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# Show 105 IBM Notes and IBM Domino on Linux 101

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# About the presenter



- Daniel Nashed
  - Nash!Com – IBM® Business Partner/ISV
  - Member of The Penumbra group
    - an international consortium of selected Business Partners pooling their talent and resources
  - focused on Cross-Platform C-API, Domino® Infrastructure, Administration, Integration, Troubleshooting and IBM® Notes® Traveler
  - Platform Focus: Windows®, Linux®, AIX® and Solaris®
  - Author of the Domino Start Script for Linux® and Unix®
- [nsh@nashcom.de](mailto:nsh@nashcom.de)
- <http://www.nashcom.de>

# Agenda

- Introduction
  - Why Notes & Domino on Linux?
  - Right distribution and Linux version
  
- Show 'n Tell
  - Start Point: Pre-Installed BASIC SLES 11 SP2 64bit Machine
    - See step by step guide in this presentation
  - End Point: Fully installed Domino Server 9.0 Beta Server
    - And Notes 9.0 Beta Client
  
  - Tips, Best Practices, Tuning and Admin Standard Operations, Troubleshooting
  
- Q & A
  
- Disclaimer: Demos are based on Notes / Domino Social Edition 9.0 Public Beta
  - The demonstration is based on the current status of the beta
  - The Notes/Domino 9 Beta software is subject to change



# Why Notes/Domino on Linux?

- Many customers moved their Domino environment to Linux
  - Most time combined with a Company-wide Corporate Strategy
  - Just running Domino on Linux might not make sense from strategic point of view
    - But Domino is a good platform to start with
- Server Consolidation
  - Multiple Partitions on a single Linux box
    - On Windows you should only use one per hardware or need Virtualization
- Cost reduction when migrating from other platforms
  - e.g. AIX®, Solaris®, iSeries®, zSeries®
- More and more customers are interested in Linux on the Desktop
  - A lot software is already available for Linux
  - Very powerful and enterprise ready desktop versions available
- Robust, Fast, Scalable Platform



# Why Notes/Domino on Linux?

- No Registry
  - Configuration is in text files
  - You know exactly what happens
- Better Security
  - For example when used inside a DMZ
- Better Manageability
  - Scripted operations (shell scripts – Linux uses scripts internally)
  - Mountable file-systems (easier separation of multiple file-systems)
  - Great performance and troubleshooting tools
- “Less licence costs”
- Very effective process scheduler and memory manager
- IBM is using RHEL 64bit Intel Linux for their “IBM SmartCloud™” offering



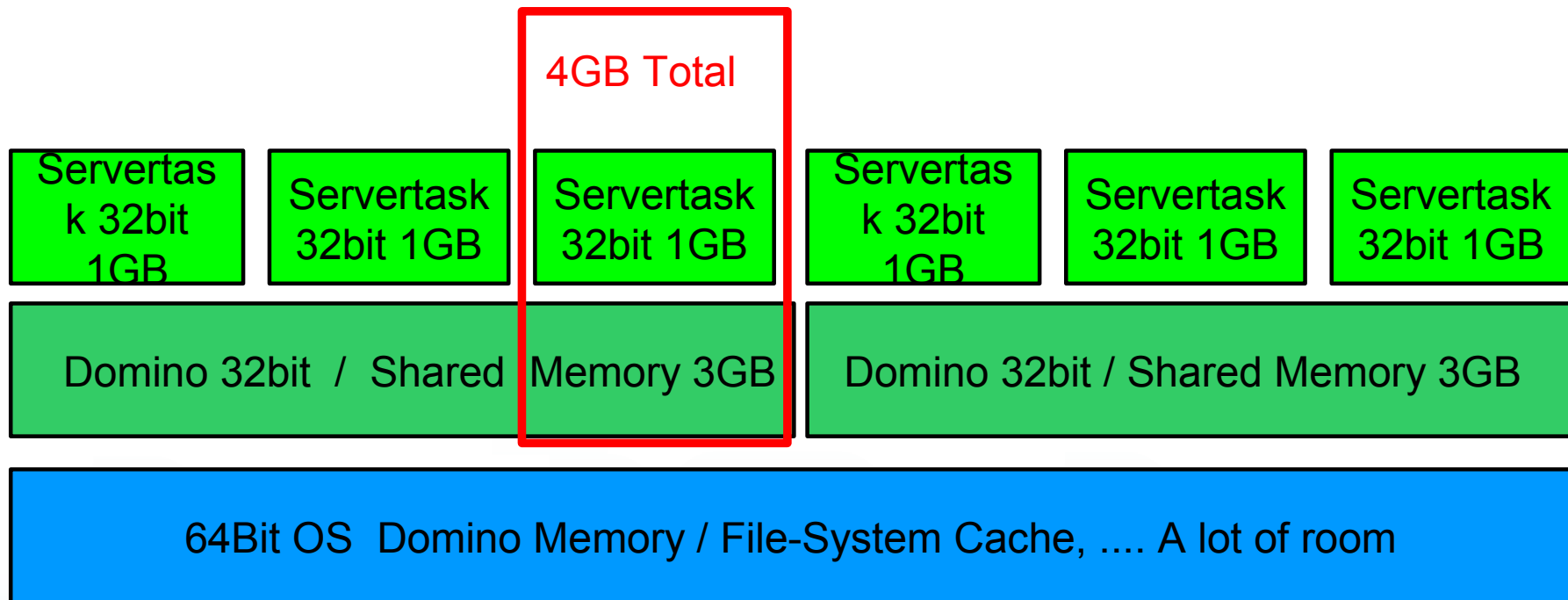
## Domino on Linux Memory Limits

- Domino 8/9 on SLES/RHEL in 64Bit Mode can support many partitions with 32Bit dedicated address space per Domino Partition (DPAR)
  - Practical limit would be 3-4 partitions with 12-16 GB of RAM
  - You need to take care to have fast disk subsystems
  - **TIP:** For better I/O performance use 32 GB of RAM or more
    - File-System cache helps dramatically to reduce the read I/O
- Windows 64bit removed a lot of constrains on the Windows side
  - File-system Cache, full 32bit address space available for the application
- But memory management on Linux is still ahead
  - tempfs – Temporary file-system
  - Better file caching – works better with large amount of RAM
- 32Bit Limit: 4 GB for Shared Memory + Local Process memory
- Domino 9 will support native 64bit Domino on Linux



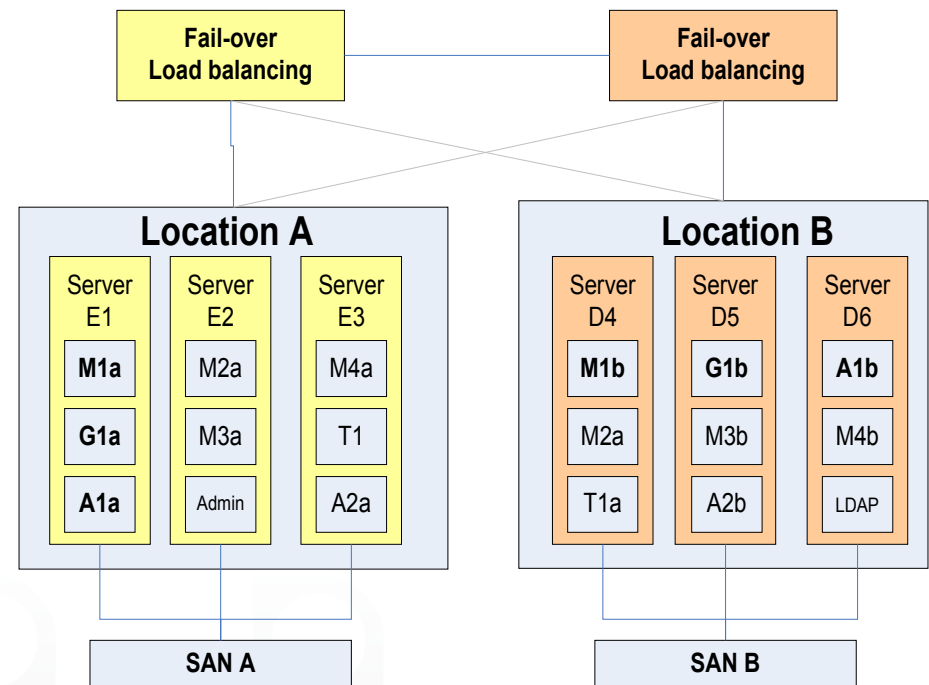
## Domino 32bit on a 64Bit Operating System

- Total Memory per Process is 32Bit = 4 GB
- Router / HTTP uses most local process memory
- NSF Buffer Pool is the biggest Shared Memory block (512 MB)



# Customer Linux Example - Two Locations - 6 Boxes

- Spread multiple Domino Partitions (DPARs)
  - On multiple physical machines
  - Each machine has one counter part on a different physical box
  - Mail-Servers are sized for 16.000 Users
  
- 3 Partitions each
  - Balance two busy and
  - one lower profile DPAR
  
- Leverage Domino Clustering
  - No SAN mirroring!
  - 2 Quad-Core CPUs
  - 16 GB RAM
  - SAN disk for data
  - Local Disks for TL





## Domino on Linux running on VMware®

- VMware is a great platform for test and demo environments
- Smaller servers that cannot be clustered are also a good candidate for VMware to ensure disaster recovery
  - E.g. Admin Server, SMTP Servers, Smaller Mail (< 800 Users)/Application Servers
- For large mail and application servers native Linux with partitioned servers is still the better option
  - Less complexity and overhead
  - Better resource scheduling because it is native
  - **But VMware has improved over the last years and became a “tier-1” virtualization platform**
  - If you apply best practices on all levels, you could also run large servers above 1000-1500 users
- In case you install productive servers on Linux check
  - [www.vmware.com/pdf/vmware\\_timekeeping.pdf](http://www.vmware.com/pdf/vmware_timekeeping.pdf)
  - Very detailed information about timer implementation
  - Old presentation but can be still relevant if you run into “time” issues with Linux on VMware



# Linux Distributions?

- SuSE®, RedHat® Enterprise are the **only** supported distributions
  - Different Releases of Domino support different Versions of each distribution
  - Take care that you use the right distribution else your Domino server might not run and is totally unsupported
- Enterprise Distributions are supported for longer time
  - Other Distributions are changing often and there is no way to do the QA and support
  - Development & support focus on major commercial distributions with support
- You should only run the supported Distributions and specific versions
  - Linux is not always the same!
  - There are important differences in each version and distribution
  - Different versions use different libraries, stack sizes, Java runtime, ...
  - Using LD\_ASSUME\_KERNEL=xyz is not really a solution
  - Specially for the Client with Eclipse and Expeditor Framework it is very important
  - Check detailed requirements for each version in readme of each release!



## Supported/Recommended Combinations

- Domino 8.5.x is only supported on SLES10/11 and RHEL5/6!
  - Ubuntu is not a supported Server platform
  - If you need a free Linux OS use CentOS
    - not supported but source code compatible with RHEL
- So you should already start with SLES 11 SP2 or RHEL 6.3 if you can
- Notes 8.5.3 Client
  - SLED 10/11 with current SP
  - RHED 5/6 with current patches
  - Ubuntu 10.04 LTS → very nice implementation. Free (support & deployment tools are commercial)
    - Only 32bit is fully supported. 64Bit is specially hard to install because there is no automatic 32bit subsystem installation
    - **Notes 9.0 has planned support also for Ubuntu 12.04 LTS!**
- The choice depends on your preferences and what your Linux team provides



# Linux Distributions and Abbreviations

- SLES - SuSE Linux Enterprise Server
  - <http://www.novell.com/products/server/>
- SLED - SuSE Linux Enterprise Desktop
  - <http://www.novell.com/products/desktop/>
- Red Hat Enterprise Linux 6
  - <http://www.redhat.com/rhel/>
- Red Hat Enterprise Linux 6 Desktop
  - <http://www.redhat.com/rhel/desktop/>
- Ubuntu Desktop
  - <http://www.ubuntu.com/>



# Show 'n Tell - Domino Installation on VMware SLES & RHEL

- VMware Player / Workstation / Server
  - Most other Virtualization Platforms would work
  - Used in this session: “VMware Workstation”
  
- SLES 11 SP2
- RHEL 6.3
  
- Next pages show how to install SLES
  - Takes too long to wait – but we go quickly thru the install screens
  - See also RHEL 6.3 install screens in Appendix
  
- This is not part of the live demo in the session
  - We start when the BASIC install is finished



## Additional Software Used

- A great free Telnet & SSH client: Putty
  - Current Version: 0.62
  - <http://www.putty.org/>
- WinSCP - Windows based copy program using SSH
  - Current Version: 5.1.2
  - <http://winscp.sourceforge.net>
- Free and very good tools
  - Used by many administrators
- Installation is easy
  - Just run the installer
  - I will skip those installation steps and assume an installed Putty and WinSCP



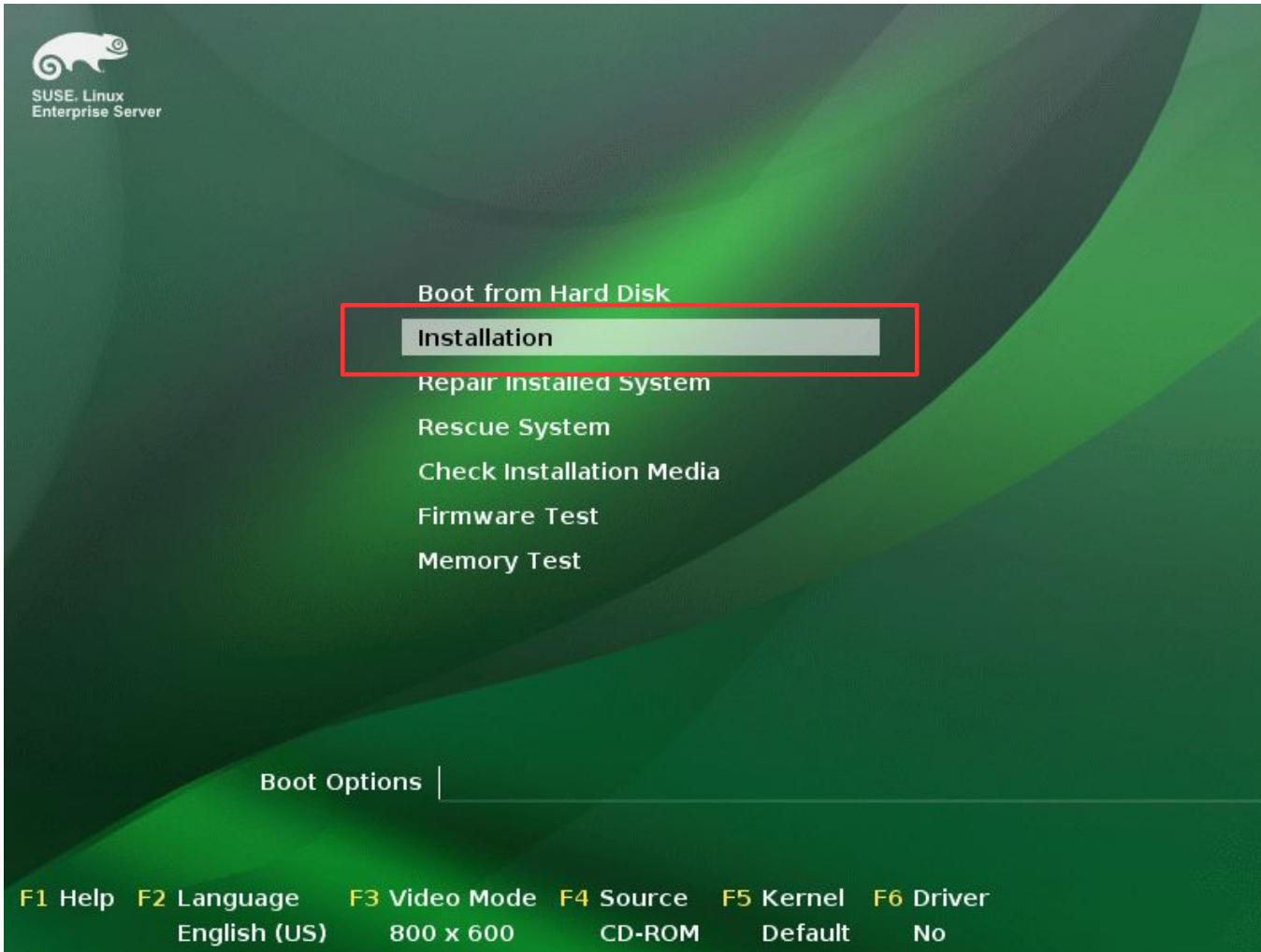


# SuSE Enterprise Server 11 SP2 Installation

- The following slides show how to install SuSE Enterprise Server
  - Not part of the demo but we need an installed server
- Quite straight forward.
  - Step by Step installation in Screen Prints
  - RHEL installation is very similar
- Takes around 10-15 minutes if you have a fast machine



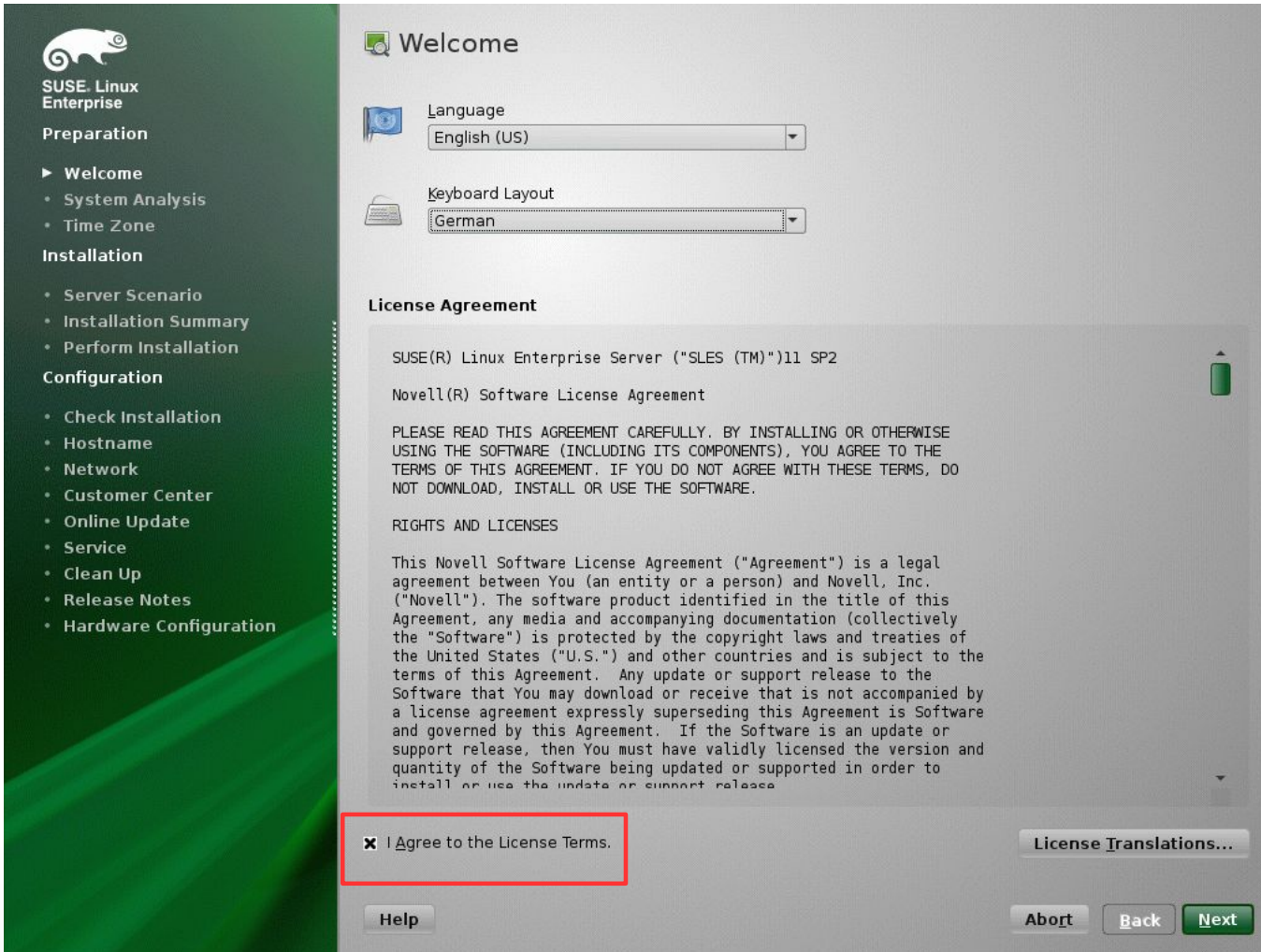
# Boot into Installation Mode



- Choose “Installation” from the boot menu



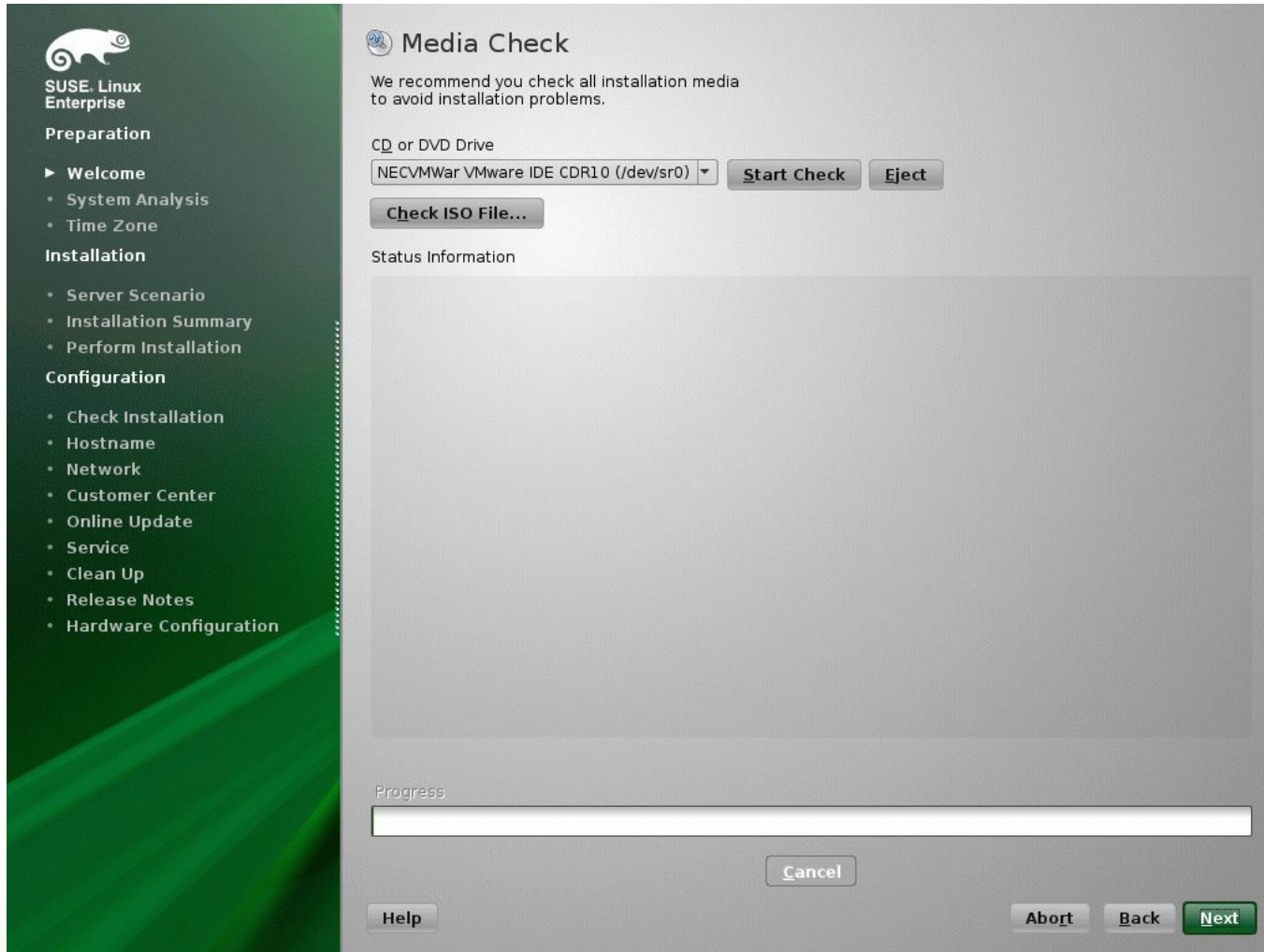
# Accept License



The screenshot shows the SUSE Linux Enterprise Server installation wizard. On the left is a navigation pane with sections: Preparation (Welcome, System Analysis, Time Zone), Installation (Server Scenario, Installation Summary, Perform Installation), and Configuration (Check Installation, Hostname, Network, Customer Center, Online Update, Service, Clean Up, Release Notes, Hardware Configuration). The main window is titled 'Welcome' and shows settings for Language (English (US)) and Keyboard Layout (German). Below this is the 'License Agreement' section, which displays the text of the Novell Software License Agreement. At the bottom of the license agreement, there is a checkbox labeled 'I Agree to the License Terms.' which is checked and highlighted with a red box. To the right of the checkbox is a 'License Translations...' button. At the bottom of the window are 'Help', 'Abort', 'Back', and 'Next' buttons. The 'Next' button is highlighted in green.

- Accept Licence Terms and Press “Next”

# Media Check



**SUSE Linux Enterprise**

**Preparation**

- Welcome
  - System Analysis
  - Time Zone
- Installation**
  - Server Scenario
  - Installation Summary
  - Perform Installation
- Configuration**
  - Check Installation
  - Hostname
  - Network
  - Customer Center
  - Online Update
  - Service
  - Clean Up
  - Release Notes
  - Hardware Configuration

## Media Check

We recommend you check all installation media to avoid installation problems.

CD or DVD Drive  
NECVMWare VMWare IDE CDR10 (/dev/sr0) **Start Check** **Eject**

**Check ISO File...**

Status Information

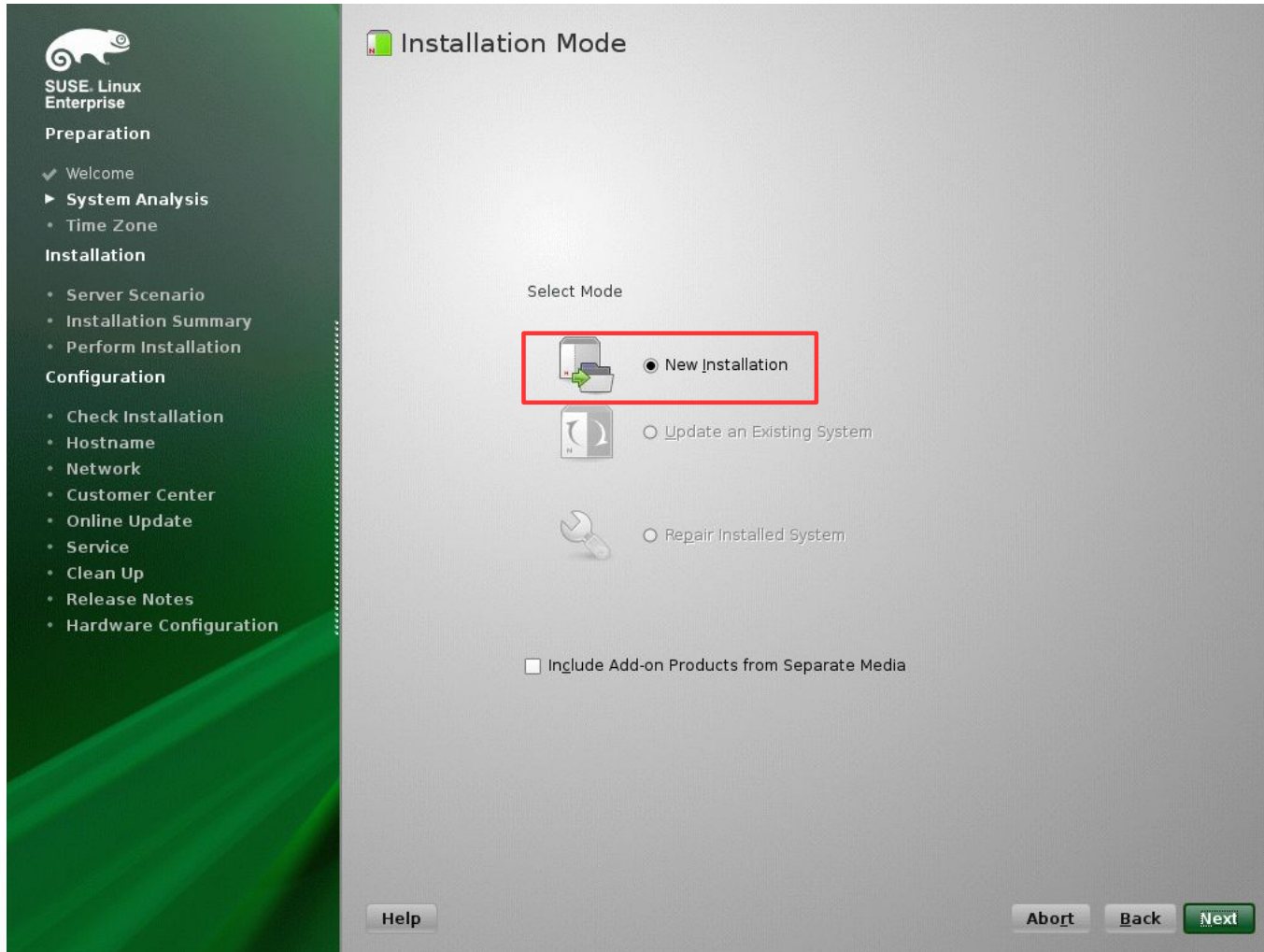
Progress

**Cancel**

**Help** **Abort** **Back** **Next**

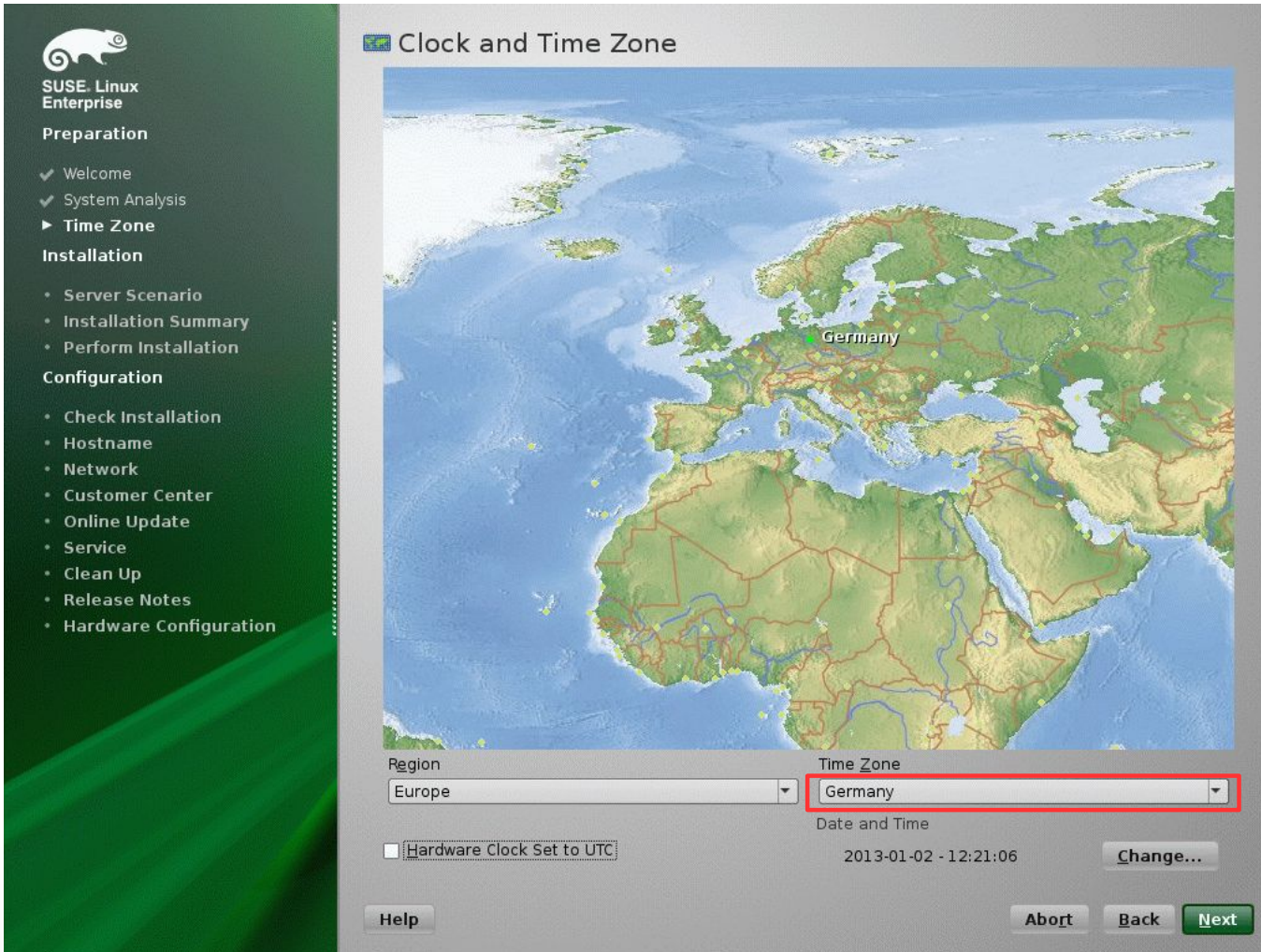
- Skip the media check unless you downloaded the ISO and did not check the checksum of the ISO

# Installation Mode



- Choose “New Installation”

# Clock and Time Zone



**SUSE Linux Enterprise**

Preparation

- ✓ Welcome
- ✓ System Analysis
- ▶ **Time Zone**

Installation

- Server Scenario
- Installation Summary
- Perform Installation

Configuration

- Check Installation
- Hostname
- Network
- Customer Center
- Online Update
- Service
- Clean Up
- Release Notes
- Hardware Configuration

**Clock and Time Zone**

Region: Europe

Time Zone: Germany

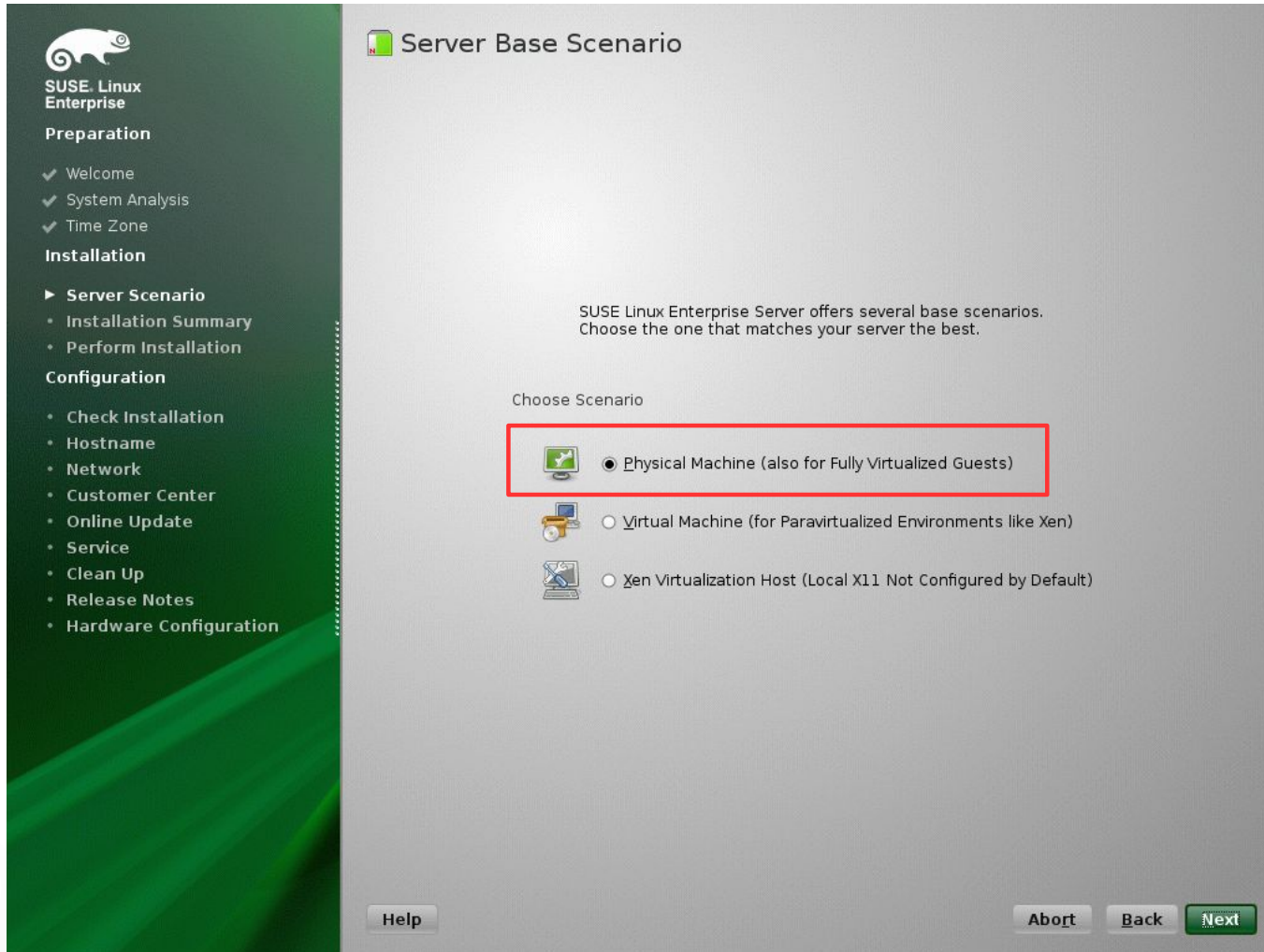
Hardware Clock Set to UTC

Date and Time: 2013-01-02 - 12:21:06 [Change...](#)

[Help](#) [Abort](#) [Back](#) [Next](#)

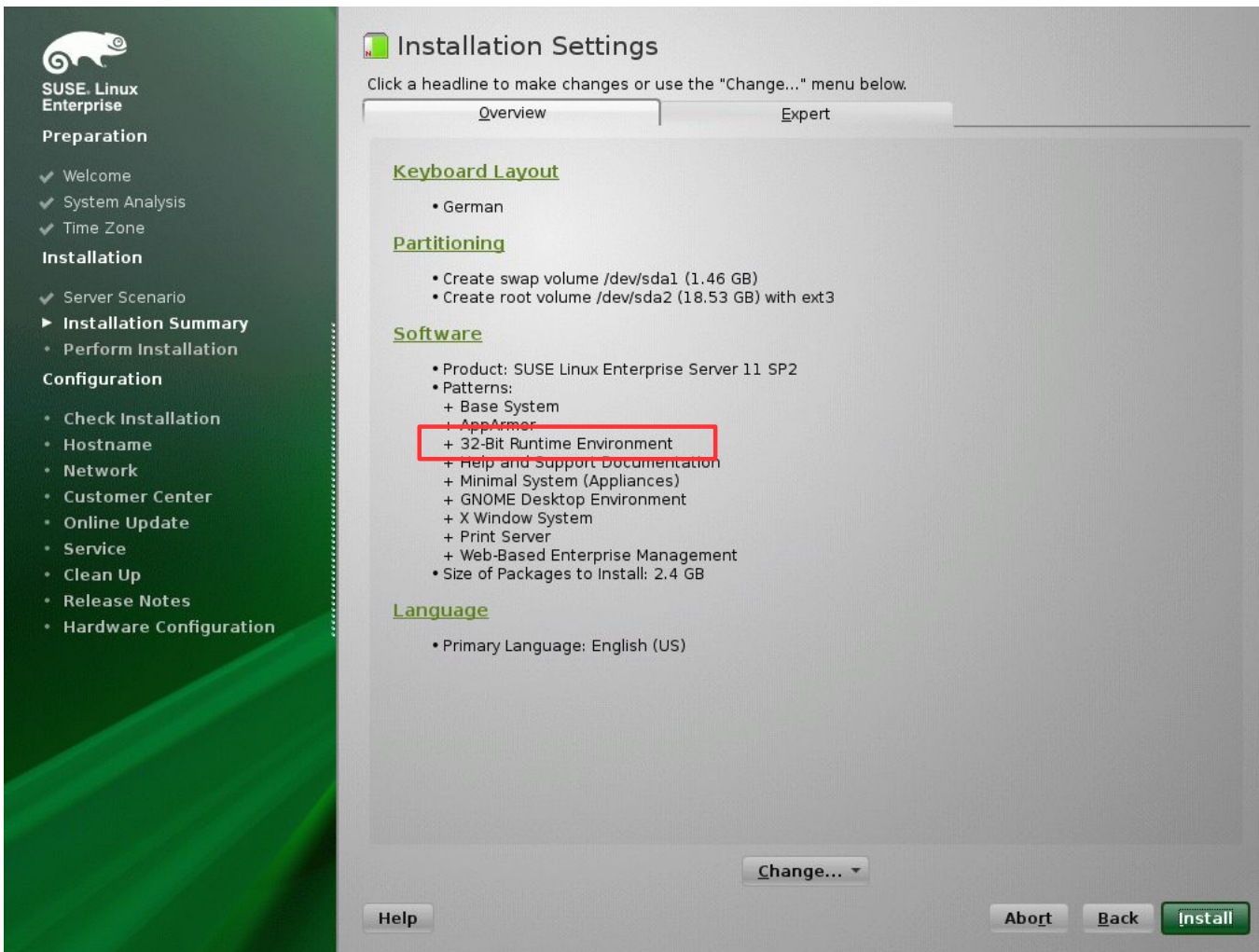
- Check and Set Time, Date and Timezone
- Hardware Clock is usually set to local time instead of UTC

# Server Base Scenario



- Choose Physical machine even if you install on VMware
- XEN is the virtualization platform offered by SLES

# Installation Settings



**SUSE Linux Enterprise**

Preparation

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone

Installation

- ✓ Server Scenario
- **Installation Summary**
- Perform Installation

Configuration

- Check Installation
- Hostname
- Network
- Customer Center
- Online Update
- Service
- Clean Up
- Release Notes
- Hardware Configuration

## Installation Settings

Click a headline to make changes or use the "Change..." menu below.

