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## 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
*Sun Enterprise Server Alternate Pathing User's Guide*
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  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.

The entry for the daemon in the /etc/inetd.conf file is:

300473/1 tli rpc/tcp wait root /usr/sbin/ap_daemon ap_daemon

SEE ALSO  Sun Enterprise Server Alternate Pathing User’s Guide

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.

$SSPOPT/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  $SSPOPT/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).

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.

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.

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 system-name] [−v vfstab-name] device
apboot [−m metadevice-name]
apboot [−u metadevice-name]

DESCRIPTION

Use /usr/sbin/apboot to edit /etc/vfstab and /etc/system 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 system-name
   Edit system-name instead of the default /etc/system file.
−v vfstab-name
   Edit vfstab-name instead of the default /etc/vfstab table of file system defaults.
−m metadevice-name
   Enable boot mirror support for the specified AP meta-device.
−u metadevice-name
   Disable boot mirror support for the specified AP meta-device.

EXAMPLES

apboot mct0d0
   Edits /etc/system and /etc/vfstab to specify that the boot disk file systems are now on meta-disk mct0d0.
apboot c3t0d0
   Edits /etc/system and /etc/vfstab to specify that the boot disk file systems are now under the physical path /dev/dsk/c3t0d0.
apboot mct0d0
apboot -m mclt0d1
   These commands edit /etc/system and /etc/vfstab to specify that the boot disk file systems are now on meta-disk mct0d0, with a mirror on mclt0d1.
apboot -u mclt0d1
   Disables AP support for the mirror device created in the previous example.

FILES

/etc/system     kernel patch file
/etc/vfstab     table of file system defaults

SEE ALSO

NAME

apcheck – determine accessibility of a meta-disk

SYNOPSIS

apcheck special

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

special represents the device node to be checked. This device node may reside under /dev/ap/dsk or /dev/ap/rdsk.
NAME
apcon®g – display and manage AP configuration

SYNOPSIS
apcon®g

apcon®g
-D

apcon®g
-F

apcon®g
-N [-u]

apcon®g
-P meta_netwk_intrfc –a new_phys_path

apcon®g
-P primary_path –a new_phys_path

apcon®g
-R

apcon®g
-S [-u]

DESCRIPTION
The /usr/sbin/apcon®g command displays and helps you manage the Alternate Pathing (AP) system configuration.

OPTIONS
-D
Display location and status information for all known copies of the host database.

-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.

-N [-u]
Display network AP information only. For each pathgroup, apcon®g –N displays the meta-network interface and the corresponding physical network interfaces.

If you specify the -u option, apcon®g displays uncommitted pathgroup information only. If you do not specify the -u option, apcon®g displays committed pathgroup information only. See Letters after names and paths, below.

-P meta_netwk_intrfc –a new_phys_path
Switch to the new physical path specified by -a for the meta-network specified by -P.

-P primary_path –a new_phys_path
Switch to the new physical path specified by -a for the primary path specified by -P.

-R
Rebuild the meta-disk device nodes in /dev/ap/dsk and /dev/ap/rdsk. apcon®g creates links to /devices for all committed disk pathgroups in the database.

Note: You must execute drvconfig –i ap_dmd before you can execute apconfig –R. See drvconfig(1M) and ap_dmd(7).

-S [-u]
Display alternate pathing information for disk pathgroups only. (S stands for SCSI.) For each pathgroup, apcon®g shows the names for the meta-disk, its physical devices, and the disk I/O ports through which
each physical device is accessed.

If you specify the \texttt{−u} option, \texttt{apconfig} displays only uncommitted pathgroup information. Otherwise, it displays only committed pathgroup information. See \texttt{Letters after names and paths}, below.

\textbf{Letters after names and paths}

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

- \textbf{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 \texttt{apdb}(1M).
- \textbf{U} Uncommitted. Note that you cannot use a meta-disk or meta-network until a commit has been done.
- \textbf{R} Marked for use as a root device. \texttt{−S} only.
- \textbf{M} Marked as the mirror for a boot device. \texttt{−S} only.
- \textbf{X} The physical paths for this meta-disk lead to different disks (i.e., different SSA’s). \texttt{−S} only.

