Adding a DAT Tape Auto-Changer unit to an SCO OpenServer 5.0.5 system.

Keywords

openserver osr5 505 5.0.5 tape dat autochanger add mkdev scsi hp autochanger add mkdev juke cartridge scoadmin hardware kernel manager sjk juke /dev/Sjk0 jukebox blad_scan_lun

Release

SCO OpenServer Enterprise System Release 5.0.5
SCO OpenServer Host System Release 5.0.5
SCO OpenServer Desktop System Release 5.0.5

Problem

I need to install a DAT Autochanger unit to my SCO OpenServer Release 5.0.5 system. What steps do I need to take?

Solution

As an example only, here are the steps undertaken to add and configure an HP Model 1557A 24x6E/6i DAT Autochanger unit to an SCO OpenServer 5 system. The particular models of tape or autochanger and SCSI adapter card may differ from your own, but the overall steps involved should be the same.

The autochanger allows the use of 6 DAT cartridges in one. However, you can load one tape by itself, loading it via the unit's front panel switches, and operate it as a single tape DAT unit (mkdev tape), or operate it as a multi-tape unit and manipulate the tapes from the operating system in a Juke box fashion (mkdev juke).

In this example, the SCSI tape unit was connected to an OpenServer 5 system via a SCSI III to SCSI I cable to an Adaptec 2940U2W SCSI card in the PC chassis.

```
The Autochanger:
================
```

The Autochanger used was a Hewlett Packard Model 1557A 24x6E/I unit. This contained six DAT tapes (which includes one cleaning tape) in an autochanger cartridge. The cartridge is loaded and you must then select a particular tape from this, using the front panel switches.

The unit contains two roller switches at the rear, both set in this case (as shipped) to "Autochanger Options" at 7 and "SCSI Address" at 2. The unit details are listed as:

```
Model HPFH-010, Part number C1558-6001, Rev E
Description: HP5, 25FH, 40W, CNT, 2RS
```

NOTE: Model numbers quoted can vary according to where the unit was purchased, country, shipping agent, and so on.

The unit ALSO contains dip switches under the base. There are eight total and they are all set to ON, except switch 3, which is set to OFF. The settings for various operating systems are listed on page 1-10 of the unit Installation Guide documentation.

NOTE: HP and other companies in general set the LUN of the tape to be 0 and the changer itself to be 1.

```
Adaptec 2940 SCSI adapter:
==========================
```

The Autochanger is attached, as mentioned above, via an Adaptec 2940U2W controller card in the PC chassis. Initially, the SCSI card was installed as shipped; no settings were altered. Subsequently, it was necessary to set the card as follows:

(On system reboot, press <Ctrl><A> to access the card BIOS.)

```
Adaptec AHA-2940U2W SCSISelect Utility v2.01.0

SCSI Bus Interface Definitions:
Host Adapter SCSI ID            7
SCSI Parity Checking            Enabled
Host Adapter SCSI Termination
        Ultra2-LVD/SE Connector Automatic
        Fast/Ultra-SE Connector Automatic

Additional Options:
Boot Device Options
        Boot SCSI ID            0
        Boot LUN Number         0
SCSI Device Configuration       (For SCSI ID 2 !)
        Initiate Sync           Yes
        Max Sync Rate           80
        Enable Disconnection    Yes
```

```
                Initiate Wide Neg       Yes
                Send Start Unit Command Yes
                BIOS Multiple LUN       Yes
                Include in BIOS Scan    Yes
            Advanced Configuration Options:
                Reset SCSI              Disabled
                Extend BIOS Translation Enabled
                Host Adapter BIOS       Enabled
                Support Removable Disks Boot Only
                Display                 Enabled
                Bootable CD-ROM         Enabled
                Int13 Extensions        Enabled

            Interrupt IRQ Channel           09
            I/O Port Address                1400h
```

The SCSI Adapter card and the HP DAT unit is detected and shown on screen before the OpenServer 5 "boot:" prompt.

