



Real Time College

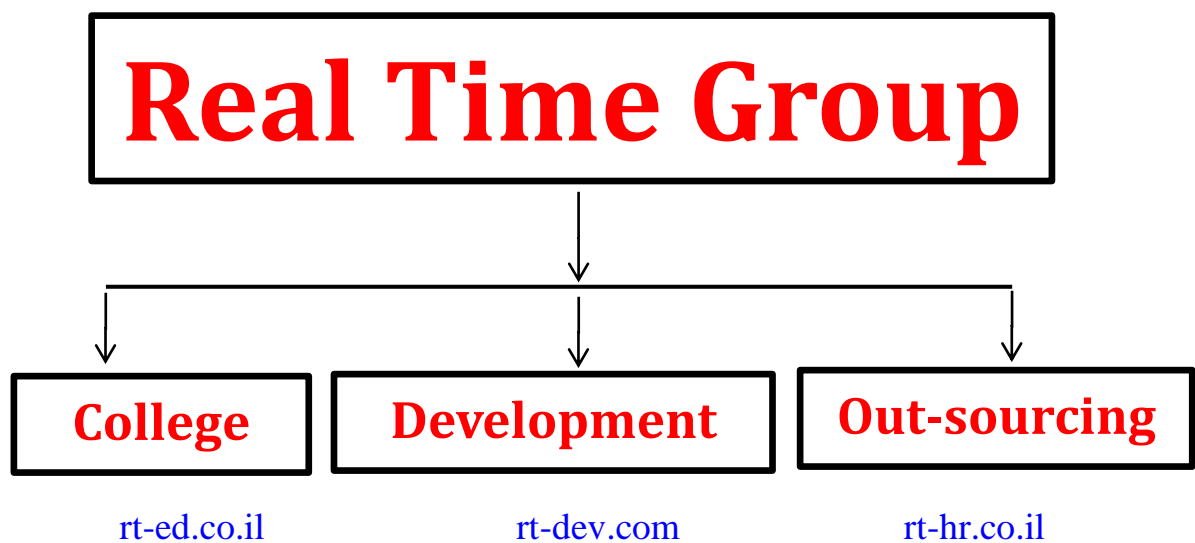
**Course: Linux Fundamentals and
Basic Administration**

Duration: 75 Hours
Hands-On-Training: 75%

Real Time Group is a multi-disciplinary dynamic and innovative Real-Time O.S. and Embedded Software Solutions Center, established in 2007.

Providing Bare-Metal and Embedded Linux solutions, professional services and consulting, end-to-end flexible system infrastructure, outsourcing, integration and training services for Hardware, Software and RT-OS \ Embedded Systems.

The company is divided into the following three Divisions:



Training Division:

Professional Training Services for Hardware, Software, RT-OS and Embedded systems industries.

We provide the knowledge and experience needed to enable professional engineers to Develop, Integrate and QA Hardware, Software and Networking Projects.

In order to insure experience, all courses are practical – hands-on-training. The latest Development, QA and Automation equipment which are adopted by the industry are used.

All students are supplied with Development-Boards for home-work and course projects.

Course Overview:

This Linux Fundamentals course provides a comprehensive introduction to Linux™ for those who are new to the Linux environment.

Students will learn how to manage files and directories, utilize the vi editor, work with Linux security mechanisms to protect files and programs, work with the Linux shell to control the flow and processing of data through pipelines, design and write shell programs of moderate complexity, and manage multiple concurrent processes in order to achieve higher utilization of Linux.

All the essential shell and basic operating system commands are taught, enabling you to start to utilize the power of the Linux operating system.

Workshops comprise approximately 50% of class time, and are based around carefully designed exercises to reinforce and challenge the extent of learning.

Who should attend:

- Suitable for delegates with existing experience of the Windows operating system .
- Students who have used Linux or UNIX systems with a graphical desktop, or who have only a limited knowledge of the command line.
- Hardware and software engineers who need to quickly speed up with Linux as a development platform.
- Embedded system developers where Linux is used in the embedded system.
- Support engineers who will be installing and managing applications hosted on Linux systems.

