Linux Installation

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The Lecture's aim

A preparation for the installation party:

- Prepare your computer for the installation
- Know what's going to happen
- Understand what's going on during the installation

You're welcome to try installing yourself - **at your own risk**!

Lecture overview

We'll concentrate on issues which might help you prepare you and your computer best.

- Before and after installing Linux
- What to do before even starting
- The hard disk: How it's organized
- The installation process itself
- The LInux boot LOader - LILO

Your computer before and after installing Linux

You currently have

- Windows 95/98/NT on the hard-drive
- A collection of Windows programs
- **When you turn the computer on**
  - a bootstrap program loads the operating system
  - the operating system gets copied into RAM
  - you run programs which use the services of that operating system

Your computer before and after installing Linux (cont.)

After installing Linux you'll have

- Windows and your windows programs intact!
- Linux and Linux programs on new partitions
- **When you turn the computer on**
  - a boot manager (LILO) will give you a choice of which operating system to load
  - the operating system you choose is loaded into RAM
  - you run programs for the chosen operating system

Some of us will prefer Linux only...

Linux Installation

We break it down into 5 steps

1. Gather the resources
2. Gather hardware information
3. Prepare the hard-drives
4. Perform the installation
5. Adding packages and customization

Step 1: Gather the resources

The following specs apply for the installation party. **Much simpler computers** will run Linux.

- a computer to install Linux on
  Minimum: Pentium 166 MHz, 8MB RAM
- Recommended free disk space: 1GB.
- A 8x speed CD-ROM.
- A Linux ditribution (Redhat, Debian, Slackware) or a private package. (Supplied in installation party).
- Three 3.5" floppy disks
- An installation guide (written or human)

Step 2: Gather hardware information

- Before installing Linux you need to have detailed information about your hardware.
- If you don't manage this, you might get help in the installation party.
- In Windows, go to Control Panel > System > Device Manager. Record the information for each of the relevant devices
- If the information doesn't reveal which device you actually have, it tells you what it's compatibale with
- Opening the computer and taking the exact details is a good idea
- Linux compatability lists are available on the web. Begin with your distributor's site (Mandrake's, Red Hat's or whatever)

Step 2: Gather hardware information (cont.)

It's very recommended to know the following:

- Your mouse: Brand and type. How is it connected to your computer? (COM1, COM2, PS/2?)
- Hard disk: Brand, type and size. How is it connected (IDE, SCSI)? Current partitioning.
- Graphics Card: Brand and exact model. RAM Size. Optimal setting (resolution, frequency).
- Modem: Brand, model and type. Is it a winmodem ("HSP modem")? If not, which COM port is it attached to?
- Sound card: Brand and model.

Step 3: Preparing the hard-drive

Possibly the most difficult part of the configuration.

The aim is to create a partition with enough free space for Linux (ca 1GB)

We shall now talk a bit about

- How data is saved on a disk
- Partitions
- Fragmentation

Before shrinking a partition

The aim: Make a Windows-DOS partition ready for shrinking, so that space will available for Linux.

- Remove hard disk compression, if present.
- defragment the drive (this can take **hours**)
  In Win98: Start > Programs > Accessories > System Tools > Disk Defragmenter
- check the disk
  In Win98: Start > Programs > Accessories > System Tools > Scan Disk

Problems

There are some files which can't be moved

- The Recycle Bin puts file in the end of disk. Empty it before defrag.
- Norton's Speeddisk is known to cause problems. Turn it off/uninstall it. Turn back on when Linux is working.
- Windows swapfiles
  Uninstall swapfiles using Control Panel > System > Performance. Delete `Win386.swp`. Reinstall swap after partitioning.

Problems (cont.)

- Other hidden files
  - Start the DOS prompt
  - go to the root directory: `cd \`
  - use `dir /A:h/s/b` - find hidden files
  - use `dir /A:s/s/b` - find system file
  - The: `attrib -h -s -r` *`filename`* - to "unset" the hidden, system and read-only attributes.
  - Carefully handle the files as needed.

Before attempting to repartition

- Backup any important files on the hard disk.
- Verify that you haven't forgotten any file
- Backup the files you thought were unimportant
- Backup
- Backup
- Backup

FIPS: Non-destructive repartitioning

- **MAKE SURE YOU READ THE FIPS DOCUMENTATION**
- `FIPS` is a program which will split a FAT (Windows, DOS) partition.
- This isn't needed if you have an unused partition which is big enough.
- Run scandisk on the partition being split
- Prepare a bootable floppy disk in drive A:
- Copy `RESTORRB.EXE FIPS.EXE ERRORS.TXT` from the Linux CD-ROM (directory `dosutils/fips20`) onto the floppy

FIPS: Non-destructive repartitioning (cont.)

