

# Section 1: Understand the Linux Story

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Course 3071 - SLES 10 Fundamentals



# Understand the Linux Story

## Objectives

1. The History of Linux
2. Understand the Multiuser Environment
3. Perform a Simple Installation of **SLES 10**



# Objective 1: The History of Linux

Section 1 - Understand the Linux Story



# The History of Linux

## Historical Development of UNIX

- At the end of the 1960's most systems were batch systems using punch cards or paper tape
  - Very inefficient since had to wait to see results
- Developers wanted a way to allow a number of users to work interactively with the system at the same time
- **MULTICS** was one of the first system to do this but was difficult to operate
- In 1969 Ken Thompson created **UNIX**, a better system
  - Dialog oriented operation
  - High functionality and structural simplicity



# The History of Linux

## Historical Development of UNIX

- First version of **UNIX** written in Assembler Language
  - Very machine dependent
- In 1971 rewritten in C language so machine independent
- System use spread rapidly since Bell Labs provided source code and documentation to universities at very little cost
- Many users and companies actively engaged in development due to
  - Simple operation
  - Availability of source code
  - Portability



# The History of Linux

## Historical Development of UNIX

- Numerous versions of **UNIX** became available
  - **AIX** from IBM, **DEC**, **HP-UX** from HP and **BSD UNIX** from University of California at Berkeley
- In 1983 AT&T started marketing **UNIX System V**
  - Defined as the **UNIX** standard
  - Licensing rules changed
  - Long-lasting legal battles with **BSD**
  - Prevented real standardization
- Modern **UNIX** can be based on **System V** or **BSD**
- Linux tries to combine best of both



# The History of Linux

## Historical Development of UNIX

- Linux is available on many different hardware platforms
  - Intel/AMD 32 bit
  - Intel/AMD 64 bit
  - PowerPC (Mac, RS/6000)
  - SPARC (Sun)
  - IBM pSeries
  - IBM zSeries (S/390)
  - Embedded



# The History of Linux

## Development of Linux

- In 1991 Linux Torvalds began to develop a UNIX-like operating system to run on a PC
- Developed a simple kernel and gave out the source code over the Internet
- Made source code available under the **GPL**
  - **GPL** = GNU General Public License
  - Allows anyone to read and edit the source code
  - If make changes, must make those changes available to others
- Developed into a project involving many people
  - Linus still controls kernel modifications





# The History of Linux

## Development of Linux

- Functions of the kernel include
  - Input and output control
  - Device control
  - Process management
  - File management
  - CPU allocation
- Other system components are handled by other groups
  - Non-Intel processor implementations
  - Shell utilities
  - Network services
  - System binaries (many are GNU utilities from the FSF)