The system hardware before configuration is seen at boot time, and using the "hwconfig(C)" command from the command line, once booted:

```
# hwconfig -h
device          address     vec  dma  comment
======          =======     ===  ===  =======
kernel             -          -    -   rel=3.2v5.0.5 kid=98/07/02
cpu                -          -    -   unit=1 family=6
cpuid              -          -    -   unit=1 vend=GenuineIntel tfms=0:6:7:2
fpu                -         13    -   unit=1 type=80387-compatible
pci          0xcf8-0xcff      -    -   am=1 sc=0 buses=2
PnP                -          -    -   nodes=0
serial       0x3f8-0x3ff      4    -   unit=0 type=Standard nports=1 fifo=yes
serial       0x2f8-0x2ff      3    -   unit=1 type=Standard nports=1 fifo=yes
console            -          -    -   unit=vga type=0 12 screens=68k
adapter     0x1400-0x14ff     9    -   type=blad ha=0 bus=0 id=7 fts=sto
floppy       0x3f2-0x3f7      6    2   unit=0 type=135ds18
kbmouse       0x60-0x64      12    -   type=Keyboard mouse
adapter      0x170-0x177     15    -   type=IDE ctlr=secondary dvr=wd
eeE0        0x1000-0x103f    11    -   type=EE PRO/100+ 00:90:27:5a:98:7d
cd-rom             -          -    -   type=IDE ctlr=sec cfg=mst dvr=Srom->wd
disk         0x1f0-0x1f7     14    -   type=W0 unit=0 cyls=1024 hds=255 secs=63
```

```
Configuration:
==============
```

The tape unit can be configured into the OpenServer 5 system using the scoadmin(F) "Hardware/Kernel Manager" utility, or via the command line "mkdev tape" or "mkdev juke" utilities.

(a) Configuring it as a single or "usual" SCSI DAT unit.

As the "root" user, start scoadmin:

```
# scoadmin

Choose "Hardware/Kernel Manager"

Choose "Tape Drive"

Pick "1. Configure a SCSI or Enhanced IDE tape drive"

Pick "6. View Current SCSI and EIDE Tape Drive configuartion"
```

It shows:

```
        0       Generic SCSI-1/SCSI-2 tape drive
        1       Generic SCSI-1/SCSI-2 tape drive
```

These correspond to default entries in the operating system and, in this case, are mapped to an Adaptec SCSI card via the "alad" driver. It is best to start from a clean point of view so you know what SCSI IDs you have set. Remove these using option "3", relink the kernel and reboot the system.

```
Re-run "mkdev tape".

Pick "1. Install a SCSI Tape Drive".

Enter the prefix of the SCSI host adapter ...   blad

(The equivalent UnixWare 7 driver is called "adsb".)

Which 'blad' SCSI host adapter supports this unit?      0

The Host Adapter parameters will be automatically configured.

What SCSI Bus is this device attached to?
Press <Return> to use the default:0
Select 0-n, or h for help, or q to quit: 0

What is the Target ID for this device?
Select 0-15, or h for help, or q to quit: 2
```

NOTE: This is the SCSI ID set to "2" at the back of the unit.

```
What is the LUN of this device?
Press <Return> to use the default: 0
Select 0-7, or h for help, or q to quit: 0

You are about to add the following SCSI device:

Host
Adapter         Adapter
Type    Device  Number  ID      LUN     BUS
```

```
-----------------------------------------------
blad    Stp     0       2       0       0

Update SCSI configuration? (y/n)
The SCSI configuration file has been updated.

Updating system configuration ...

System files have been successfully updated.

Configuring Tape Driver ...( Stp )


Enter Vendor Identification string or
press <Return> to use default
or enter q to return to main menu: q

Tape Driver Successfully Configured

Default special devices have been created with the following
links:

/dev/xct0       linked to  /dev/xStp0
/dev/rct0       linked to  /dev/rStp0    and /dev/rmt/0b
/dev/nrct0      linked to  /dev/nrStp0   and /dev/rmt/0bn

In /etc/default/boot:
No current boot string.

Enter new string, "rm" to remove string,
or enter q to leave current string as is: q
```

Quit the menus. Relink and reboot the system and check "hwconfig -h".

```
...
tape -          -    -    type=S ha=0 id=2 lun=0 bus=0 ht=blad
...
```

Load the tape from the HP front panel switch:

```
# tar cvf /dev/rStp0 /etc/profile
a /etc/profile symbolic link to
/var/opt/K/SCO/Unix/5.0.5Eb/etc/profile
```

List the contents of the tape:

```
# tar tv8
tar: blocksize = 3
rwxrwxrwx  0/0        0 Aug 20 09:49 1999 /etc/profile
```

("8" corresponds to "/dev/rct0" in the file "/etc/default/tar" which is another

name that accesses the same **device**.)

