Terminal and Console Access

Unix/IP Preparation Course

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Dar es Salaam, Tanzania

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- Virtual terminals
- Mouse daemon buffer (if available)
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(Virtual) Consoles

- Usually you have 6:
  - `tty[1-6]`
- `tty7` takes you back to X
- Access them using `ALT-CTRL-F[1-7]`
- Virtual terminals are *very useful*. If you run without a GUI, then they are your friend.
- Some Unix/Linux versions have optional mouse daemons in text mode (FreeBSD).

(Virtual) Consoles

- Depending on Unix/Linux version these are defined in:
  - `/etc/default/console-setup` (Upstart)
  - `/etc/inittab`
  - `/etc/ttys` (FreeBSD)
  - `/boot/defaults/loader.conf`

Copy/Paste Between Consoles

If you boot without a GUI (no gnome, KDE, etc.) *and* you have a mouse-daemon, the for example you can:

- Highlight text in `tty1`
- Press `ALT-CTRL-F2` to access `tty2`
- Place mouse in another file
- Press middle-mouse button to paste text from `tty1`

OOB and Serial Console Access

OOB or “Out Of Band” access:

- *Critical* for remote management of servers.
- How do you access a machine's BIOS remotely?
- How do you access RAID BIOS remotely?

In UNIX/Linux tell the boot loader to pass options to the kernel. The kernel can send output to `ttyS0`.

Why is this useful?...

OOB and Serial Console Access

- Use serial to ethernet converter.
- With an OOB solution connect to separate IP to view your machine's console.
- During boot you can see your machine's console using terminal software connecting to a separate IP (*user* and *password* almost always required as well).
- Set Kernel load options (for instance) in `/boot/defaults/loader.conf`

Other OOB Options

- Motherboard card with ethernet interface. Usually runs a web server with Java or ActiveX controls. (We recommend against ActiveX as this is a Windows only solution).
- KVM over IP (more expensive, much simpler). KVM switch accessible via a single IP address. Standard monitor/ keyboard/mouse connectors (or specialized.
  - Again, will use a web server w/ Java or ActiveX

Questions

?

OOB and Serial Console Access
Linux Example

Sample `/boot/grub/menu.1st` file entry:

```
title           Ubuntu 8.04.2, kernel 2.6.24-23-server
root            (hd0,0)
kernel          /vmlinuz-2.6.24-23-server root=UUID=96e73009-3bf7-421e
                -a4bc-6de1d21eaa97 ro console=ttyS0,38400n8 console=tty0
                quiet splash
initrd          /initrd.img-2.6.24-23-server
quiet
```

What does this mean?

Key option for OOB serial console access is:

```
console=ttyS0,38400n8 console=tty0
```

We'll look at an example now...

Server/Switch Console Access

- Connect serial cable from your machine to serial/aux port on switch or router.
- Default settings in most cases are:
  - 9600 bps, 8 bits, no parity, 1 stop bit
  - Or, `9600 8n1`
  - Be sure that Hardware Flow Control is off (No). Your data cable probably does not have the lines for hardware flow control.
  - Your serial port is probably ttyS0.

Console Access using Minicom

To configure 9600bps, 8-n-1, no hardware flow control and use ttyS0 in *Minicom* do:

- `sudo minicom`
- CTRL-a, z. Choose “cOnfigure Minicom”
- Choose “Serial port setup”
  - Set Serial Device to `/dev/ttyS0`
  - Set Hardware Flow Control to “No”
- Exit, then press CTRL-a, z. Choose “comm Parameters”
  - Set Speed to 9600
- Exit. Exit Minicom (CTRL-a, x) and restart.

Console Access using Minicom

When you start your device, if you need to send a BREAK do:

CTRL-a, f

Note, to ensure access to your serial port(s) you must run Minicom using `sudo` or as root.