# The History of Linux

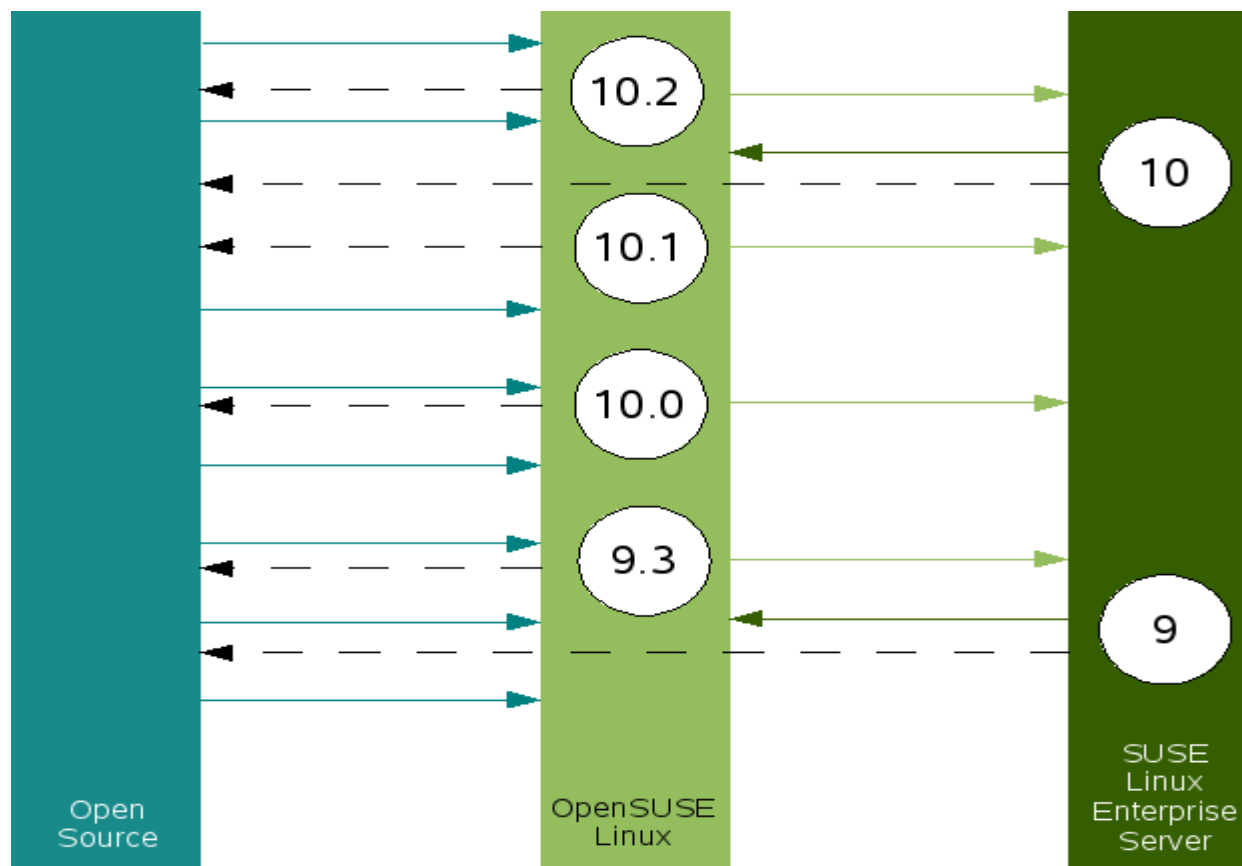
## Differences Between SUSE Linux and SLES

- **SLES 10** is based on **SUSE Linux 10.x** with this process
  - **SUSE Linux 10.x** is released first
  - Code is tested and patched
  - Security and stability are improved
  - **SLES 10** is released
- **SLES 10** has fewer packages
  - **SUSE Linux 10** has about 3,500
  - **SLES 10** has about 1,000
  - Most packages removed are desktop applications



# The History of Linux

## Differences Between SUSE Linux and SLES



# The History of Linux

## Differences Between SUSE Linux and SLES

- **SLES 10** has much better and longer support
  - Has a guaranteed 7 years for patches and fixes
  - Has a range of support options
- **SLES 10** is certified by many independent hardware and software vendors



# Objective 2: Understand the Multiuser Environment

## Section 1 - Understand the Linux Story



# The Multiuser Environment

## Overview

- UNIX was designed to be multiuser and multitasking
- A multiuser system enables a number of users to use the system at the same time
- A multitasking system allows users to run multiple programs at the same time
  - Only appears to be that way on a single processor system
  - Need a multiprocessor system to really do it



# The Multiuser Environment

## Overview

- UNIX implements preemptive multitasking
  - Each process has a maximum time in which to work before the kernel takes the processor away
- In other operating systems processor control must be released by the process
  - Can lead to one process hijacking the CPU
  - Other processes are blocked and can not run
- The kernel coordinates access to resources
  - If multiple processes want a resource only one can have it at a time
  - Complex task and no OS is perfect