Overview Expert

### Keyboard Layout

- German

### Partitioning

- Create swap volume /dev/sda1 (1.46 GB)
- Create root volume /dev/sda2 (18.53 GB) with ext3

### Software

- Product: SUSE Linux Enterprise Server 11 SP2
- Patterns:
  - + Base System
  - AppArmor
  - + **32-Bit Runtime Environment**
  - + Help and Support Documentation
  - + Minimal System (Appliances)
  - + GNOME Desktop Environment
  - + X Window System
  - + Print Server
  - + Web-Based Enterprise Management
- Size of Packages to Install: 2.4 GB

### Language

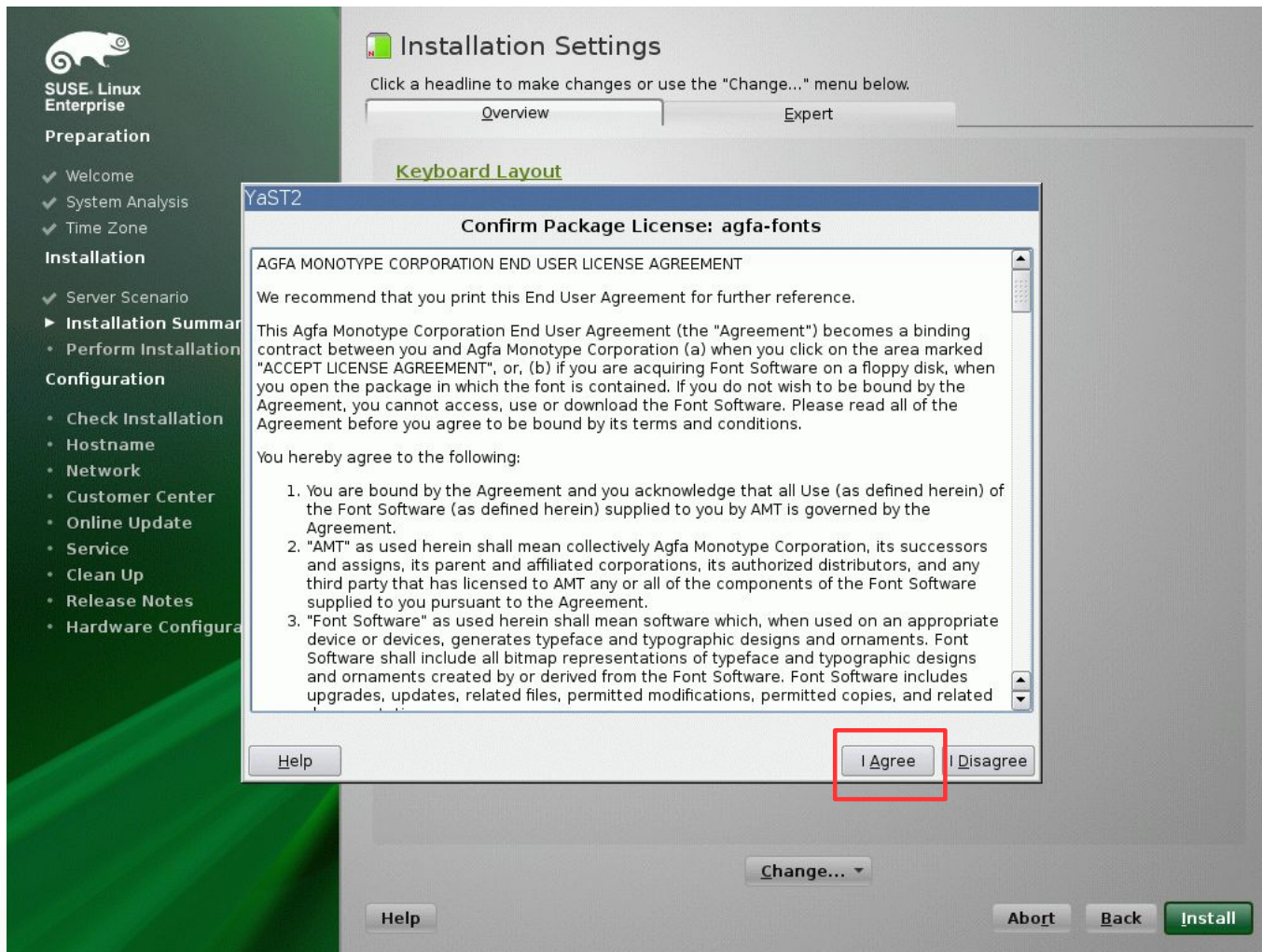
- Primary Language: English (US)

Change...

Help Abort Back Install

- Default Settings work fine for a test Server
- This includes
  - X Window/GNOME Desktop for the Graphical System
  - 32Bit Runtime Environment
- On a 64bit OS you need a 32Bit Runtime Environment for applications like Domino 32bit
- For Domino 9 64bit you can skip the 32bit runtime environment

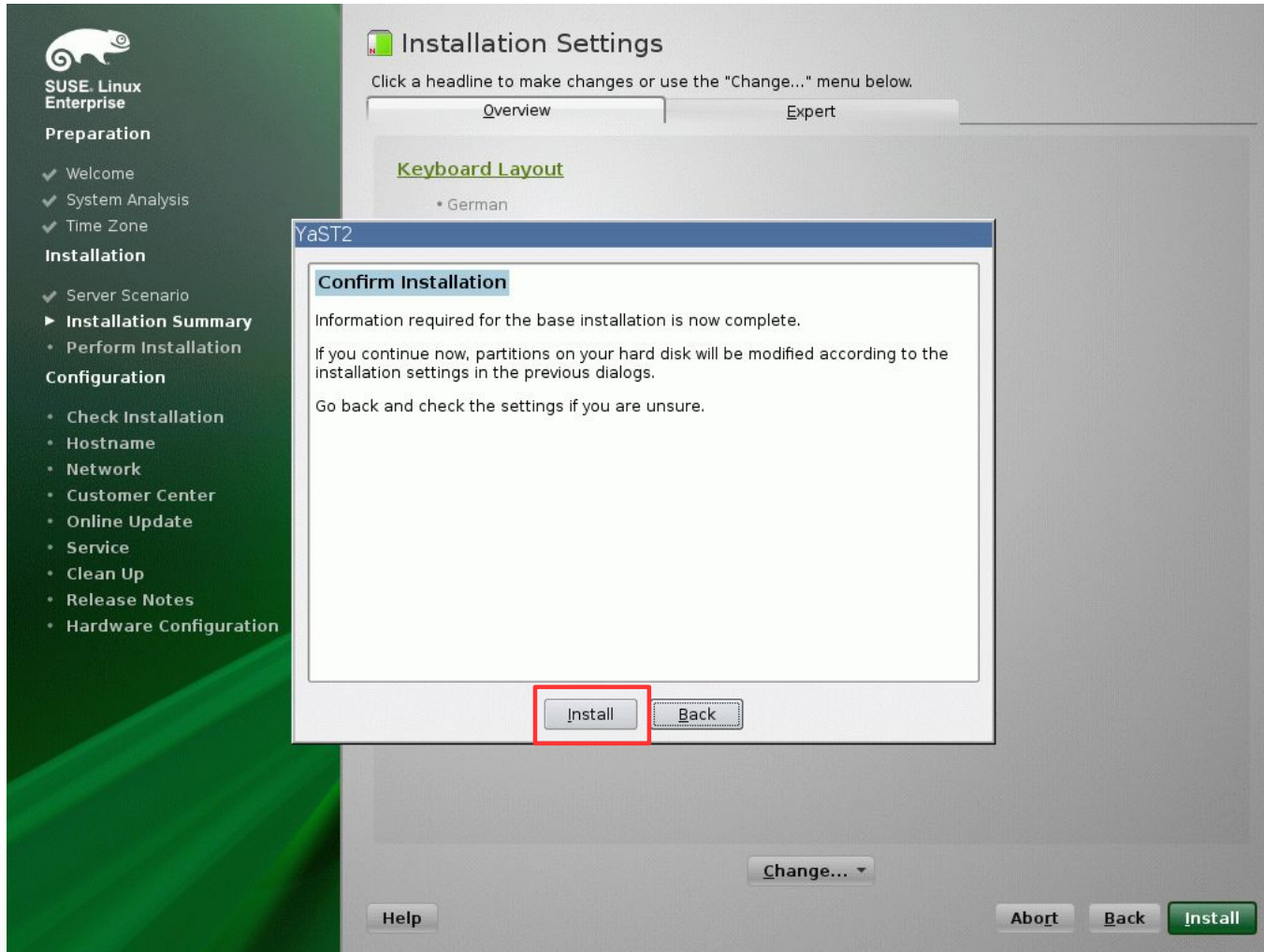
# License Agreement for Agfa-Fonts



- Current Fonts used by SLES need special license agreement



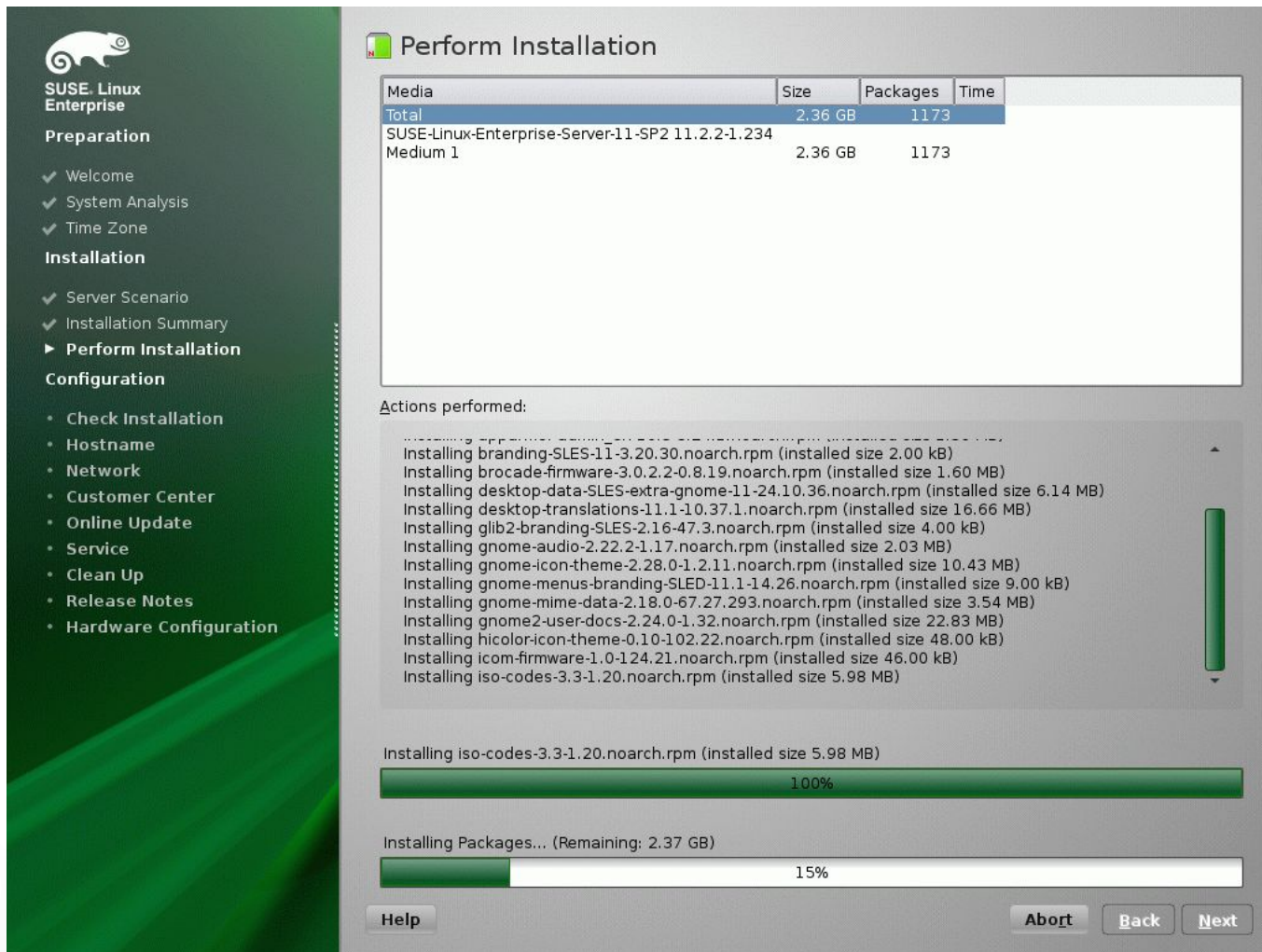
# Confirm Installation



- Confirm your selection
- Start Installation



## Installation ...

**SUSE Linux Enterprise**

**Preparation**

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone

**Installation**

- ✓ Server Scenario
- ✓ Installation Summary
- ▶ **Perform Installation**

**Configuration**

- Check Installation
- Hostname
- Network
- Customer Center
- Online Update
- Service
- Clean Up
- Release Notes
- Hardware Configuration

**Perform Installation**

Media	Size	Packages	Time
Total	2.36 GB	1173	
SUSE-Linux-Enterprise-Server-11-SP2 11.2.2-1.234 Medium 1	2.36 GB	1173	

**Actions performed:**

- Installing branding-SLES-11-3.20.30.noarch.rpm (installed size 2.00 kB)
- Installing brocade-firmware-3.0.2.2-0.8.19.noarch.rpm (installed size 1.60 MB)
- Installing desktop-data-SLES-extra-gnome-11-24.10.36.noarch.rpm (installed size 6.14 MB)
- Installing desktop-translations-11.1-10.37.1.noarch.rpm (installed size 16.66 MB)
- Installing glib2-branding-SLES-2.16-47.3.noarch.rpm (installed size 4.00 kB)
- Installing gnome-audio-2.22.2-1.17.noarch.rpm (installed size 2.03 MB)
- Installing gnome-icon-theme-2.28.0-1.2.11.noarch.rpm (installed size 10.43 MB)
- Installing gnome-menus-branding-SLED-11.1-14.26.noarch.rpm (installed size 9.00 kB)
- Installing gnome-mime-data-2.18.0-67.27.293.noarch.rpm (installed size 3.54 MB)
- Installing gnome2-user-docs-2.24.0-1.32.noarch.rpm (installed size 22.83 MB)
- Installing hicolor-icon-theme-0.10-102.22.noarch.rpm (installed size 48.00 kB)
- Installing icom-firmware-1.0-124.21.noarch.rpm (installed size 46.00 kB)
- Installing iso-codes-3.3-1.20.noarch.rpm (installed size 5.98 MB)

Installing iso-codes-3.3-1.20.noarch.rpm (installed size 5.98 MB)

100%

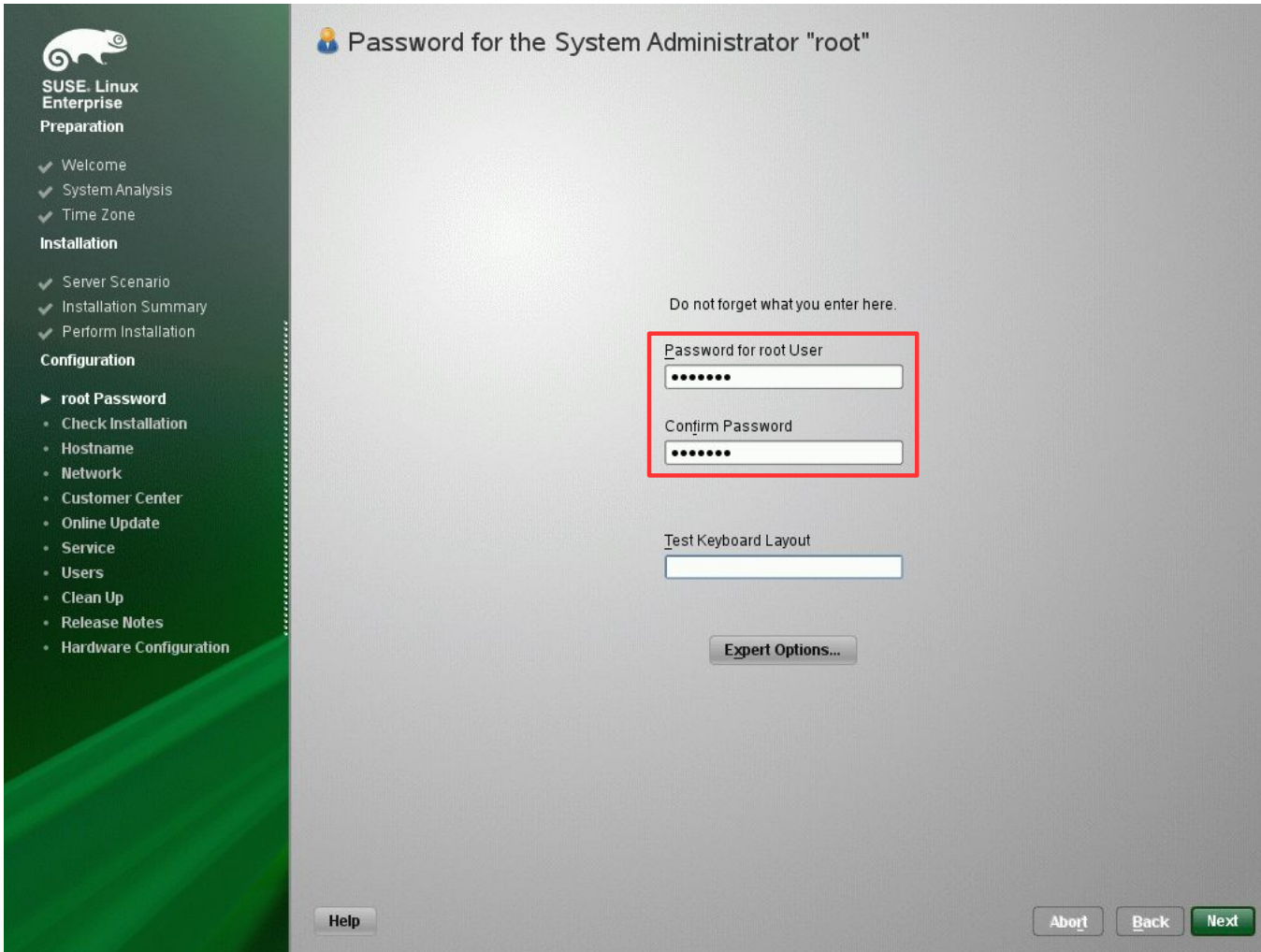
Installing Packages... (Remaining: 2.37 GB)

15%

Help Abort Back Next

- Installation takes 10-20 minutes depending on your hardware
- Kernel Installation
- Packet Installation

# Root Password



**SUSE Linux Enterprise Preparation**

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone
- Installation**
  - ✓ Server Scenario
  - ✓ Installation Summary
  - ✓ Perform Installation
- Configuration**
  - ▶ **root Password**
  - Check Installation
  - Hostname
  - Network
  - Customer Center
  - Online Update
  - Service
  - Users
  - Clean Up
  - Release Notes
  - Hardware Configuration

**Password for the System Administrator "root"**

Do not forget what you enter here.

Password for root User  
.....

Confirm Password  
.....

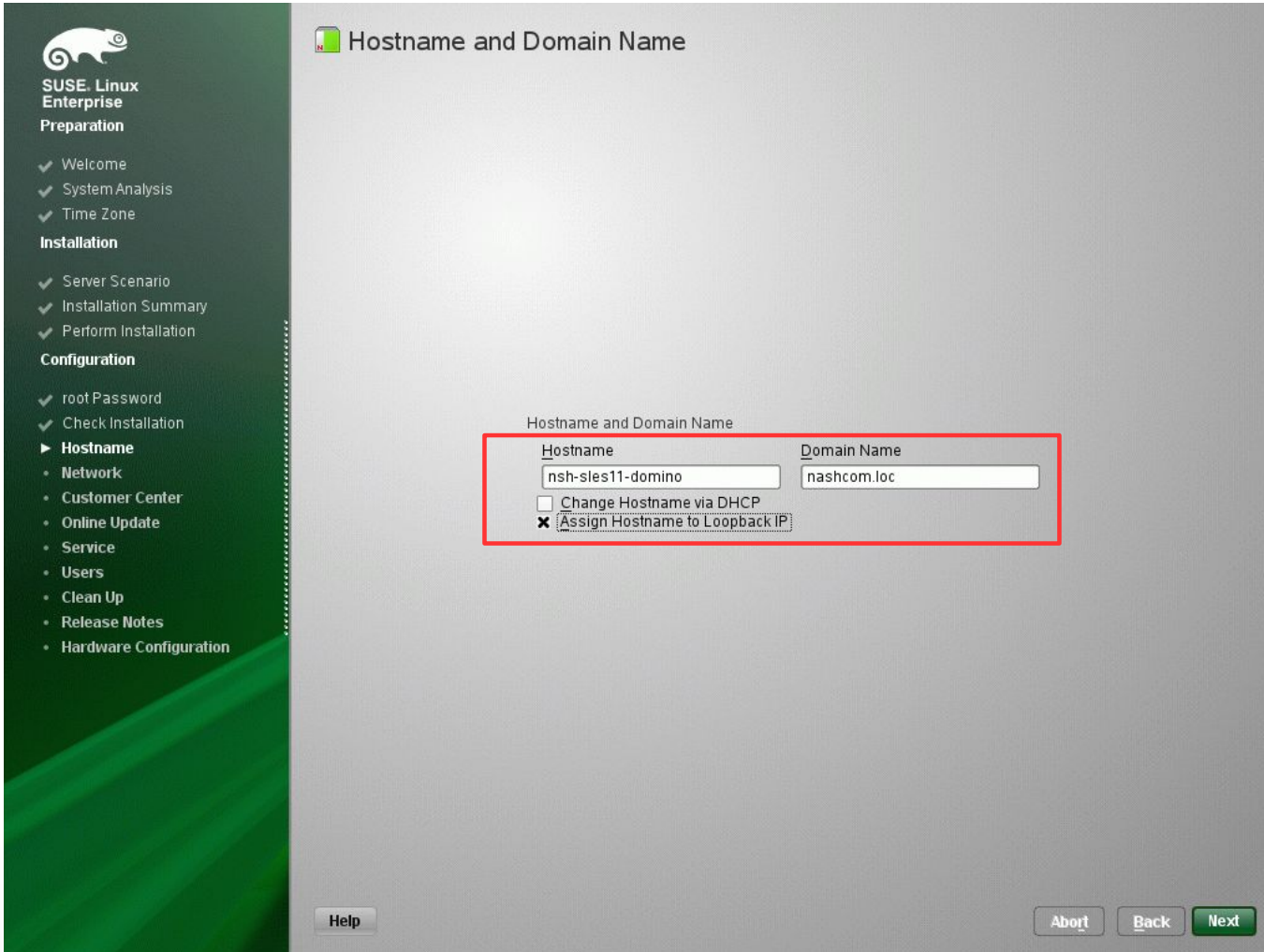
Test Keyboard Layout  
.....

Expert Options...

Help Abort Back Next

- “root” is the super user / system account
- You should specify a strong password

# Hostname and Domain Name



SUSE Linux Enterprise Preparation

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone
- Installation**
- ✓ Server Scenario
- ✓ Installation Summary
- ✓ Perform Installation
- Configuration**
- ✓ root Password
- ✓ Check Installation
- ▶ **Hostname**
- Network
- Customer Center
- Online Update
- Service
- Users
- Clean Up
- Release Notes
- Hardware Configuration

Hostname and Domain Name

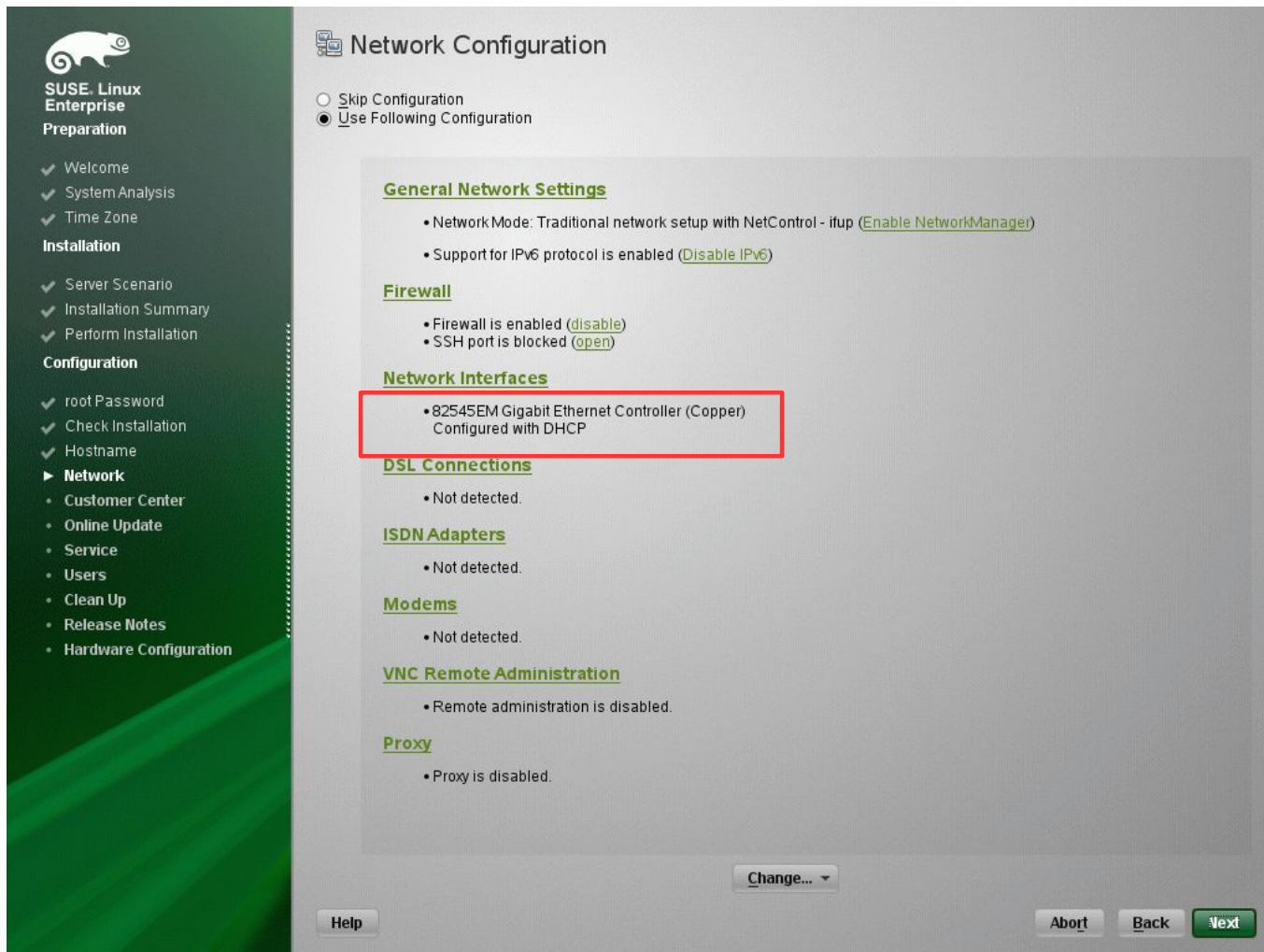
Hostname	Domain Name
<input type="text" value="nsh-sles11-domino"/>	<input type="text" value="nashcom.loc"/>

Change Hostname via DHCP  
 Assign Hostname to Loopback IP

Help Abort Back Next

- Specify Hostname and Internet Domain

# Network Configuration



**SUSE Linux Enterprise Preparation**

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone
- Installation**
- ✓ Server Scenario
- ✓ Installation Summary
- ✓ Perform Installation
- Configuration**
- ✓ root Password
- ✓ Check Installation
- ✓ Hostname
- ▶ **Network**
- Customer Center
- Online Update
- Service
- Users
- Clean Up
- Release Notes
- Hardware Configuration

## Network Configuration

Skip Configuration  
 Use Following Configuration

### General Network Settings

- Network Mode: Traditional network setup with NetControl - ifup ([Enable NetworkManager](#))
- Support for IPv6 protocol is enabled ([Disable IPv6](#))

### Firewall

- Firewall is enabled ([disable](#))
- SSH port is blocked ([open](#))

### Network Interfaces

- 82545EM Gigabit Ethernet Controller (Copper)  
Configured with DHCP

### DSL Connections

- Not detected.

### ISDN Adapters

- Not detected.

### Modems

- Not detected.

### VNC Remote Administration

- Remote administration is disabled.

### Proxy

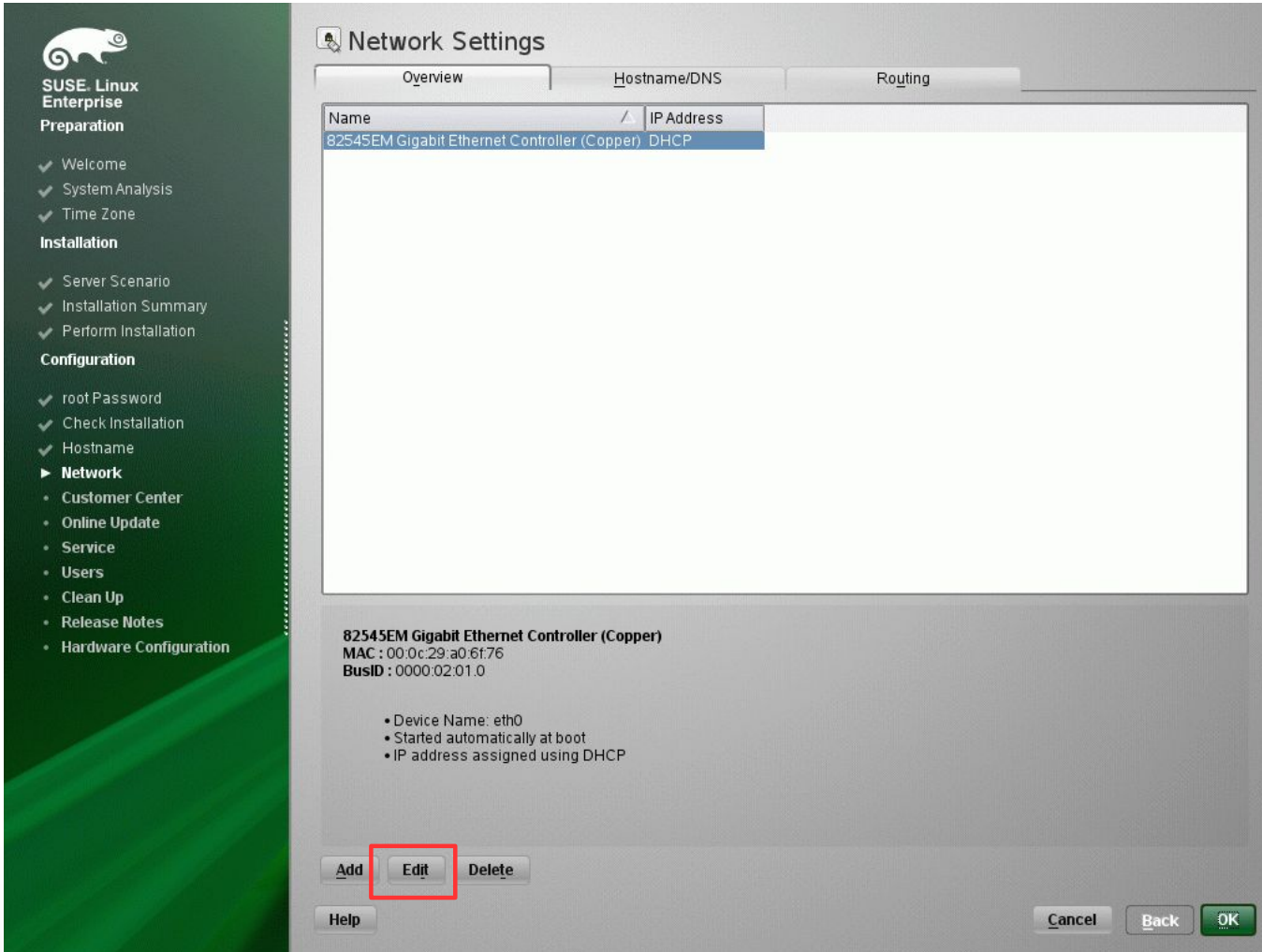
- Proxy is disabled.

Change... ▾

Help Abort Back Next

- Firewall is enabled by default
- You can open the SSH (Secure Shell Port 22) in the firewall now
  - Or later when we open other ports for the Domino server
- Network-Card is configured using DHCP by default
  - Change settings for a static IP in your subnet

# Network Settings



**SUSE Linux Enterprise Preparation**

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone
- Installation**
  - ✓ Server Scenario
  - ✓ Installation Summary
  - ✓ Perform Installation
- Configuration**
  - ✓ root Password
  - ✓ Check Installation
  - ✓ Hostname
  - ▶ **Network**
    - Customer Center
    - Online Update
    - Service
    - Users
    - Clean Up
    - Release Notes
    - Hardware Configuration

## Network Settings

Overview | Hostname/DNS | Routing

Name	IP Address
82545EM Gigabit Ethernet Controller (Copper)	DHCP

**82545EM Gigabit Ethernet Controller (Copper)**  
MAC : 00:0c:29:a0:6f:76  
BusID : 0000:02:01.0

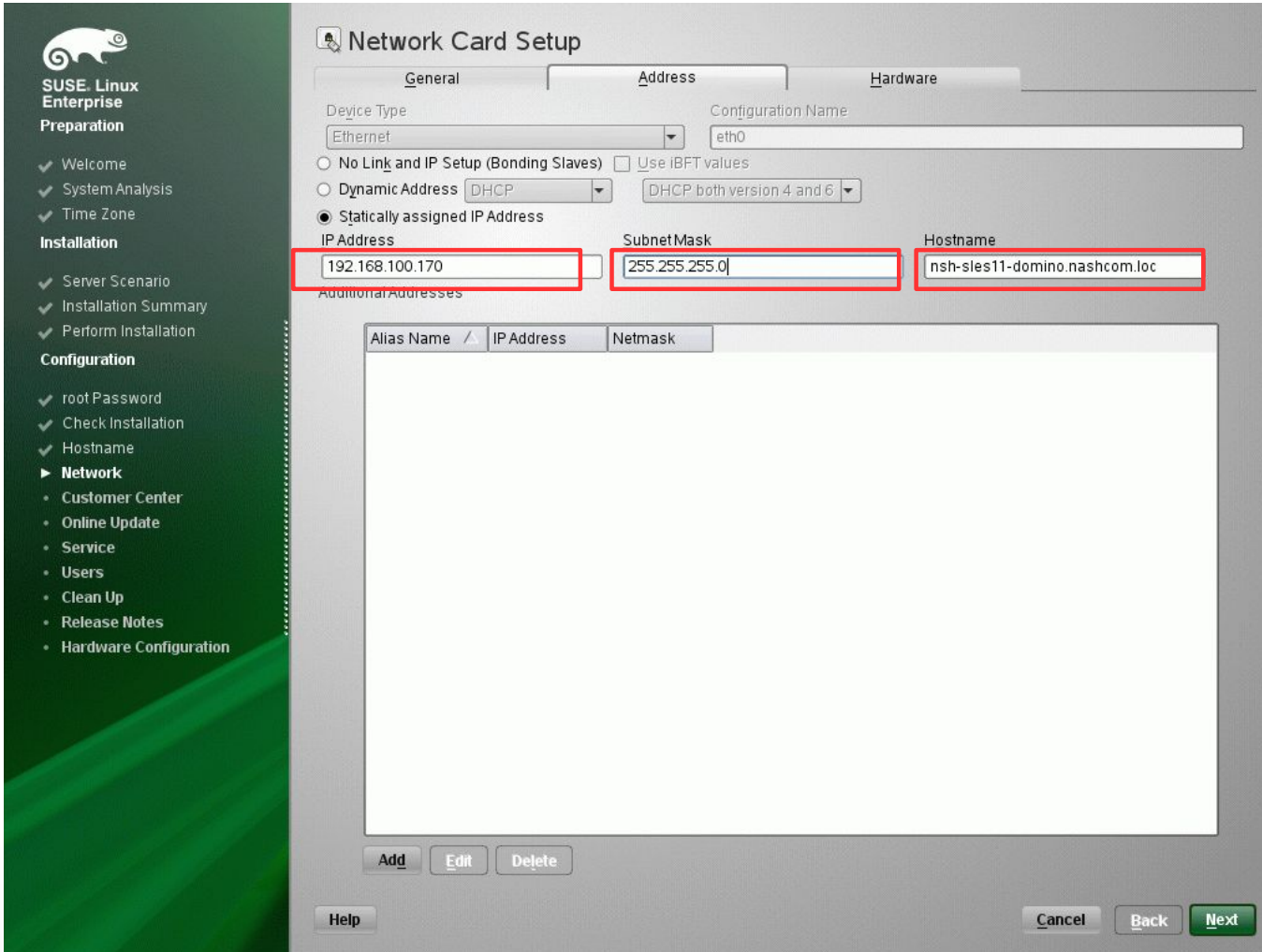
- Device Name: eth0
- Started automatically at boot
- IP address assigned using DHCP

Buttons: Add, Edit, Delete, Help, Cancel, Back, OK

- Edit Network Card Settings



# Network Card Setup



**Network Card Setup**

General | **Address** | Hardware

Device Type: Ethernet | Configuration Name: eth0

No Link and IP Setup (Bonding Slaves)  Use IBFT values

Dynamic Address: DHCP | DHCP both version 4 and 6

Statically assigned IP Address

IP Address: 192.168.100.170 | SubnetMask: 255.255.255.0 | Hostname: nsh-sles11-domino.nashcom.loc

