

Automount NFS

tsaimh (2022, CC BY)

lwhsu (2019-2021, CC BY)

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交大資工系資訊中心

Computer Center of Department of Computer Science, NCTU

Automatic mounting

- Problems of /etc/fstab
 - Maintenance of /etc/fstab in a large network
 - Crashed NFS server will make operation blocked
 - Removable media support
- automounter (autofs) daemon
 - Mount filesystems when they are referenced and unmount them when they are no longer needed
 - Supply a list of **replicated filesystems** as backup of important resource
 - Transparent to users

Automounter

- Products
 - 1988, automount (from Sun), simple and concise (Solaris & other Unix-like)
 - 1989, amd (from Jan-Simon Pendry), a.k.a. Berkeley Automounter, complicated but more powerful (*BSD and Linux, **Obsoleted now**)
 - 2014, autofs, starting with FreeBSD 10.1-RELEASE it has a new automounter very similar to the Solaris/Linux one

autofs (1)

- autofs
 - Kernel component: autofs(5)
 - Userspace applications
 - [automount\(8\)](#): Update autofs mounts
 - [automountd\(8\)](#): Daemon handling autofs mount requests
 - [autounmountd\(8\)](#): Daemon unmounting automounted filesystems
 - 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
- <https://www.freebsd.org/doc/handbook/network-nfs.html#network-autofs>

autofs (2)

- Example of auto_master and map file ([auto_master\(5\)](#))

	mountpoint	map_name	[-options]
master	/net	/etc/auto.net	-rw, intr
	/-	/etc/auto.direct	-ro, intr
	+autofs.map		

(indirect)
(direct)
(include NIS map)

	key	[-options]	location
direct	/data/redi	-rw, soft, nosuid	storage:/redis
	/data/mysql		storage:/mysql
indirect	www	-rw, soft, nosuid, vers=2	web0:/home/www
	mail	-rw, soft, nosuid, quota	ccserv:/spool/mail
	ftp	-ro, soft, nosuid	ftp:/home/ftp
	*	-intr, nfsv4	192.168.1.1:/share/&
	sys		dragon:/sys/\${OSNAME}

* : match any unmatched key
& : replaced by matched key field

autofs (3)

Selector	Description
ARCH	Expands to the output of <code>uname -p</code>
CPU	Same as ARCH
HOST	Expands to the output of <code>uname -n</code>
OSNAME	Expands to the output of <code>uname -s</code>
OSREL	Expands to the output of <code>uname -r</code>
OSVERS	Expands to the output of <code>uname -v</code>
&	Volume name being resolved

- Additional variable can be defined with the `-D` flag of `automount(8)` and `automountd(8)`

autofs (4)

- 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 }

autofs (5)

- autofs in FreeBSD

```
/etc/rc.conf
```

```
...  
autofs_enable="YES"  
...
```

- Example after mounting maps

```
$ mount -t autofs  
map -hosts on /net (autofs)  
map /etc/auto.mnt on /mnt (autofs)
```


autofs (6)

- Replicated filesystems
 - There are several identical NFS and we want to mount anyone of them
 - Constraints
 - Read-only
 - These replicated filesystems should be truly identical
 - Automounter will choose a server based on its own idea of which one is the best

```
/usr/man    -ro    bsd1:/usr/man bsd2:/usr/man  
/www/data  -ro    web1,web2:/www/data
```

autofs (7)

- 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 **bsd1** exports **/usr/share/man**
 - Automount at the path **/net/bsd1/usr/share/man**