Alternate Pathing 2.0 Reference Manual

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 copies of AP database
apdisk(1M)	manage disk pathgroups
apinst(1M)	identify pln ports, **/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   *Alternate Pathing 2.0 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   *Alternate Pathing 2.0 User's Guide*

apconfig(1M), **apdb**(1M), **apdisk**(1M), **apnet**(1M)

NAME	ap_reboot_host – fast boot alternate path
SYNOPSIS	**ap_reboot_host**
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**

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*
DESCRIPTION	The **/usr/sbin/apboot** command can edit the **/etc/vfstab** and **/etc/system** files 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.
OPTIONS	–**n** Print what would be done without actually doing it.
	–**k** *system-name* Edit *system-name* instead of the default **/etc/system** system configuration information file.
	–**v** *vfstab-name* Edit *vfstab-name* instead of the default **/etc/vfstab** table of file system defaults.
EXAMPLES	The following command edits **/etc/system** and **/etc/vfstab** to specify that the boot disk file systems are now on meta-disk **mc3t0d0**:
	apboot mc3t0d0
	The following command edits **/etc/system** and **/etc/vfstab** to specify that the boot disk file systems are now under the physical path **/dev/dsk/c3t0d0**:
	apboot c3t0d0
FILES	**/etc/system** kernel patch file
	/etc/vfstab table of file system defaults
SEE ALSO	**system**(4), **vfstab**(4) in the *SunOS Reference Manual*

NAME	apcheck – determine accessibility of a meta-disk
SYNOPSIS	**apcheck** *special*
DESCRIPTION	Use **/sbin/apcheck** to ascertain whether a meta-disk is usable. If so, **apcheck** exits with a zero status; if not, it exits with a non-zero status.
	special represents the device node to be checked. This device node may reside under **/dev/ap/dsk** or **/dev/ap/rdsk.**
EXAMPLE	% **apcheck /dev/ap/rdsk/mc1t0d0s7**

NAME	apconfig – display and manage AP configuration
SYNOPSIS	**apconfig** –**D** [–**h** *hostname*] **apconfig** –**F** [–**h** *hostname*] **apconfig** –**N** [–**u**] [–**h** *hostname*] **apconfig** –**P** *meta_ntwk_intrfc* –**a** *phys_ntwk_intrfc* [–**h** *hostname*] **apconfig** –**R** [–**h** *hostname*] **apconfig** –**S** [–**u**] [–**h** *hostname*]
DESCRIPTION	The **/usr/sbin/apconfig** command displays and helps you manage the Alternate Pathing (AP) system configuration.

OPTIONS

–**h** *hostname*   The name of the host on which the AP daemon resides.

–**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 pln port and physical network interface defined for all committed pathgroups.

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

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** *meta_network_interface* –**a** *phys_ntwk_intrfc*
Switch to the alternate path specified by –**a** for the meta-network specified by -**P**.

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

Note: You must execute **drconfig** –**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, **apconfig** shows the names for the meta-disk, its physical devices, and the pln ports through which each physical device is accessed.

If you specify the –**u** option, **apconfig** displays only uncommitted pathgroup 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.

  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 pln 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 *Alternate Pathing 2.0 User's Guide*.

  DE Marked as detached by Dynamic Reconfiguration.

  P   The primary path. The primary path cannot be changed.

  T   Tried as a *temporary active*. See **apnet**(1M). –**N** only.

  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 data-
base.

```
# 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
timestamp: Wed Sep 28 18:50:43 1994
checksum: 2636010350
default: no
synced: yes
corrupt: no
inaccessible: no
```

SEE ALSO   *Alternate Pathing 2.0 User's Guide*

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

ap_dmd(7) in *man Pages(7): Alternate Pathing Special Files*

drvconfig(1M) in the *SunOS Reference Manual*

NAME	apdb – manage AP database
SYNOPSIS	**apdb** –**c** *raw_disk_slice* [–**h** *hostname*] [–**k** *system_file*] [–**f**] **apdb** –**d** *raw_disk_slice* [–**h** *hostname*] [–**k** *system_file*] [–**f**] **apdb** –**m** *major* –**n** *minor* [–**h** *hostname*] [–**f**] **apdb** –**C** [–**h** *hostname*] **apdb** –**Z** [–**h** *hostname*]
DESCRIPTION	The **/usr/sbin/apdb** command helps you manage the AP database.
OPTIONS	–**h** *hostname* The name of the host on which the AP daemon resides.