Additional Addresses

Alias Name	IP Address	Netmask
------------	------------	---------

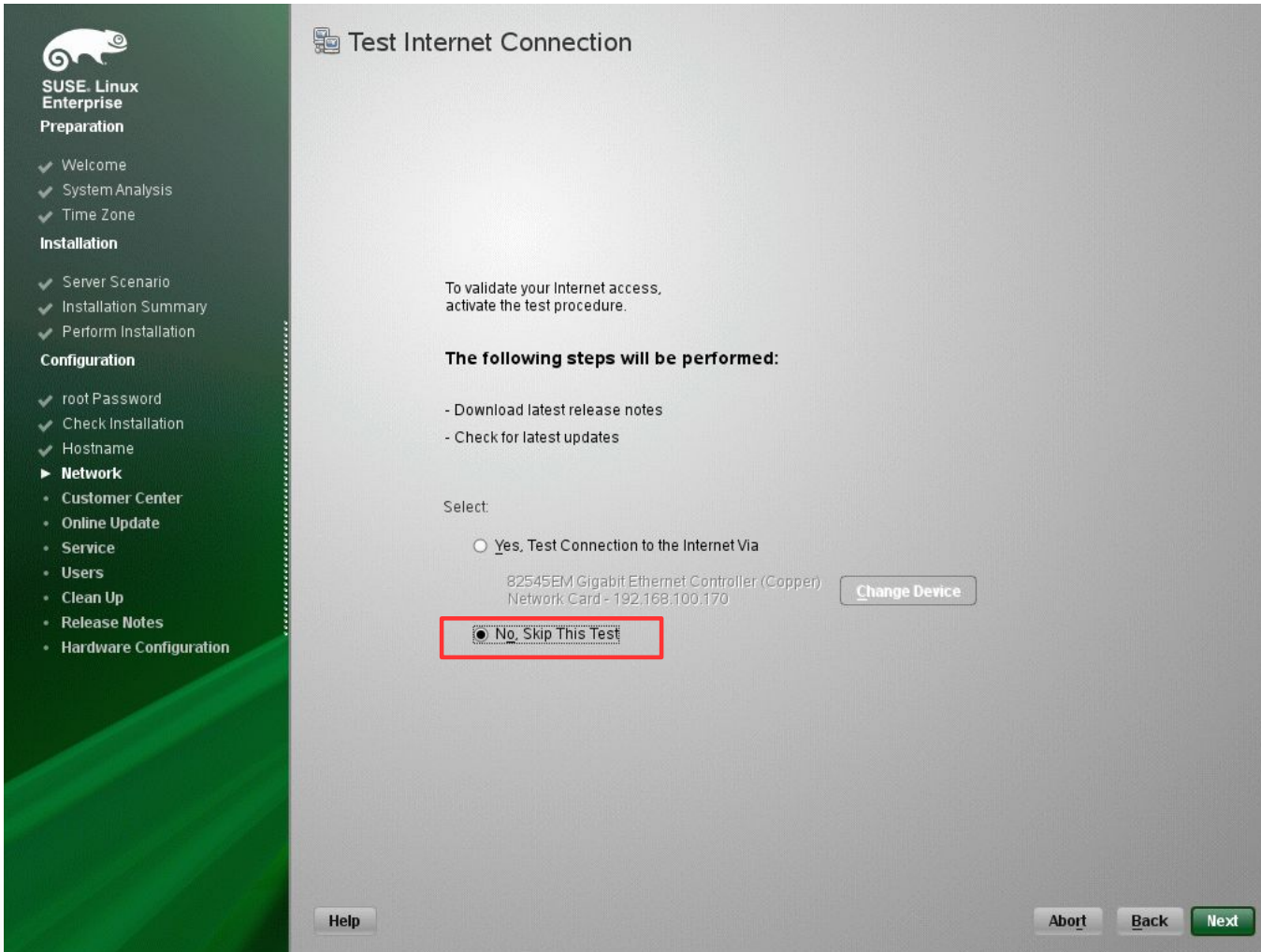
Add Edit Delete

Help Cancel Back Next

- Choose “Statically assigned IP Address”
- Enter IP Adresse and Subnet Mask



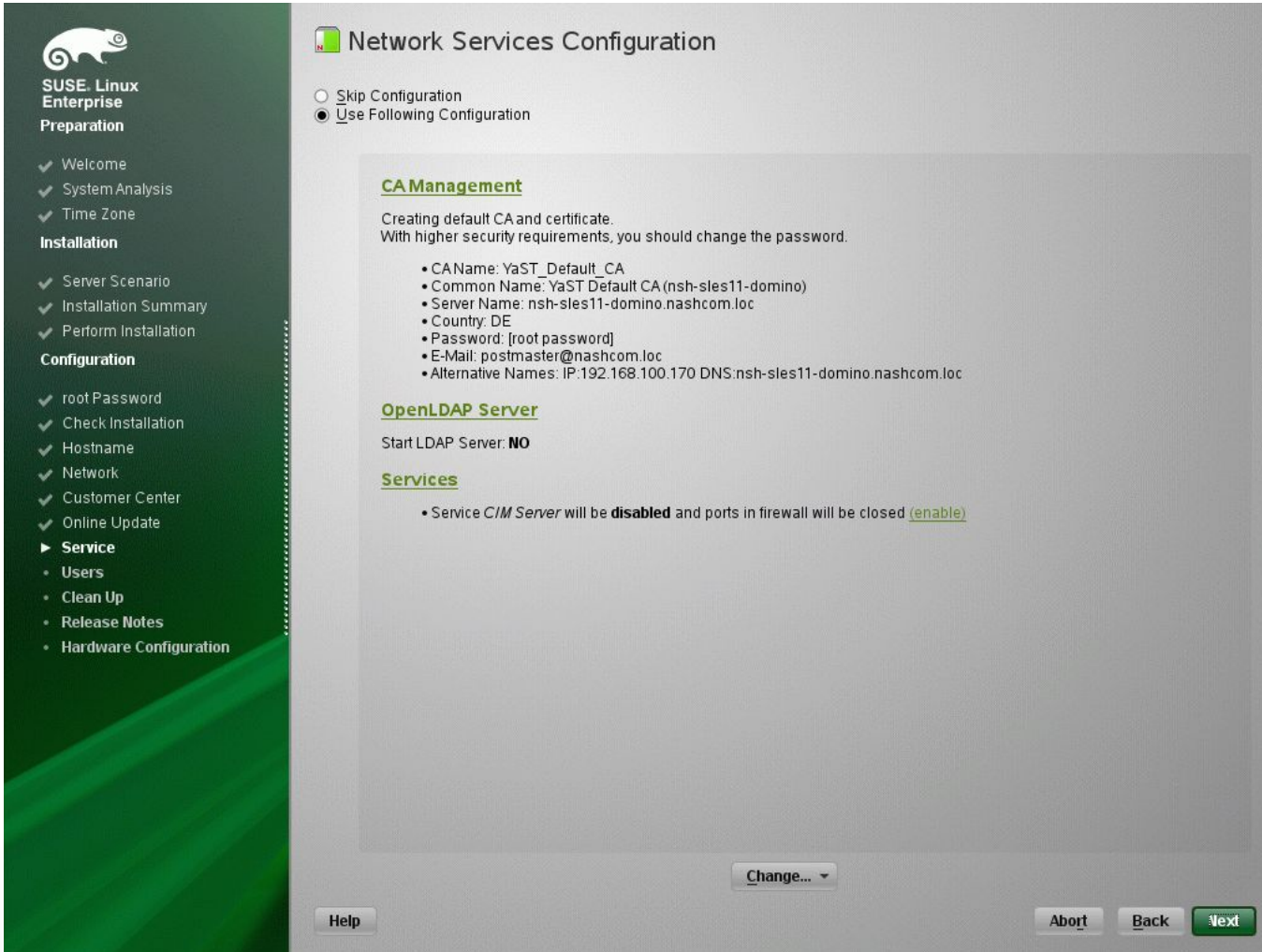
# Test Internet Connection



The screenshot shows the 'Test Internet Connection' screen in the SUSE Linux Enterprise Preparation utility. On the left is a navigation pane with sections: 'SUSE Linux Enterprise Preparation' (with sub-items: Welcome, System Analysis, Time Zone), 'Installation' (with sub-items: Server Scenario, Installation Summary, Perform Installation), and 'Configuration' (with sub-items: root Password, Check Installation, Hostname, Network, Customer Center, Online Update, Service, Users, Clean Up, Release Notes, Hardware Configuration). The 'Network' section is expanded. The main area is titled 'Test Internet Connection' and contains the following text: 'To validate your Internet access, activate the test procedure.' Below this, it states 'The following steps will be performed:' followed by a list: '- Download latest release notes' and '- Check for latest updates'. A 'Select:' section has two radio buttons: 'Yes, Test Connection to the Internet Via' (unselected) and 'No, Skip This Test' (selected and highlighted with a red box). Below the radio buttons, the network card information is displayed: '82545EM Gigabit Ethernet Controller (Copper) Network Card - 192.168.100.170' with a 'Change Device' button. At the bottom, there are 'Help', 'Abort', 'Back', and 'Next' buttons.

- You can skip the internet connection test
- You always can test the connection via ping later on

# Network Services Configuration



**SUSE Linux Enterprise Preparation**

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone
- Installation**
- ✓ Server Scenario
- ✓ Installation Summary
- ✓ Perform Installation
- Configuration**
- ✓ root Password
- ✓ Check Installation
- ✓ Hostname
- ✓ Network
- ✓ Customer Center
- ✓ Online Update
- ▶ **Service**
- Users
- Clean Up
- Release Notes
- Hardware Configuration

## Network Services Configuration

Skip Configuration  
 Use Following Configuration

### CA Management

Creating default CA and certificate.  
With higher security requirements, you should change the password.

- CA Name: YaST\_Default\_CA
- Common Name: YaST Default CA (nsh-sles11-domino)
- Server Name: nsh-sles11-domino.nashcom.loc
- Country: DE
- Password: [root password]
- E-Mail: postmaster@nashcom.loc
- Alternative Names: IP:192.168.100.170 DNS:nsh-sles11-domino.nashcom.loc

### OpenLDAP Server

Start LDAP Server: **NO**

### Services

- Service *CIM Server* will be **disabled** and ports in firewall will be closed ([enable](#))

Change... ▾

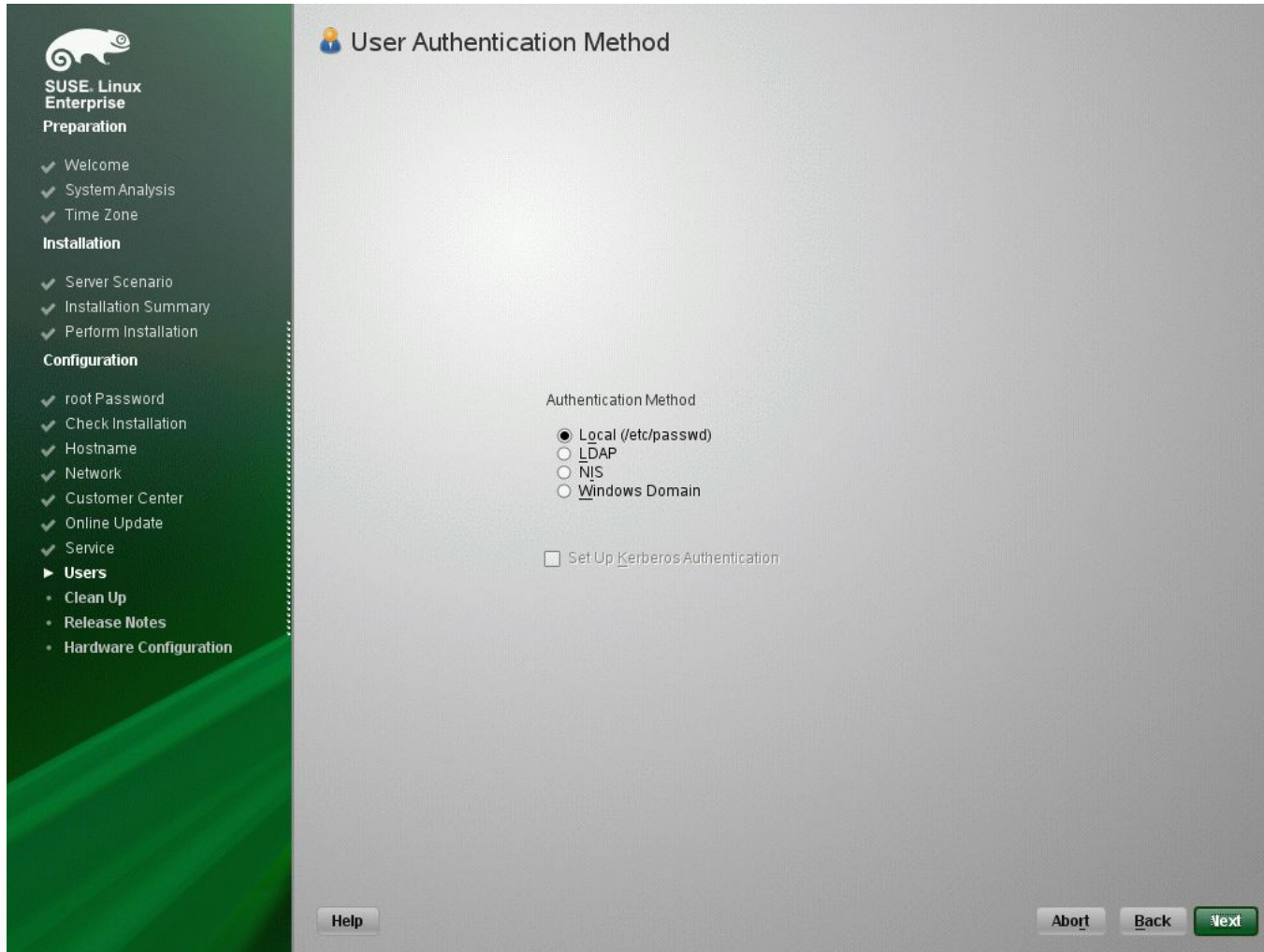
Help Abort Back Next

- No additional services are needed
- But it is good to have a CA and Certificate just in case
  - Default option



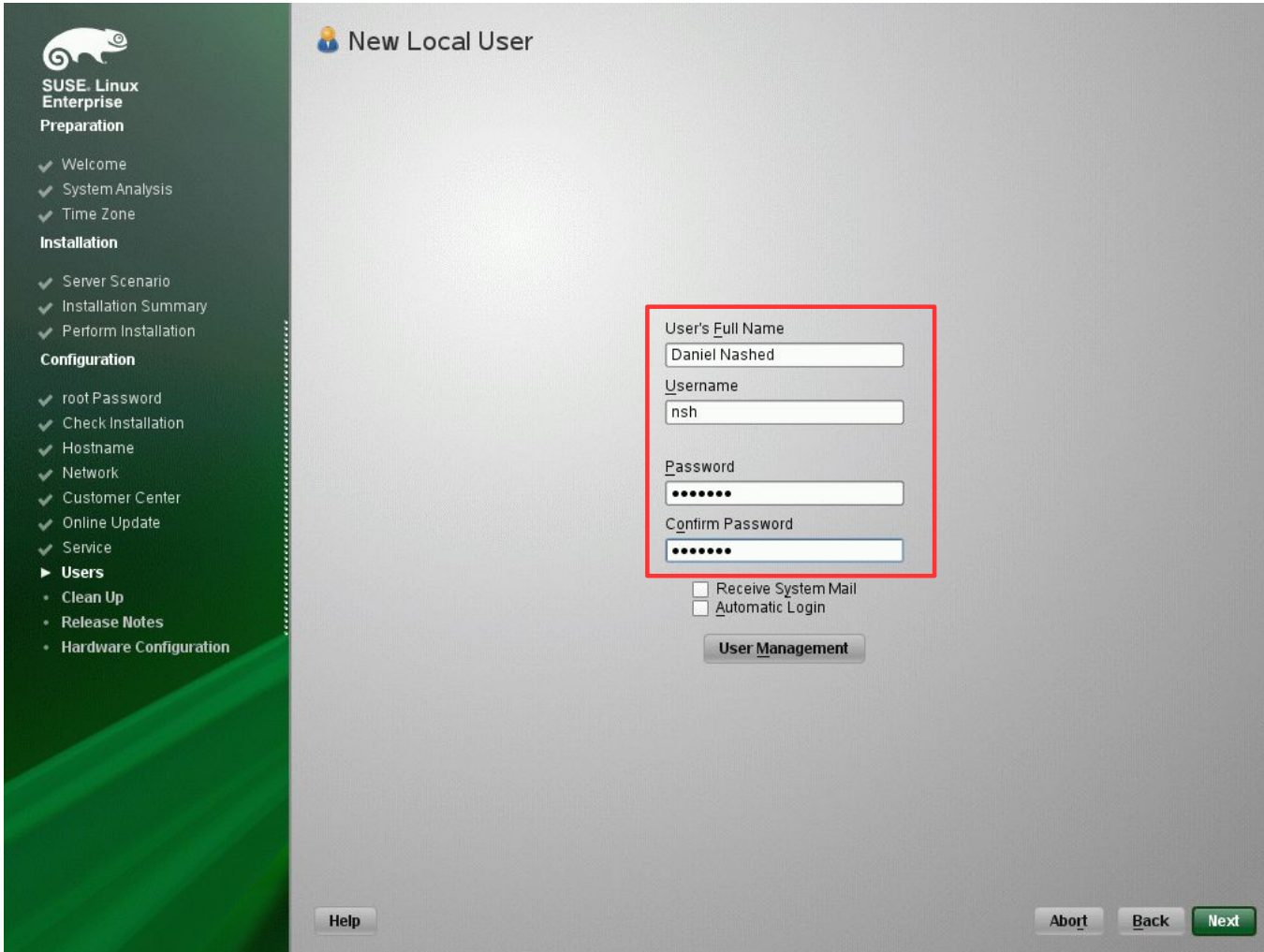


# User Authentication Method



- Choose Local Password
- Other methods are available for enterprise wide authentication
- Can make sense if you have many users and servers
  - For example if every admin has his own account on a Domino server for login

# New Local User



**SUSE Linux Enterprise Preparation**

- ✓ Welcome
- ✓ System Analysis
- ✓ Time Zone
- Installation**
- ✓ Server Scenario
- ✓ Installation Summary
- ✓ Perform Installation
- Configuration**
- ✓ root Password
- ✓ Check Installation
- ✓ Hostname
- ✓ Network
- ✓ Customer Center
- ✓ Online Update
- ✓ Service
- ▶ **Users**
- Clean Up
- Release Notes
- Hardware Configuration

**New Local User**

User's Full Name  
Daniel Nashed

Username  
nsh

Password  
••••••

Confirm Password  
••••••

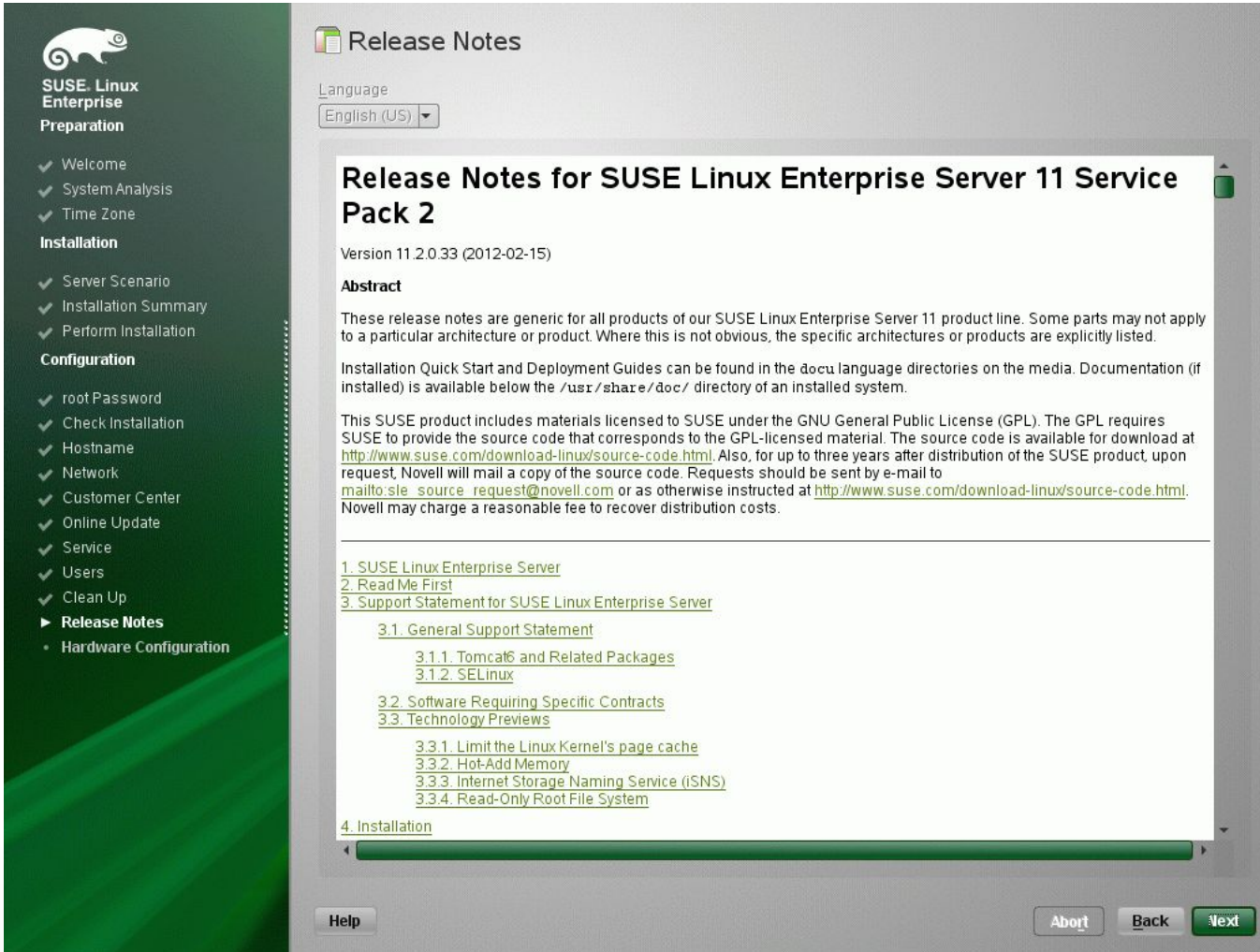
Receive System Mail  
 Automatic Login

User Management

Help Abort Back Next

- Create your local user for login
  - Fullname
  - Username
  - Password
- Click “Next”

# Release Notes



**Release Notes**

Language  
English (US)

## Release Notes for SUSE Linux Enterprise Server 11 Service Pack 2

Version 11.2.0.33 (2012-02-15)

**Abstract**

These release notes are generic for all products of our SUSE Linux Enterprise Server 11 product line. Some parts may not apply to a particular architecture or product. Where this is not obvious, the specific architectures or products are explicitly listed.

Installation Quick Start and Deployment Guides can be found in the `docu` language directories on the media. Documentation (if installed) is available below the `/usr/share/doc/` directory of an installed system.

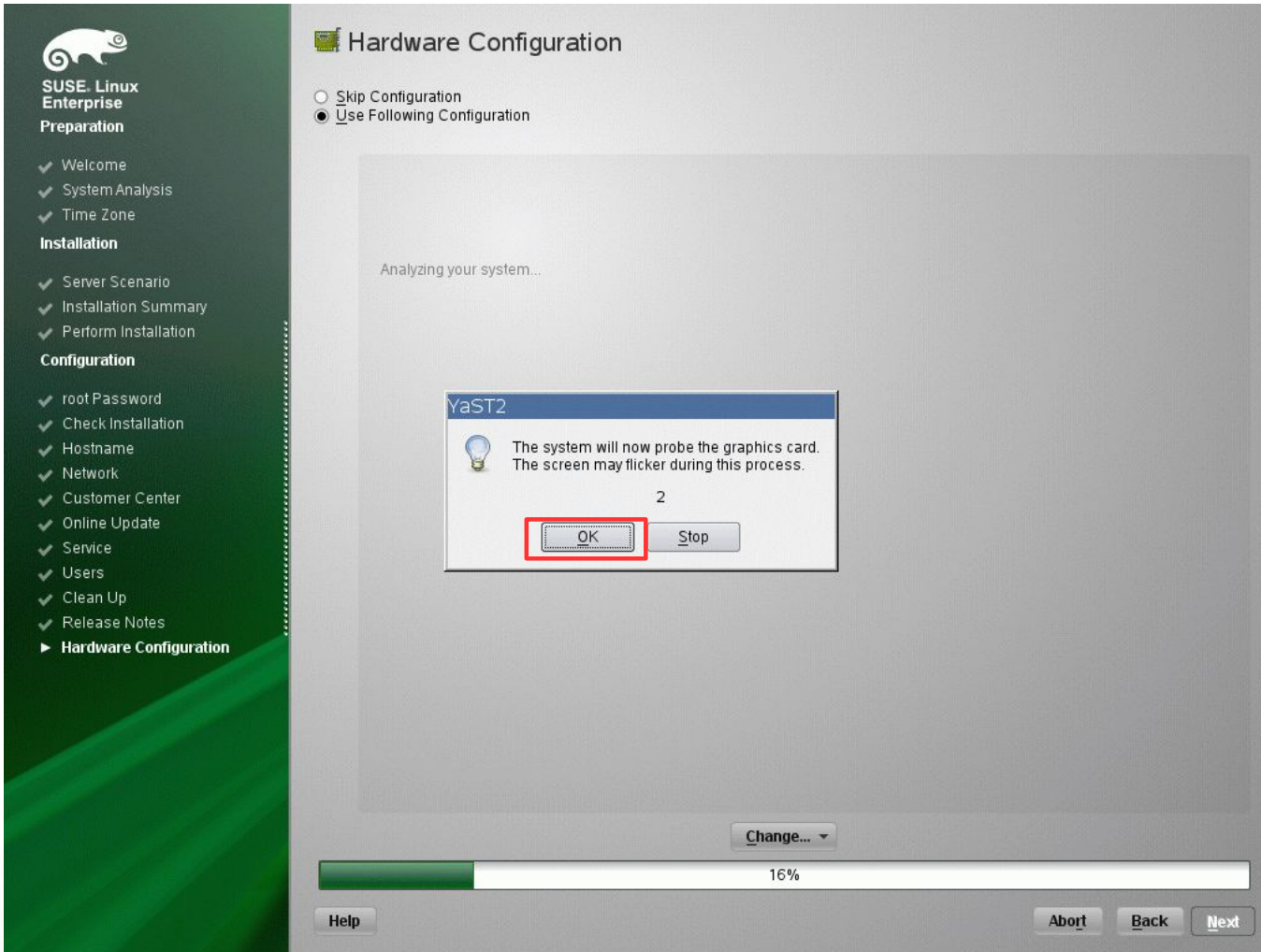
This SUSE product includes materials licensed to SUSE under the GNU General Public License (GPL). The GPL requires SUSE to provide the source code that corresponds to the GPL-licensed material. The source code is available for download at <http://www.suse.com/download-linux/source-code.html>. Also, for up to three years after distribution of the SUSE product, upon request, Novell will mail a copy of the source code. Requests should be sent by e-mail to [mailto:sle\\_source\\_request@novell.com](mailto:sle_source_request@novell.com) or as otherwise instructed at <http://www.suse.com/download-linux/source-code.html>. Novell may charge a reasonable fee to recover distribution costs.

- [1. SUSE Linux Enterprise Server](#)
- [2. Read Me First](#)
- [3. Support Statement for SUSE Linux Enterprise Server](#)
  - [3.1. General Support Statement](#)
    - [3.1.1. Tomcat6 and Related Packages](#)
    - [3.1.2. SELinux](#)
  - [3.2. Software Requiring Specific Contracts](#)
  - [3.3. Technology Previews](#)
    - [3.3.1. Limit the Linux Kernel's page cache](#)
    - [3.3.2. Hot-Add Memory](#)
    - [3.3.3. Internet Storage Naming Service \(ISNS\)](#)
    - [3.3.4. Read-Only Root File System](#)
- [4. Installation](#)

Help Abort Back Next

- Release Notes give an overview over changes and new functionality

# Hardware Configuration



**SUSE Linux Enterprise Preparation**


- ✓ Welcome
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- ✓ Users
- ✓ Clean Up
- ✓ Release Notes
- ▶ **Hardware Configuration**

**Hardware Configuration**

Skip Configuration  
 Use Following Configuration

Analyzing your system...

**YaST2**

 The system will now probe the graphics card.  
The screen may flicker during this process.

2

**OK** Stop

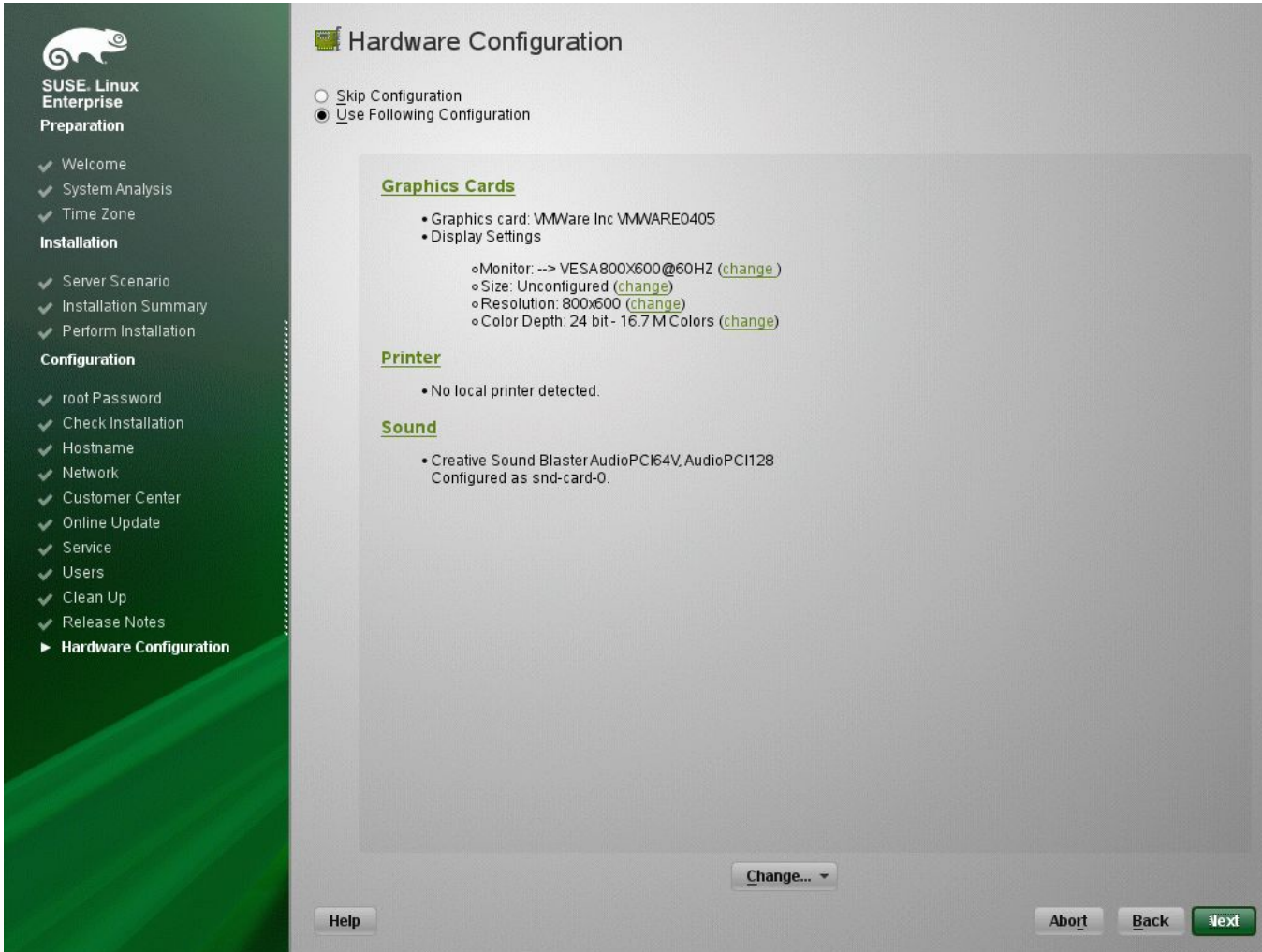
Change... ▾

16%

Help Abort Back Next

- Hardware Configuration will probe the graphic card

# Hardware Configuration



**SUSE Linux Enterprise Preparation**

- ✓ Welcome
- ✓ System Analysis
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- Installation**
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- Configuration**
- ✓ root Password
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- ✓ Network
- ✓ Customer Center
- ✓ Online Update
- ✓ Service
- ✓ Users
- ✓ Clean Up
- ✓ Release Notes
- ▶ **Hardware Configuration**

## Hardware Configuration

Skip Configuration  
 Use Following Configuration

### Graphics Cards

- Graphics card: VMware Inc VMWARE0405
- Display Settings
  - Monitor: --> VESA800X600@60HZ ([change](#))
  - Size: Unconfigured ([change](#))
  - Resolution: 800x600 ([change](#))
  - Color Depth: 24 bit - 16.7 M Colors ([change](#))

### Printer

- No local printer detected.

### Sound

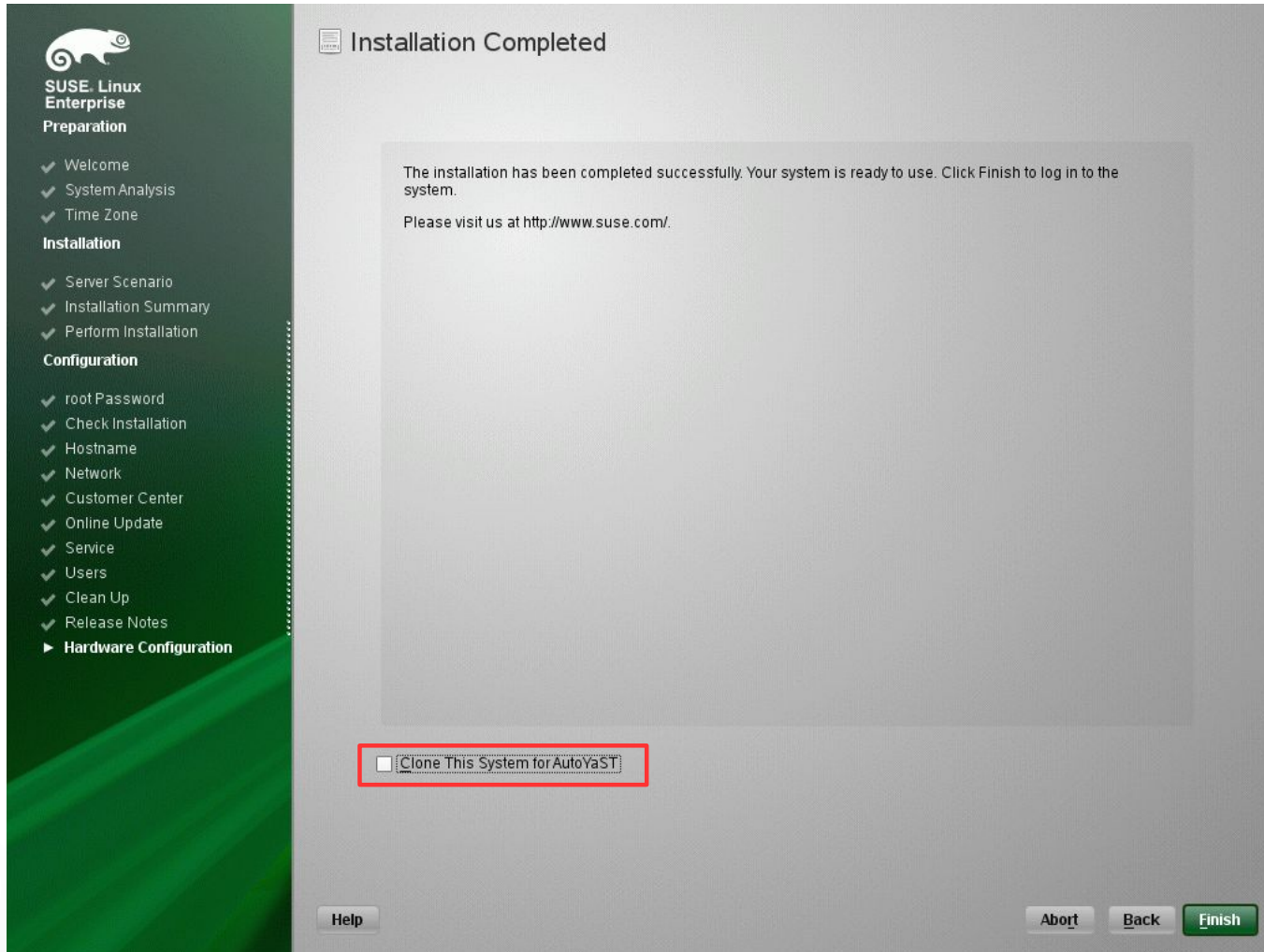
- Creative Sound Blaster AudioPCI64V, AudioPCI128  
Configured as snd-card-0.