# The Multiuser Environment

## Resource Conflicts

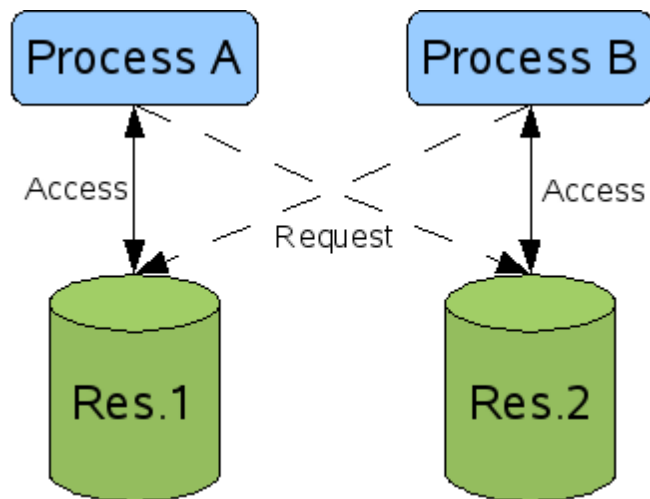
- The classic deadlock problem
  - Process A has resource 1 and is waiting for resource 2
  - Process B has resource 2 and is waiting for resource 1
- Multithreading helps solve this problem
  - An extension of multitasking
  - A process has a number of independent parts called threads
  - Increases the level of parallel processes
  - Makes use of a multiprocessor system better as well





# The Multiuser Environment

## Resource Conflicts



# Objective 3: Perform a Simple SLES 10 Installation

Section 1 - Understand the Linux Story



# Simple SLES 10 Installation

## Overview

- The process can be divided into the following steps
  - Pre-Installation Requirements and Guidelines
  - Installation Options
  - Basic Installation
  - Configuration



# Simple SLES 10 Installation

## Pre-Installation Requirements and Guidelines

- Minimum
  - 256 MB RAM
  - 500 MB hard disk space for software
- Recommended
  - 512 to 3 GB RAM
  - 4 GB hard disk space for software



# Simple SLES 10 Installation

## Pre-Installation Requirements and Guidelines

- After installation some configurations are hard to change so consider the following items before installing
- **Hardware compatibility**
  - Supports most enterprise server hardware
  - Supports most hardware for desktops
  - Laptops can be a problem
  - To verify compatibility go to

<http://www.novell.com/partnerguideline/section/481.html>



# Simple SLES 10 Installation

## Pre-Installation Requirements and Guidelines

- **File system types**
  - Select the file system type for each partition
  - Default system is Reiser which is good for most partitions
  - More about this in the Administration course 3072
- **Partitioning Scheme**
  - Plan before implementing since harder to change later
  - Easier to configure software RAID or LVM during install
- **Software Package Selection**
  - For better security only install what is required



# Simple SLES 10 Installation

## Installation Options

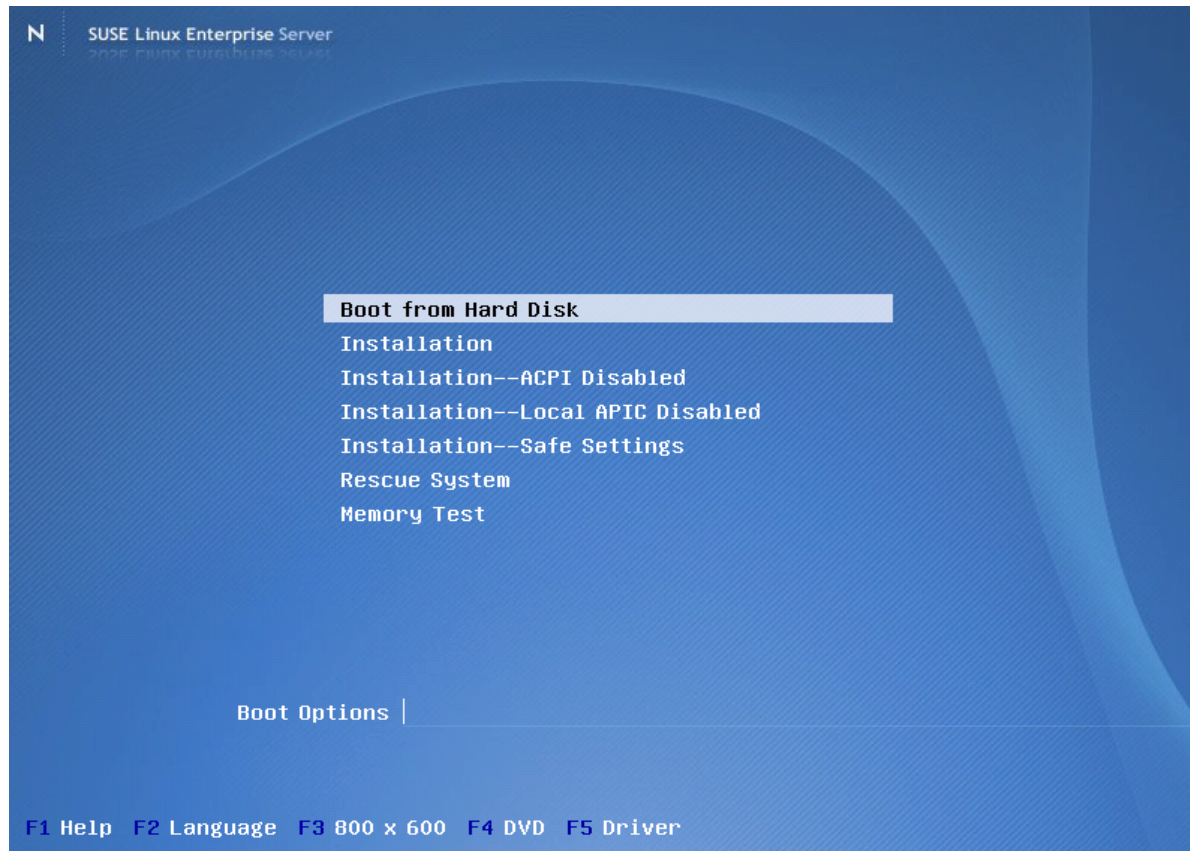
- When boot get the welcome screen
- Must choose an option in 20 seconds or first entry is chosen and system boots from hard disk
  - To stop process just press any key
- The functions keys at the bottom are important
  - **F1** to get help
  - **F2** for the Installation Language
  - **F3** to change display resolution
  - **F4** to choose an installation source
  - **F5** to load other drivers