Prerequisite:

- A basic level of computer literacy is expected, using a PC running Windows.
- No previous experience of Linux or UNIX is necessary

Linux Fundamentals and Basic Administration

1. Introduction to Linux

- a. Linux-what is it good for?
- b. Linux distributions overview
- c. Shell Login
- d. Linux command Structure
- e. Command line interpreters
- f. Unix and its Design Principles
- g. The Manual Pages
- h. Linux Kernel architecture
- i. FSF and GNU
- j. GPL - General Public License

2. Linux Basics

- a. Linux Kernel – the heart of the system
- b. Different Linux Distributions
 - Debian
 - Ubuntu
 - Red-Hat

3. Linux File-System

- a. Everything is a file
- b. GNU / Linux file-system structure
- c. Command line interpreters
- d. Handling files and directories using the Bash Shell
- e. Using "wildcards"
- f. Symbolic links - Hard & soft links
- g. Displaying, scanning and sorting files
- h. Comparing files and directories
- i. Comparing files and directories
- j. Determining Disk Usage With different shell command:
 - df and du
 - baobab
 - Quotas

4. **Linux Text editors**

- a. Pico/GNU Nano
- b. vi and vim
- c. gedit
- d. geany

5. **Creating and Mounting File-Systems**

- a. What is a Filesystem (Concept Review)
- b. Linux supported File-Systems
- c. Creating file-systems
- d. The Inode table
- e. Mounting devices (Filesystem)
- f. Attaching a disk-on-key to the system
- g. NFS – the Network File-System
- h. Intro to SMB
- i. Filesystem Table (/etc/fstab)
- j. AutoFS
- k. Removable Media

6. **Users & Groups, permissions**

- a. File permissions in Linux
- b. File Ownership
- c. Default Group Ownership
- d. File and Directory permissions
- e. File Creation permissions with umask
- f. Changing File permissions

7. **Pipes, Filters and I/O**

- a. I/O redirections
- b. Noclobber
- c. Using pipe and tee
- d. head/tail
- e. Cut
- f. sort/uniq
- g. grep
- h. tr
- i. diff command
- j. Using Find
- k. Regular Expressions
- l. using Sed & Awk (optional)

8. Active tasks

- a. What are Process and threads?
- b. Process\Threads lifecycle in Linux
- c. Linux Scheduler
 - Scheduling processes
 - Scheduling Threads
- d. Handling Processes priority
- e. Shell commands to monitor Processes
 - top/htop
 - ps
 - job
- f. killing Processes
- g. Job Control Overview
- h. Job Control Commands
- i. Executing in background, suspending, resuming and aborting
- j. List of active tasks
- k. Environment variables
- l. What are Signals
- m. Tools to Send Signals

9. Network Administration (**Based on Constraints**)

- a. Network setup – ifconfig options
- b. Configuring static and dynamic IP address
- c. Connectivity testing – ping
- d. Installing new applications
- e. SSH - Secure Shell
- f. SCP - Secure Copy
- g. rsync
- h. Name resolution
- i. Using tcpdump
- j. traceroute
- k. route
- l. hosts
- m. arp
- n. ip forwarding
- o. configuration files

10. Tuning Linux (**Based on Constraints**)

- a. The proc filesystem
- b. The sys filesystem
- c. RPM Packages
- d. yum\apt-get
- e. Ftrace \ Strace
- f. Linux services
- g. dmesg
- h. Kernel Modules
- i. Linux Antivirus

11. Linux Startup (**Based on Constraints**)

- a. Linux startup flow
- b. Run levels & inittab
- c. controlling services (service, checkconfig, ntsysv, upstart)
- d. Installing external software (RPM. *.tgz...)

12. The BASH Shell

- a. What is shell,
- b. Different Linux shells
- c. Role of Command Shells
- d. File Redirection
- e. Piping Commands
- f. Standard input and output, using pipes and redirections
- g. File name Matching
- h. File searching and Wildcard patterns
- i. grep usage
- j. Shell and Environment Variables
- k. PATH environment variables
- l. The .bashrc file
- m. Shell aliases,
- n. Linux Quotation Rules
- o. Nesting Commands
- p. Compression and archiving (tarring and Un-tarring files)
- q. History
- r. Environment files & startup files

13. Installing Linux (**Based on Constraints**)

- a. Difference between distributions
- b. HW requirements
- c. Pre installation
- d. Creating needed partitions
- e. Installing packages

14. Integrating Linux & MS Windows: (**Based on Constraints**)

- a. Installing MS-Windows Programs on Linux
- b. Accessing Windows File-systems
- c. Using Samba to access Linux servers from Windows