(b) Configuring it as a Juke Box SCSI DAT unit.

This can be confusing. You need to configure the SCSI tape unit as in (a) to access the tape and then configure the Juke Box cartridge as in (b) to be able to control several tapes in the cartridge.

Log in as "root" and either run "scoadmin, Hardware/Kernel Manager, SCSI Juke Box", or from the command line, run "mkdev juke".

```
# mkdev juke

SCSI Juke Box Configuration Program

1. Install a SCSI Juke Box
2. Remove a SCSI Juke Box
3. View Current SCSI Juke Box configuration

Select an option or enter q to quit:

The Juke Box Driver usually requires one or more associated
SCSI devices to be configured which act as the read/write and
control devices. Often the Juke Box driver differs only in the
LUN (logical unit number), or Target ID.  Consult your Juke
Box documentation for more information.

Do you wish to configure the associated SCSI devices now? (y/n)
```

Answer "n". If you answer "y", the following message is shown and you need to go back and create the tape as in (a):

```
...
Please use the mkdev command to configure the associated
devices, noting Adapter, ID, LUN and BUS configurations and
then re-invoke mkdev juke.
....

Enter the prefix of the SCSI host adapter that supports
this device or press <Return> for the default: 'blad'
Enter h for a list of host adapters or enter q to quit:

Which 'blad' SCSI host adapter supports this device?
Select 0-4, or enter q to quit: 0

The Host Adapter parameters will be automatically configured

What SCSI Bus is this device attached to?
Press <Return> to use the default:0
Select 0-n, or h for help, or q to quit: 0

What is the Target ID for this device?
Select 0-15, or h for help, or q to quit: 2
```

NOTE: The Changer is usually set to LUN 1 and the SCSI tape at LUN 0.

```
What is the LUN of this device?
Press <Return> to use the default: 1
Select 0-7, or h for help, or q to quit: 0

You are about to add the following SCSI device:

Host
Adapter         Adapter
Type   Device   Number  ID      LUN     BUS
-----------------------------------------------
blad    Sjk     0       2       1       0

Update SCSI configuration? (y/n)

The SCSI configuration file has been updated.

Create a new kernel and reboot
```

The "hwconfig -h" command should now show the Juke Box configured:

```
....
juke  -         -   -   type=S ha=0 id=2 lun=1 bus=0 ht=blad
....
```

The associated device file is:

```
# ls -al /dev/Sjk*
crw-rw-rw-   1 root   root  30,  0 May  7 22:26 /dev/Sjk0
```

The DAT cartridge/Juke box tapes are manipulated from the operating system with the "juke(HW)" command. Load the autochanger cartridge into the unit and run:

```
# juke elem
Valid elements for device /dev/Sjk0:
juke: /dev/Sjk0: No such device or address
```

In this case, the Adaptec "blad" driver does NOT scan for LUNs other than "0". Edit the following file:

```
"/etc/conf/pack.d/blad/space.c"
```

Search for:

```
int blad_scan_lun = 0;
```

Change it to:

```
int blad_scan_lun = 1;
```

Relink the kernel:

```
# cd /etc/conf/cf.d
# ./link_unix
```

Run juke:

```
# juke elem
Valid elements for device /dev/Sjk0:
Import/Export Elements:
Medium Transport Elements:
Storage Elements:               st0 st1 st2 st3 st4 st5
Data Transfer Elements:         dt0
```

Load the second DAT tape:

```
# juke move st1 dt0
```

Test writing to it:

```
# tar cv8 /etc/motd
```

See Also

Technical Article 110689, "Adding a DAT Tape Auto-Changer unit to a UnixWare 7.1.0 system."

Technical Article 110216, "My HewLett Packard DAT autoloader does not work with SCO OpenServer 5.0.5."

Manual pages: juke(HW), jukebox(HW)

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