Change... ▾

Help Abort Back Next

- Confirm detected graphics card
  - Should be fine in most cases
  - You could also switch to a different resolution
  - VMware should auto detect the resolution when you change it

# Installation Complete



- Disable “Clone This System to AutoYaST” unless you want to setup the same configuration on a different server
  - Takes a while to clone the config

## Starting Point for the “Show” part of “Show & Tell”

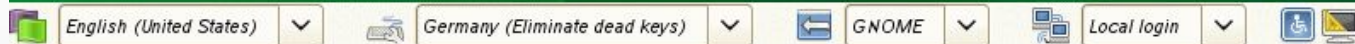
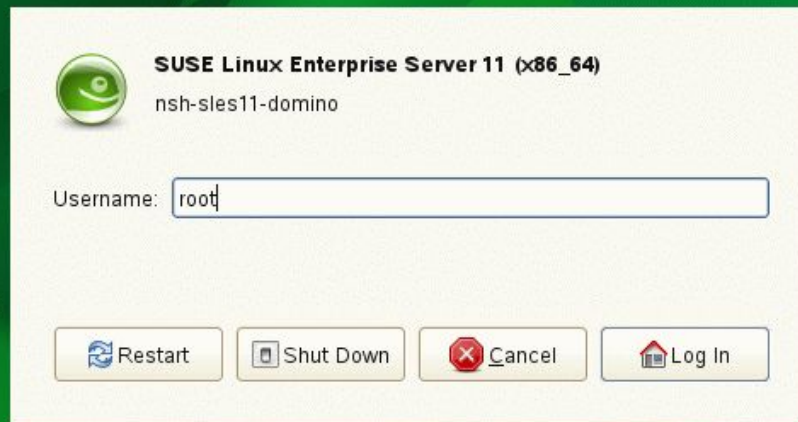
- Installation on SLES and RHEL are quite similar
- The installation in this Show & Tell presentation is done on SLES
  - I will also show differences for the RHEL install part
- The installation is pretty straight forward too
- So we will focus on the important aspects
  - Domino Server configuration/setup looks very similar to what we know from Windows



# First Login

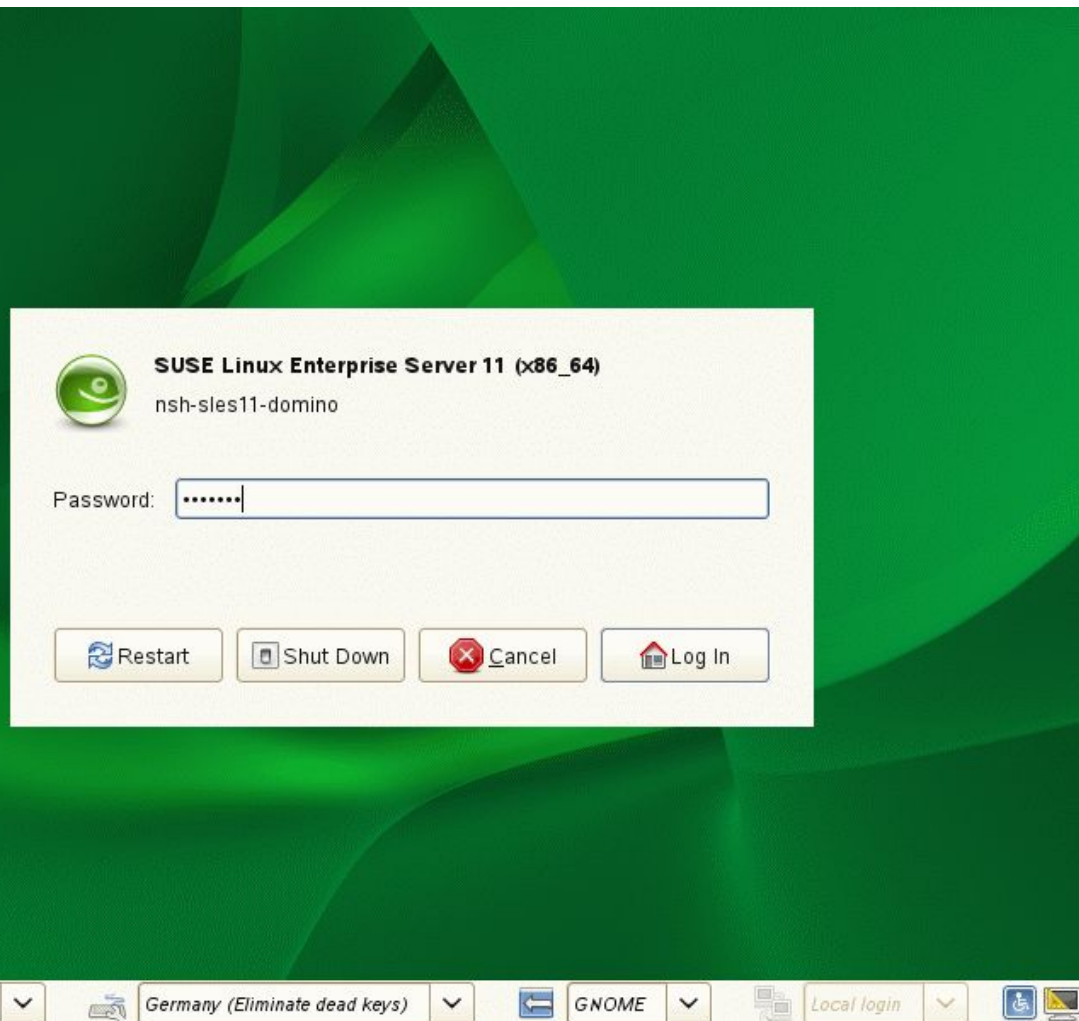


- Login into the machine using either your new account or “root”





# First Login



- Type in your password

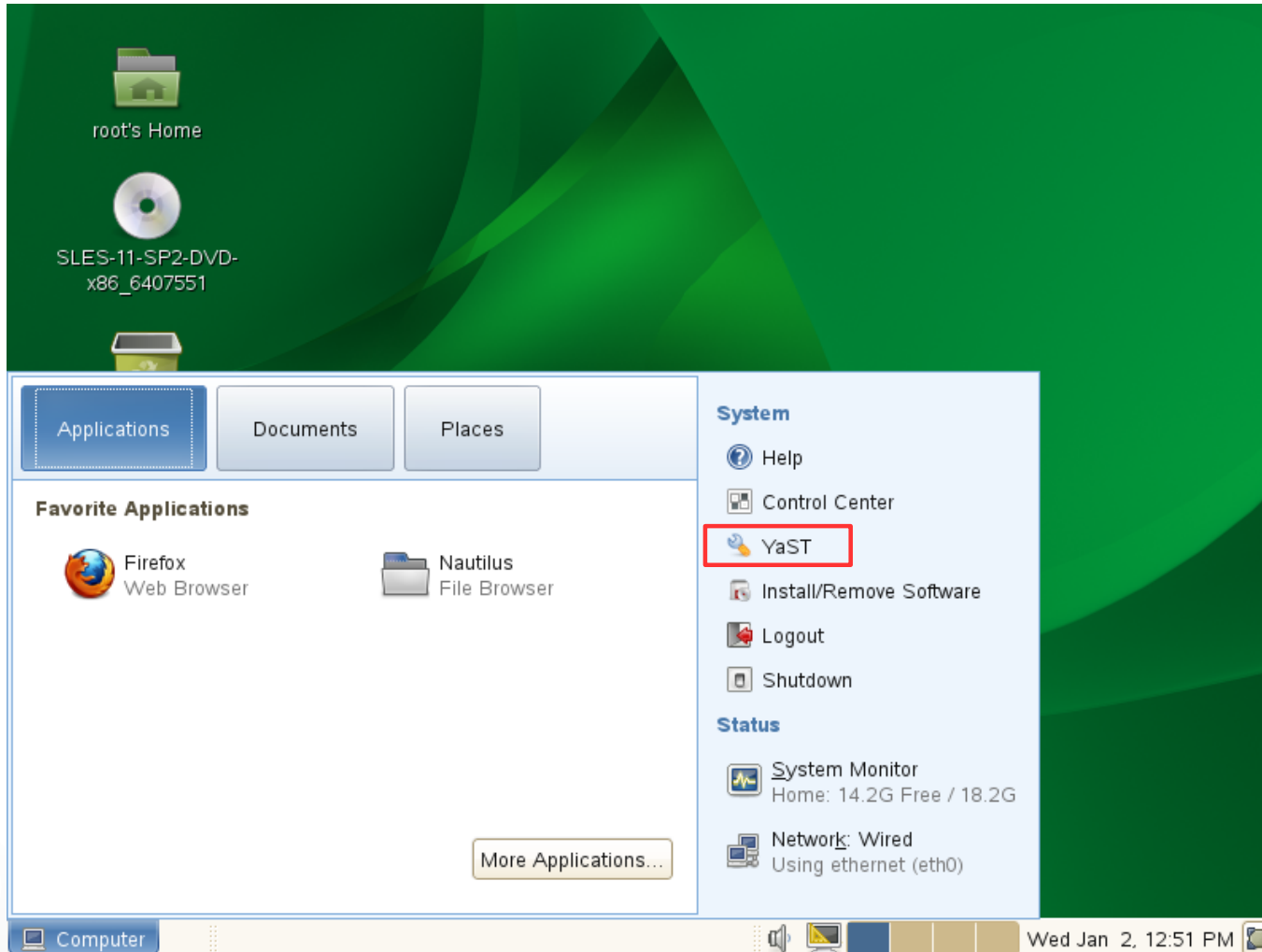
# Linux Desktop after Installation



- This is the graphical UI for SLES 11 SP2

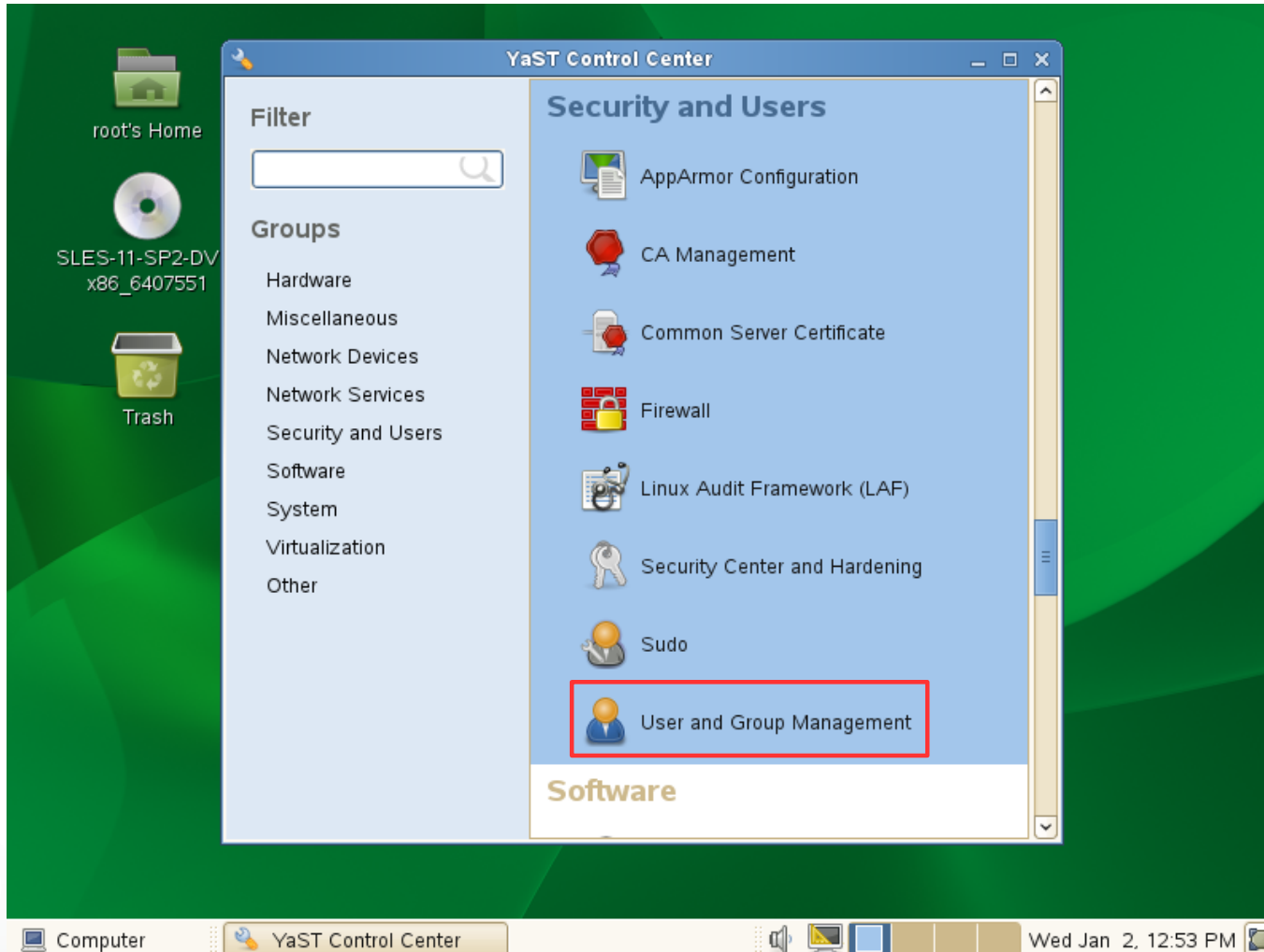


# “Computer Menu” contains applications



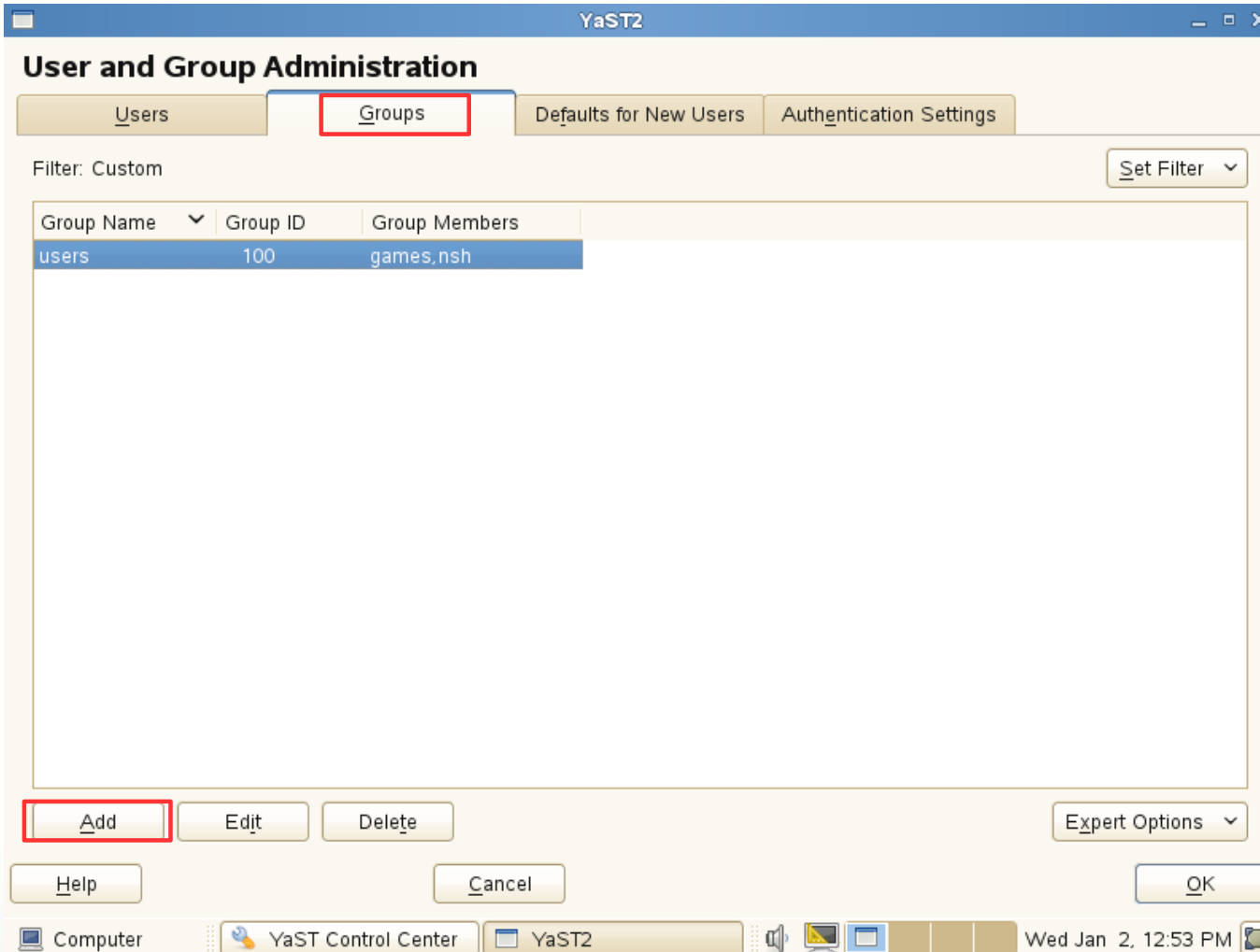
- All installed software you need is here
- Select YaST for admin tools

# YaST Control Center



- YaST = Yet another Setup Tool
  - Sounds basic but contains all essential admin steps you need
  - Different sections for most of your administrative work
- Select “User and Group Management”

# Group Administration



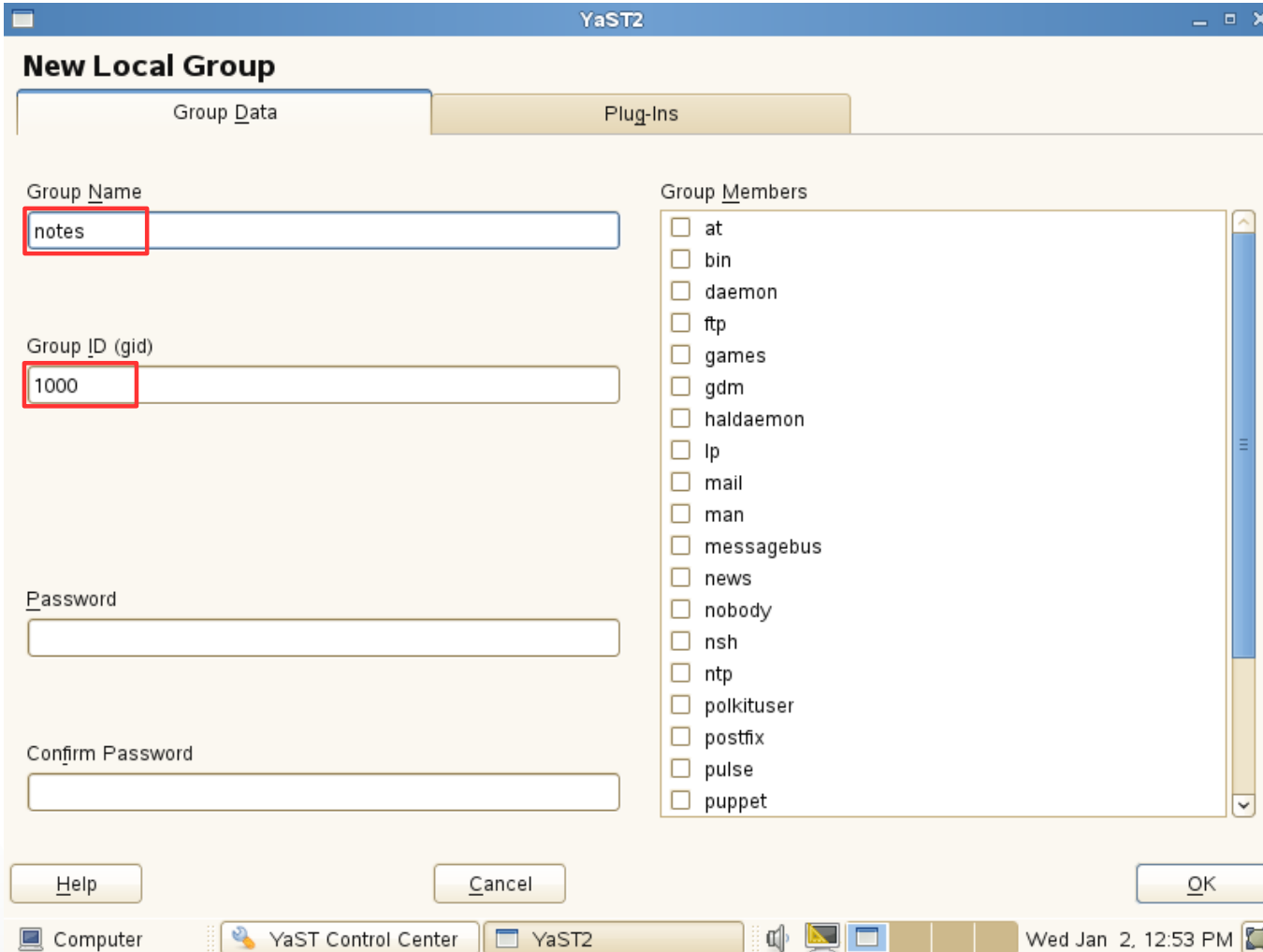
The screenshot shows the YaST2 User and Group Administration window. The 'Groups' tab is selected and highlighted with a red box. Below the tabs, there is a table with the following data:

Group Name	Group ID	Group Members
users	100	games, nsh

At the bottom of the window, the 'Add' button is highlighted with a red box. Other buttons include 'Edit', 'Delete', 'Help', 'Cancel', 'OK', and 'Expert Options'. The system tray at the bottom shows 'Computer', 'YaST Control Center', 'YaST2', and the date 'Wed Jan 2, 12:53 PM'.

- Select “Groups”
- Click “Add”

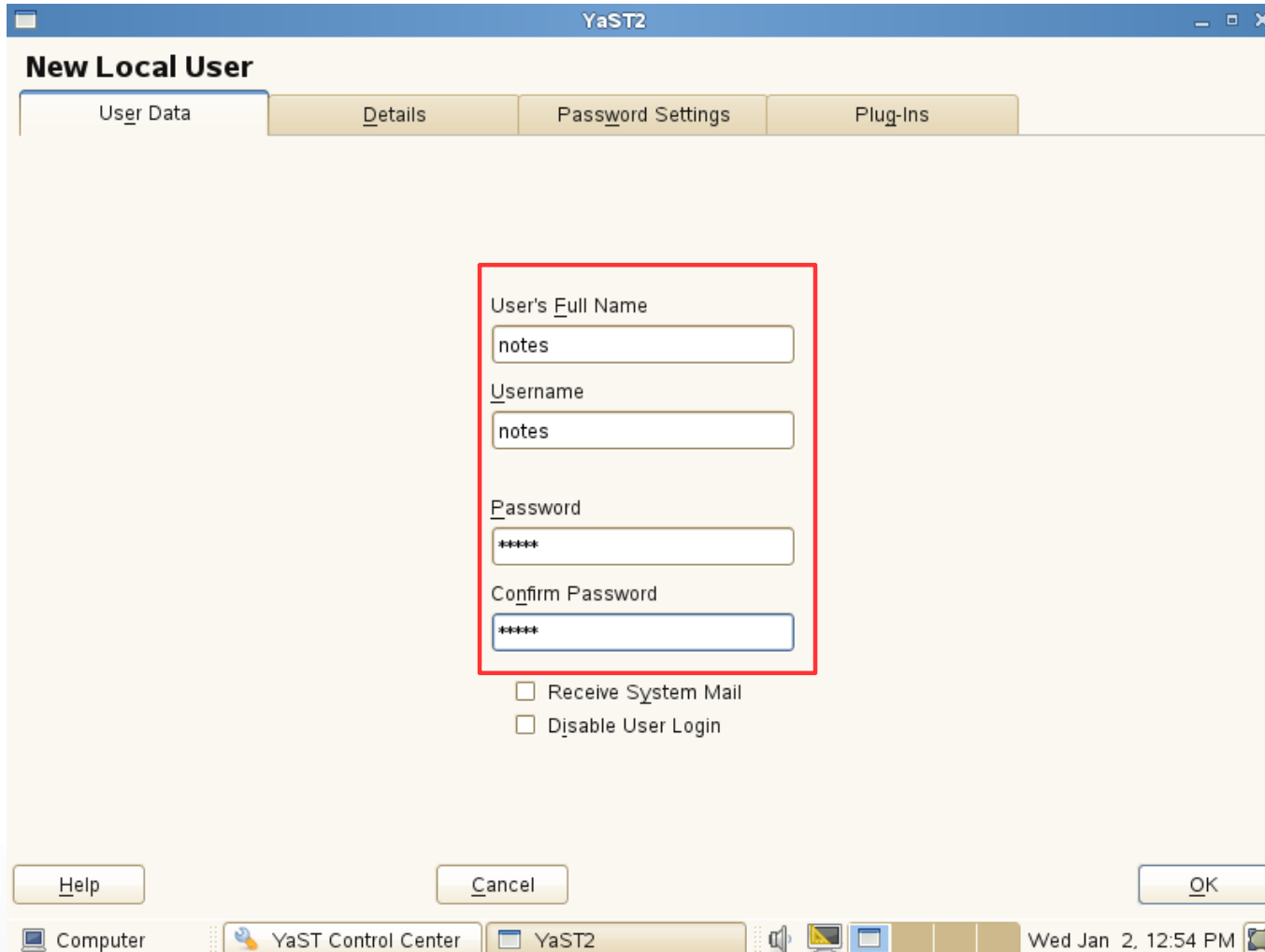
# Add Group “notes”



The screenshot shows the YaST2 'New Local Group' dialog box. The 'Group Name' field is set to 'notes' and the 'Group ID (gid)' field is set to '1000'. The 'Group Members' list is empty. The 'Password' and 'Confirm Password' fields are empty. The 'OK' button is highlighted.

- Type in “notes”
- Group ID defines the internal ID used for this group
  - Automatically maintained
- Click “OK”

# New Local User “notes”



YaST2

## New Local User

User Data | Details | Password Settings | Plug-Ins

User's Full Name  
notes

Username  
notes

Password  
\*\*\*\*

Confirm Password  
\*\*\*\*

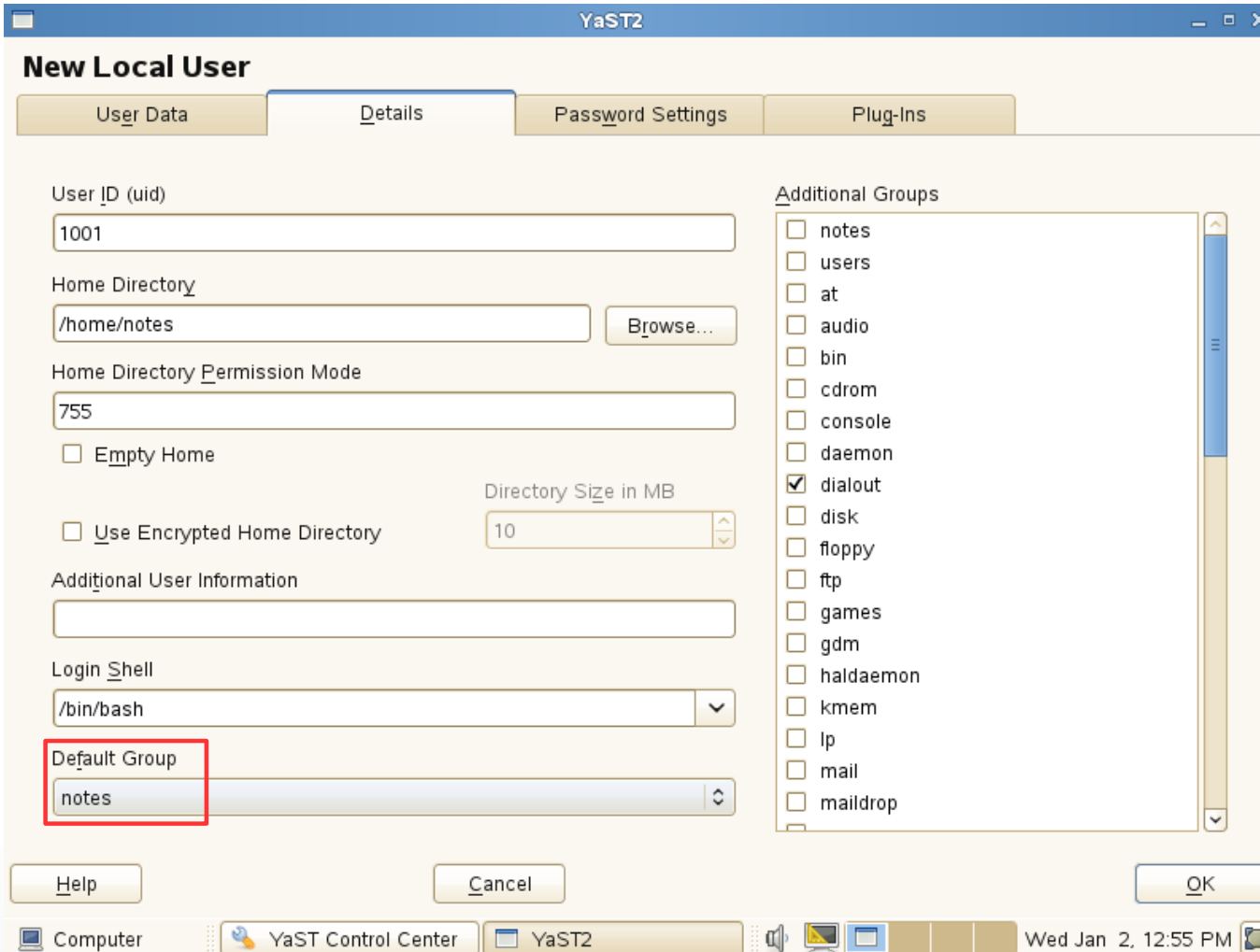
Receive System Mail  
 Disable User Login

Help Cancel OK

Computer YaST Control Center YaST2 Wed Jan 2, 12:54 PM

- Create an user “notes”
- Type in
  - Fullname
  - Username
  - Password
- Username should never exceed 8 chars
  - Does not work well with some admin tools like “ps” (process list)
- Click on “Details”

# New Local User - Details



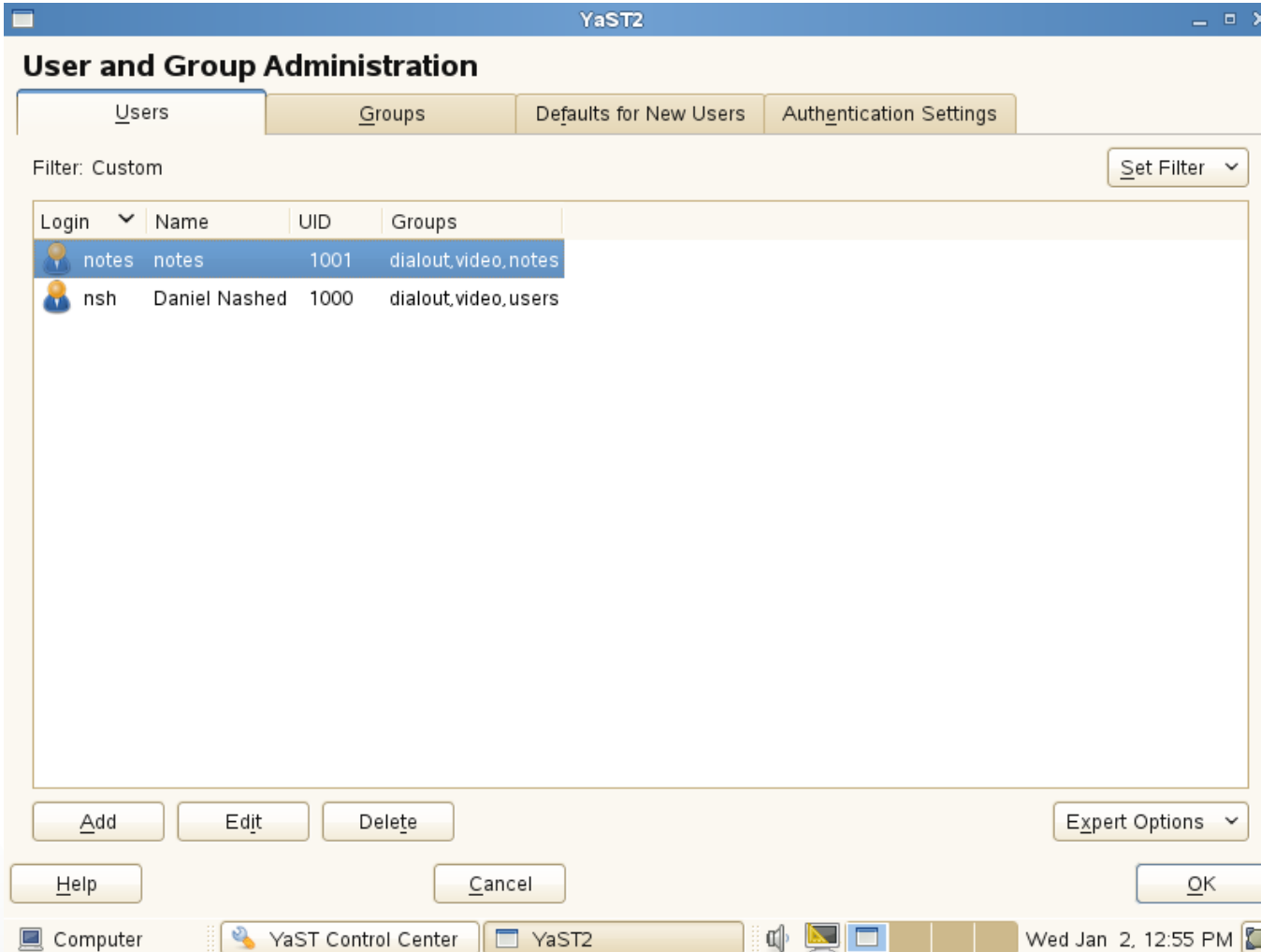
The image shows a screenshot of the YaST2 'New Local User' window, specifically the 'Details' tab. The window is titled 'YaST2' and has a blue header bar. Below the header, there are four tabs: 'User Data', 'Details', 'Password Settings', and 'Plug-Ins'. The 'Details' tab is active. The form contains several fields and a list of groups. The 'User ID (uid)' field is set to '1001'. The 'Home Directory' field is set to '/home/notes' with a 'Browse...' button next to it. The 'Home Directory Permission Mode' field is set to '755'. There are three checkboxes: 'Empty Home' (unchecked), 'Use Encrypted Home Directory' (unchecked), and 'Directory Size in MB' (set to '10'). The 'Additional User Information' field is empty. The 'Login Shell' dropdown is set to '/bin/bash'. The 'Default Group' dropdown is set to 'notes' and is highlighted with a red box. To the right of the form is a list of 'Additional Groups' with checkboxes: notes, users, at, audio, bin, cdrom, console, daemon, dialout (checked), disk, floppy, ftp, games, gdm, haldaemon, kmem, lp, mail, and maildrop. At the bottom of the window are 'Help', 'Cancel', and 'OK' buttons. The taskbar at the bottom shows 'Computer', 'YaST Control Center', and 'YaST2' windows, along with system icons and the date 'Wed Jan 2, 12:55 PM'.

- Select “notes” as the Default Group for this user
  - The group we created earlier
- Click “OK”





# User and Group “notes” created

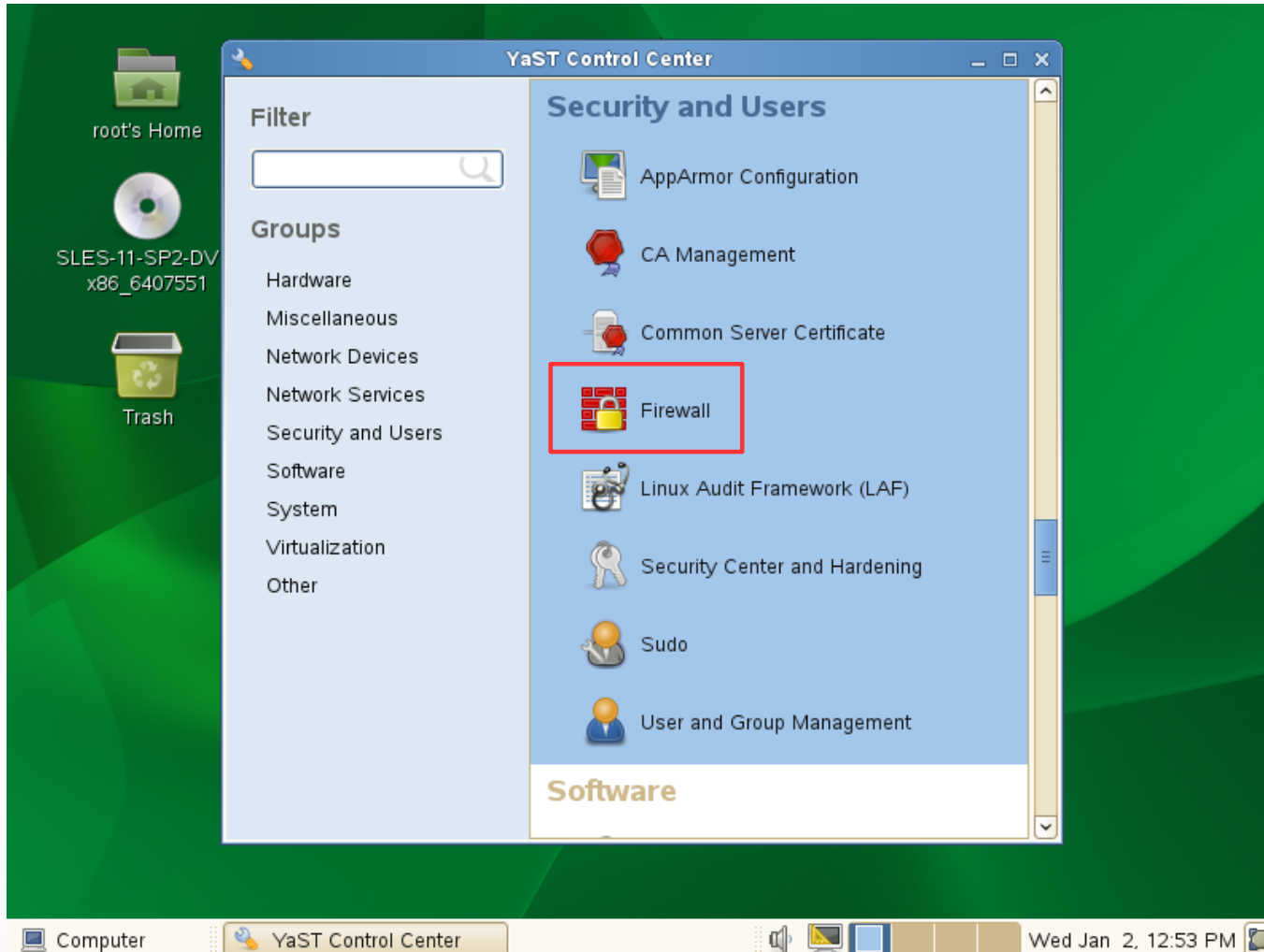


The screenshot shows the YaST2 User and Group Administration window. The window title is "YaST2" and the main title is "User and Group Administration". There are four tabs: "Users", "Groups", "Defaults for New Users", and "Authentication Settings". The "Users" tab is selected. A filter is set to "Custom". Below the filter is a table with columns: "Login", "Name", "UID", and "Groups". The table contains two rows: one for user "notes" (UID 1001) and one for user "nsh" (UID 1000). At the bottom of the window are buttons for "Add", "Edit", "Delete", "Help", "Cancel", and "OK". The system tray at the bottom shows "Computer", "YaST Control Center", "YaST2", and the date/time "Wed Jan 2, 12:55 PM".

Login	Name	UID	Groups
notes	notes	1001	dialout,video,notes
nsh	Daniel Nashed	1000	dialout,video,users

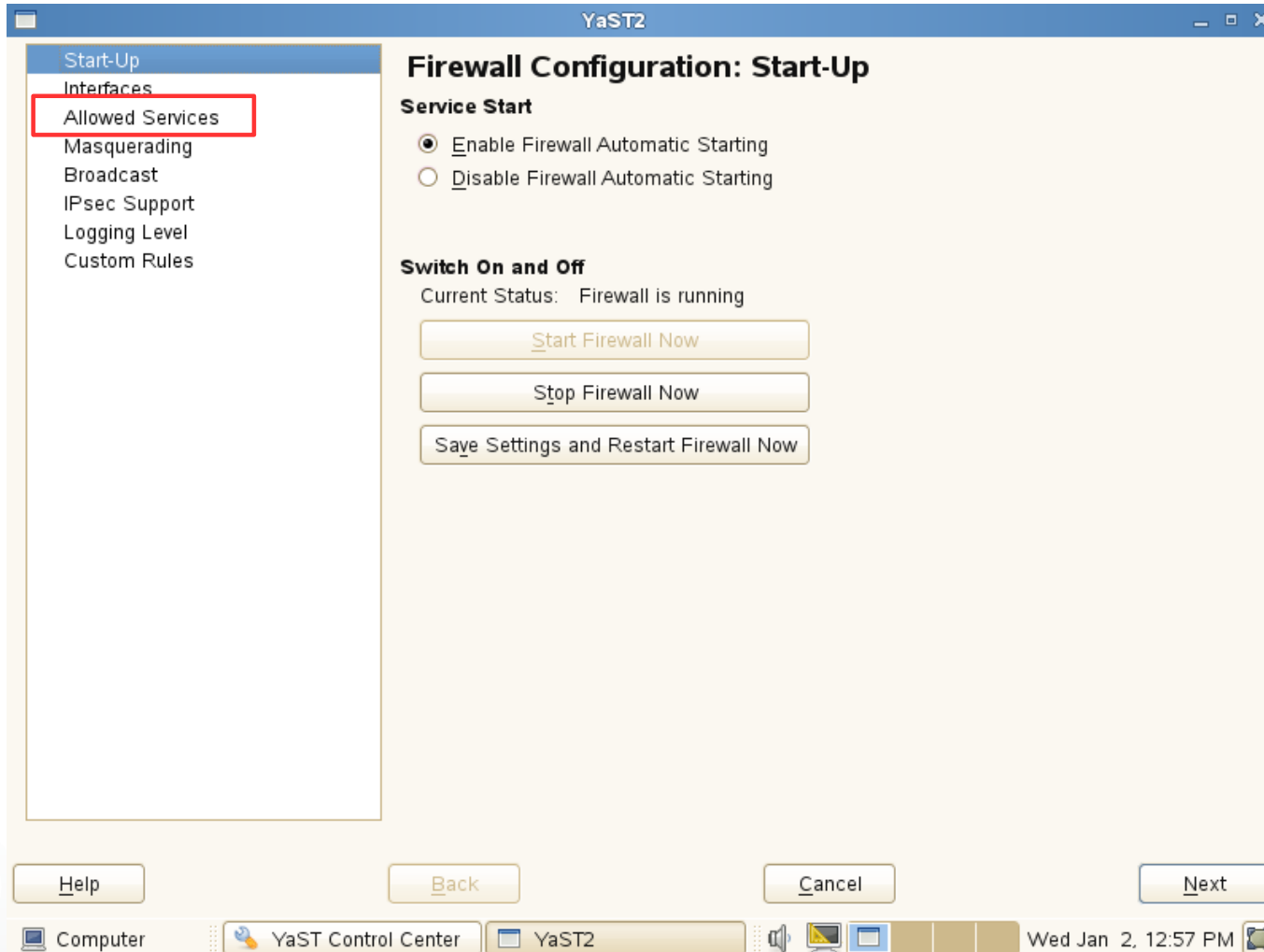
- Overview shows current users
- Click “OK”

# Firewall Configuration



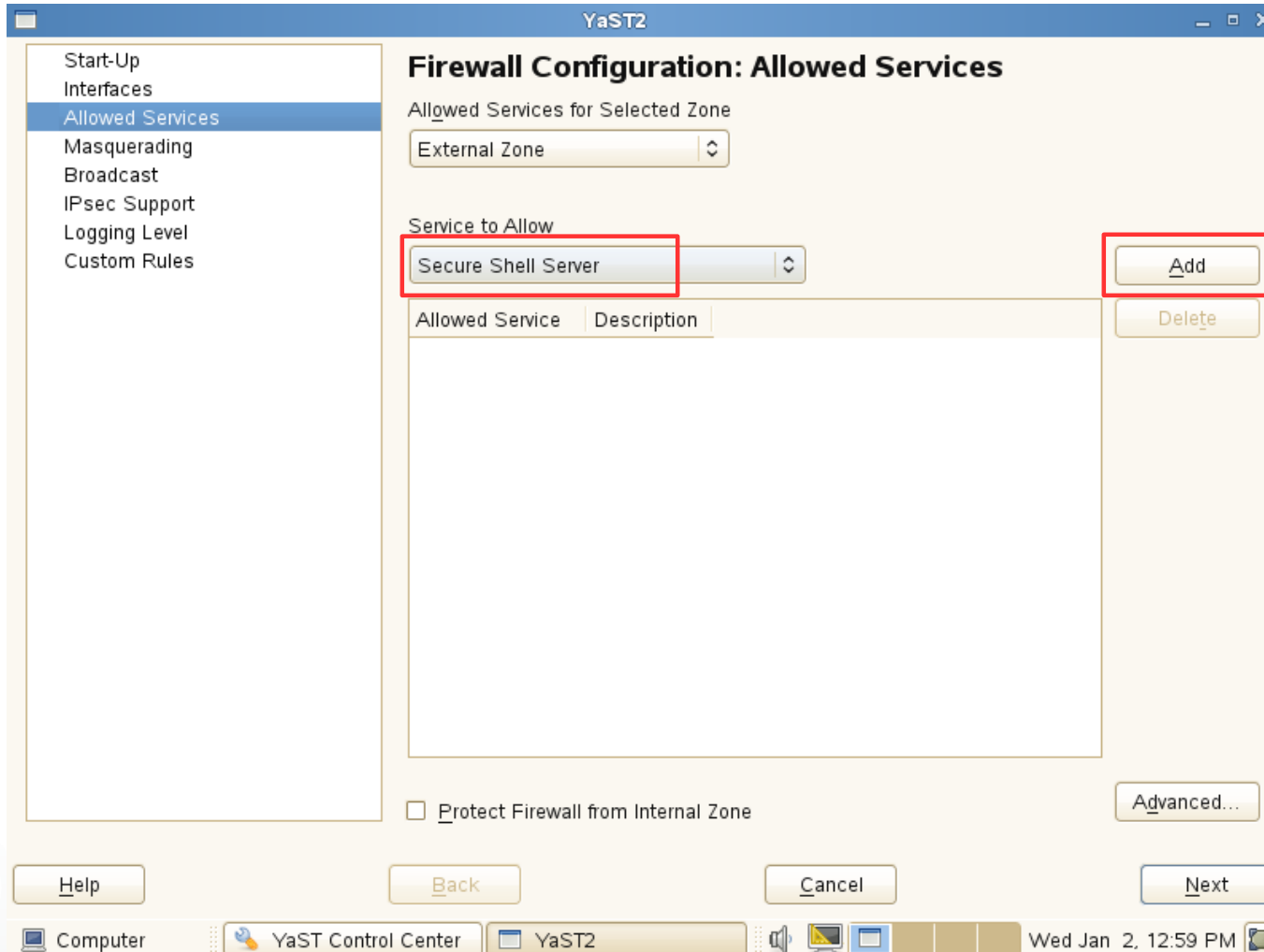
- Click on “Firewall”