–**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 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	*Alternate Pathing 2.0 User's Guide* **apconfig**(1M), **apdisk**(1M), **apnet**(1M)

NAME | apdisk – manage disk pathgroups

SYNOPSIS
apdisk −**c** −**p** *primary_path* −**a** *alternate_path* [−**h***hostname*]
apdisk −**d** *primary_path* [−**h** *hostname*]
apdisk −**z** *primary_path* [−**h** *hostname*]
apdisk −**f** *pln_port* [−**h** *hostname*]
apdisk −**n** *pln_port* [−**h** *hostname*]
apdisk −**u** −**p** *primary_path* −**a** *alternate_path* [−**h***hostname*]s

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

OPTIONS
−**h** *hostname*   The name of the host on which the AP daemon resides.

−**c** −**p** *primary_path* −**a** *alternate_path*
Create database entries for a disk (i.e., a SPARCStorage Array) that is connected to two pln ports. Give the pln 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** *pln_port*   Mark the pln port as offline. The corresponding meta-disk can still be used if the other pln port in the pathgroup is functioning properly. Note that you cannot take a pln port offline if it is currently the active alternate.

−**n** *pln_port*   Mark the pln port as online. Note that this operation does not automatically cause the pln 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*.

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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**
      # **apconfig** -**R**

Example 2   The following example deletes the AP database entries for disks with **pln1** specified as the primary path.

      # **apdisk -d pln1**
      # **apdb** -**C**

SEE ALSO   *Alternate Pathing 2.0 User's Guide*

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

devlinks(1M), **drvconfig**(1M) in the *SunOS Reference Manual*

NAME | apinst – identify pln ports, **/dev/dsk** targets

SYNOPSIS | **apinst**

DESCRIPTION | The **/usr/sbin/apinst** program identifies all pln ports and provides the name, instance number, and **/dev/dsk** targets attached to each.

EXAMPLE | % **apinst**

```
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
```

NAME | apnet – manage network pathgroups

SYNOPSIS | **apnet** –**c** -**p** *ntwk_intrfc* [–**a** *ntwk_intrfc*] [–**h** *hostname*]
apnet –**d** *meta_ntwk_intrfc* [–**h** *hostname*]
apnet –**z** *meta_ntwk_intrfc* [–**h** *hostname*]
apnet *meta_ntwk_intrfc* –**f** *ntwk_intrfc* [–**h** *hostname*]
apnet *meta_ntwk_intrfc* –**n** *ntwk_intrfc* [–**h** *hostname*]
apnet –**m** *meta_ntwk_intrfc* –**a** *ntwk_intrfc* [–**a** *ntwk_intfc* ...] [–**h** *hostname*]
apnet –**m** *meta_ntwk_intrfc* –**r** *ntwk_intrfc* [–**r** *ntwk_intfc* ...] [–**h** *hostname*]
apnet –**t** *meta_ntwk_intrfc* [–**h** *hostname*]
apnet –**w** *meta_ntwk_intrfc* [–**h** *hostname*]

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**.

–**h** *hostname* The name of the host on which the AP daemon resides.

–**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 the primary interface, or 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 net-
>   work pathgroup. You can use this option only if the network pathgroup
>   currently contains exactly one path.

−**m** *meta_ntwk_intrfc* −**r** *ntwk_intrfc*
>   Remove the specified network interface from the specified network path-
>   group.
>
>   **Note:**   When an alternate is added (−**a**) or removed (−**r**) from a commit-
>   ted 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 tem-
>   porary 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
Alternate Pathing 2.0 User's Guide

apconfig(1M), **apdb**(1M), **apdisk**(1M)

NAME	apssp – client of AP SSP daemon
SYNOPSIS	**apssp**
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)