When you specify \texttt{−N} or \texttt{−S}, one or more of the following letters may be displayed after each physical network name or disk I/O port name:

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

\textbf{EXAMPLES}

\textbf{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
```

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

path: /dev/rdsk/c3t3d0s6
major: 32
minor: 150
checksum: 2636010350
default: no
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 -c raw_disk_slice [-k system_file] [-f]
apdb -d raw_disk_slice [-k system_file] [-f]
apdb -m major -n minor [-f]
apdb -C
apdb -Z

DESCRIPTION

The /usr/sbin/apdb command helps you manage the AP database.

OPTIONS

- c raw_disk_slice
  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.

- d raw_disk_slice
  Delete a database copy from the specified raw disk slice.

- f
  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.

- k system_file
  Patch the database copy information to the kernel file system_file, rather than the default file, /etc/system.

- m major - n minor
  Remove a database copy by specifying its location as a major-minor pair. Use - m to specify the major and - n for the minor. This option pair is useful when there is no path to the database because the device no longer exists.

- C
  Commit all uncommitted entries within the database.

- Z
  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. - Z lets you update the database copies at your discretion.

EXAMPLE

The following example creates a copy of the AP system database on /dev/rdsk/c2t0d0s1.

# apdb -c /dev/rdsk/c2t0d0s1

SEE ALSO

Sun Enterprise Server Alternate Pathing User’s Guide

apconfig(1M), apdisk(1M), apnet(1M)
NAME

apdisk – manage disk pathgroups

SYNOPSIS

apdisk -c -p primary_path -a alternate_path
apdisk -d primary_path
apdisk -z primary_path
apdisk -f io_port
apdisk -n io_port
apdisk -u -p primary_path -a alternate_path
apdisk -w io_port

DESCRIPTION

The /usr/sbin/apdisk command helps you manage disk pathgroups in the Alternate Pathing (AP) system.

OPTIONS

-c -p primary_path -a alternate_path
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 primary_path and alternate_path.

-d primary_path
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.

-z primary_path
Undelete AP information for the specified disk pathgroup. This option cancels a previous apdisk -d request that marked committed information for deletion.

-f io_port
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.

-n io_port
Mark the I/O port as online. Note that this operation does not automatically cause the I/O port to become the active alternate.

-u -p primary_path -a alternate_path
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 man Pages(1M): System Administration Commands of the SunOS Reference Manual.

-w io_port
Clear the tried flag for the specified I/O port.
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
```
% 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
```
## NAME
apnet – manage network pathgroups

## SYNOPSIS

- `apnet -c p ntwk_intrfc [-a ntwk_intrfc]`
- `apnet -d meta_ntwk_intrfc`
- `apnet -z meta_ntwk_intrfc`
- `apnet -f ntwk_intrfc`
- `apnet -n ntwk_intrfc`
- `apnet -m meta_ntwk_intrfc -a ntwk_intrfc`
- `apnet -m meta_ntwk_intrfc -r ntwk_intrfc`
- `apnet -t meta_ntwk_intrfc`
- `apnet -w meta_ntwk_intrfc`

## DESCRIPTION
The `/usr/sbin/apnet` command helps you manage network pathgroups in the Alternate Pathing (AP) system.

## OPTIONS

**Note:** The parameters `meta_ntwk_intrfc` and `ntwk_intrfc` are strings of the form `type instance_#`, but with no space between them; for example, `mle0` and `mle1`.

- `-c p ntwk_intrfc [-a ntwk_intrfc]`
  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`.)

- `-d meta_ntwk_intrfc`
  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.

- `-z meta_ntwk_intrfc`
  Undelete the specified meta-network interface and pathgroup. This option cancels a previous `apnet -d` request that marked a committed pathgroup for deletion.

- `-f ntwk_intrfc`
  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.

- `-n ntwk_intrfc`
  Mark the specified network interface as online and therefore accessible through its meta-network interface.

- `-m meta_ntwk_intrfc -a ntwk_intrfc`
  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.
### AP Commands

#### apnet (1M)

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