# Firewall Configuration



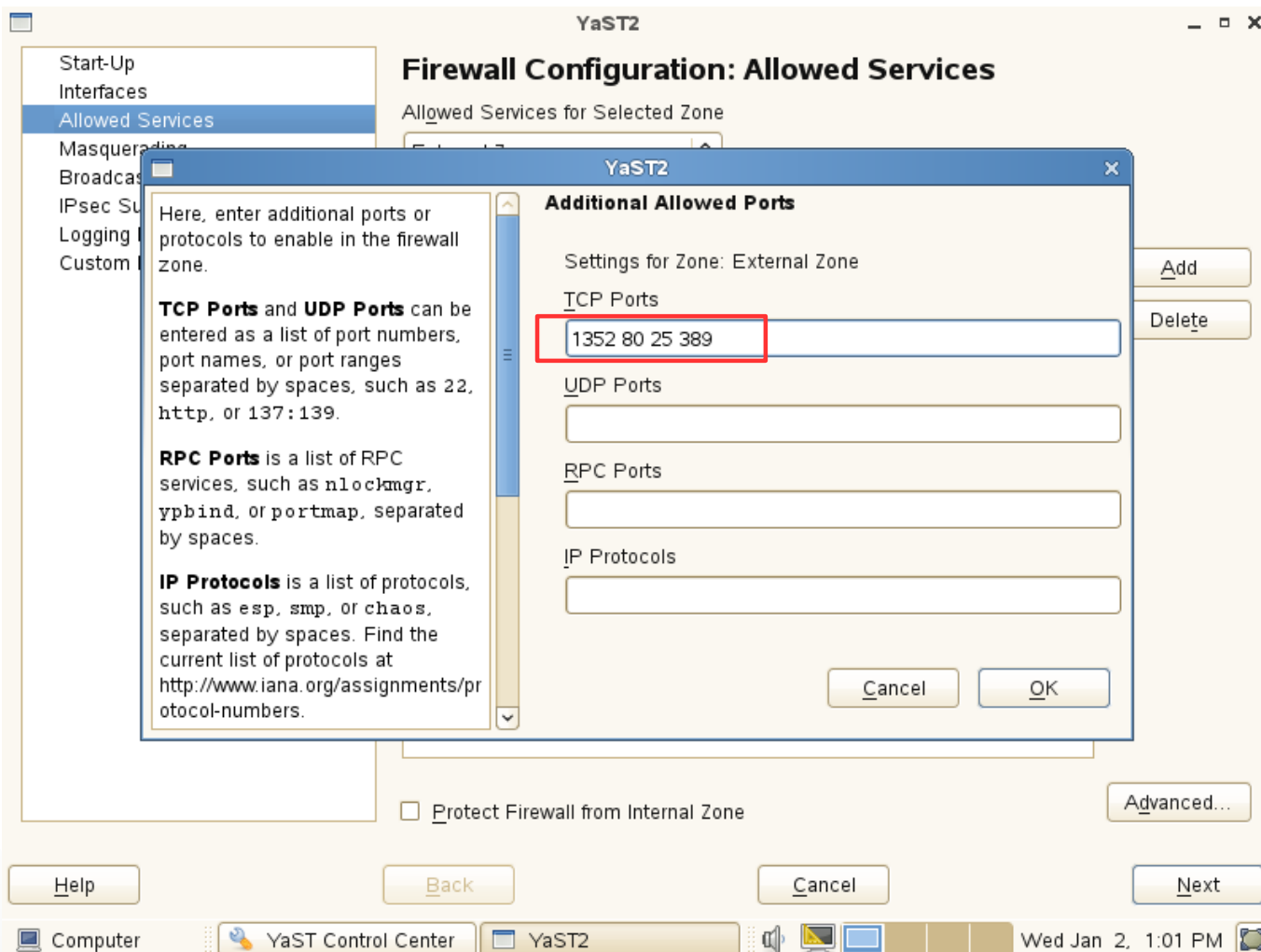
- Firewall is enabled by default
- You just need to enable required services
- Click “Allowed Services”

# Firewall Configuration – Allow SSH



- Add “Secure Shell Server” (SSH) to the allowed services by selecting and clicking “Add”
- Click on “Custom Rules” to specify additional services

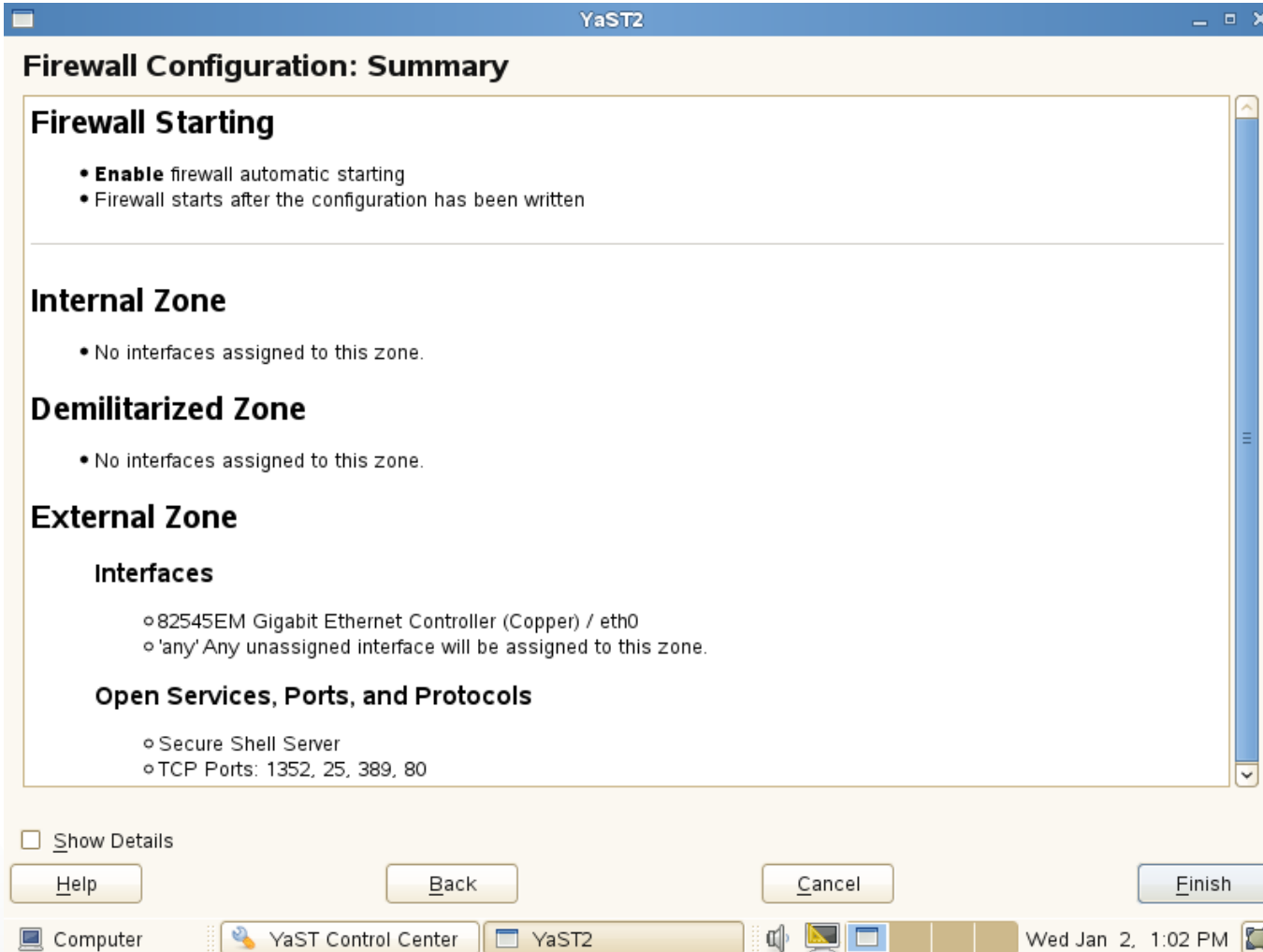
# Firewall Configuration – Allow Additional Ports



The screenshot shows the YaST2 Firewall Configuration interface. The main window is titled "Firewall Configuration: Allowed Services" and displays "Allowed Services for Selected Zone". A sidebar on the left lists various configuration options, with "Allowed Services" selected. A dialog box titled "YaST2" is open, titled "Additional Allowed Ports". It contains instructions for entering ports and protocols. The "TCP Ports" field is highlighted with a red box and contains the text "1352 80 25 389". Other fields for "UDP Ports", "RPC Ports", and "IP Protocols" are empty. The dialog has "Add" and "Delete" buttons on the right and "Cancel" and "OK" buttons at the bottom. The main window also has "Add" and "Delete" buttons on the right and "Cancel" and "OK" buttons at the bottom. The system tray at the bottom shows the date and time as "Wed Jan 2, 1:01 PM".

- Specify Ports for NRPC, HTTP, SMTP, LDAP
  - 1352 80 25 389
- Note: Do not add a comma between the ports!
- Click “OK”

# Firewall Configuration Summary



The screenshot shows the YaST2 Firewall Configuration Summary window. The window title is "YaST2" and the main title is "Firewall Configuration: Summary". The content is organized into several sections:

- Firewall Starting**
  - **Enable** firewall automatic starting
  - Firewall starts after the configuration has been written
- Internal Zone**
  - No interfaces assigned to this zone.
- Demilitarized Zone**
  - No interfaces assigned to this zone.
- External Zone**
  - Interfaces**
    - 82545EM Gigabit Ethernet Controller (Copper) / eth0
    - 'any' Any unassigned interface will be assigned to this zone.
  - Open Services, Ports, and Protocols**
    - Secure Shell Server
    - TCP Ports: 1352, 25, 389, 80

At the bottom of the window, there is a checkbox for "Show Details" (unchecked), a "Help" button, a "Back" button, a "Cancel" button, and a "Finish" button. The taskbar at the bottom shows the "YaST Control Center" and "YaST2" windows, along with system icons and the date/time "Wed Jan 2, 1:02 PM".

- Check the changes
- Click "Finish"



## RHEL 6.3 - Installation and Configuration

- RHEL installation is very similar to SLES installation
- Menus and Admin Tools are different
- For RHEL the default is a text based UI (not X11)
  - You can install the X11 interface and graphical Admin Tools
- Bonus Material → Appendix
  - Screenshots for RHEL 6.3 Install
- Next slides contain the parts you need to take special care for RHEL install



# RHEL 6.3 - Install Basis Server with Custom Options

The default installation of Red Hat Enterprise Linux is a basic server install. You can optionally select a different set of software now.

- Basic Server
- Database Server
- Web Server
- Identity Management Server
- Virtualization Host
- Desktop
- Software Development Workstation
- Minimal

Please select any additional repositories that you want to use for software installation.

- High Availability
- Load Balancer
- Red Hat Enterprise Linux
- Resilient Storage

+ Add additional software repositories

Modify repository

You can further customize the software selection now, or after install via the software management application.

- Customize later
- Customize now

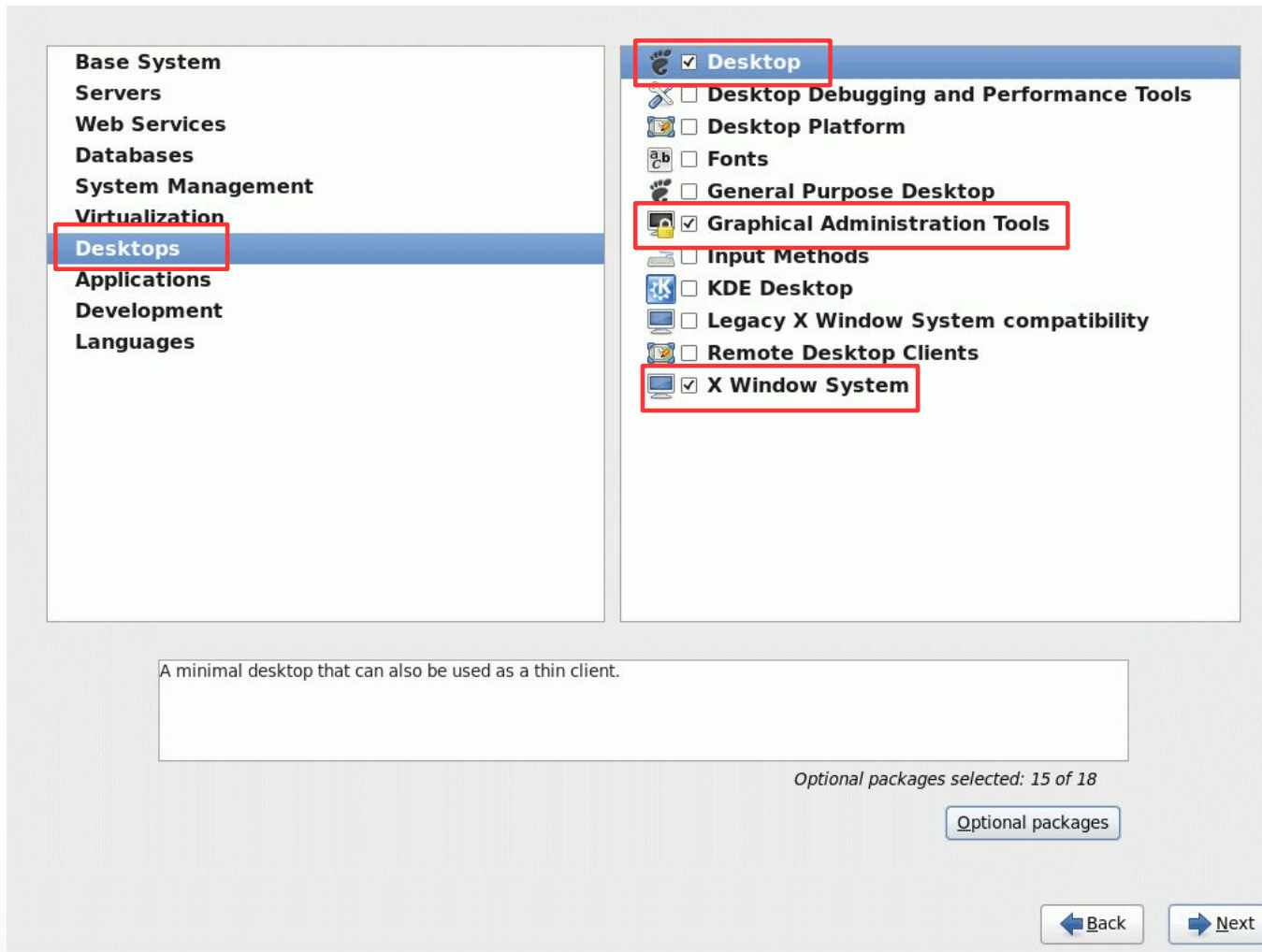
Back

Next

- Default installation does not select the graphical interface and Admin Tools
- Select “Customize now”
- And press “Next”



# RHEL 6.3 - Install Graphical Interface (X11)



Base System  
Servers  
Web Services  
Databases  
System Management  
Virtualization  
**Desktops**  
Applications  
Development  
Languages

Desktop  
 Desktop Debugging and Performance Tools  
 Desktop Platform  
 Fonts  
 General Purpose Desktop  
 Graphical Administration Tools  
 Input Methods  
 KDE Desktop  
 Legacy X Window System compatibility  
 Remote Desktop Clients  
 X Window System

A minimal desktop that can also be used as a thin client.

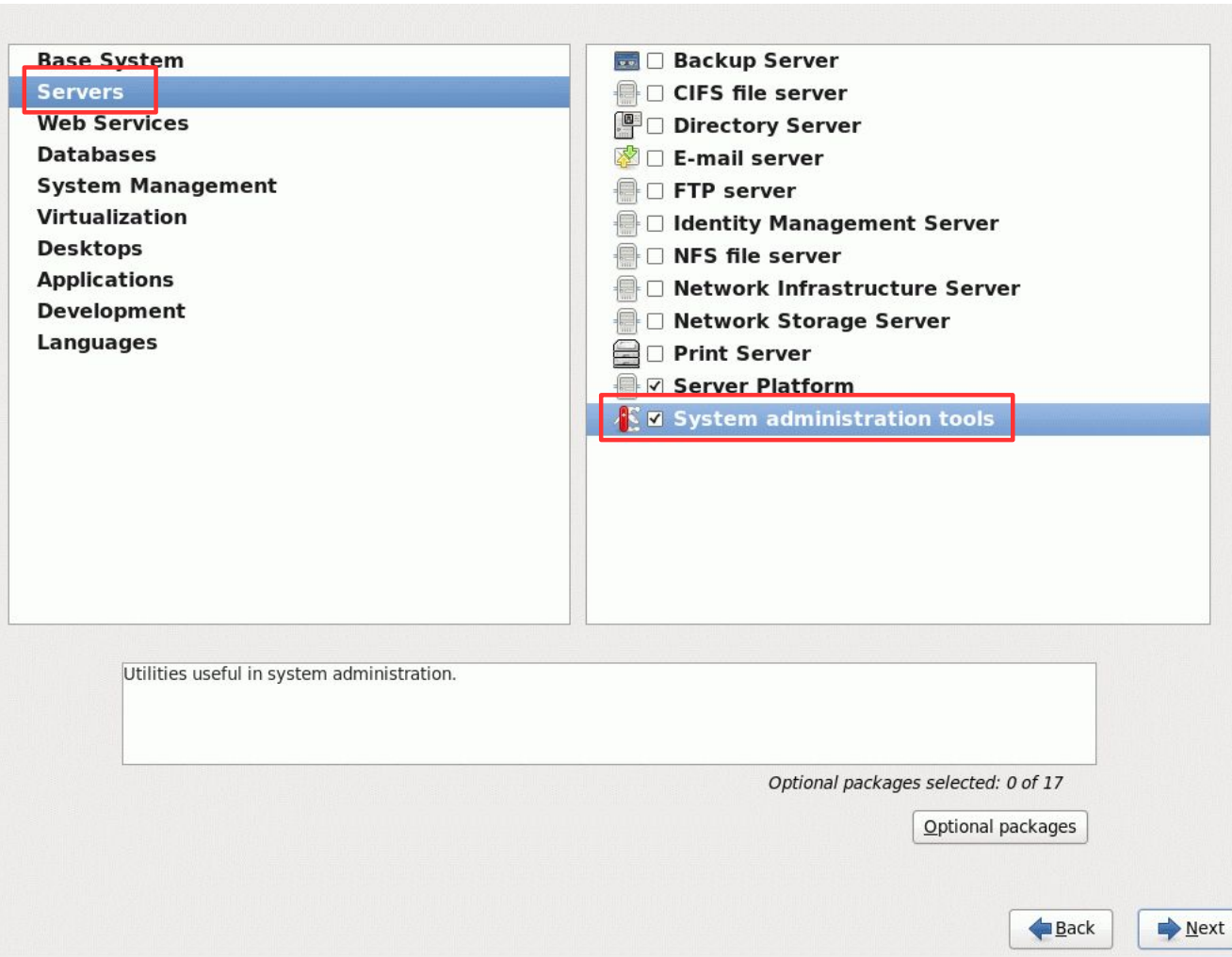
Optional packages selected: 15 of 18

Optional packages

Back Next

- Select “Desktops”
- Enable
  - Desktop
  - Graphical Administration Tools
  - X Window System

# RHEL 6.3 - Install System Administration Tools



Base System

**Servers**

Web Services

Databases

System Management

Virtualization

Desktops

Applications

Development

Languages

- Backup Server
- CIFS file server
- Directory Server
- E-mail server
- FTP server
- Identity Management Server
- NFS file server
- Network Infrastructure Server
- Network Storage Server
- Print Server
- Server Platform
- System administration tools

Utilities useful in system administration.

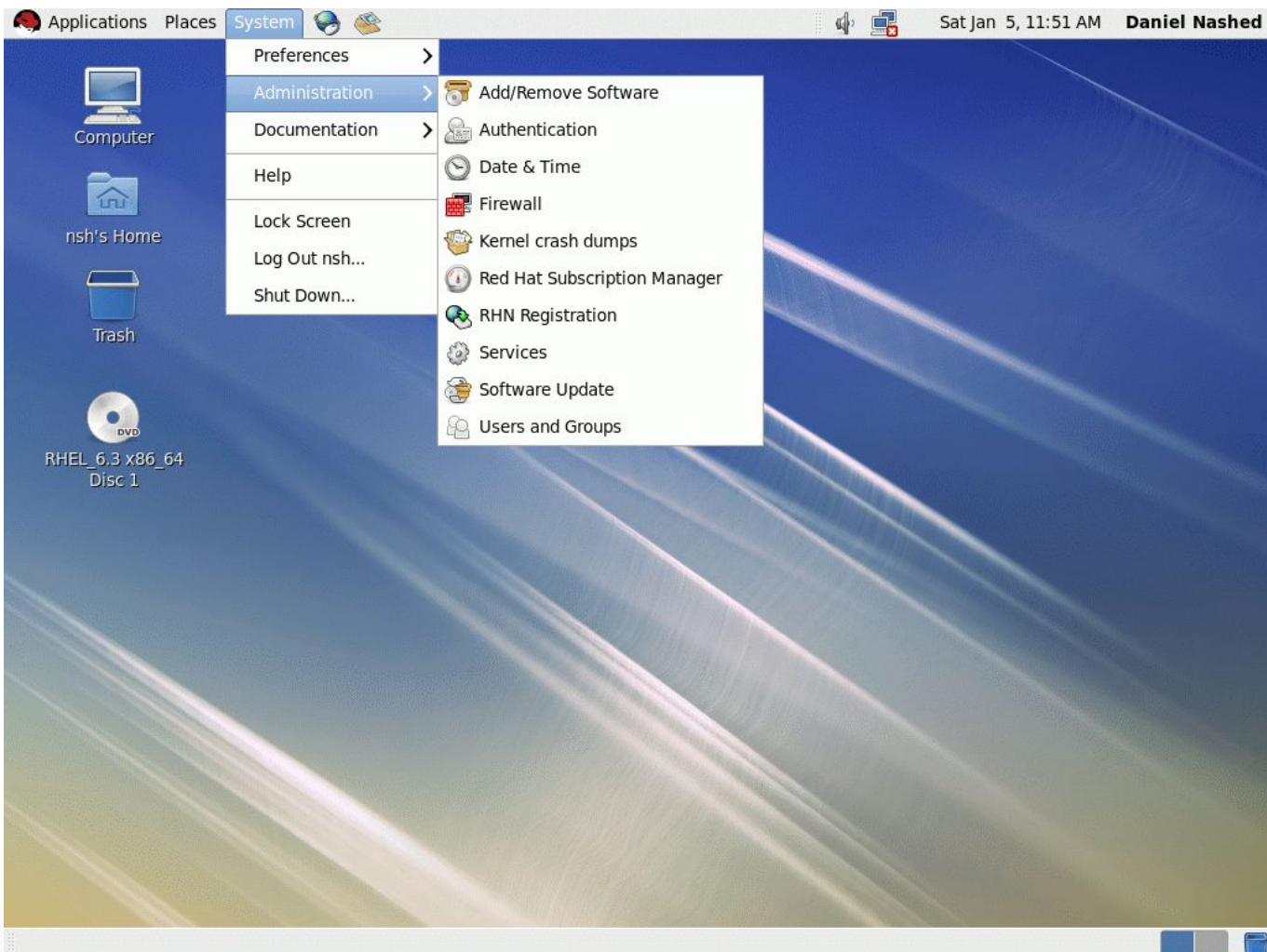
Optional packages selected: 0 of 17

Optional packages

Back Next

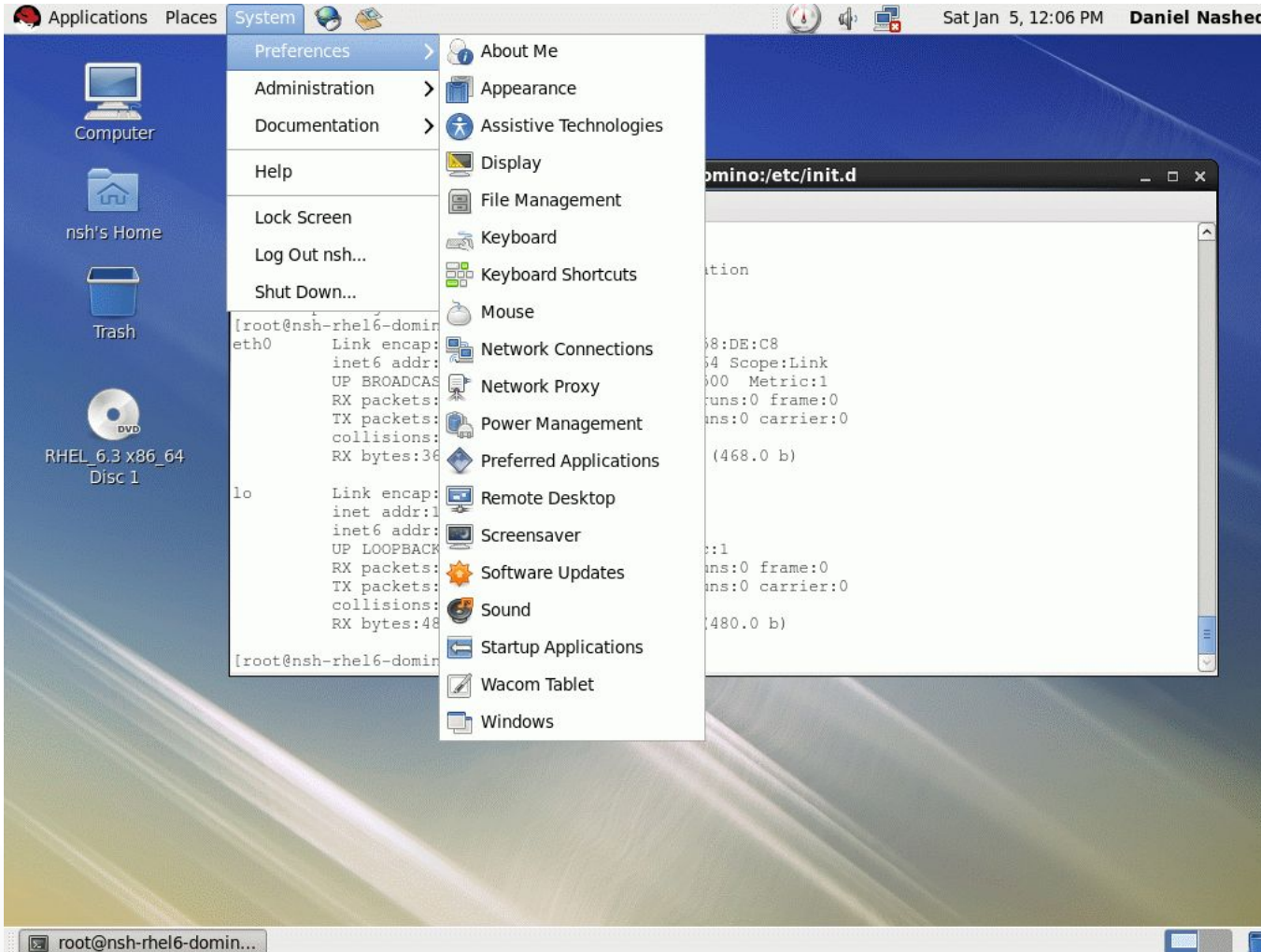
- Select “Servers”
- Select “System administration tools”
- Press “Next”
- Install looks very similar to what you have seen for SLES

## RHEL 6.3 - Admin Menu



- Quite similar basic options
- YaST is a bit ahead for system configuration etc
- You have to register your server to use “yum” to install additional packages
- On SLES all packages can be installed quite easy from the DVD image
  - But you need to register on SLES too for updates afterwards

# RHEL 6.3 - Preferences Menu



- Quite similar basic options

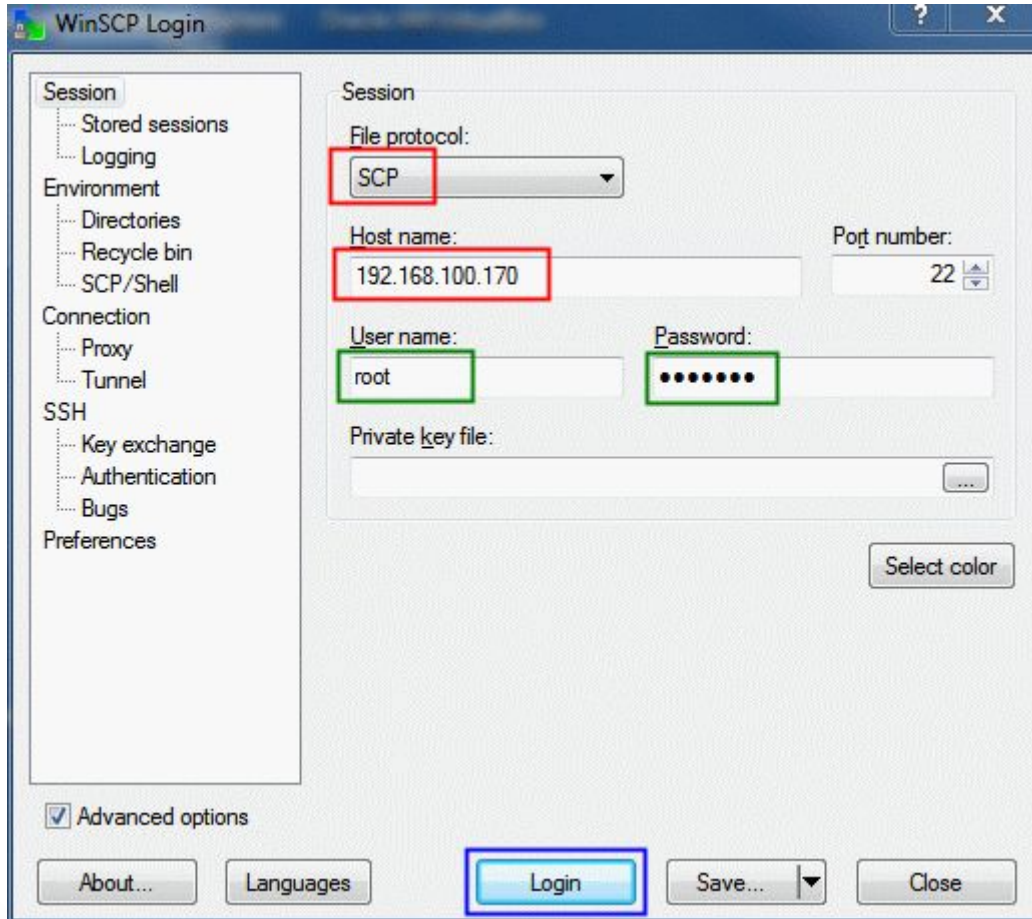


## Next Steps

- Now that we have configured the basis Linux machine we can install Domino
- The basic remote protocol for accessing a Linux machine is “SSH”
  - Secure Shell (Port 22)
  - Used for Login into the machine and for file-transfer
- Next steps:
  - Copy installations files
  - Install Domino
  - Configure Domino

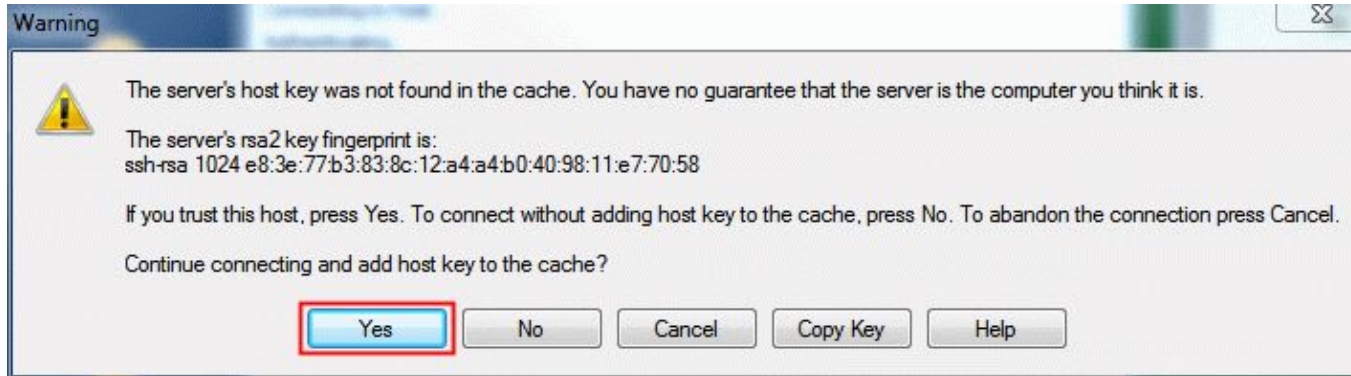


# WinSCP - File-Transfer



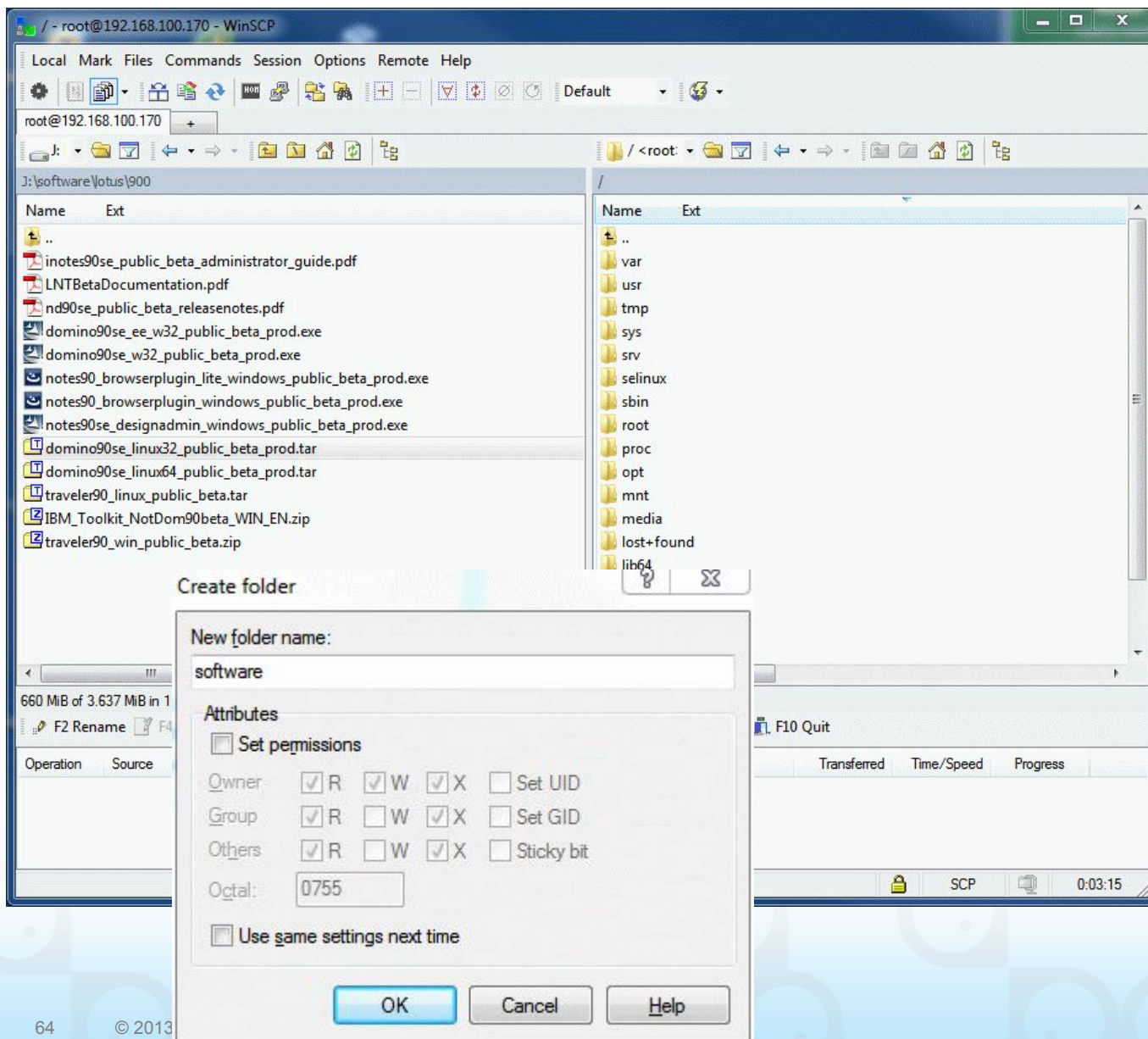
- Start WinSCP
- Specify a new Connection
- Use SCP Protocol
- Type in IP Address of the Linux machine for the host name
- Type in “root” and the password you configured earlier
- Type “Login”

# Confirm SSH Fingerprint



- Each machine generates a RSA certificate which is used to identify the machine
- When connecting for the first time the key is unknown and you have to confirm it
- Next time the key is verified
  - If it does not match a security warning is shown
  - Similar to this dialog
- Press “Yes” to confirm

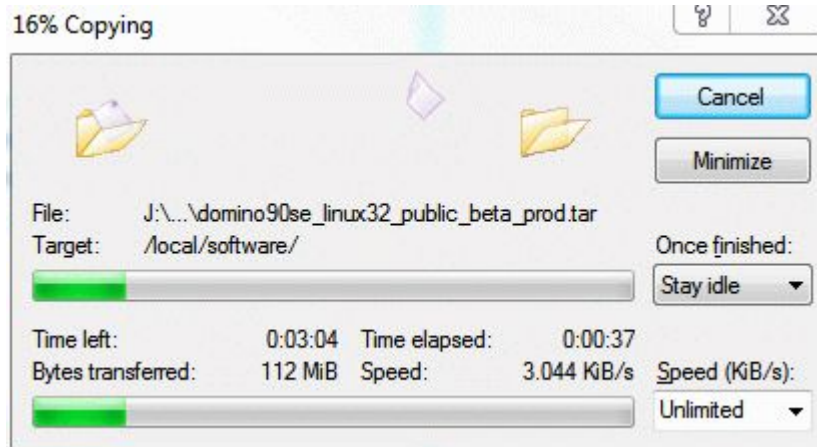
# WinSCP GUI



- WinSCP uses a Norton Commander like Style by default
- Left side shows local disk
- Right side shows remote Linux file-system
- Press F7 and create the folder “software”
- Keep default permissions

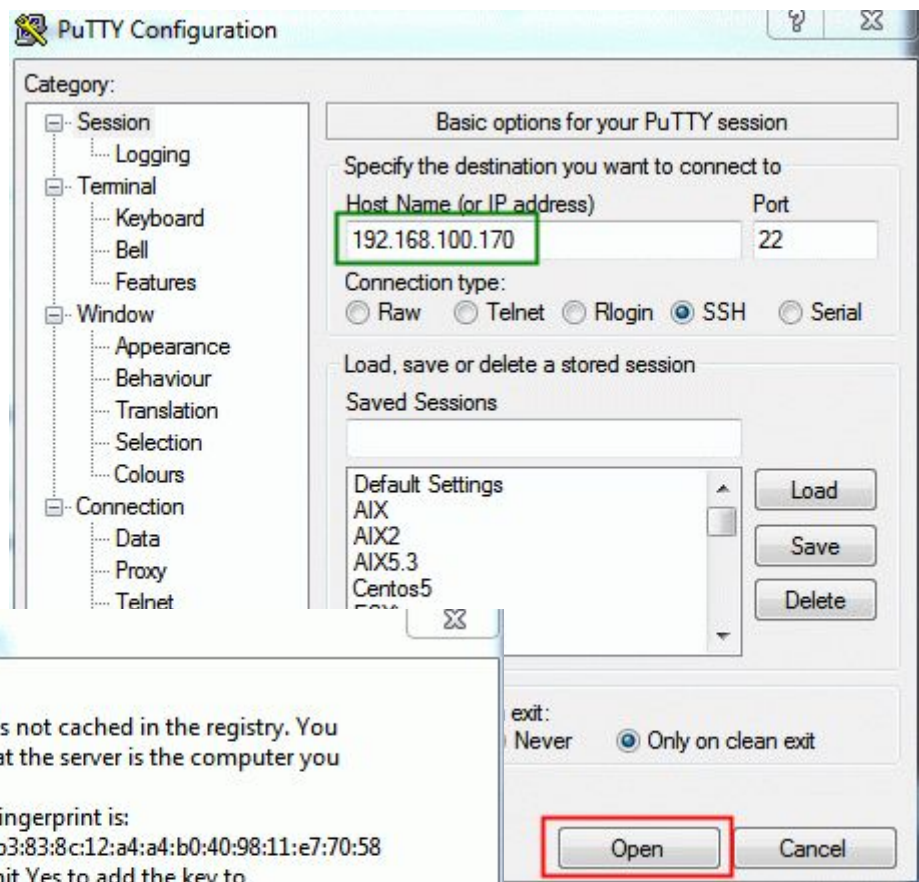


# WinSCP - Copy Installation Files



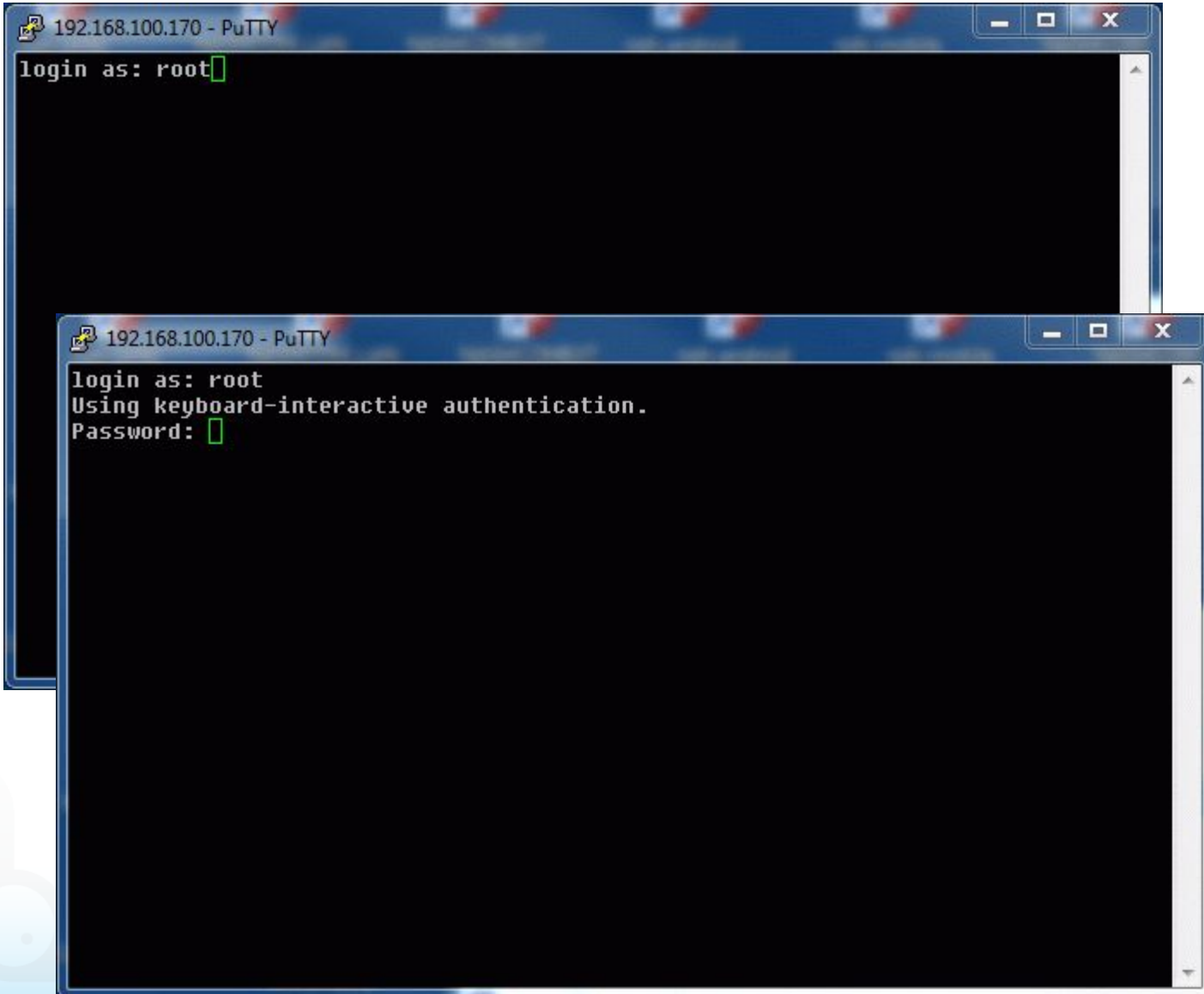
- Press F5 to copy selected Files
- Navigation with WinSCP is straight forward
- Look and feel can be changed to Explorer style.

