

Chapter I

Using UnixWare

I. Using UnixWare

After having exposed the installation of the ICP Controller as well as that of the Host Drives in chapters B and C, we would now like to give you some hints and pieces of advice on how to install the operating system UnixWare version 2.x.

I.1 Transparency of Host Drives

The structure of the Host Drives, which have been installed with GDTSETUP (in chapter C), is not known to UNIX. I.e., the operating system does not recognize that a given Host Drive consists of a number of hard disks forming a disk array. To UNIX, this Host Drive simply appears as one single SCSI hard disk with the capacity of the disk array. This complete transparency represents the easiest way to operate disk arrays under UNIX; neither UNIX nor the PCI computer need to be involved in the administration of these complex disk array configurations.

I.2 General Installation Notes

In the following description, we shall explain the installation of UnixWare in connection with the ICP Controller step by step. Apart from the UnixWare floppy disks, the CD-ROM and the UnixWare documentation, you also need the GDT floppy disk:

UnixWare BTL-Disk

In the following discussion, when we speak of a *boot drive* we refer to the drive which is first integrated upon system power up. For the ICP Controller, this drive is the first Host Drive in the list of GDT Host Drives, i. e. the Host Drive with number 0 (see GDTSETUP menu *Configure Host-Drives*). During the installation you will have to decide whether you want the ICP Controller to make the boot drive available, or whether you want to operate the ICP Controller as an additional controller in the computer system. If the ICP Controller is the only hard disk controller in the computer system, it will automatically make the boot drive available.

If there are more hard disk controllers, the controller which makes the first drive (the drive containing the MS-DOS partition C:) available will be the boot controller. If the ICP Controller does not make the boot drive, you can skip the following paragraph.

I.3 GDT as Boot Controller

First initialize a hard disk connected to the ICP Controller (using GDTSETUP under DOS) and install it as a Host Drive (see chapters C and M "Configure Host Drives"). If there are several ICP Controllers in the system, this Host Drive must be connected to the first ICP Controller found during a cold boot. In addition, the GDT BIOS must be enabled and the SCSI-ID of the corresponding GDT SCSI channel must be set to 7.

Now you can begin the installation. Boot the system with the first UnixWare boot disk. UnixWare scans the system for host adapters. When requested insert the GDT *UnixWare BTL-Disk*. The installation procedure which follows then has to be carried out as described in the UnixWare documentation.

Important note: As already mentioned in chapter B "Hardware Installation", the assignment of an IRQ to an INT is made by the PCI System BIOS. The UnixWare versions 2.xy and higher automatically recognize the IRQ of a PCI expansion card.

1.4 GDT as an additional Controller

We distinguish two cases.

a.) No ICP Controller has been configured for UnixWare yet.

In this case, the GDT driver must be installed from the *GDT UnixWare BTL-Disk* by means of the UnixWare desktop and the options "System Setup", "Application Setup". Alternatively, this procedure can be carried out from the UnixWare shell: `pkgadd -d /dev/dsk/10t` (GDT driver disk in drive 0).

b.) A ICP Controller has already been configured for UnixWare.

In this case, you only have to add an additional entry for the new ICP Controller. This is carried out by

```
/etc/scsi/pdiadd -d DRQ -v IRQ -m MEM gdt
```

for DRQ use 0 (not necessary for PCI boards), for IRQ write the IRQ number the ICP Controller uses. MEM corresponds with the DPMEM address of the ICP Controller (which is displayed in the BIOS message of the ICP Controller after power up). In both cases, you have to carry out a cold boot in order to use the new ICP Controller under UnixWare.

Example: `/etc/scsi/pdiadd -d 0 -v 12 -m c8000 gdt`.

After that, a reboot of the UnixWare system is necessary. No kernel link is required because the driver will be dynamically loaded.

1.5 Coordinates of SCSI devices

a.) Host adapter Number (HA)

The host adapter number assigned to the ICP Controller is derived from the PCI slot number of the ICP Controller. Therefore, if there is only one ICP Controller installed in the PCI bus computer system, the host adapter number=0. If there are two ICP Controllers installed, the ICP Controller with the lower PCI Slot number is assigned host adapter number 0 and the ICP Controller with the higher PCI slot number is assigned host adapter 1. (Note: After a cold boot, the GDT BIOS displays a couple of messages, each beginning with the controller's PCI slot number, e.g. "[PCI 0/3] 4 MB RAM detected". The number after the '/' is the slot number of the controller. This helps you to determine which is the order of the ICP Controllers and which host adapter number is assigned to them by UNIX. See also chapter B, Hardware Installation).

b.) UnixWare Bus number, Target-ID and LUN

Target-IDs and LUNs for "Not Direct Access Devices" (devices like streamers, tapes and CD-ROMs and therefore not configurable via GDTSETUP), are directly assigned to the SCSI-ID and the channel of the ICP Controller. Host Drives are assigned in increasing order to the free coordinates (bus number and target ID; LUN is always 0).

Configuration Example:

In the PCI computer are two ICP Controllers (HA 0 = 1st GDT, HA 1 = 2nd GDT), each with two SCSI channels.

1 hard disk	as Host Drive no. 0 on HA0
1 hard disk	as Host Drive no. 0 on HA1
1 hard disk	as Host Drive no. 1 on HA1

1 Streamer SCSI-ID 2, LUN 0 on SCSI channel A of HA0
 1 CD-ROM SCSI-ID 3, LUN 0 on SCSI channel B of HA0
 1 DAT SCSI-ID 2, LUN 0 on SCSI channel A of HA1

Result:

HA	Bus	Target-ID	LUN	Device
0	0	0	0	1 st hard disk, Host Drive no. 0 (boot drive)
0	0	2	0	Streamer
0	1	3	0	CD-ROM
1	0	0	0	hard disk, Host Drive no. 0
1	0	1	0	hard disk, Host Drive no. 1
1	0	2	0	DAT
1	0	3	0	hard disk, Host Drive no.2

1.6 Further Information

- During the installation of the GDT driver, additional tools are copied into the /etc directory. Before you can use them you have to create a special device file named /dev/rgdth by means of "link"; this device file has to be placed on a device of a GDT Host Drive. With 'gdtsync' from the /etc directory, you can determine the coordinates of a GDT Host Drive. Usually the first Host Drive has the coordinates c0b0t0d0. A special device file (character device) is '/dev/rdisk/c0b0t0d0s0'. In this case, /dev/rgdth can be generated with: `ln /dev/rdisk/c0b0t0d0s0 /dev/rgdth`. (c0 = HA, b0 = Bus number, t0 = Target-ID 0, d0 = LUN 0, s0 = UnixWare partition).
- All new SCSI devices will be automatically recognized and a corresponding special-device-file will be generated
- Host Drives must be partitioned and a file system/file system(s) must be created. You can do this with `diskadd cCbBtTdD`.
- When using *Direct Access Devices* with **exchangeable media** (e.g., removable hard disks) that are not reserved for the raw service, a media has to be inserted either when the system is booted, or with GDTSETUP (mount/unmount), otherwise the device is not available under UnixWare.
- The GDT UnixWare driver supports *Direct Access Devices* (e.g., hard disks, removable hard-disks) as SCSI-raw devices. This is especially important if you use removable hard disks which you want to exchange with other controllers. How to reserve a device for the SCSI-raw service is described in the file `space.c` on the GDT BTLT disk (example and documentation).
- Multi-processor support: The GDT device drivers for UnixWare 2.01 and UnixWare 2.1 support multi-processor systems.