_port</i> Mark the I/O port as online. Note that this operation does not automatically cause the I/O port to become the active alternate.</p> <p>-u -p <i>primary_path</i> -a <i>alternate_path</i> Update existing database entries for the disk pathgroup identified by the primary path (e.g., pln0). Disk targets that are no longer accessible through one or more paths are removed, and new disk targets are added. To update the meta-disk device nodes execute drvconfig -i ap_dmd and apconfig -R. See apconfig(1M) in this document and drvconfig(1M) in <i>man Pages(1M): System Administration Commands of the SunOS Reference Manual</i>.</p> <p>-w <i>io_port</i> Clear the tried flag for the specified I/O port.</p>

EXAMPLES**Example 1**

The following example creates meta-disk device nodes and AP database entries for disks reachable through **pln0** and **pln1**, with **pln0** specified as the primary path.

```
# apdisk -c -p pln0 -a pln1
# apdb -C
# drvconfig -i ap_dmd
# apconfig -R
```

Example 2

The following example deletes the AP database entries for disks with **sf1** specified as the primary path.

```
# apdisk -d sf1
# apdb -C
```

SEE ALSO

Sun Enterprise Server Alternate Pathing User's Guide

apdb(1M), **apconfig(1M)**, **apinst(1M)**, **apnet(1M)** in this reference manual

devlinks(1M), **drvconfig(1M)** in *man Pages(1M): System Administration Commands* of the *SunOS Reference Manual*

NAME	apinst – identify disk host adapter instances, /dev/dsk targets
SYNOPSIS	apinst
DESCRIPTION	The /usr/sbin/apinst program identifies all disk host bus adapters and provides the name, instance number and /dev/dsk targets attached to each.
EXAMPLE	<pre>% apinst isp0 /dev/dsk/c0t0d0 /dev/dsk/c0t1d0 /dev/dsk/c0t2d0 pln0 /dev/dsk/c1t0d0 /dev/dsk/c1t1d0 /dev/dsk/c1t2d0 /dev/dsk/c1t3d0 /dev/dsk/c1t4d0 /dev/dsk/c1t5d0 pln1 /dev/dsk/c2t0d0 /dev/dsk/c2t1d0 /dev/dsk/c2t2d0 /dev/dsk/c2t3d0 /dev/dsk/c2t4d0 /dev/dsk/c2t5d0 sf0 /dev/dsk/c3t0d0 /dev/dsk/c3t1d0 /dev/dsk/c3t2d0 /dev/dsk/c3t3d0 /dev/dsk/c3t4d0 /dev/dsk/c3t5d0 sf1 /dev/dsk/c4t0d0 /dev/dsk/c4t1d0 /dev/dsk/c4t2d0 /dev/dsk/c4t3d0 /dev/dsk/c4t4d0 /dev/dsk/c4t5d0</pre>

NAME	apnet – manage network pathgroups
SYNOPSIS	<pre> apnet -c -p <i>ntwk_intrfc</i> [-a <i>ntwk_intrfc</i>] apnet -d <i>meta_ntwk_intrfc</i> apnet -z <i>meta_ntwk_intrfc</i> apnet -f <i>ntwk_intrfc</i> apnet -n <i>ntwk_intrfc</i> apnet -m <i>meta_ntwk_intrfc</i> -a <i>ntwk_intrfc</i> apnet -m <i>meta_ntwk_intrfc</i> -r <i>ntwk_intrfc</i> apnet -t <i>meta_ntwk_intrfc</i> apnet -w <i>meta_ntwk_intrfc</i> </pre>
DESCRIPTION	The <code>/usr/sbin/apnet</code> command helps you manage network pathgroups in the Alternate Pathing (AP) system.
OPTIONS	<p>Note: The parameters <i>meta_ntwk_intrfc</i> and <i>ntwk_intrfc</i> are strings of the form <i>type instance_#</i>, but with no space between them; for example, mle0 and mle1.</p> <p>-c -p <i>ntwk_intrfc</i> [-a <i>ntwk_intrfc</i>] Create a meta-network interface and network pathgroup for the specified network. If -a is given, apnet designates the specified network interface as the alternate for the meta-network interface. (If you initially create a network pathgroup with only one path, you can later add an additional path using apnet -m.)</p> <p>-d <i>meta_ntwk_intrfc</i> Delete the specified meta-network interface and corresponding network pathgroup. If the pathgroup is currently uncommitted, apnet removes the interface and the pathgroup immediately. If the pathgroup is committed, the interface and pathgroup are only marked for deletion, and the interface continues to function until a commit is performed.</p> <p>-z <i>meta_ntwk_intrfc</i> Undelete the specified meta-network interface and pathgroup. This option cancels a previous apnet -d request that marked a committed pathgroup for deletion.</p> <p>-f <i>ntwk_intrfc</i> Mark the specified network interface as offline and therefore inaccessible through its meta-network interface. Note: An interface cannot be marked as offline if it is active.</p> <p>-n <i>ntwk_intrfc</i> Mark the specified network interface as online and therefore accessible through its meta-network interface.</p> <p>-m <i>meta_ntwk_intrfc</i> -a <i>ntwk_intrfc</i> Add the specified network interface as the alternate for the specified network pathgroup. You can use this option only if the network pathgroup currently contains exactly one path.</p>

-m meta_ntwk_intrfc -r ntwk_intrfc

Remove the specified network interface from the specified network pathgroup.

Note: When an alternate is added (**-a**) or removed (**-r**) from a committed network pathgroup, a commit operation must be done for the change to take effect. In practice, the existing meta-network interface is marked for deletion and a new one is created without affecting current usage of the interface.

-t meta_ntwk_intrfc

Make the next alternate path in sequence (after the primary) the temporary active path. This option is intended for scripts that are trying alternate paths in sequence until a working path is found. The command returns an error if the sequencing wraps back to the original primary.

-w meta_ntwk_intrfc

Make the current temporary active path the actual active path.

EXAMPLES

Example 1

The following example creates a network pathgroup and a meta-network interface, **mle0**, which has **le0** as its primary physical network interface and **le1** as its alternate physical network interface.

```
# apnet -c -p le0 -a le1
# apdb -C
```

Example 2

The following example deletes the network pathgroup and meta-network interface **mle0**:

```
# apnet -d mle0
# apdb -C
```

SEE ALSO

Sun Enterprise Server Alternate Pathing User's Guide
apconfig(1M), **apdb(1M)**, **apdisk(1M)**

NAME	apssp – client of AP SSP daemon
SYNOPSIS	apssp
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	Caution: Do not execute apssp on the command line; it is intended for use only by other commands. apssp is a client of the Alternate Pathing SSP daemon, ap_ssp_daemon(1M) . It takes information from ap_ssp_daemon and passes it to ap_reboot_host(1M) .
SEE ALSO	ap_ssp_daemon(1M) , ap_reboot_host(1M)