# Simple SLES 10 Installation

## Installation Options

- The Welcome Screen





# Simple SLES 10 Installation

## Installation Options

- **Boot from Hard Disk**
  - Boots installed Operating System from hard disk
- **Installation**
  - Starts the normal GUI based install
- **Installation - Local APIC Disabled**
  - **APIC** = Advanced Programmable Interrupt Controller
  - Each CPU is made of a core and a local **APIC**
  - The **APIC** handles CPU specific interrupt configuration
  - Can lead to problems



# Simple SLES 10 Installation

## Installation Options

- **Installation - Local ACPI Disabled**
  - **ACPI** = Advanced Configuration and Power Interface
  - Can lead to installation problems on older computers
- **Installation - Safe Settings**
  - Good for older computers with no power management or hard disk acceleration
- **Rescue System**
  - Starts a minimal Linux system (no GUI) from a DVD
  - Lets you repair the Linux installation on the hard disk
- **Memory Test**
  - Tests the RAM for physical errors until terminated



# Simple SLES 10 Installation

## Basic Installation

- YaST may ask for a language
  - If selected a language using **F2** then this does not appear
- Read and Accept the **License Agreement**
- If already have Linux on the computer get the choices
  - **New Installation** - To do a new installation
  - **Update** - To update an existing system
  - **Other** button offers the choices
    - **Repair Installed System**
    - **Boot installed system**



# Simple SLES 10 Installation

## Basic Installation

- YaST now asks you to select a **Time Zone**
- YaST now displays information about your hardware and makes suggestions
- Can change the settings by selecting a **headline** link or using the **Change** button menu



# Simple SLES 10 Installation

## Basic Installation

- The **Overview** tab includes some other choices
  - **Keyboard Layout** - Identifies the layout of the keyboard
  - **Partitioning** - Create and change partition table
    - If a Windows partition exists it tries to resize it
    - Any existing Linux partition is overwritten
    - If have another OS and have free space **YaST** tries to install Linux in the free space for dual boot
  - **Software** - Select the software to be installed
  - **Language** - Select default language for the installation



# Simple SLES 10 Installation

## Basic Installation

- The **Expert** tab includes some other choices
  - **System** - Details about the hardware
  - **Add-On Products** - If have media with add-ons
  - **Booting** - Install and configure the GRUB boot loader
  - **Time Zone** - Select your time zone
  - **Language** - Select default language for the installation
  - **Default Runlevel** - Select default runlevel
    - Runlevels are different modes the server can run in