# SSH Console Login using Putty



- Putty is a very common SSH client
- Configuration is very similar to WinSCP
- Configure Hostname and click “Open”
  - You could also save your configuration later
  - See stored sessions
- Similar key warning seen on WinSCP
  - Confirm the warning with “Yes”
  - This will put the key into cache

## SSH Window – First Login



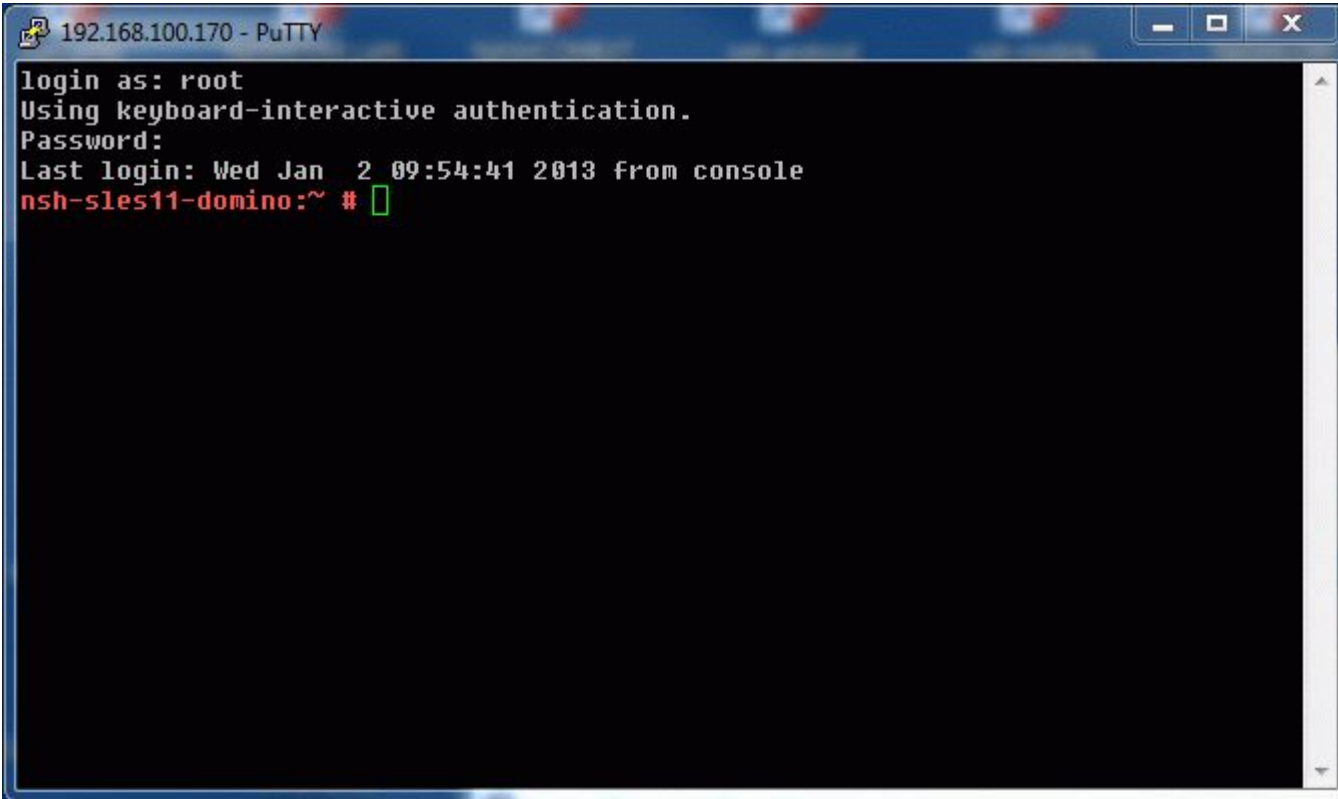
```
192.168.100.170 - PuTTY
login as: root

192.168.100.170 - PuTTY
login as: root
Using keyboard-interactive authentication.
Password: 
```

- Login using your root user and password
- SSH command line shell is what is used most for administration



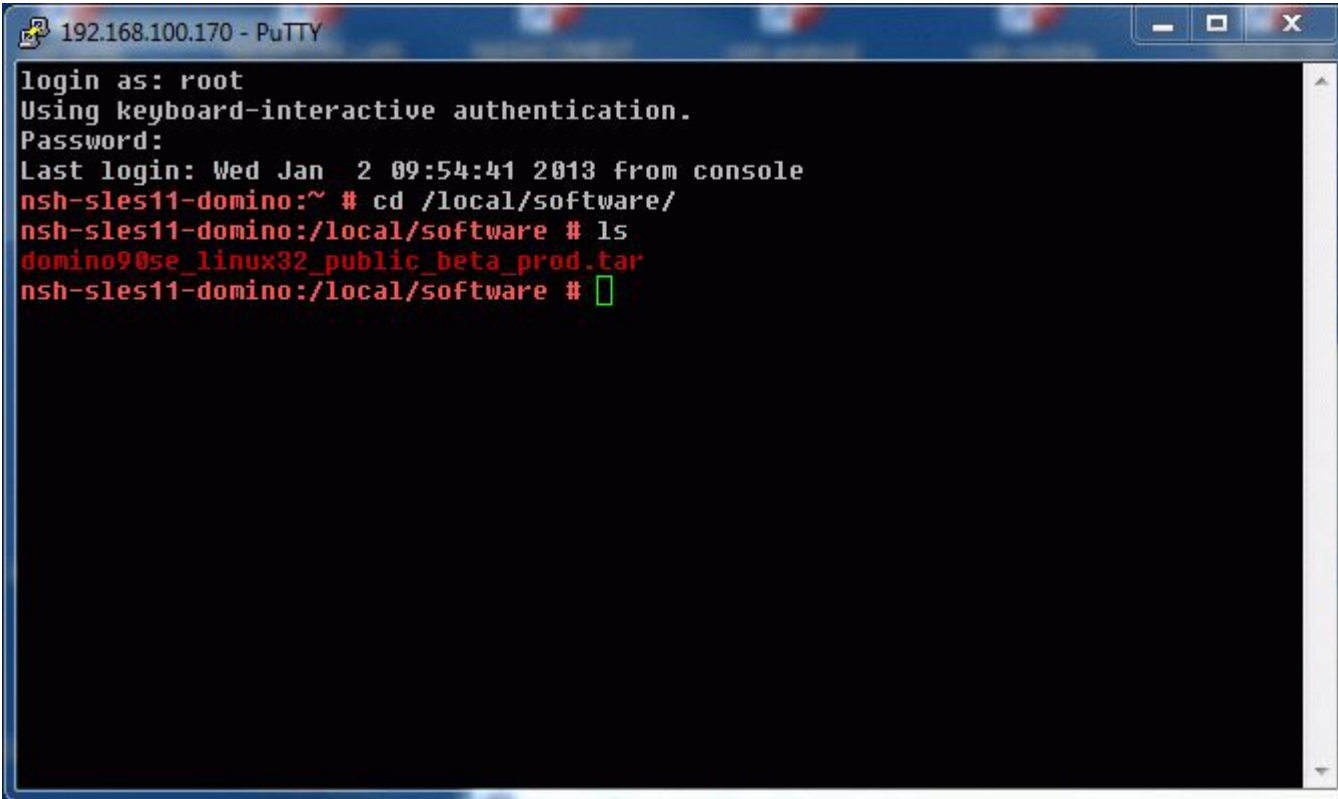
## Console after First Login



```
192.168.100.170 - PuTTY
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Wed Jan  2 09:54:41 2013 from console
nsh-sles11-domino:~ #
```

- Prompt shows
  - Machine Name
  - # means you are root user
- Command Line is similar to “DOS” command-line
- Only the “root” User can install a Domino server

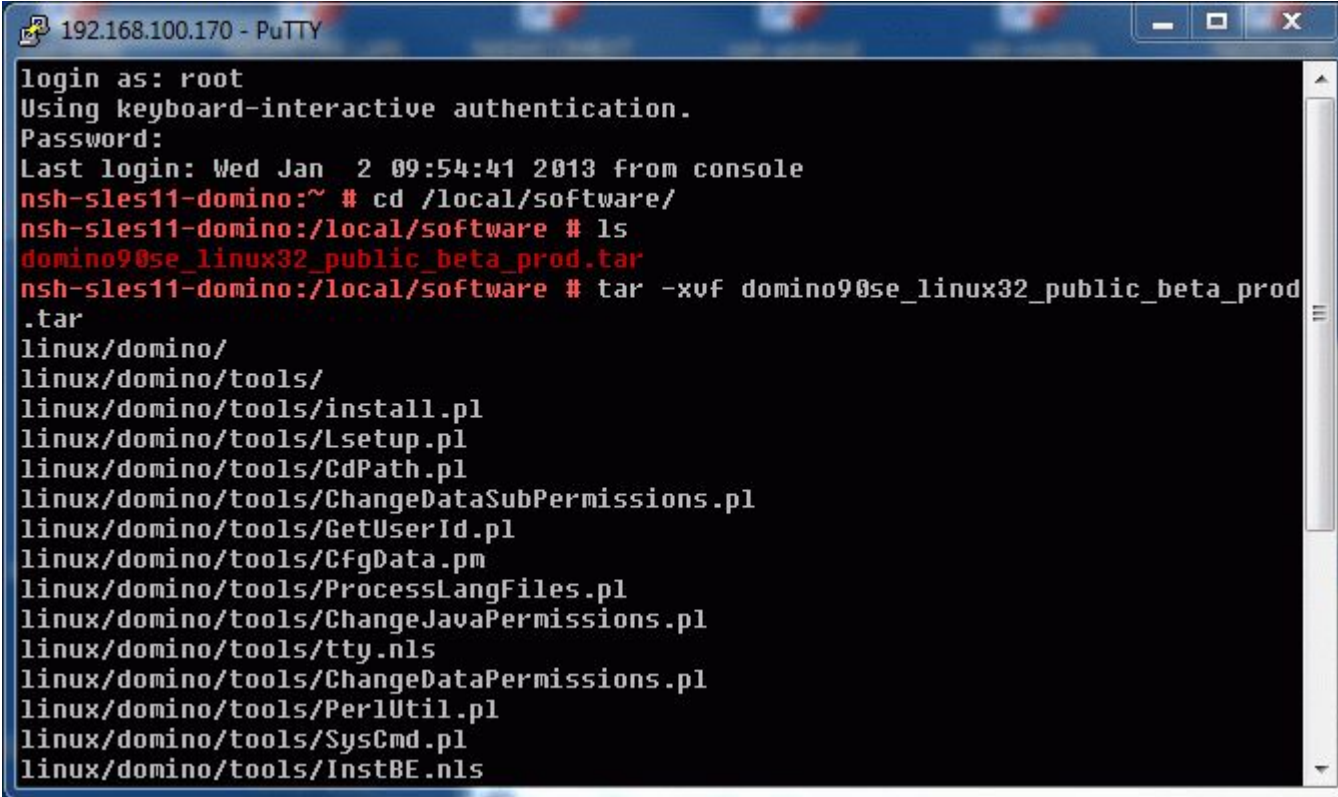
## Switch to “Software” Directory



```
192.168.100.170 - PuTTY
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Wed Jan  2 09:54:41 2013 from console
nsh-sles11-domino:~ # cd /local/software/
nsh-sles11-domino:/local/software # ls
domino90se_linux32_public_beta_prod.tar
nsh-sles11-domino:/local/software #
```

- Linux uses “/” instead of “\”
- “ls” is the directory list command
- There are no drive letters
  - Everything is mounted into the root tree
  - More details later
- Switch to software directory via: “cd /local/software”
- List directory via “ls”

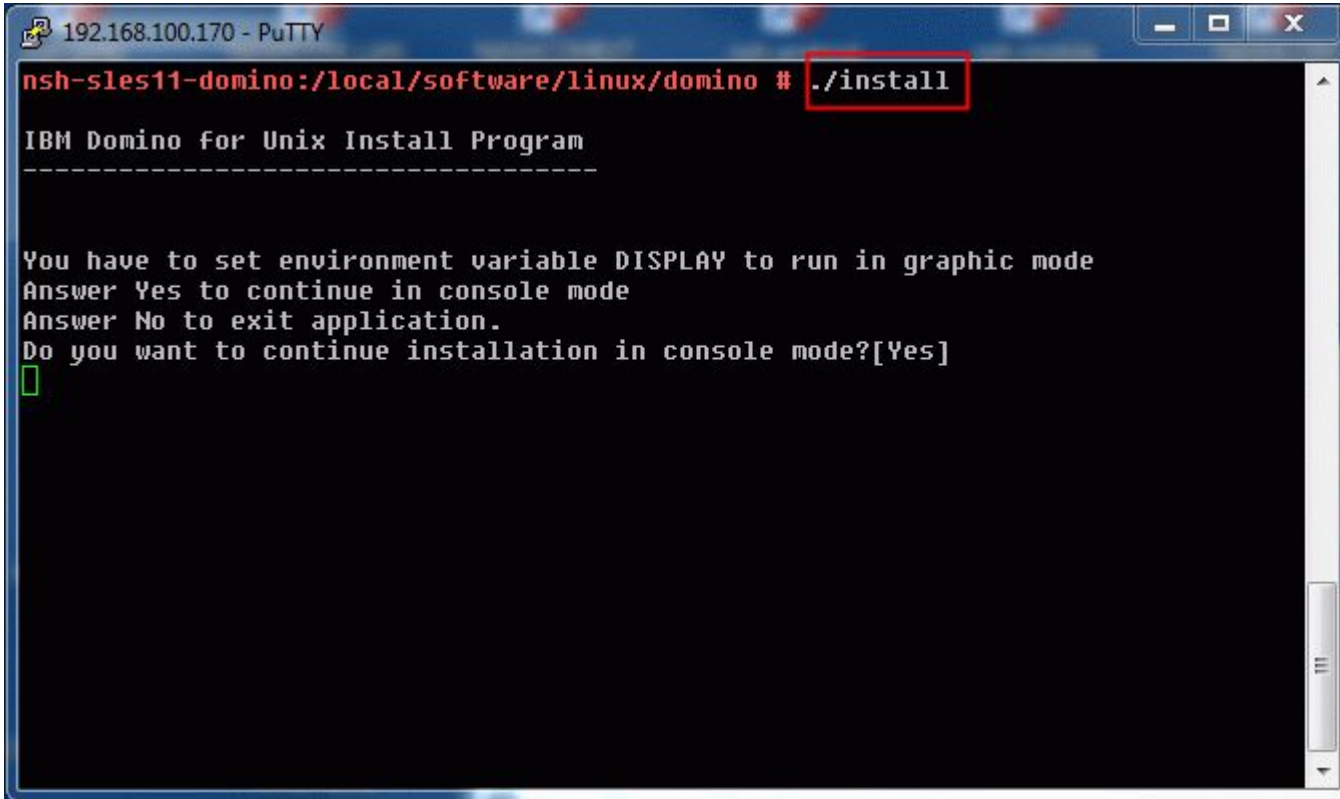
# Extract Installation Files



```
192.168.100.170 - PuTTY
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Wed Jan  2 09:54:41 2013 from console
nsh-sles11-domino:~ # cd /local/software/
nsh-sles11-domino:/local/software # ls
domino90se_linux32_public_beta_prod.tar
nsh-sles11-domino:/local/software # tar -xvf domino90se_linux32_public_beta_prod
.tar
linux/domino/
linux/domino/tools/
linux/domino/tools/install.pl
linux/domino/tools/Lsetup.pl
linux/domino/tools/CdPath.pl
linux/domino/tools/ChangeDataSubPermissions.pl
linux/domino/tools/GetUserId.pl
linux/domino/tools/CfgData.pm
linux/domino/tools/ProcessLangFiles.pl
linux/domino/tools/ChangeJavaPermissions.pl
linux/domino/tools/tty.nls
linux/domino/tools/ChangeDataPermissions.pl
linux/domino/tools/PerlUtil.pl
linux/domino/tools/SysCmd.pl
linux/domino/tools/InstBE.nls
```

- Installation files are packed together using the “tar” tool
- “untar” (extract) files via tar command
- `tar -xvf file.tar`
  - -x = extract
  - -v = verbose
  - -f specify file
- Tar outputs the extracted file list

# Run Install



```
192.168.100.170 - PuTTY
nsh-sles11-domino:/local/software/linux/domino # ./install

IBM Domino for Unix Install Program
-----
You have to set environment variable DISPLAY to run in graphic mode
Answer Yes to continue in console mode
Answer No to exit application.
Do you want to continue installation in console mode?[Yes]
█
```

- Switch to “linux/domino” via `cd linux/domino`
  - Without leading slash for a relative path
- Run `./install` to start the installation
- “./” means current directory
  - Root does not search the current directory by default
  - You have to specify `./` explicitly
- There is a console mode (used in our case) and a graphical mode
  - Both work similar
  - You need to get used to the way data is entered
  - Type Numbers and Option
  - Enter = confirm

## RHEL 6.3 needs additional packages for Domino 32bit

- By default RHEL 6.3 does not install 32 bit packages!
- If you install a 32 bit the server will complain about missing packages
- The following is the missing list for Domino 8.5.x and 9.x Public Beta
  - The installer complains about those missing packages – see below

```
To run this installer you need 32bit (i686) packages installed on your 64 bit Linux RedHat.  
They are not installed by default, but are mandatory. The installer will exit after  
this message.
```

```
glibc-2.12-1.7.e16.i686  
libgcc-4.4.4-13.e16.i686  
libXtst-1.0.99.2-3.e16.i686  
libXmu-1.0.5-1.e16.i686  
libXp-1.0.0-15.1.e16.i686  
libXft-2.1.13-4.1.e16.i686  
libXi-1.3-3.e16.i686  
libstdc++-4.4.4-13.e16.i686
```







## RHEL 6.3 needs additional packages for Domino 32bit

- Add the following line to `/etc/yum.conf`
  - `multilib_policy=all`
  - This will install also 32bit LIBs in addition to 64 bit LIBs on your 64bit machine
- Run `yum install <packagename>` to install missing packages
  - You can specify multiple packages in the same install command line → see below

```
# yum install glibc
# yum install libgcc libXtst libXmu libXp libXft libXi
# yum install libstdc++
```

# YUM Example Output

```
# yum install glibc
Loaded plugins: product-id, refresh-packagekit, rhnplugin, security, subscription-manager
Updating certificate-based repositories.
Setting up Install Process
Package glibc-2.12-1.80.el6_3.6.x86_64 already installed and latest version
Resolving Dependencies
--> Running transaction check
--> Package glibc.i686 0:2.12-1.80.el6_3.6 will be installed
--> Processing Dependency: libfreebl3.so(NSSRAWHASH_3.12.3) for package: glibc-2.12-1.80.el6_3.6.i686
--> Processing Dependency: libfreebl3.so for package: glibc-2.12-1.80.el6_3.6.i686
--> Running transaction check
--> Package nss-softokn-freebl.i686 0:3.12.9-11.el6 will be installed
--> Finished Dependency Resolution

Dependencies Resolved


=====
Package                Arch                Version              Repository            Size
=====
Installing:
glibc                   i686                2.12-1.80.el6_3.6   rhel-x86_64-server-6 4.3 M
Installing for dependencies:
nss-softokn-freebl     i686                3.12.9-11.el6       rhel-x86_64-server-6 116 k

Transaction Summary
=====
Install                2 Package(s)

Total download size: 4.4 M
Installed size: 0
Is this ok [y/N]: y
```



# InstallShield Dialog



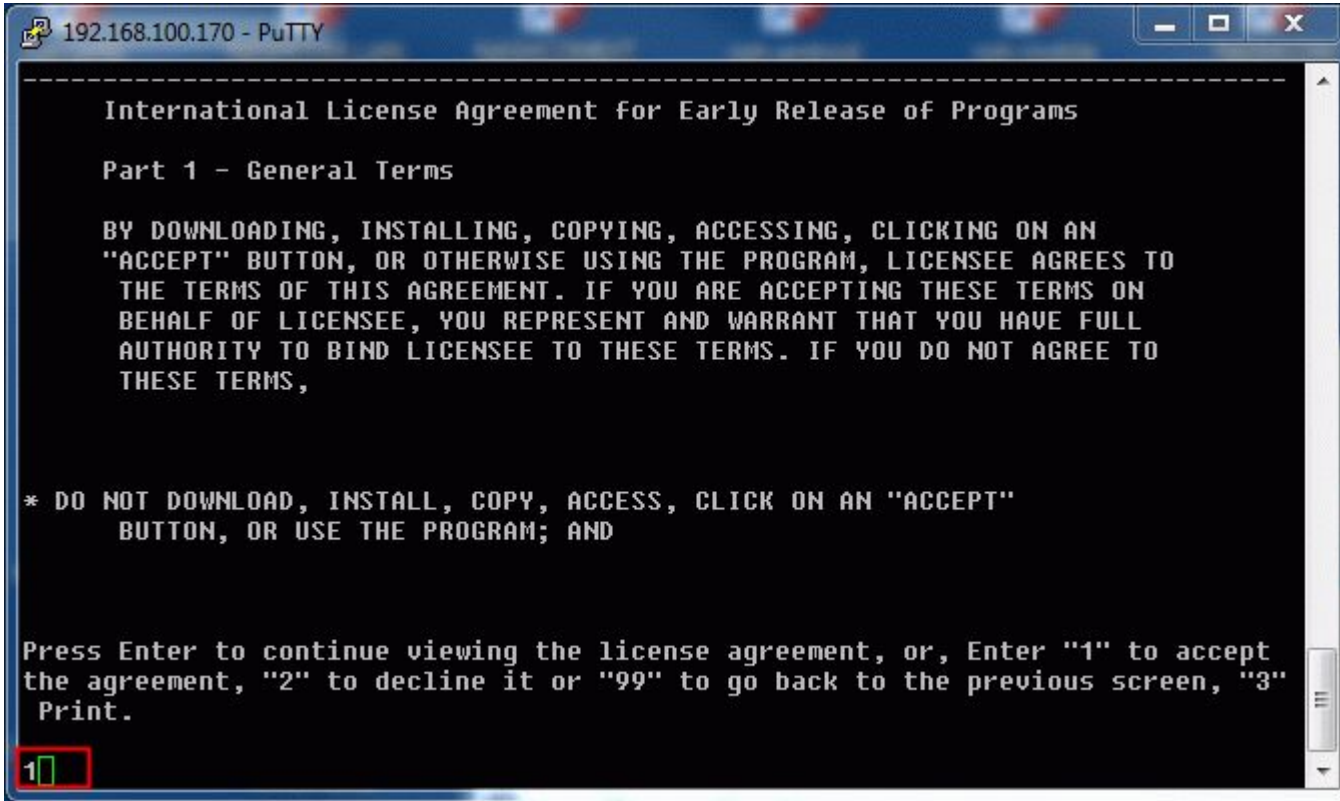
```
192.168.100.170 - PuTTY
.....
.....
.....
.....
.....
.....
.....
-----
Welcome to the InstallShield Wizard for IBM Domino Social Edition
The InstallShield Wizard will install IBM Domino Social Edition on your
computer.
To continue, choose Next.

IBM Domino Social Edition
IBM
http://www.ibm.com

Press 1 for Next, 3 to Cancel or 4 to Redisplay [1] █
```

- Domino uses the Java version InstallShield to install
  - Same tools family used on Windows
  - JVM is included in the package
- Type in “1” and “Enter”

# Read and Confirm License



```
192.168.100.170 - PuTTY
-----
International License Agreement for Early Release of Programs

Part 1 - General Terms

BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, CLICKING ON AN
"ACCEPT" BUTTON, OR OTHERWISE USING THE PROGRAM, LICENSEE AGREES TO
THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON
BEHALF OF LICENSEE, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL
AUTHORITY TO BIND LICENSEE TO THESE TERMS. IF YOU DO NOT AGREE TO
THESE TERMS,

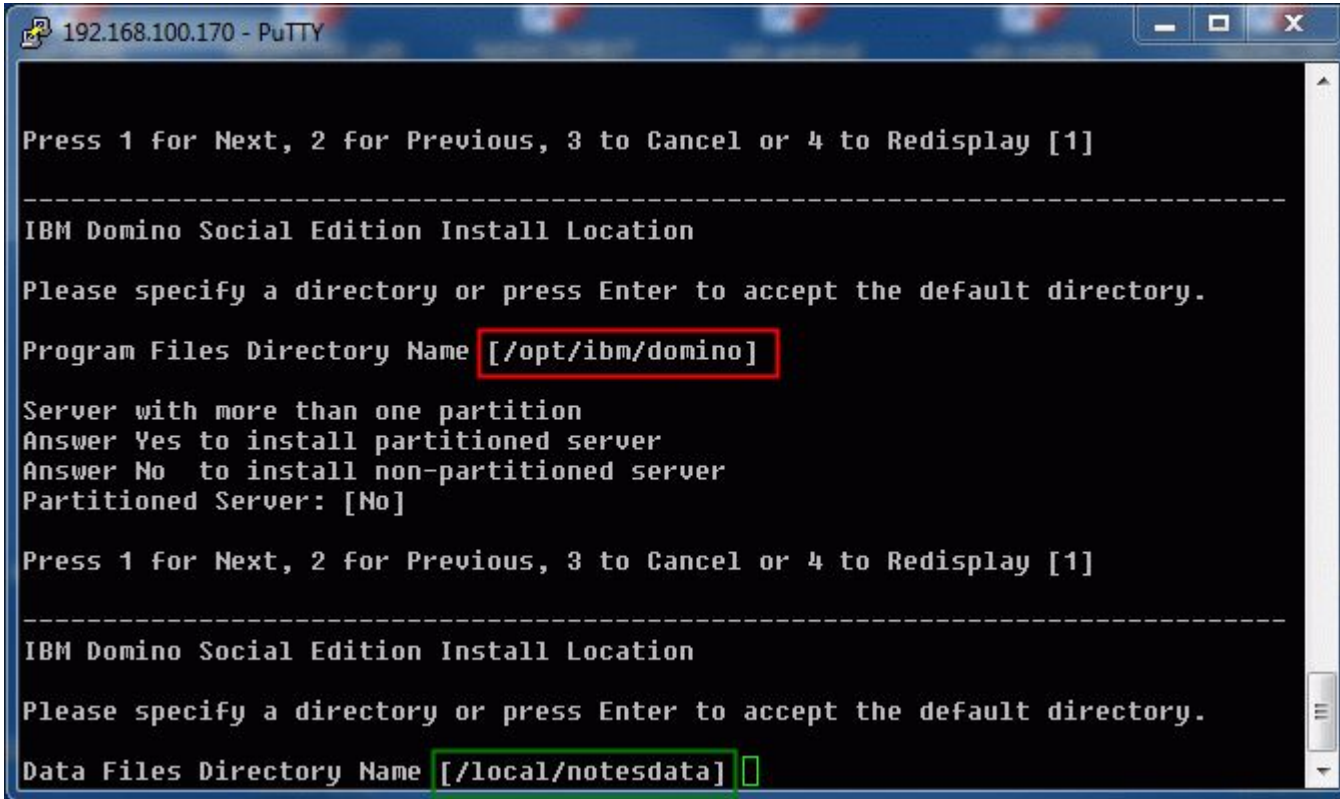
* DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, CLICK ON AN "ACCEPT"
  BUTTON, OR USE THE PROGRAM; AND

Press Enter to continue viewing the license agreement, or, Enter "1" to accept
the agreement, "2" to decline it or "99" to go back to the previous screen, "3"
Print.

1
```

- Read and confirm the License
- Type "1" and "Enter"

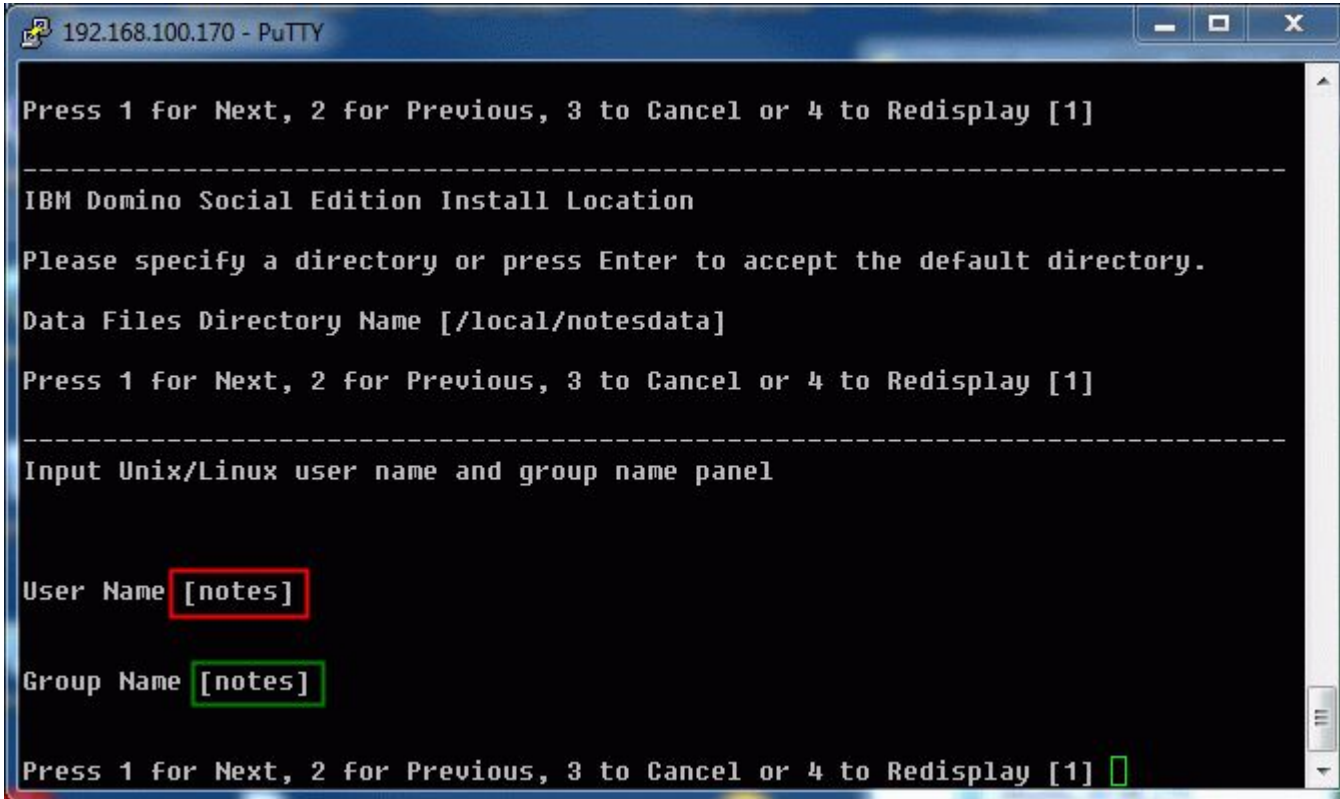
# Installation Directories



```
192.168.100.170 - PuTTY
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
-----
IBM Domino Social Edition Install Location
Please specify a directory or press Enter to accept the default directory.
Program Files Directory Name [/opt/ibm/lotus]
Server with more than one partition
Answer Yes to install partitioned server
Answer No to install non-partitioned server
Partitioned Server: [No]
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
-----
IBM Domino Social Edition Install Location
Please specify a directory or press Enter to accept the default directory.
Data Files Directory Name [/local/notesdata]
```

- Keep the default for binaries if you can
  - Domino 8.x: /opt/ibm/lotus
  - Domino 9.x: /opt/ibm/domino
- Data Directory can be anywhere but default is used quite often
  - /local/notesdata
- Confirm selection with “Enter”

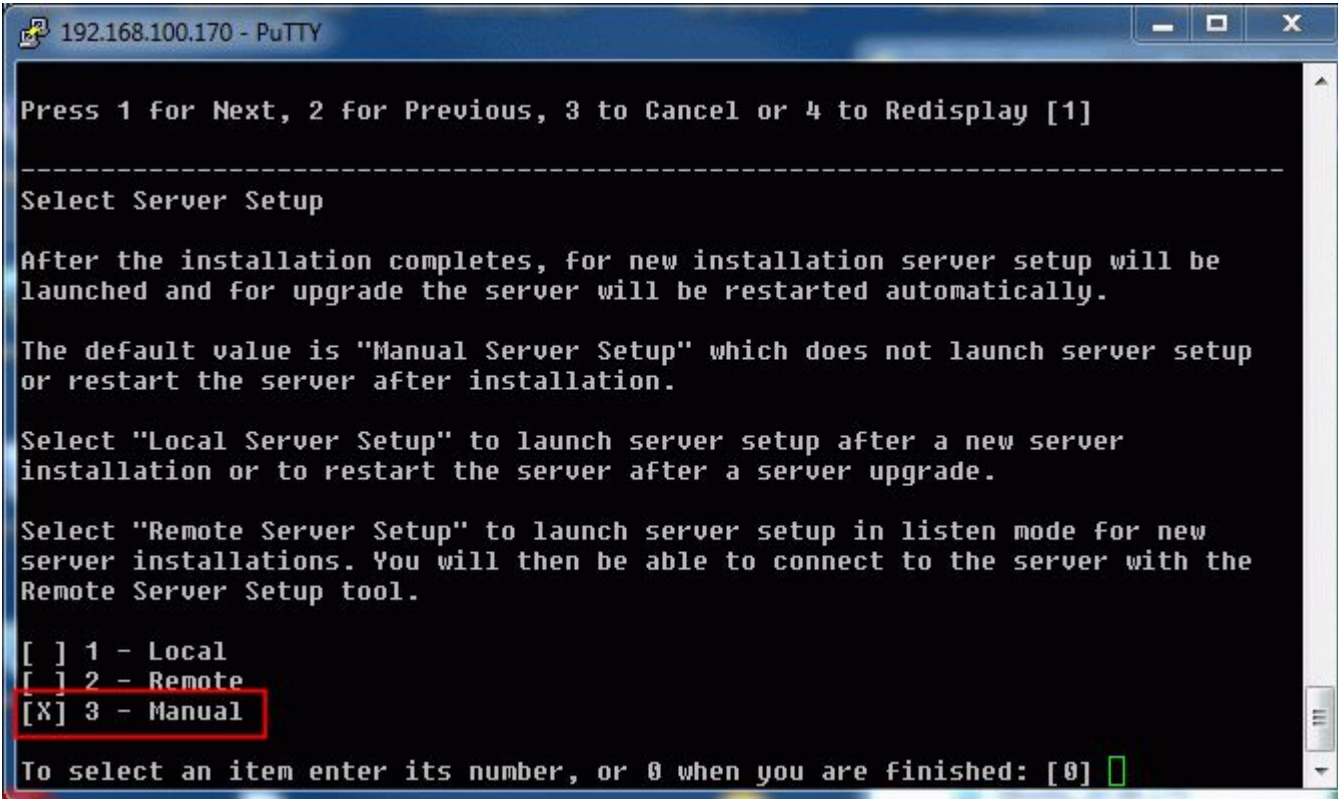
# User and Group for Domino Server



```
192.168.100.170 - PuTTY
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
-----
IBM Domino Social Edition Install Location
Please specify a directory or press Enter to accept the default directory.
Data Files Directory Name [/local/notesdata]
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
-----
Input Unix/Linux user name and group name panel
User Name [notes]
Group Name [notes]
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1] █
```

- By default the user and group “notes” is used
- User and Group need to exist before the installation
  - That's why we created user and group earlier
- Confirm selection with “Enter” and continue
  - “[1]” is already selected

