Automount NFS

Automatic mounting

❑ Problems of /etc/fstab

- Maintenance of /etc/fstab in large network
- Crashed NFS server will make operation blocked

❑ automount daemon

- Mount filesystems when they are referenced and unmount them when they are no longer needed
- Supply a list of replicated filesystems to replace important but crashed NFS servers
- Transparent to users

❑ Products

- automount (from SUN Micro), simple and concise (Solaris/Linux)
- amd (from Jan-Simon Pendry), complicated but more powerful (Generally Used)

automount (1)

❑ Three kinds of configuration files (map)

- Direct map
- Indirect map
- Master map

Provide information about filesystems that are to be automounted

  ➢ List which direct and indirect maps that automount should pay attention to

- Difference between direct and indirect

  ➢ All mount points in indirect map has common directory defined in master map

automount (2)

❑ Example of automount maps

master

/net	/etc/auto.net	-rw, intr
/-	/etc/auto.direct	-ro, intr

indirect

WWW	-rw,soft,nosuid,vers=2	vega:/home/www
mail	-rw,soft,nosuid,quota	ccserv:/spool/mail
ftp	-ro,soft,nosuid	ftp:/home/ftp

direct

/vlsi/vlsi1	-rw,soft,nosuid	scorpio:/vlsi1
/vlsi/vlsi2	-rw,soft,nosuid	scorpio:/vlsi2

automount (3)

❑ Master map

- /etc/auto_master   (FreeBSD)
- /etc/auto.master   (Linux)
- /etc/auto_master   (Solaris)

❑ Restart automounter when you change the maps

- /etc/rc.d/automount {start|stop}
- /etc/rc.d/automountd {start|stop}
- /etc/rc.d/autounmountd {start|stop}   (FreeBSD)
- /etc/init.d/autofs {start|stop}   (Solairs)
- /etc/init.d/autofs {start|stop|reload|status}   (Linux)

automount (4)

❑ Replicated filesystem

- There are several identical NFS and I would like to mount anyone of them

- Constrain
  - ➢ Read-only
  - ➢ These replicated filesystem should be truly identical

- Automounter will choose a server based on its own idea of which one is the best

| /usr/man | -ro | chimchim:/usr/man band(1):/usr/man |
| /www/data | -ro | ccbsd4,altair:/www/data |

automount (5)

❑ Automatic automounts

- ***automount*** can query the ***mountd*** to find out what filesystems the server exports

- Using -host as map name in the master map file

/net	-host	-nosuid,soft

- -host does not enumerate all possible hosts
  - ➢ It waits for individual subdirectory names to be referenced
  - ➢ If chimchim exports **/usr/share/man**
    - – Automount at the path **/net/chimchim/usr/share/man**

amd (1)

❑ Advantages over automount

- Sends "keep alive" queries to remote servers at regular intervals and maintains a list of servers that are accessible
  ➢ Return an "operation would block" rather than hanging
- Not proprietary source code
- Offer another mount types that are not supported by automount
  ➢ union
- Map syntax is more generic
- Provide a query-and-manipulation tool, amq
- …

amd (2)

❑ Flexible map syntax

- One map used by many machines
- Contain conditions that control which parts of map entry are activate
  - ➢ Selector variable

```
/defaults          type:=nfs;fs:=${autodir}/${key};opts:=nfsv3,rw, \
                   grpid,quota,intr,soft,nodev,nosuid,resvport, \
                   timeo=10,retrans=5,nqnfs
mail               rhost:=ccserv;rfs:=/spool/mail
ftp                rhost:=ftp;rfs:=/home/ftp
raid1              host==cchome;type:=ufs;dev:=/dev/da0s1e\
                   host!=cchome;type:=nfs;rhost:=cchome;rfs:=/${key};\
                   opts:=nfsv3,rw,soft,nosuid,resvport
dragon             host==magpie;type:=link;fs:=/${key} \
                   host!=magpie;type:=nfs;rhost:=magpie;rfs:=/${key}
```

amd (3)

Selector	Description
arch	Architecture of the current machine
autodir	Default directory under which to mount filesystems
domain	Local NIS domain name
host	Local hostname
key	Volume name being resolved
map	Name of mount map being used
os	Operating System

Option	Description
rhost	Remote host on which the volume lives
rfs	Remote filesystem name
type	Type of mount, nfs or ufs (local disk)
fs	Local mount point
opts	Mount options
remopts	Options to use if server is nonlocal

amd (4)

❑Starting amd

- % amd -a /tmp_mnt -l syslog -x fatal, error, user /net /etc/amd.conf

❑Stopping amd

- % kill -15 <amd_pid>

options	Description
-x	Sets run-time logging options, such as fatal, error, user, warn, info, ...
-r	Restart existing mounts
-l	Log file name or "syslog"
-a	Specify alternative location for mount points
/net	Sets the automount directory
/etc/amd.conf	The map files

amd (5)

❑ Remount without kill amd

- Unmount such mounted partition
  - ➢ % umount /amd/magpie
- Delete such virtual /net/DIR
  - ➢ % rm /net/magpie
- cd /net/DIR
  - ➢ % cd /net/magpie

❑ amd in FreeBSD

- Edit rc.conf

```
…
amd_enable="YES"
amd_flags="-a /amd -y sa.nis -l /var/log/amd.log -x all /net auto.home"
…
```