# Simple SLES 10 Installation

## Configuration

- If the installation was successful the computer reboots and YaST starts again so you can configure some basic settings
- During the configuration phase you configure the following:
  - Root Password
  - Network Devices
  - Services
  - Users
  - Hardware



# Simple SLES 10 Installation

## Configuration

- **System Information**
  - The **hostname** and **domain name** need to be specified
  - Option to allow **DHCP** to change the **Hostname**
    - This overwrites the entered **hostname**
- **Root Password**
  - Password for the system administrative
  - Warnings appear if it is too simple or only lowercase





# Simple SLES 10 Installation

## Configuration

- **Network Devices**
  - The types of discovered network devices displayed are
    - **Network Interfaces**
    - **DSL Connections**
    - **ISDN Adapters**
    - **Modems**
  - By default YaST selects **DHCP** for the network interface



# Simple SLES 10 Installation

## Configuration

- **Network Devices**
  - **Network Mode**
    - The network manager applet tries to manage the network configuration automatically
  - **Firewall**
    - Can be activated by default
    - Blocks the **SSH** port



# Simple SLES 10 Installation

## Configuration

- **Network Devices**
  - **VNC Remote Administration**
    - Allows you to export the desktop to another computer setup as the **VNC** client
    - Can start GUI applications and use the mouse
  - **Proxy**
    - Configure and enable a proxy
    - Handles **HTTP, HTTPS, FTP**



# Simple SLES 10 Installation

## Configuration

- **Network Devices**
  - Now you can test your Internet connection
  - **Yes, Test Connection to the Internet**
    - Downloads the latest **Release Notes**
    - Starts the **Novell Customer Center** to check for updates
    - If any are found, **YaST** asks you to verify the download and installation



# Simple SLES 10 Installation

## Configuration

- Services
  - CA Management
    - CA = Certificate Authority
    - Purpose is to guarantee trust relationships among network services
    - Created by default
  - OpenLDAP Server
    - Can run an **LDAP** server on your host
    - Provides a central location for user authentication
    - Also used for **mail**, **DHCP** and **DNS**
    - **LDAP** server is setup but not started



# Simple SLES 10 Installation

## Configuration

- Users
  - Authentication methods
    - Local
      - » User accounts managed locally using **/etc/passwd**
    - LDAP
      - » User accounts managed centrally by **LDAP** server
      - » Use in mixed **UNIX** and Windows environments
    - NIS
      - » User accounts managed centrally by **NIS** server
      - » Use in pure **UNIX** environments only
    - Windows Domain
      - » User accounts managed centrally by Windows or Samba servers



# Simple SLES 10 Installation

## Configuration

- **Users**
  - If choose **Local (/etc/passwd)** get the following to create users
    - **User's Full Name**
    - **Username**
      - » Login name
      - » Must be unique
    - **Password**
      - » Case sensitive
      - » Enter twice for verification
      - » Get warnings if too simple or only lowercase



# Simple SLES 10 Installation

## Configuration

- **Users**
  - **Receive System Mail**
    - User automatically receives email for root
  - **Automatic login**
    - Avoids login at system startup
    - Use only at your own desk
    - A security risk
  - After making all selections the information is written to disk





# Simple SLES 10 Installation

## Configuration

- **Hardware**
  - **Graphics Card**
    - Configures the graphics card automatically
  - **Printers**
    - Detects local printers automatically
  - **Sound Card**
    - Configures the sound card automatically



# Simple SLES 10 Installation

## Configuration

- **Installation Completed**
  - **Clone this System for Autoyast**
    - Activated by default
    - Autoyast is a tool to clone systems during installs
  - **Finish**
    - System is now ready to use



# Simple SLES 10 Installation

## Exercise 1-1

- Install **SLES 10**
  - Purpose is to show you how to install **SLES 10** using defaults when possible
    - In part III enter **digitalairlines.com** as the domain
    - In part IV use **novell** as the root password
    - In part V deactivate the **firewall**
    - In part VI create an account for **geeko** with **novell** as the password
- Page WB 1-2
- Estimated time: 45 minutes



# Any Question?

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