# Configuration Mode



```
192.168.100.170 - PuTTY
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
-----
Select Server Setup

After the installation completes, for new installation server setup will be
launched and for upgrade the server will be restarted automatically.

The default value is "Manual Server Setup" which does not launch server setup
or restart the server after installation.

Select "Local Server Setup" to launch server setup after a new server
installation or to restart the server after a server upgrade.

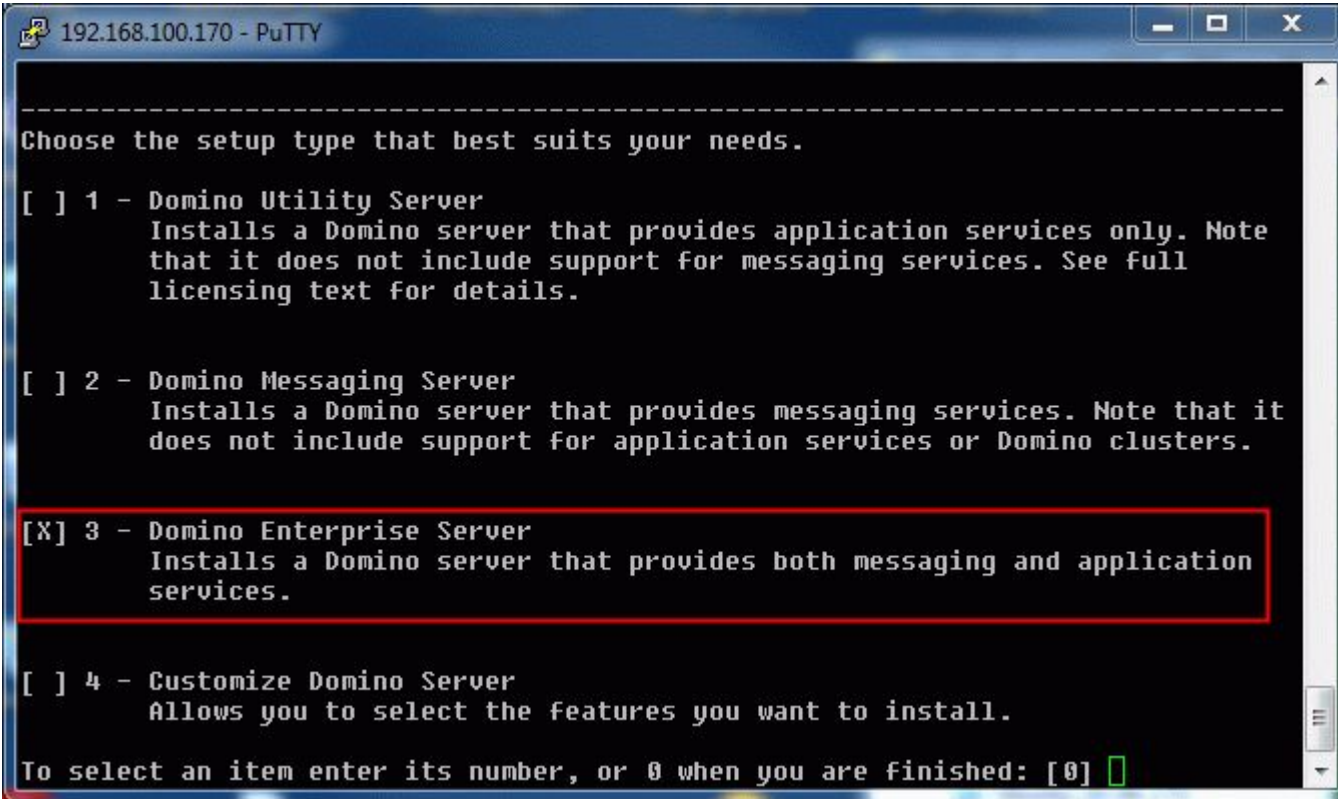
Select "Remote Server Setup" to launch server setup in listen mode for new
server installations. You will then be able to connect to the server with the
Remote Server Setup tool.

[ ] 1 - Local
[ ] 2 - Remote
[X] 3 - Manual

To select an item enter its number, or 0 when you are finished: [0] [ ]
```

- Different options available
  - Manual means you specify how to install depending how you invoke the server
- Keep “Manual” and confirm with “Enter”
  - More details about configuration in a minute

# Server Type

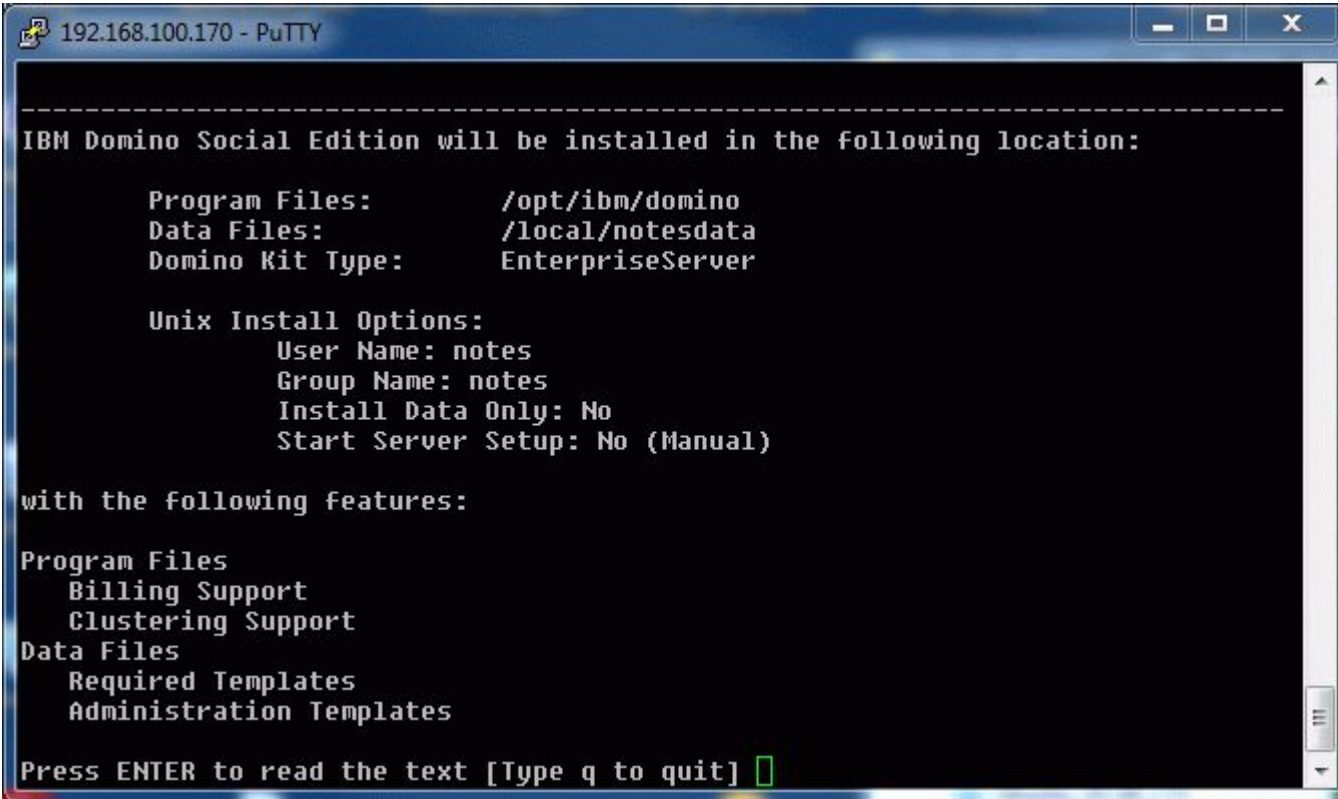


```
-----  
Choose the setup type that best suits your needs.  
  
[ ] 1 - Domino Utility Server  
  Installs a Domino server that provides application services only. Note  
  that it does not include support for messaging services. See full  
  licensing text for details.  
  
[ ] 2 - Domino Messaging Server  
  Installs a Domino server that provides messaging services. Note that it  
  does not include support for application services or Domino clusters.  
  
[X] 3 - Domino Enterprise Server  
  Installs a Domino server that provides both messaging and application  
  services.  
  
[ ] 4 - Customize Domino Server  
  Allows you to select the features you want to install.  
  
To select an item enter its number, or 0 when you are finished: [0] █
```

- In most of the cases the server type “Domino Enterprise Server” is what you want to install
- But there might be other options depending on your needs
- Enterprise Server is pre-selected
- Confirm selection with “Enter”



# Installation Preparation Summary



```
192.168.100.170 - PuTTY
-----
IBM Domino Social Edition will be installed in the following location:

Program Files:      /opt/ibm/domino
Data Files:        /local/notesdata
Domino Kit Type:   EnterpriseServer

Unix Install Options:
  User Name: notes
  Group Name: notes
  Install Data Only: No
  Start Server Setup: No (Manual)

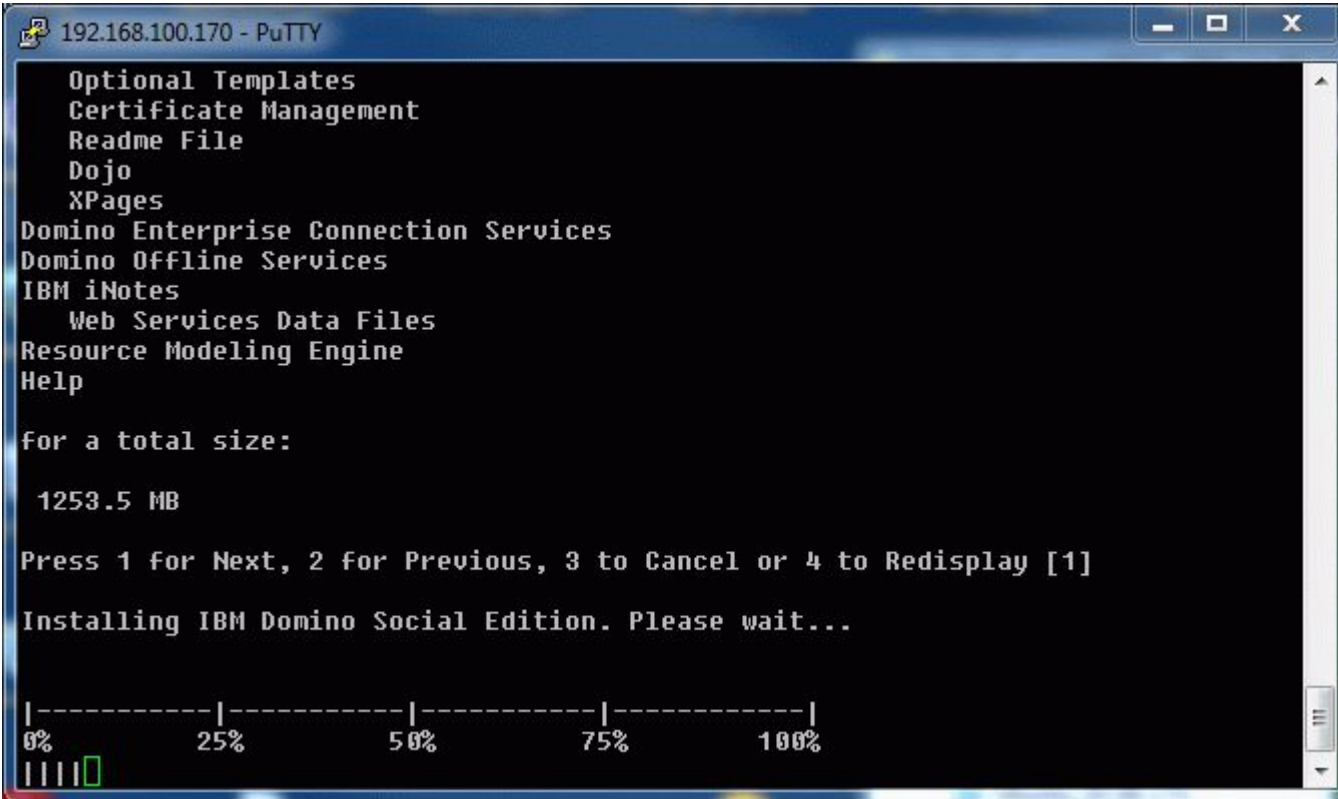
with the following features:

Program Files
Billing Support
Clustering Support
Data Files
Required Templates
Administration Templates

Press ENTER to read the text [Type q to quit] █
```

- Review the Configuration Summary and confirm with “Enter”

# Installation



```
192.168.100.170 - PuTTY
Optional Templates
Certificate Management
Readme File
Dojo
XPages
Domino Enterprise Connection Services
Domino Offline Services
IBM iNotes
  Web Services Data Files
Resource Modeling Engine
Help

for a total size:

1253.5 MB

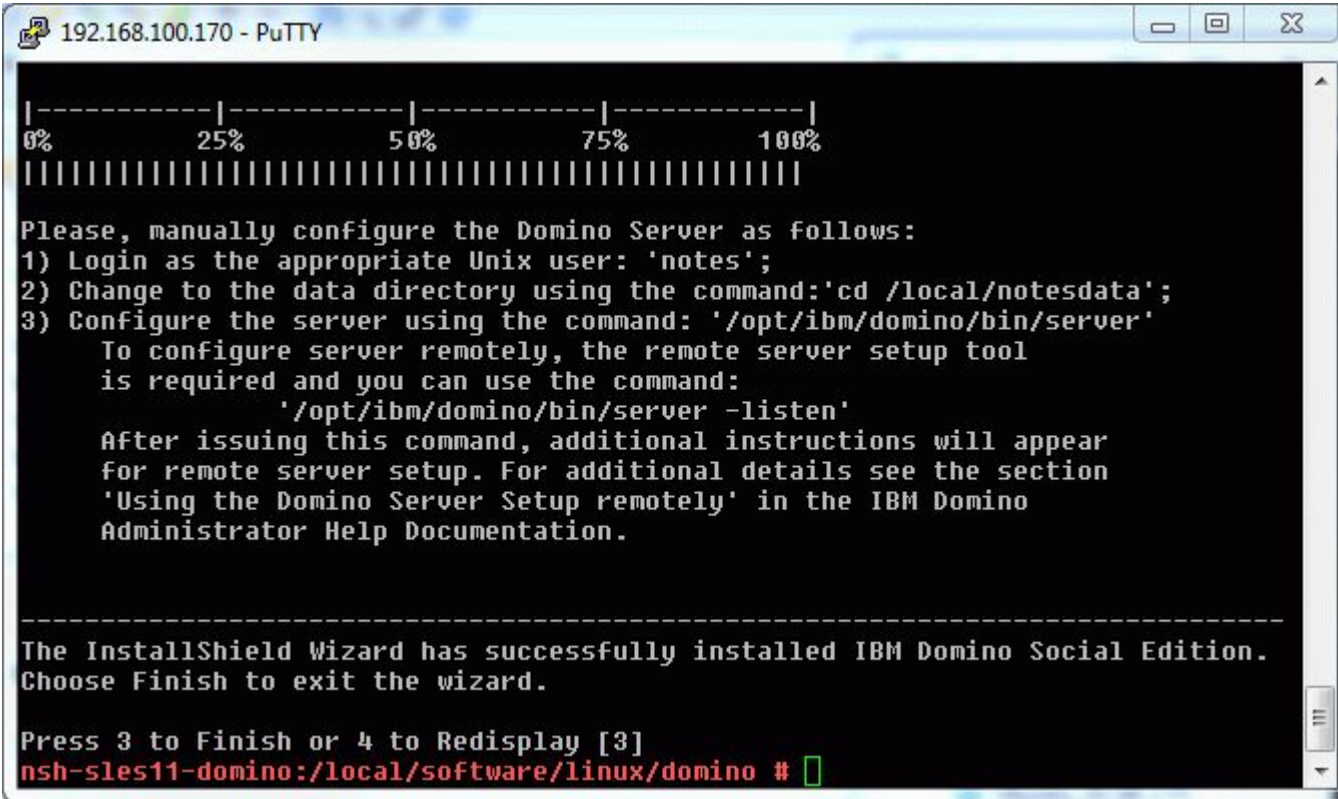
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

Installing IBM Domino Social Edition. Please wait...

|-----|-----|-----|-----|
0%      25%     50%     75%     100%
|||||
```

- Installation takes a couple of minutes
  - The uninstaller is created in the last step and the install might look like hanging at 100% for a while
  - That's normal
- Installation should take only a couple of minutes

# Installation Done



```
-----|-----|-----|-----|
0%      25%      50%      75%      100%
|||||

Please, manually configure the Domino Server as follows:
1) Login as the appropriate Unix user: 'notes';
2) Change to the data directory using the command: 'cd /local/notesdata';
3) Configure the server using the command: '/opt/ibm/domino/bin/server'
   To configure server remotely, the remote server setup tool
   is required and you can use the command:
   '/opt/ibm/domino/bin/server -listen'
   After issuing this command, additional instructions will appear
   for remote server setup. For additional details see the section
   'Using the Domino Server Setup remotely' in the IBM Domino
   Administrator Help Documentation.

-----

The InstallShield Wizard has successfully installed IBM Domino Social Edition.
Choose Finish to exit the wizard.

Press 3 to Finish or 4 to Redisplay [3]
nsh-sles11-domino:/local/software/linux/domino # █
```

- Press “Enter” to terminate the finished installation
- Installation is fast and straight forward
- There is not much that can go wrong
- If you typed in something in the wrong way you can always go back

## Fixpack & Hotfix Installer

- Installer looks different than Fixpack installer
  - Fixpack installer uses “**Tab**” instead of “**Enter**”
  - Based on IBM code not InstallShield
- Fixpack / Hotfix is only aware of the standard location for binaries and data
- If you switch chose a different binary directory you need an environment setting “**NUI\_NOTESDIR**” to specify the location
  - If you keep the original location you don't need this
- Example: export **NUI\_NOTESDIR=/opt/domino**
- This allows the installer to find .install.dat
  - .install.dat contains all information about the installed Domino version

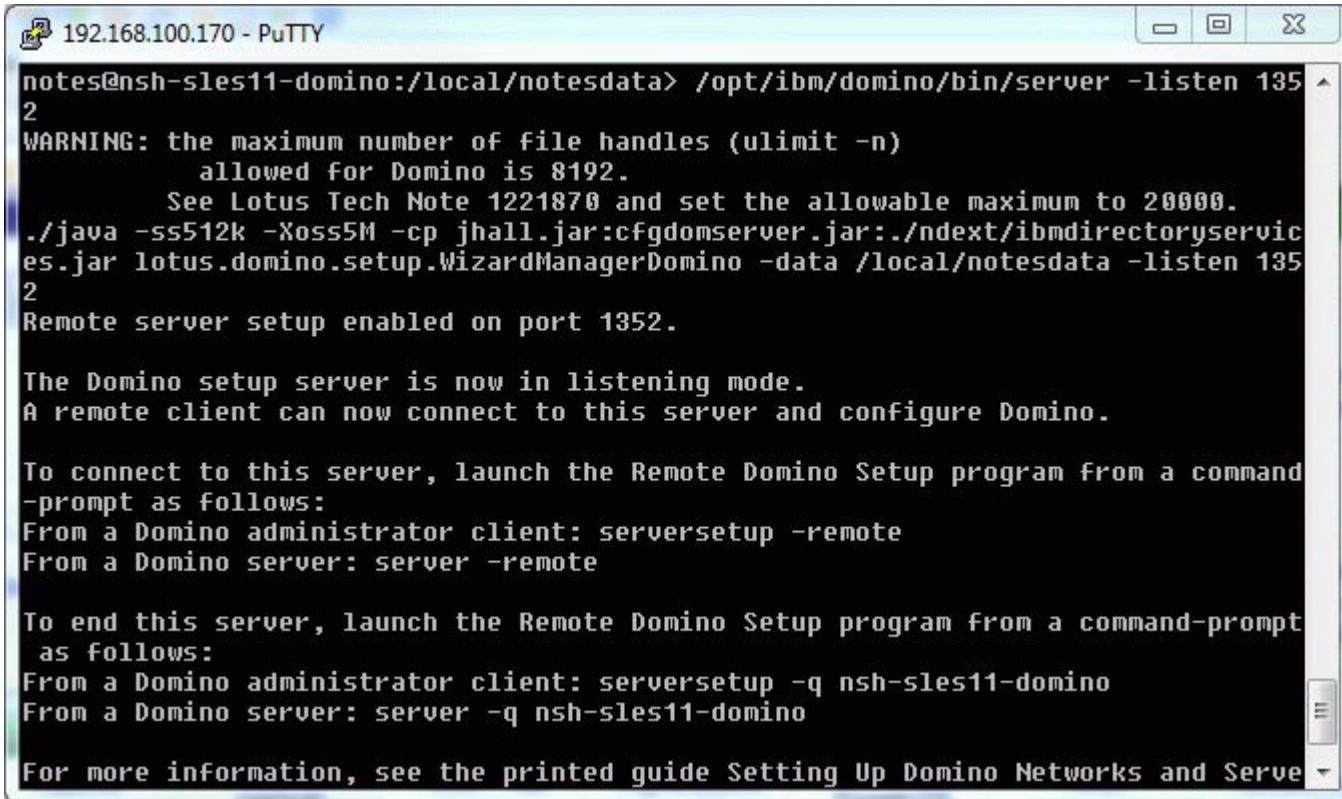


# Domino Server Configuration

- Now that we have installed the Server we have two options to configure the server
  
- a.) Remote Setup
  - Start Server in “Listen” mode
  - Connect via Remote Setup Utility to the server
  - See some screen prints on the next slides
  
- b.) Local Setup using the Graphical Interface
  - Just start the Icon installed on the notes user's desktop
  - See live demo



## Start Server in “Listen” Mode



```
192.168.100.170 - PuTTY
notes@nsh-sles11-domino:/local/notesdata> /opt/ibm/domino/bin/server -listen 1352
2
WARNING: the maximum number of file handles (ulimit -n)
        allowed for Domino is 8192.
        See Lotus Tech Note 1221870 and set the allowable maximum to 20000.
./java -ss512k -Xoss5M -cp jhall.jar:cfgdomserver.jar:./ndext/ibmdirectoryservices.jar lotus.domino.setup.WizardManagerDomino -data /local/notesdata -listen 1352
2
Remote server setup enabled on port 1352.

The Domino setup server is now in listening mode.
A remote client can now connect to this server and configure Domino.

To connect to this server, launch the Remote Domino Setup program from a command
-prompt as follows:
From a Domino administrator client: serversetup -remote
From a Domino server: server -remote

To end this server, launch the Remote Domino Setup program from a command-prompt
as follows:
From a Domino administrator client: serversetup -q nsh-sles11-domino
From a Domino server: server -q nsh-sles11-domino

For more information, see the printed guide Setting Up Domino Networks and Serve
```

- Login as “notes” user
- Switch to data directory
  - cd /local/notesdata
- Run server via -listen Option
- /opt/ibm/domino/bin/server **-listen 1352**
- Tip: You can specify a port number instead using the default port (8585)
- In my case I have used 1352 because this port is already open in the firewall

# Connect to Server via “Remote Server Setup”

Connect To Remote Domino Server

Please provide the host name or network address of the remote server you wish to set up.

Remote Host Address: 192.168.100.170 Port: 1352

OK Cancel Ping

- Invoke “Remote Server Setup”
  - Installed as an option in Admin Client
  - serversetup.exe
- Connect to Domino Server on Linux via IP Address and port the server is currently listening on
- Setup looks very similar to a Domino on Windows server setup

You are about to set up a new Lotus Domino Server.

Setup will ask you a few questions and suggest default options whenever possible to quickly and easily setup your Domino server.

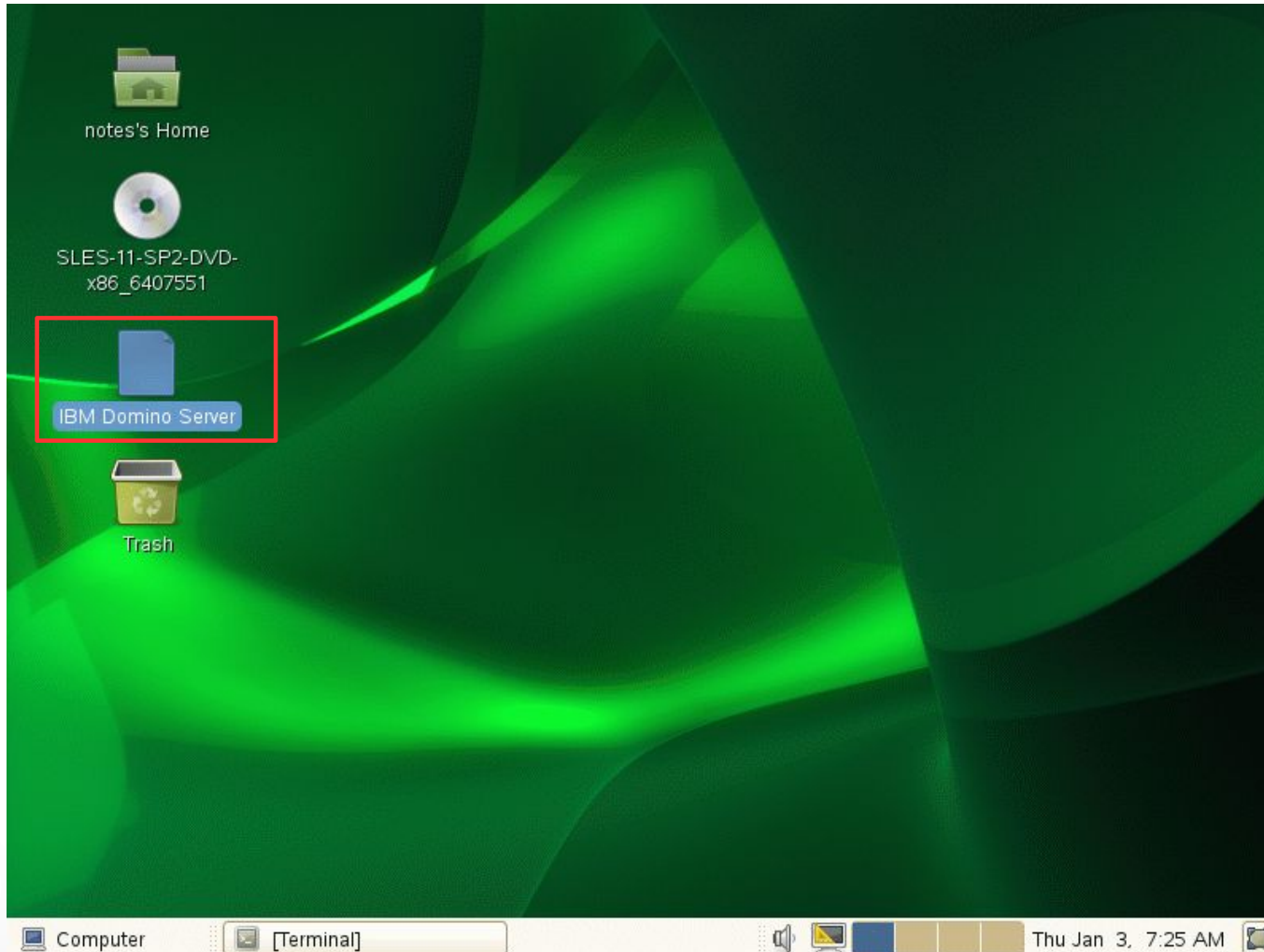
Setting up remote Domino server: 192.168.100.170

To change the font for your language settings, click "Fonts..."

Fonts...

To continue with Setup click Next.

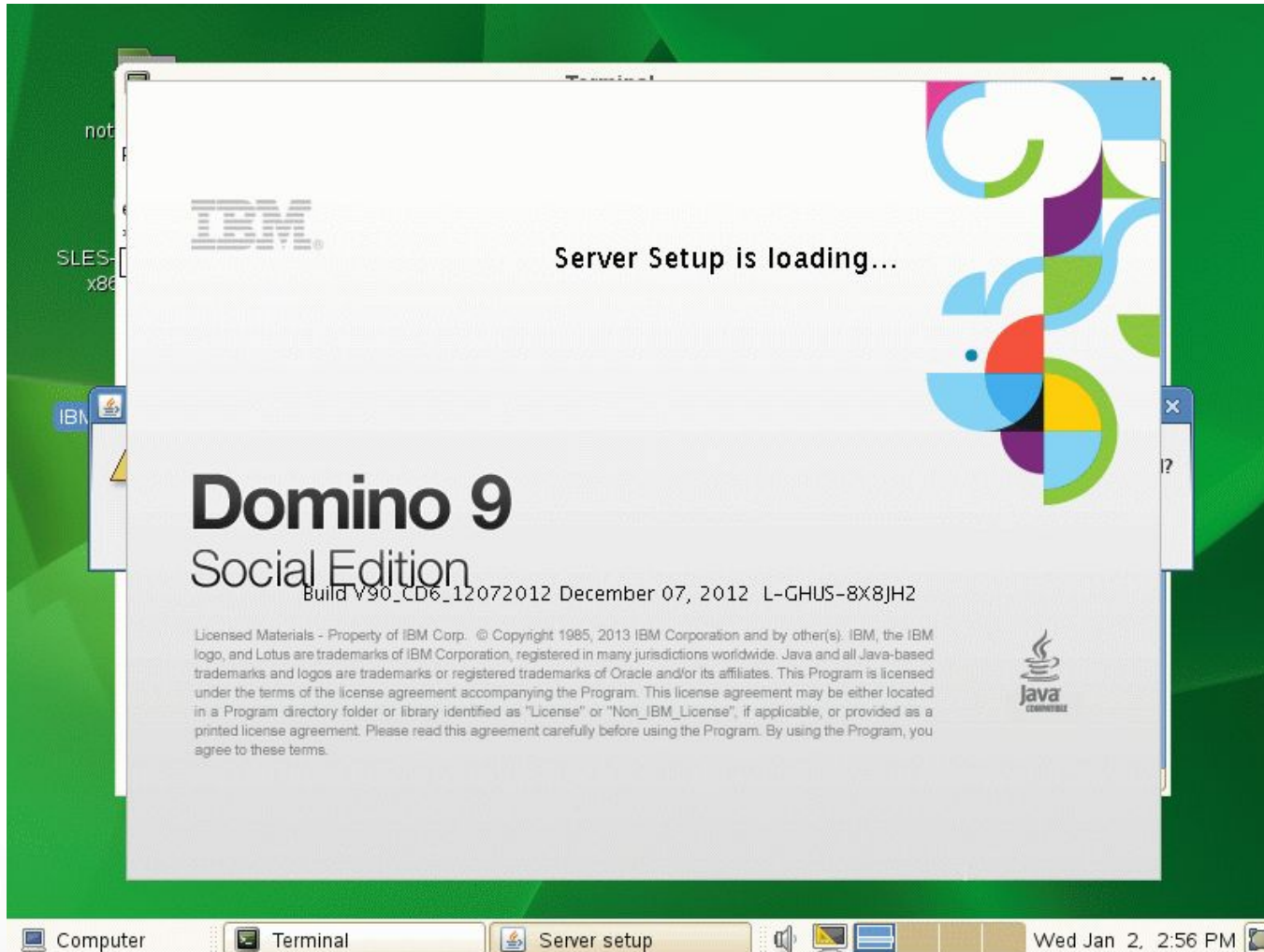
# Local Configuration



- Login via “notes” User instead of the “root” user
- Click on “IBM Domino Server” icon on desktop
  - Configuration will start on first server invocation
- You might have to type in the “notes” password again

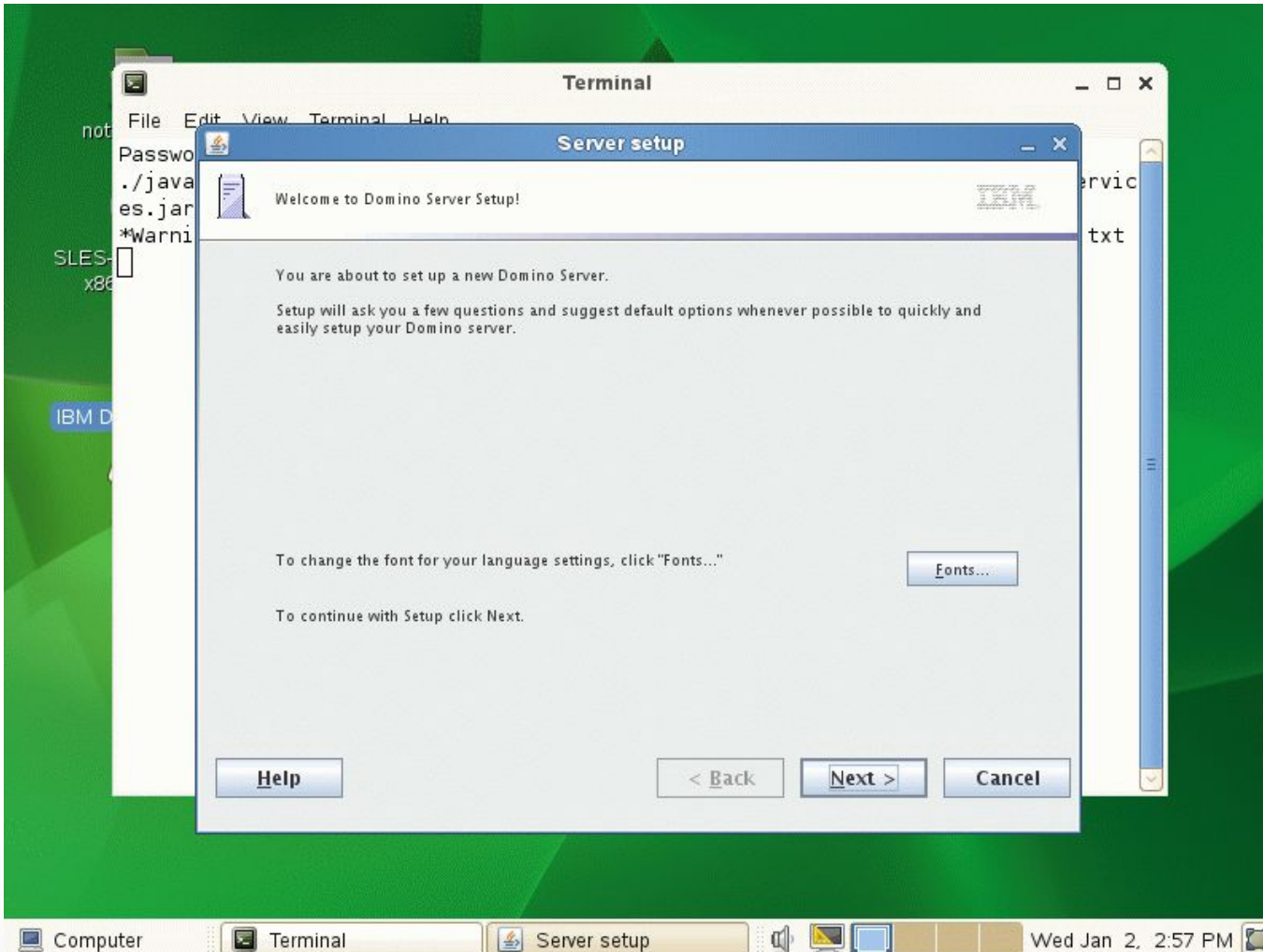


# Domino 9 Social Edition Splash Screen



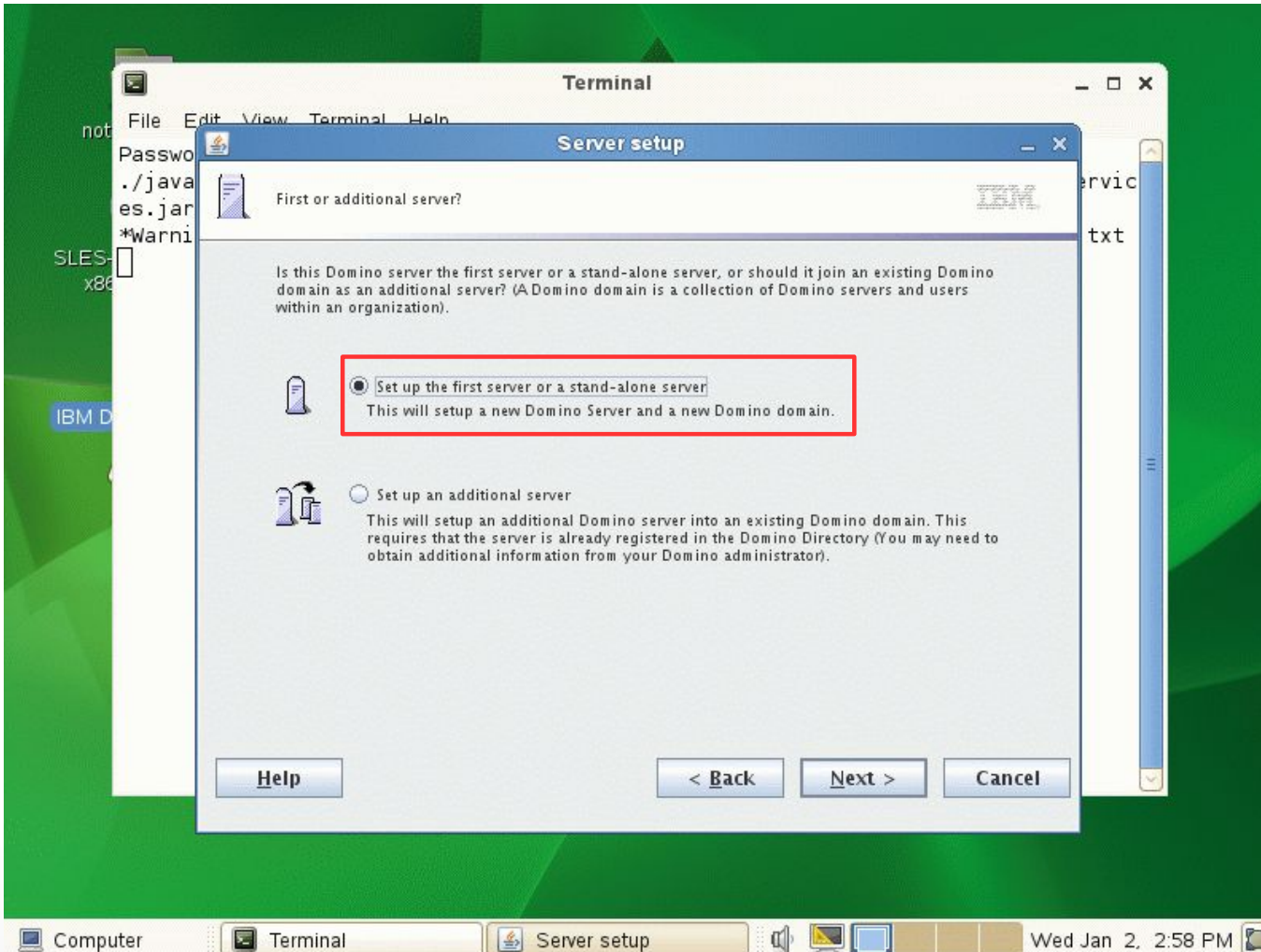
- New Splash Screen
- Configuration looks very similar to Windows
  - No surprises

# Font Setup



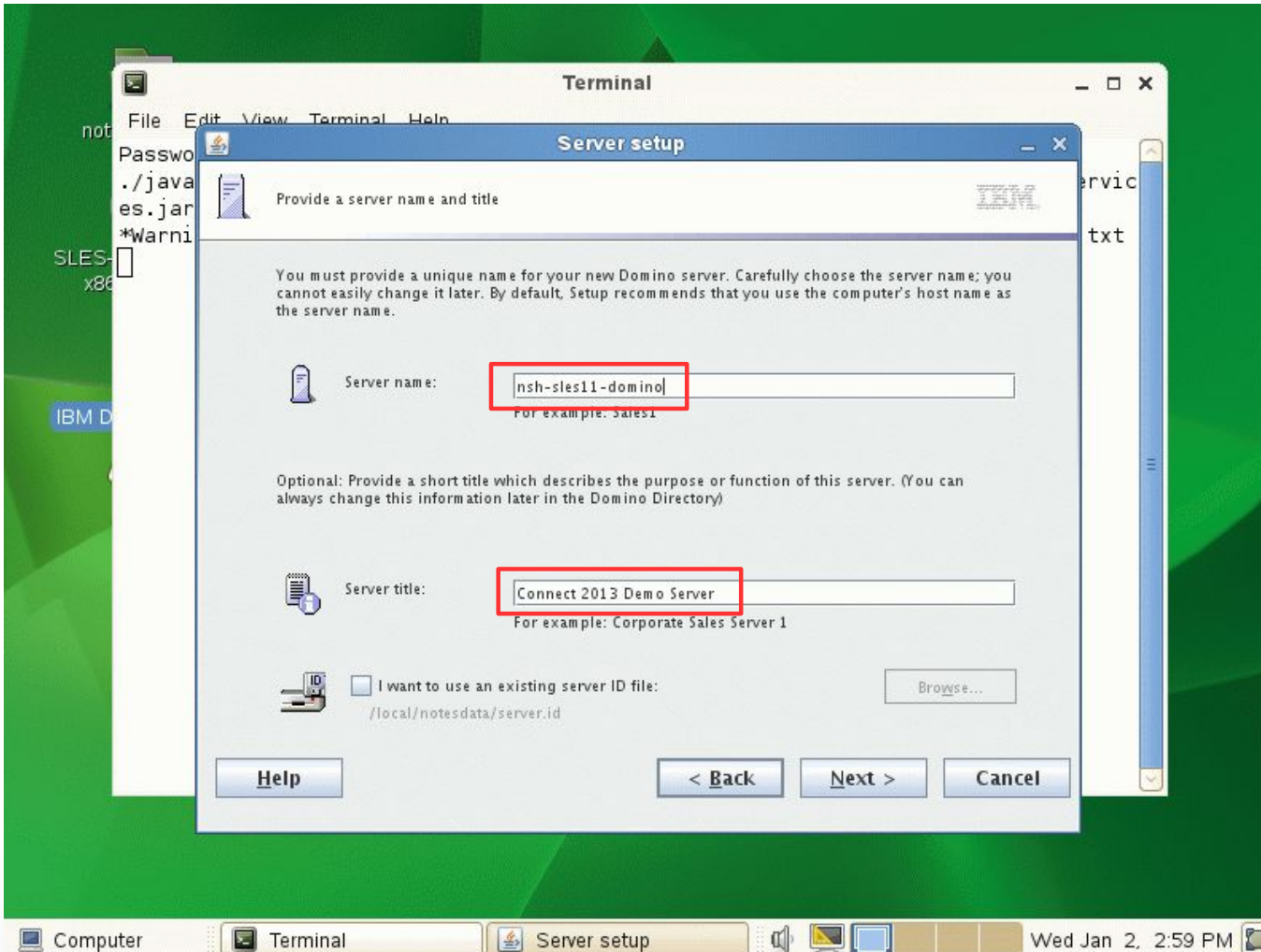
- The Fonts should match
- Just confirm with “Next”

