Installing IRIX over a Network

General Information

Introduction

Sometimes it may be desirable to do a network installation of IRIX - that is the computer to be installed does not have direct access to the installation media (normally CD-ROMs), but there is another computer (preferably another SGI) in the LAN which either has a CD-ROM drive or the wohle installation CDs on its local storage. Then you might want to use this SGI as an installation server.

This page tries to explain how this can be done rather easily. The most important things is to prepare the *trivial file transfer protocol server* (**`tftp`**) and the *boot protocol server* (**`bootp`**) on the installation server. The later enables a boot accross the network while the first is a rather slim ftp-server which will be used for transferring the files to the client.

Preparing the Client

Before you can prepare the server, you have to get the physical 48bit ethernet address of the machine (or MAC-Address which stands for *Media Access Control*) of the machine to be installed (the *client*). The adress consists of 6 hexnumbers seperated by colons, for example **`08:00:69:02:38:1c`** is the adress of my Personal Iris 4D/25. Write this adress down, it is needed later for preparation of the installation server.

There are two possibilities how to find our the ethernet adress from the command line interface of the PROM monitor. Older machines use the **`eaddr`**-command, newer machines store the adress in the environment variable **`eaddr`** which can be viewed by typing **`printenv`**.

```
>> printenv
AutoLoad=Yes
console=g
diskless=0
dbaud=9600
```

```
volume=80
sgilogo=y
monitor=h
TimeZone=PST8PDT
netaddr=192.168.1.23
crt_option=1
SystemPartition=pci(0)scsi(0)disk(1)rdisk(0)partition(8)
OSLoadPartition=pci(0)scsi(0)disk(1)rdisk(0)partition(0)
OSLoadFilename=/unix
OSLoader=sash
keybd=DE
cpufreq=200
eaddr=08:00:69:0c:f2:ae
NoAutoLoad=CONSOLE OPEN FAILED.
ConsoleOut=serial(0)
ConsoleIn=serial(0)
videostatus=illegal_env_var
>>
```

While you are in the PROM monitor you can already set the IP adress of the client (that is the box itself) by typing

```
>> setenv netaddr 192.168.1.25
```

Of course you have to replace **192.168.1.25** by the correct adress. The IP adress of the client will be refered as ***[client-ip]***.

On some old SGIs you should also disable the tapedrive as an installation drive by typing

```
>> setenv notape 1
```

Preparing the Server

First you have to copy *all* CDs onto the server, each CD should reside in a different directory, but it is wise to use a common parent directory like `/cds`.

From now on ***[inst-src]*** will refer to the first installation CD that contains the installation tools and ***[root-src]*** will refer to the common directory where all CDs are stored. And the IP adress of the server will be refered as ***[server-ip]*** and remember that the IP adress of the machine itself will be refered as ***[client-ip]***.

There is only one exception, when you do not need to copy all CDs to your harddisc: You can omit this step, if the wohle IRIX release fits onto one CD. Then of course, you can simply insert that CD into the drive and in this case ***[inst-src] = [root-src] =*** **/CDROM**.

First you should enter the hardware adress of the client together with its hostname into the file **/etc/ethers**

```
#
# /etc/ethers maps Ethernet addresses to hostnames
#
# The library routine ether_line() uses this file.
#
# The format of a line is:
#
#       x:x:x:x:x:x     hostname
#
# where the first field is the 48-bit Ethernet address
# expressed as 6 hexadecimal bytes.
#
08:00:69:02:38:1c       iris
```

Now you have to edit the file **/etc/bootptab** and specify the kernel which has to be used for booting the client. Note that you first have to chose the correct **sash** version for your target platform, see the table below:

```
#
# /etc/bootptab:  config file for bootp server (/usr/etc/bootp)
#

# Root of boot subtree. If tftpd(1M) is running in "secure" mode,
# this directory must be specified on tftpd's entry
# in /usr/etc/inetd.conf.

/usr/local/boot

# default bootfile

unix

# end of first section

%%

#
# The remainder of this file contains one line per client
# interface with the information shown by the table headings
# below. The 'host' name is also tried as a suffix for the
# 'bootfile' when searching the home directory.  (e.g.,
# bootfile.host)
#
# host htype haddr             iaddr       bootfile
#

iris    1  08:00:69:02:38:1c  192.168.1.25  [inst-src]/stand/sashARCS
```

Now we have to enable the **bootp** and **tftp** daemons on the server by editing the file **/etc/inetd.conf**

```
#
# /etc/inetd.conf
#
[...]
bootp dgram   udp   wait  root    /usr/etc/bootp  bootp
tftp  dgram   udp   wait  guest   /usr/etc/tftpd  tftpd -s [root-src]
[...]
```

Now for the changes of the configuration to take effect, we finally have to restart the **inetd** daemon by typing

```
/etc/killall -HUP inetd
```

For more information on the details of configuring **inetd**, **tftpd** and **bootp**, consult the relevant man pages and also read sections 9.4 to 9.6 in the "*IRIX Admin: System Configuration and Operation*" online book, as well as Chapter 2 in "*IRIX Admin: Software Installation and Licensing*".

Now the installation server is readily configured.

Selecting the Correct `fx/sash` Version

Before you start the installation, you have to know which version of **sash** and **fx** your machine (the client) requires. Many platform require different kernel versions, even already for the installation. The following table gives you an overview of the different versions. Note that not all hardware platforms are supported by all IRIX versions!