- Boot the system with the floppy
- Run `FIPS`. Confirm that FIPS finds the right number of drives
- Split the desired partition.
- You will be asked if you want a backup copy of your root and boot sector. **Yes, make a backup!**
- Exit `FIPS` and let the changes be written
- Run scandisk (from DOS) on old partition to see that all is OK.
- We aren't finished yet...

Setting up Linux partitions

- Linux uses at least two partitions on hard disks
  1. The filesystem (ext2)
  2. The swap partition
- You may choose to have more partitions. (Recommended for advanced installations)
- The swap partition is typically 128-200MB on modern PC's.

There are two simple utilities for setting up partitions. Both are called `fdisk`.
The Linux utility is better, but the MS-DOS' is simpler to use.
These are **very dangerous** utilities.

Step 4: The installation

Time to start the installation.

What's going to happen is

- You'll create a boot disk (unless you can boot from CD-ROM)
- Will boot up a version of Linux
- Run the installation program
- The installation program will ask some questions
- The installation program will install and configure a copy of Linux

Creating the boot disk

Use `rawrite` to copy (at a low level) boot.img onto a floppy

Under Windows

- insert the Distribution CD
- go into the `dosutils` directory
- run the program `rawrite`
- when asked for "image source file name" reply with `..\ images\ boot.img` (or something else – pick the `.img` file that makes sense.
- when asked for "target disk drive" reply with `a:`
- A Windows Rawwrite is also available in current distributions.

Booting Linux to Install

With the boot disks created you can boot into Linux

- shutdown your computer
- insert the boot floppy
- turn it back on

You should see

- some stuff being read from the floppy
- a lot of kernel messages
- A windowish menu should appear

What the installation will eventually do

- Create (”format”) one or more Linux native filesystems (known as ext2)
- Create a swap partition
- Set up special files and directories
- Copy files into the disk
- Install packages
- Run certain configure utilities - actually set up configuration files
- **Install LILO** (or “grub”)

Doing the installation

Steps are (more or less)

- welcome message
- choose a language
- choose a keyboard type
- installation method
- install or upgrade
- choose installation class
- probe for mouse
- Internet configuration

Doing the installation (cont.)

- timezone
- printer
- root password
- Add users
- X-Windows
- custom boot disk
  More info on a following slide.
- boot loader (LILO)
- installation complete

LILO and boot diskette

LILO

- During the a normal installation, LILO is installed onto your disk's Master Boot Record (MBR).
- You will be asked for information about other operating systems on your system, you may wish to boot into. Windows can be set as default boot.
- May cause problems if you have NT (LILO may not work).

Boot diskette

- It is strongly suggested that you create a Linux boot disk.
- This is used for a number of reasons including getting back into your system if there is a problem with LILO.

LILO and boot diskette (cont.)

How to restore MBR – generally not a good idea unless LILO causes trouble

- Enter MS-DOS prompt
- type `fdisk /mbr`
- If you decide to uninstall Linux, do this before trashing the Linux partitions.
- The old MBR is stored when LILO is installed, so it can be restored from within Linux as well.
- More about this in future lectures

LILO bootup

When you turn your computer on you should see

- A little prompt (`LILO:`) appears
- If you wait a little while, default OS will boot (Windows in many cases).
- boot into Linux
  Type **`linux`** (or any other word chosen during installation) at the prompt
- see other available OSes
  Press `TAB` at the prompt

Help! Help! Linux is gone!

- Sometimes it appears as if Linux has been deleted from the computer
- Usually, it's only LILO which has been disabled
- The common reason: Some Windows application has written to MBR
- This happens often after a re-installing Windows.
- The easy way to fix this will be shown in the lecture about administration
- Until then, you may safely boot from diskette

Windows doesn't recognize Linux

Usually, Windows ignores the Linux partitions, and Linux in general. But:

- Scandisk and/or anti-viruses might complain about MBR being inproper (because LILO was installed)
  It's OK – do nothing. Ask the anti-virus to learn the new MBR sector.
- The Linux partitions may be recognized as junk by Windows. You may be offered to format them. **Refuse**, of course.

Esoteric tips for the lonely installer

- If some installation stage fails, Just continue with the next stage if possible. There might be good documentation on the web or already on your disk. Look for HOWTO's.
- If X-Windows setup fails, don't hassle with it. Use `XFdrake` to fix this after booting Linux (assuming you've installed Mandrake)
- In Mandrake, there is a X-Windows configuration utility named `DrakConf`
- If you haven't Mandrake, be aware that the X-Windows system is called XF86Free. Find the configuration files and utilities, as well as documentations.
- You can choose "Graphical login". Not recommended. Start the graphics with `startx`

THE END

See you at the installation party – or Good Luck installing!