Linux Basics

Introduction & Basic Commands

Contents

Unix / Linux Features

- **Multi-Tasking**
  - Runs more than one program at a time
- **Multi-User**
  - Distinguishes different users, assigns access rights
- **Multi-Session**
  - Serves different users at time
  - Concurrent sessions by the same user are possible

Login

- A multi-user system requires user credentials at login
  - E.g. username + password
  - For authentication and authorization
  - Echo of passwords is masqueraded or completely suppressed
- Session may be started from a text or graphical terminal device
  - Local text console or display manager
  - Over the network using SSH, remote display manager, ...

Text Login

- Leads to invocation of an interactive command line interpreter („shell“)
  - Different shells are available, e.g. „bash“, „csh“, ...
- Command line prompt invites user to enter a command
  - Usually ends with „$“ for normal users and „#“ for the system administrator, but may be changed
- Command execution starts after the <RETURN> key is pressed
  - Output is shown before the next prompt

First Simple Commands

- „`id`“
  - Shows your user identification and group membership
- „`pwd`“
  - Shows the working directory
- „`tty`“
  - Shows the terminal device
- „`who`“
  - Shows active sessions of all users
- „`date`“
  - Shows current system date and time
- „`hostname`“
  - Shows the name of your system
- „`ip addr`“
  - Shows the IP address configuration of the network interfaces
- „`ip route`“
  - Shows the routing information of your system (e.g. default gateway)

General Command Line Syntax

- $ <command> <option(s)> <object(s)>
  - <command>: what is to be done
  - <option(s)>: how is it to be done
  - <object(s)>: what is affected by the command
- Options and objectes may usually be omitted
- Option „--help“ or „-h“ usually shows a short description of the syntax
- Example:

```
$ id -u root
```

Remarks on Entering Commands

- Characters after „#“ are treated as comments and not interpreted by the shell
- Terminal control characters
  - <CTRL-c> terminates command input and execution
  - <CTRL-s> stops terminal output
  - <CTRL-q> resumes terminal output
  - <CTRL-z> stops current command execution and puts it into the background – use „`fg`“ command to move it back into the foreground
  - <CTRL-d> End-of-File character, will terminate the shell

List Directory Contents

- „ls“ command shows directory contents
- Examples

```
$ ls        # listing of current working directory
$ ls -l -a # long listing of all objects of working
directory
$ ls -l /etc/passwd # long listing of /etc/passwd file
$ ls -l /home    # long listing of objects in /home directory
```

Show File Contents

- „`cat`“
  - Concatenates one or more files and prints the content
- „`more`“ and „`less`“
  - View the content of a file one screen (page) at a time
- „`head`“
  - Show first lines of a file
- „`tail`“
  - Show last lines of a file

Getting Help

- Many commands display usage information with „`--help`“ or „`-h`“ options
- Search the internet
- Use the online **manual pages**, e.g.

```
$ man ls

$ man -k 'working directory'
```