System	sash- / fx-Version	IRIX Version
Personal Iris 4D/2x	**sash.IP6** **fx.IP6**	4.0.1 or 5.3
Personal Iris 4D/3x	**sash.IP12** **fx.IP12**	4.0.1 or 5.3
Professional Iris 4D/120	**sash.IP5** **fx.IP5**	
Professional Iris 4D/210	**sash.IP9** **fx.IP9**	
Professional Iris 4D/2x0 Professional Iris 4D/3x0 Professional Iris 4D/4x0	**sash.IP7** **fx.IP7**	
Crimson	**sash.IP17** **fx.IP17**	
Indigo R3000	**sash.IP12** **fx.IP12**	
Onyx/Challenge R4000 Indigo R4000	**sashARCS** **fx.ARCS**	5.3 or 6.5

Indigo² R4000 Indy		
O2	**sashARCS** **fx.ARCS**	5.3 or 6.5
Onyx/Challenge R8000 Onyx/Challenge R10K Indigo² R8000 Indigo² R10K Onyx2 Origin Octane Fuel	**sash.64** **fx.64**	6.5

From now on we assume that we are installing on a newer 32bit system like an Indy or an O2. So we need **sashARCS** and **fx.ARCS**.

Accessing the Network

All access from the client to the files on the server is done by the **bootp()** device which can be used in any place where you can use the **dksc()** or **cdrom()** devices. The syntax of `bootp()` is as follows:

bootp()*[server-ip]*:*[server-file]*

For example refers `bootp()192.168.1.23:/cds/6.5inst/stand/fx.ARCS` to the `fx.ARCS` file on the server with IP `192.168.1.23`. Note that you cannot access servers in other networks, behind routers or gateways, because the PROM and `sash` both do not know anything about routes.

This implies the following important fact: *The server and the client both have to reside within the same network!*

Starting the `fx` over Network

Now we can start the installation on the client. First we have to boot into the PROM monitor and enter the command line interface. Now we can set the IP adress of the station and disable a tape installation on older SGI boxes by typing

```
>> setenv netaddr [client-ip]
>> setenv notape 1
```

Now you can boot the disc partitioning program **fx** with the expert mode enabled by typing (of course, you have to chose the correct version of **fx** as listed in the table above)

```
>> boot -f bootp()[server-ip]:[inst-src]/stand/fx.ARCS --x
```

For more details on using **fx** please read the page "Disc Initialisation with IRIX fx". This will explain the most important options and commands of **fx**.

```
System Maintenance Menu

1) Start System
2) Install System Software
3) Run Diagnostics
4) Recover System
5) Enter Command Monitor

Option? 5

Command Monitor.  Type "exit" to return to the menu.
>> setenv notape 1
>> setenv netaddr 192.168.1.25
>> boot -f bootp()192.168.1.23:/cds/6.5inst/stand/fx.ARCS --x
Obtaining /cds/6.5inst/stand/fx.ARCS from server 192.168.1.23
230608+91888+1863568 entry: 0x80055d00

fx version 6.5, Oct  1, 1999
fx: "device-name" = (dksc)
fx: ctlr# = (0)
fx: drive# = (1)
fx: lun# = (0)
...opening dksc(0,1,0)

fx: partitions in use detected on device
fx: devname             seq owner   state
fx: /dev/rdsk/dks0d1s0    1 xfs     already in use

...drive selftest...OK
Scsi drive type == SGI     IBM DDRS-34560W S96A

----- please choose one (? for help, .. to quit this menu)-----
[exi]t             [d]ebug/           [l]abel/           [a]uto
[b]adblock/        [exe]rcise/        [r]epartition/
fx> a

[...]
```

Starting the Installer from Network

When you have finished initializing your disc, you can start the installtion from the PROM monitor by selecting "*Network Installation*" or you can also start the installation from the Command Line Interface by first booting into **sash** by typing (of course, you have to chose the correct version of **sash** as listed in the table above)

```
>> boot -f bootp()[server-ip]:[inst-src]/stand/sashARCS
```

Then starting the installation procedure by typing **`install -n`**. Note that you always have to enter the *IP adress* of the server, and not its *hostname*, as the SGI box still has no proper networking running and cannot resolve DNS names properly.

```
System Maintenance Menu

1) Start System
2) Install System Software
3) Run Diagnostics
4) Recover System
5) Enter Command Monitor

Option? 5

Command Monitor.  Type "exit" to return to the menu.
>> setenv notape 1
>> setenv netaddr 192.168.1.25
>> boot -f bootp()192.168.1.23:/cds/6.5inst/stand/sashARCS
sash: install -n
Copying installation program to disk.........................
.............................................................
.........................Copy complete
```

If your disc is already partitioned and the IP adress is already set, you may also chose directly "*Install System Software*" from the Main Menu. But note that on older machines (4D era), the first way is preferred. This second approach will look like this:

```
System Maintenance Menu

1) Start System
2) Install System Software
3) Run Diagnostics
4) Recover System
5) Enter Command Monitor

Option? 2

                          Installing System Software...

                        Press <Esc> to return to the menu.

1) Remote Tape  2) Remote Directory  3)[Local CD-ROM]  X) Local Tape
      *a) Local SCSI CD-ROM drive 4

Enter 1-4 to select source type, a to select the source, <esc>
to quit, or <enter> to start: 2
```

```
Enter the name of the remote host: 192.168.1.23
Enter the remote directory: /cds/6.5inst/dist
Copying installation program to disk.............................
.............................................................
.........................Copy complete
```

Continuing the Installation

Now you have started the installation process of IRIX. Read on in "IRIX Base Installation" for further instructions.

Links

- Installing IRIX 6.5 accross a network