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UNDP

MODULE 03

Hardware configuration

Objectives

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- 1. Memory Support
- 2. Resource Allocation
- 3. USB Support
- 4. SCSI Devices
- 5. Network cards
- 6. Setting up modems
- 7. Printer Configuration

Memory Support

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- The system's RAM is first detected by the BIOS. All types of RAM (EDO, DRAM and SDRAM) are recognised by the Linux kernel. There can be problems with old hardware when the BIOS cannot detect 64MB of RAM or more. In this case one needs to passe parameters to the kernel at boot time.
- When using LILO insert the following into **/etc/lilo.conf**:

  append="mem=<*amount of ram*>M"

  Remember to run /**sbin/lilo**.
- If you are using GRUB add the following to /**etc/grub.conf** on the line beginning with *kernel* :
- kernel *vmlinuz* mem=<*amount of ram*>*M*

Resource Allocation

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- RQs: The Interrupt Request Lines allow devices to request CPU time. The CPU will stop its current activity and process the instructions sent by the device. IRQs range from **0** to **15**.
- I/O address: These represent specific addresses in the system's memory map. The CPU will then communicate with the device by *reading and writing to memory* at the specified address.
- DMA: Certain devices can access the system's memory through a DMA channel, allowing them to write and process data without accessing the CPU. This can enhance performance.

Listing Allocated Resources

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- The relevant files are:
  - */proc/dma*
  - */proc/interrupts*
  - */proc/ioports*
  - */proc/pci*

*Allocated resources can also be listed using tools such as **lspci** and **dmesg**:*

Typical Resources

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Device	*I/O port*	*IRQ*
/dev/ttyS0	0x03f8	4
/dev/ttyS1	0x02f8	3
/dev/lp0	0x378	7
/dev/lp1	0x278	5
soundcard	0x220	

USB Support

- The USB devices are divided into four classes:
  - Display Devices
  - Communication Devices
  - Audio Devices
  - Mass Storage Devices
  - Human Interface Devices (HID)

There are 3 types of USB host controllers:

Host Controler Kernel Module

OHCI (Compaq)usb-ohci.o

UHCI (Intel)usb-uhci.o

EHCI (USB v 2.0)ehci-hdc.o

SCSI Devices

- Small Computer System Interface (SCSI)
  - Usually found in servers and other high-end computers
- Interface of choice for servers
  - Many commands and special features
  - Support for high-performance storage devices
- Multiple forms of SCSI standards
  - SCSI-1, SCSI-2, and SCSI-3.
- All SCSI standards have two things in common:
  - Controlled by a host adaptor
  - Connected in series with the last device using a terminator

SCSI Device Numbering

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- The type of SCSI bus determines the number of SCSI devices you can have on your computer
  - 8-bit SCSI: 8 devices
  - 16-bit SCSI: 16 devices
- Each device is associated with a number that determine the priority in accessing the SCSI bus.
  - Regular SCSI uses numbers 0 through 7, and Wide SCSI uses numbers 0-15
  - SCSI ID 7 is reserved for the SCSI host adapter since 7 has the highest priority
- SCSI numbering, going from highest to lowest in priority, is as follows
  - 7, 6, 5, 4, 3, 2, 1, 0, 15, 14, 13, 12, 10, 9, 8.

Network cards

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- The Network Interface
  - You can get information about your current card using either of the following:
  - dmesg, lspci, scanpci, /proc/interrupts, /sbin/lsmod.or /etc/modules.conf

Setting up modems

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- The Modem device

DOS	*Linux*
COM1	/dev/ttyS0
COM2	/dev/ttyS1
COM3	/dev/ttyS2

- Most Linux distributions have hardware browser can detect modems. But one can also use setserial to scan the serial devices

Printer Configuration

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- The printers are detected at boot time automatically and can be seen in the dmesg output.
- Printing is covered in depth in LPI 102
- Using printtool
- Using cups

Exercises

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