# First Server Setup



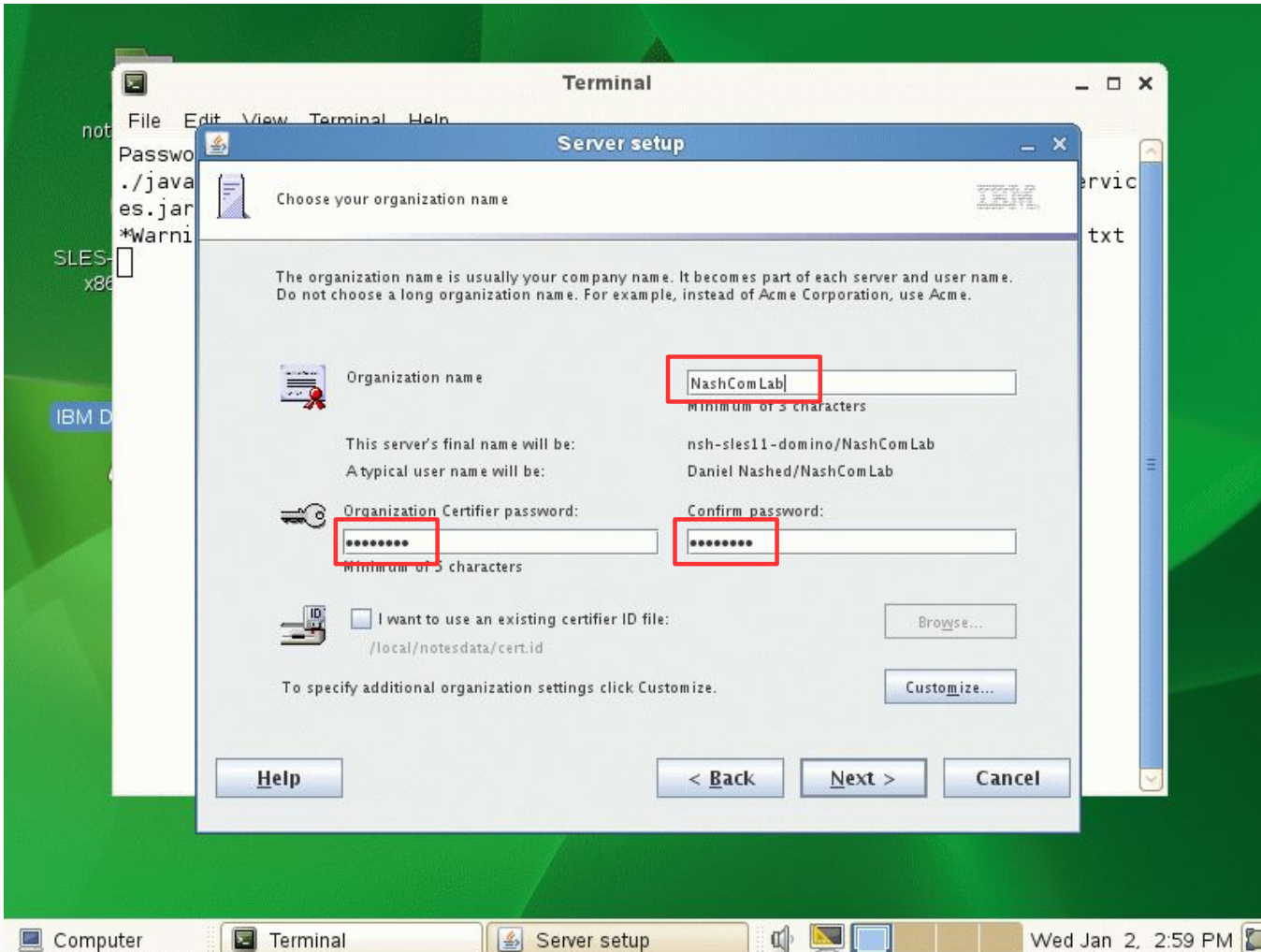
- Normal Setup
- Just specify first Server and Click "Next"

# Specify Server Name



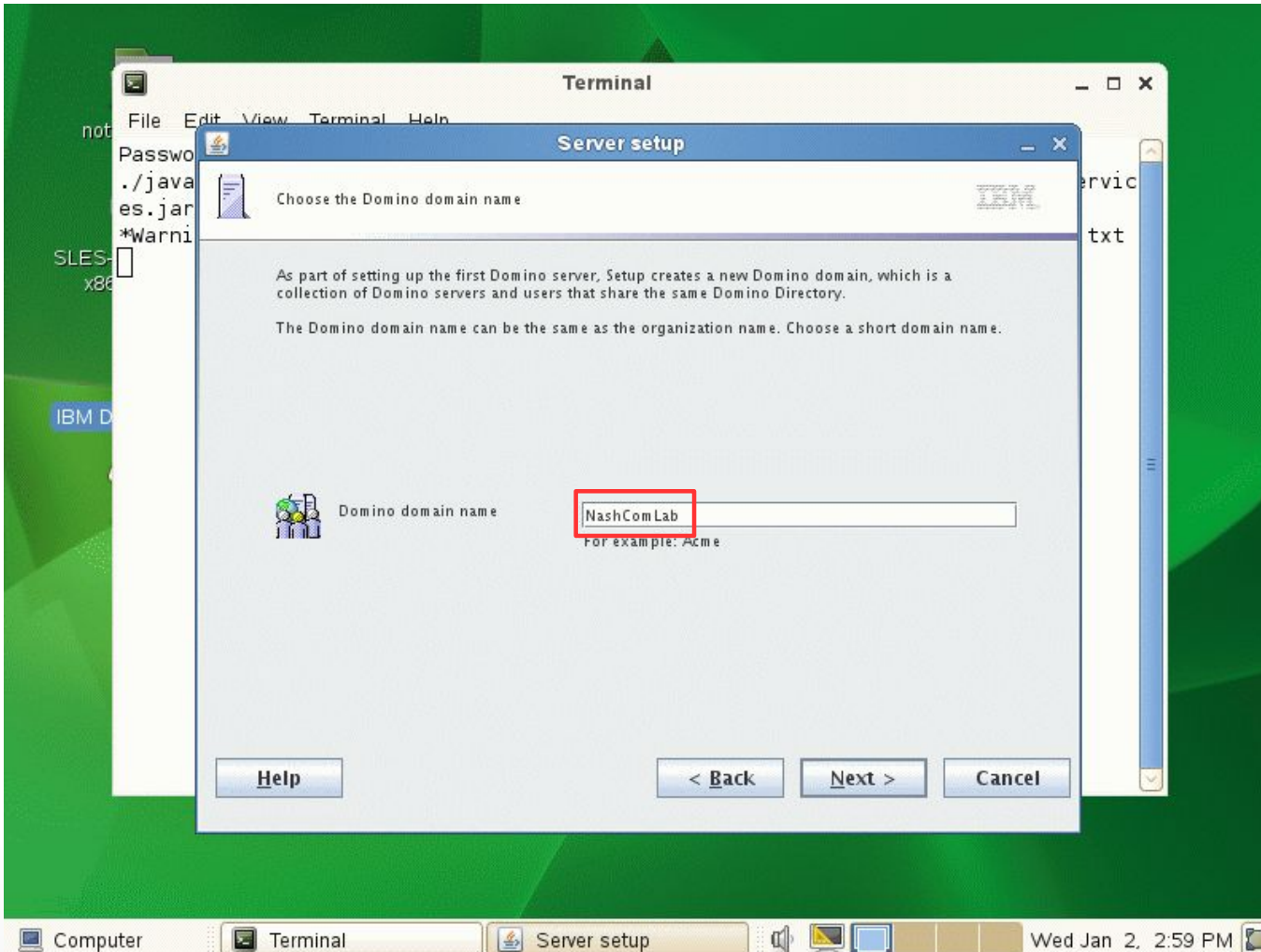
- Type in Server name and Title
- Press “Next”

# Specify Organisation and Password



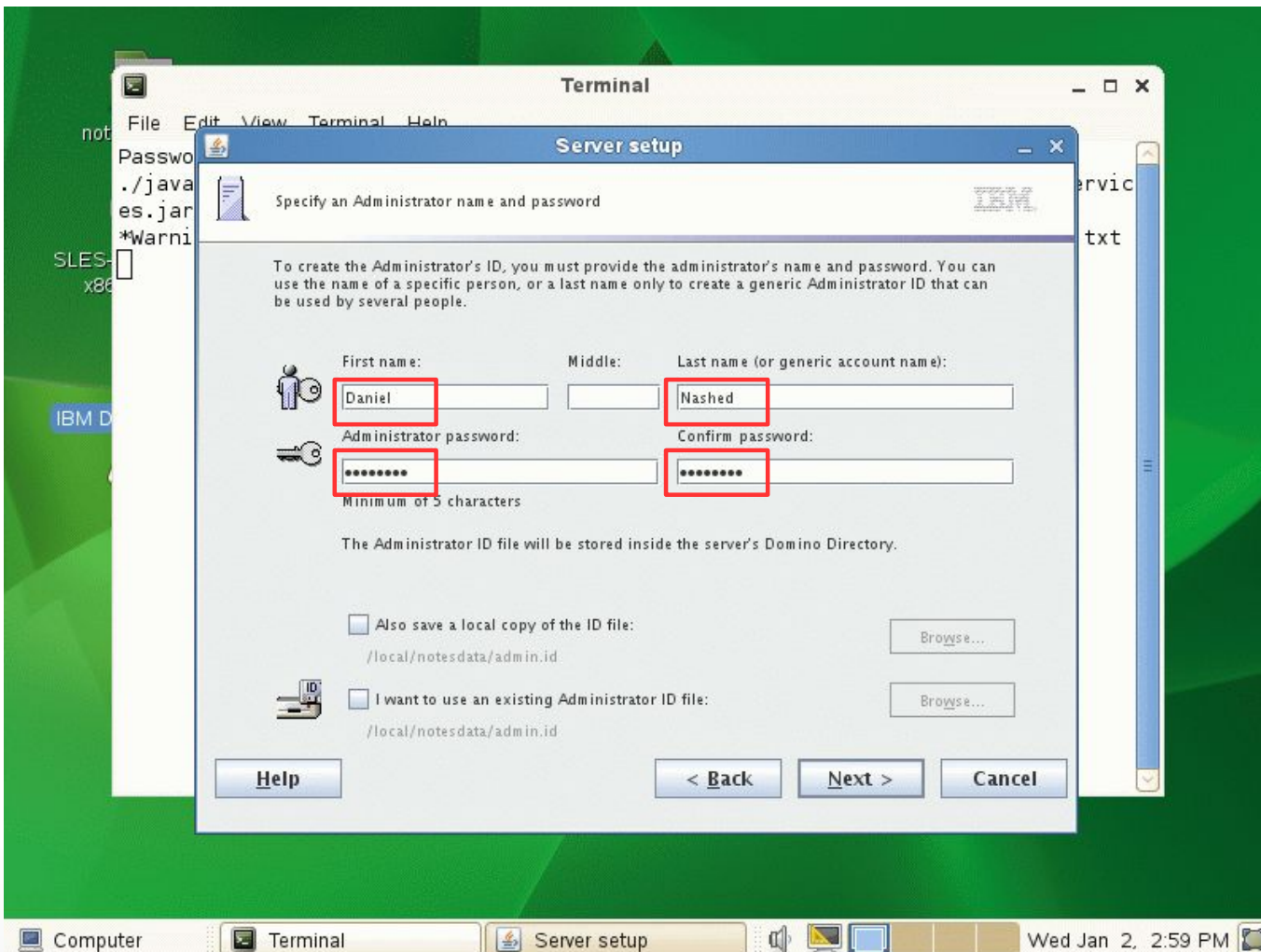
- Type in Organization Name and Password
- Press “Next”

# Specify Notes Domain



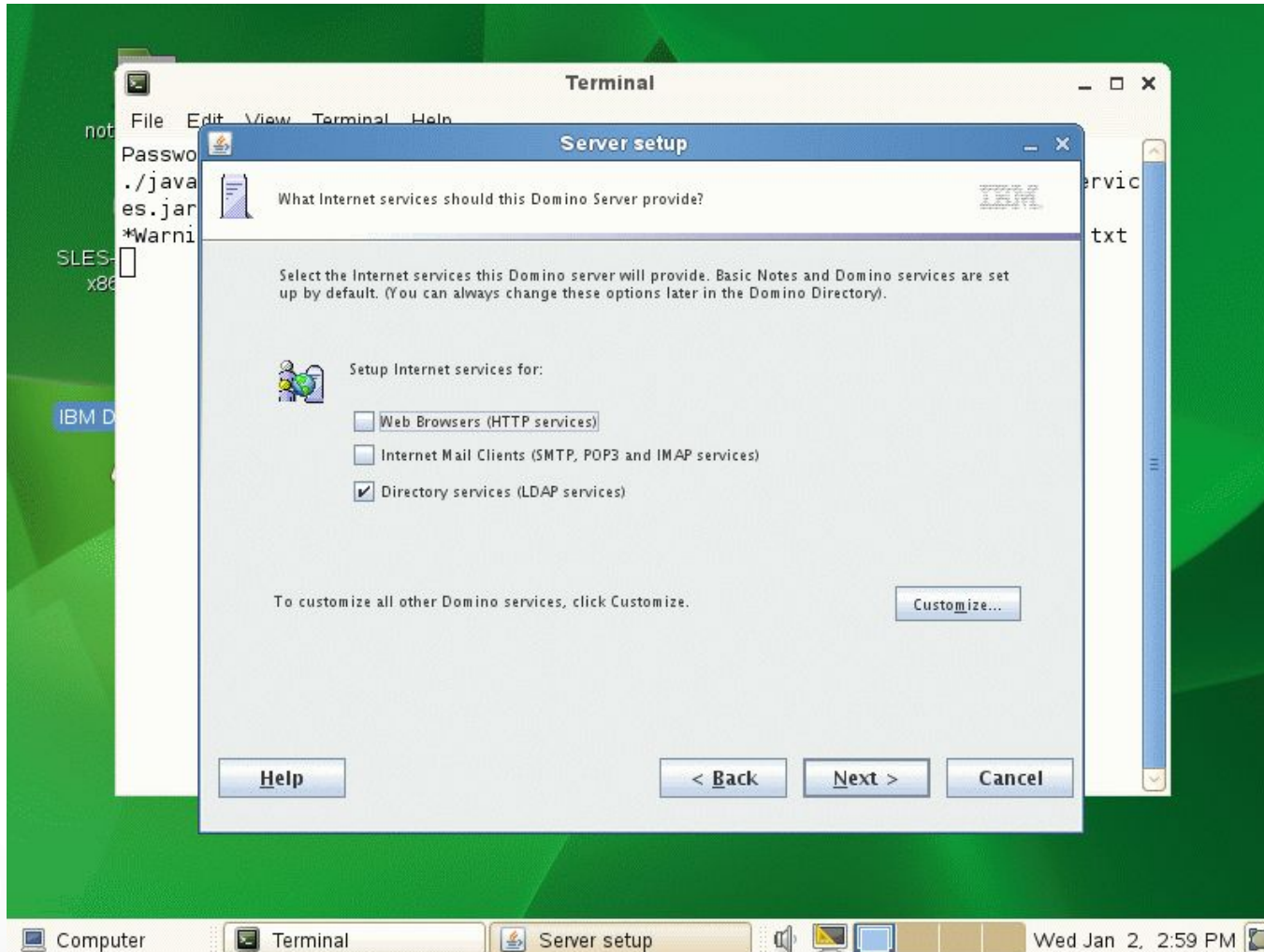
- Type in Notes Domain
- Press “Next”

# Specify Admin User



- Type in information for Admin User including Password
  - You might want to save a local copy of the ID
- Press “Next”

# Configure Internet Services

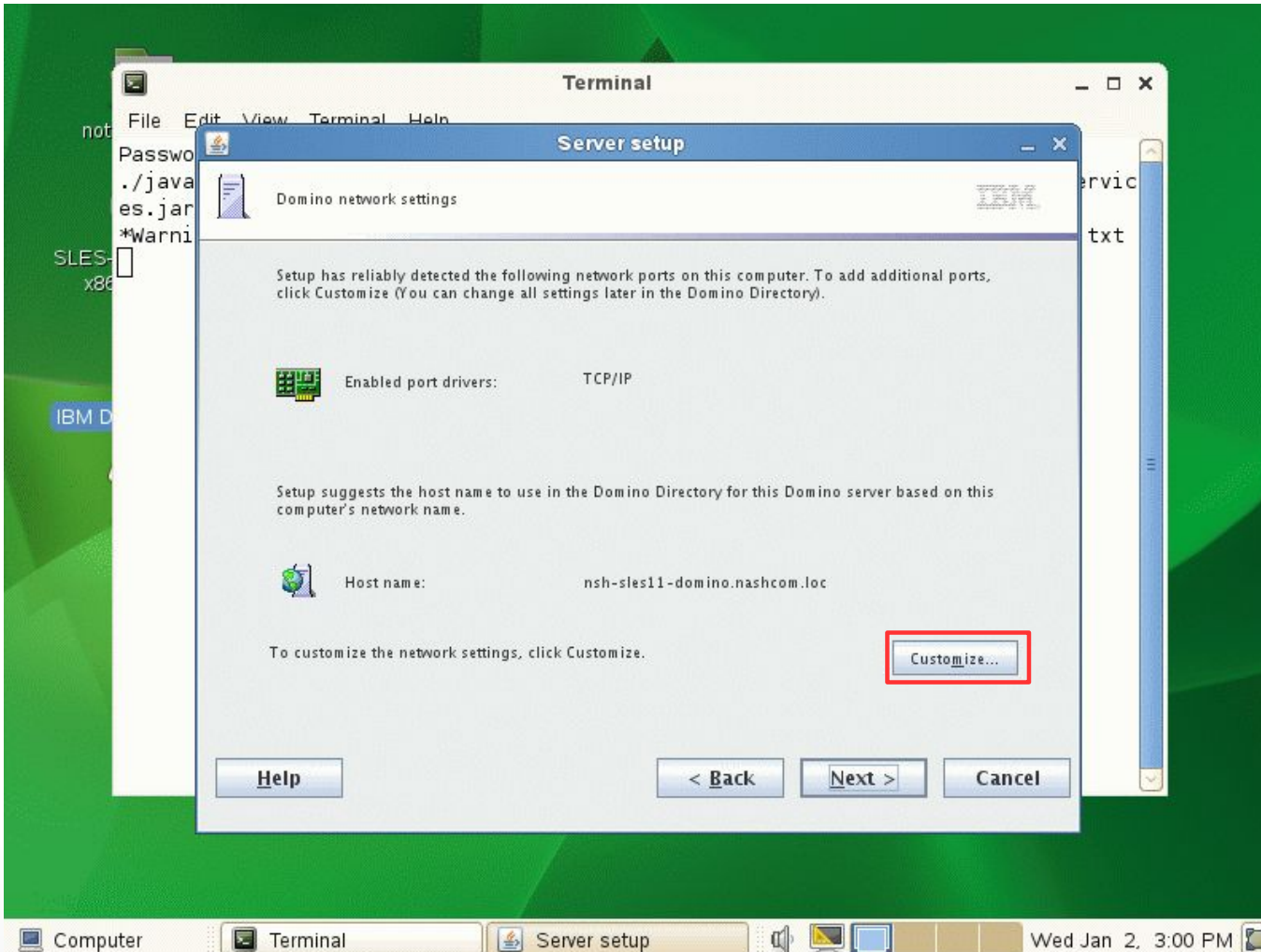


- Select the Internet Services you want to enable
- Press “Next”

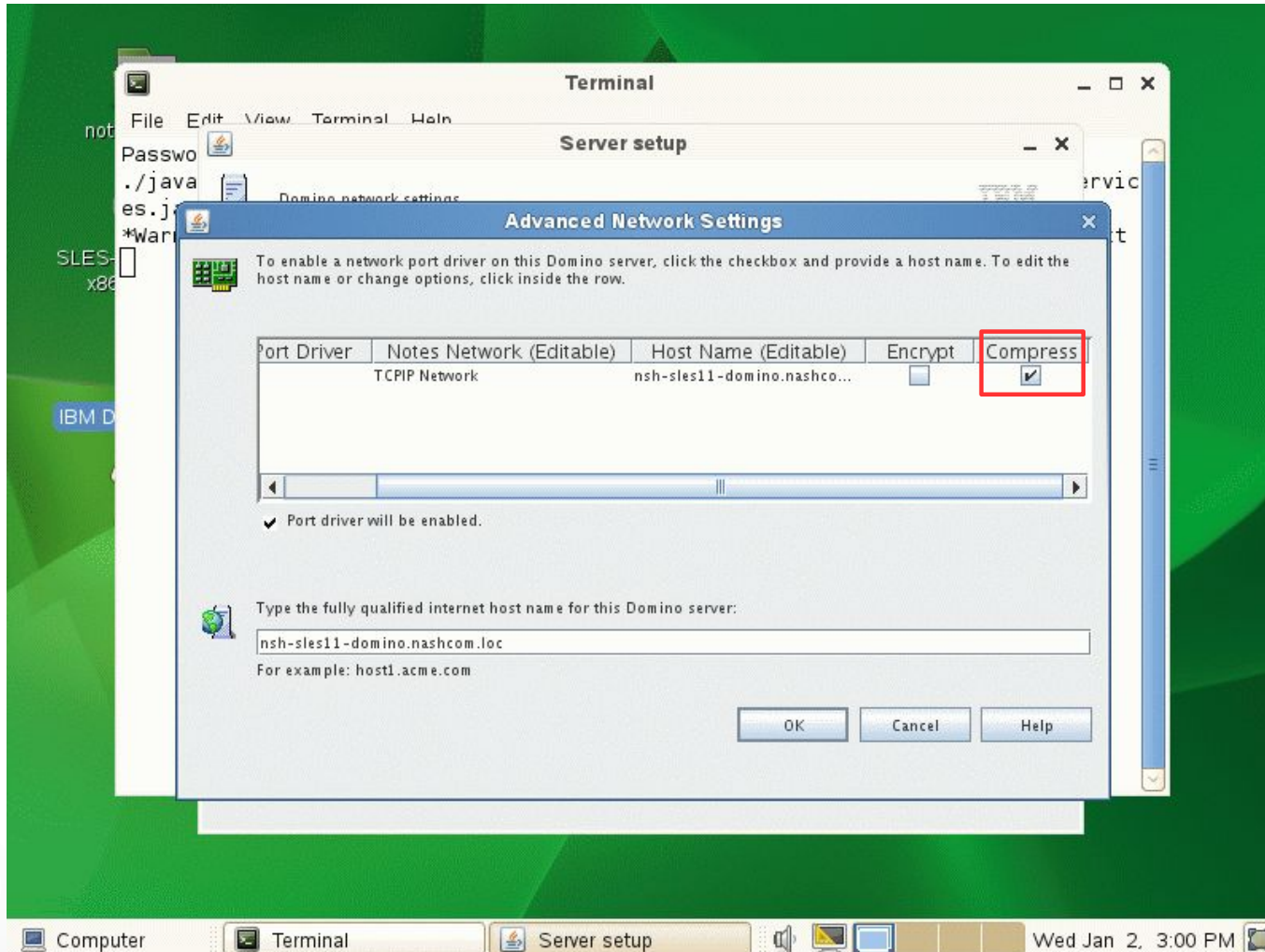


# Customize Network Settings

- Press “**Customize**” to change network settings

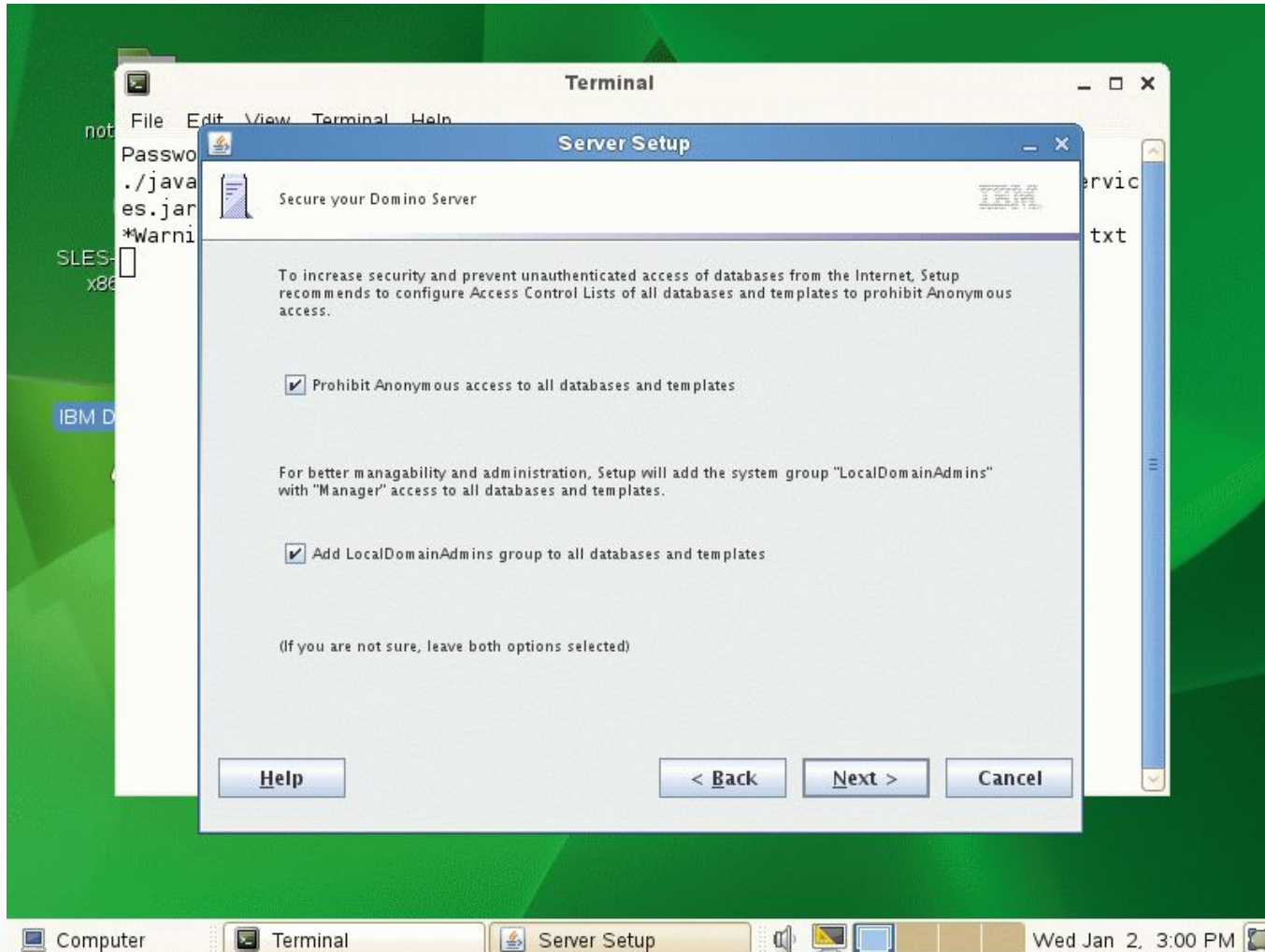


# Enable Network Compression



- Verify Settings
- Select “Compress” Option and press “OK”

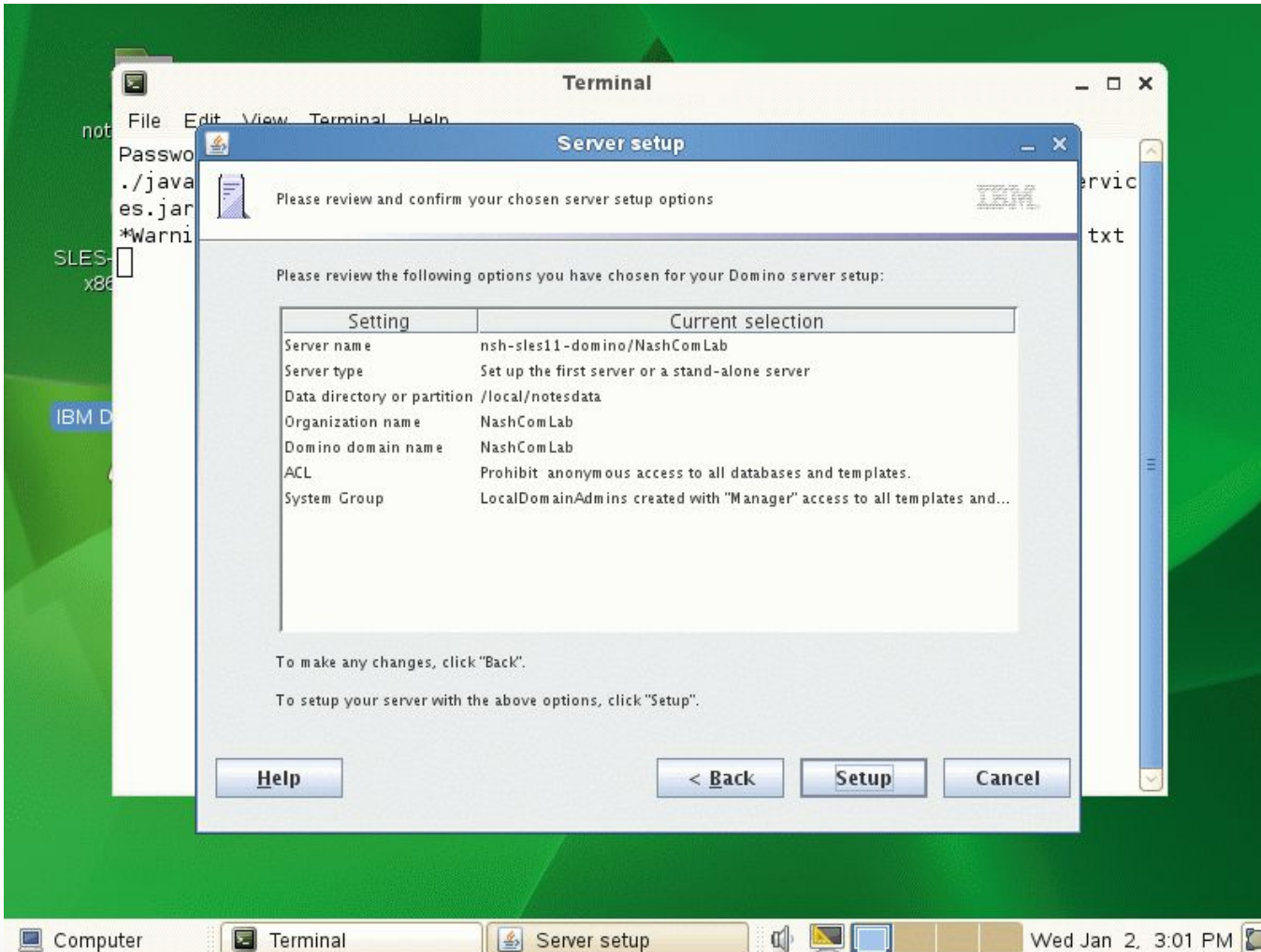
# Domino Server Database Security



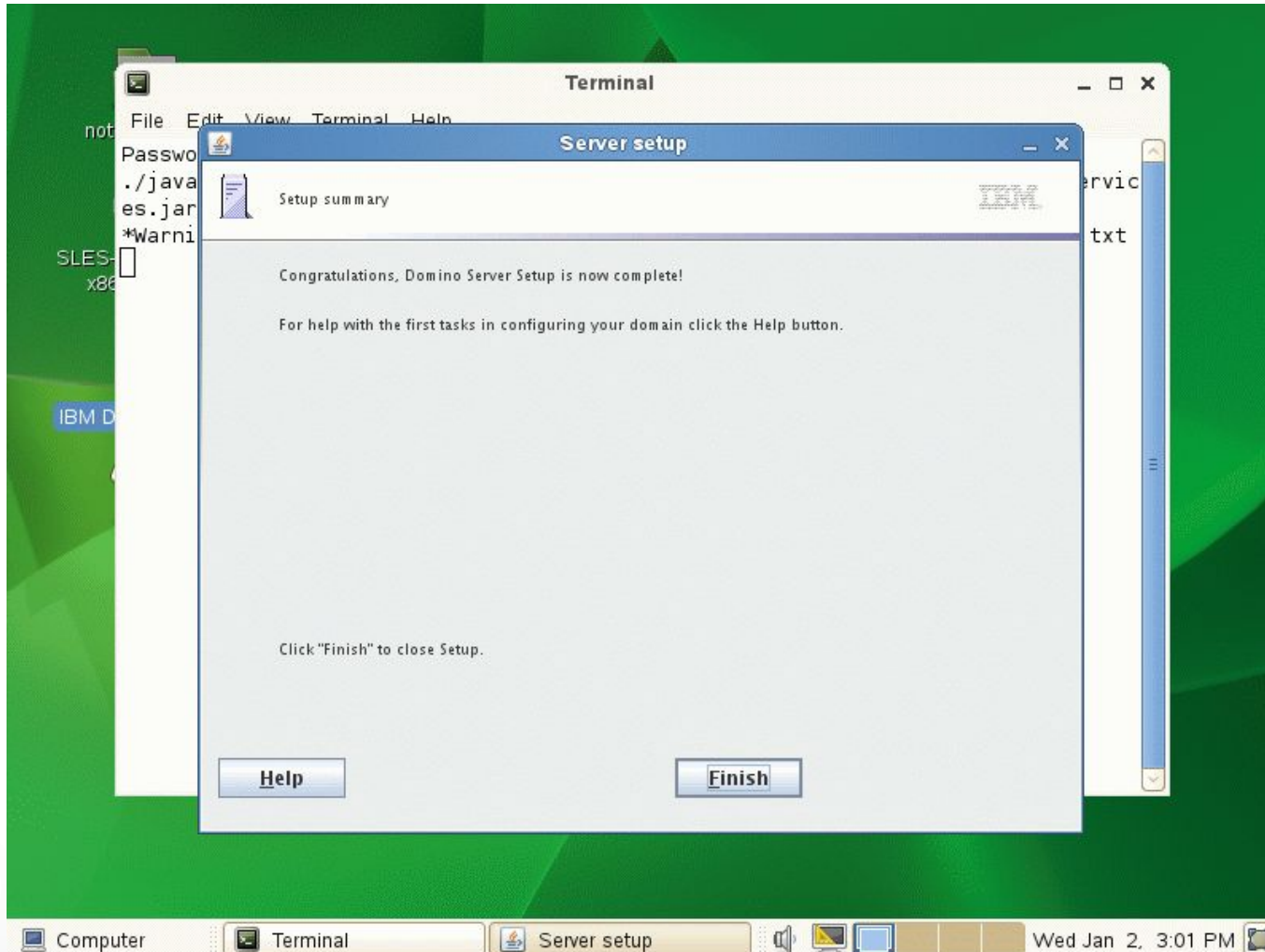
- Confirm the standard Security Settings
  - Press "Next"

# Setup Summary before Configuration

- Check the Setup Summary and confirm via "Setup"

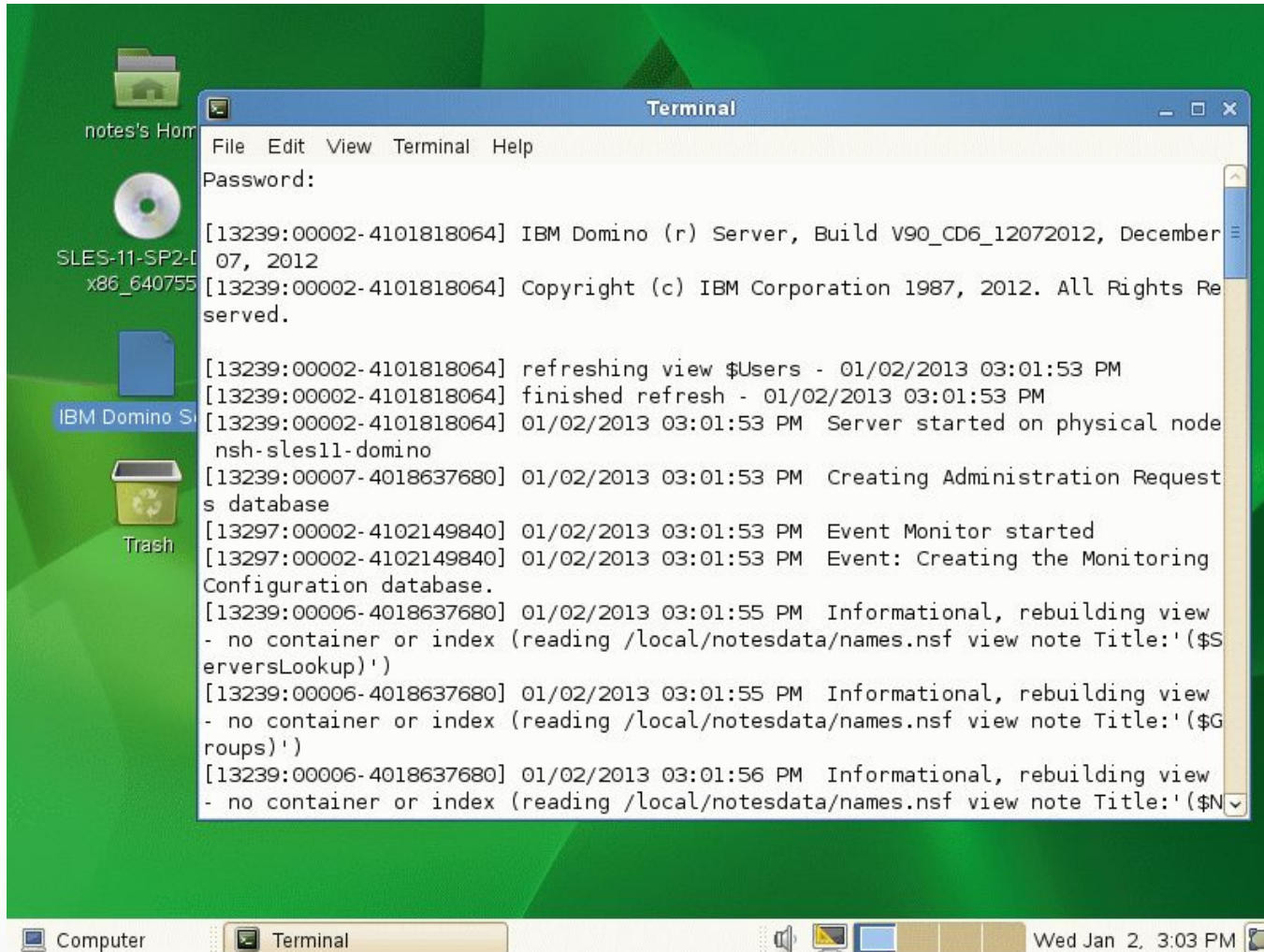


# Configuration Done



- Press “Finish” to start the server for the first time

# Started Domino Server



The screenshot shows a Linux desktop with a green background. A terminal window is open, displaying the following output:

```
Terminal
File Edit View Terminal Help
Password:
[13239:00002-4101818064] IBM Domino (r) Server, Build V90_CD6_12072012, December 07, 2012
[13239:00002-4101818064] Copyright (c) IBM Corporation 1987, 2012. All Rights Reserved.
[13239:00002-4101818064] refreshing view $Users - 01/02/2013 03:01:53 PM
[13239:00002-4101818064] finished refresh - 01/02/2013 03:01:53 PM
[13239:00002-4101818064] 01/02/2013 03:01:53 PM Server started on physical node nsh-sles11-domino
[13239:00007-4018637680] 01/02/2013 03:01:53 PM Creating Administration Request database
[13297:00002-4102149840] 01/02/2013 03:01:53 PM Event Monitor started
[13297:00002-4102149840] 01/02/2013 03:01:53 PM Event: Creating the Monitoring Configuration database.
[13239:00006-4018637680] 01/02/2013 03:01:55 PM Informational, rebuilding view - no container or index (reading /local/notesdata/names.nsf view note Title:'($ServersLookup)')
[13239:00006-4018637680] 01/02/2013 03:01:55 PM Informational, rebuilding view - no container or index (reading /local/notesdata/names.nsf view note Title:'($Groups)')
[13239:00006-4018637680] 01/02/2013 03:01:56 PM Informational, rebuilding view - no container or index (reading /local/notesdata/names.nsf view note Title:'($N
```

- Domino Server runs in Terminal Window very similar how it runs on Windows

# Let's take a look at the server

## ■ Domino Binary Directory **/opt/ibm/domino**

- Directory “**bin**”: contains startup links for all binaries like server, replica, etc
  - All those links are also links to an internal start script
    - Used to configure the environment for the process
    - Each add-on product should have also a startup link
- Directory “**notes**” : contains sub-directories and links.
- “**latest**” points to “**linux**” which contains all binaries

```
# cd /opt/ibm/domino/
# ls -l
total 12
-rw-r--r-- 1 root root 766 Jan 2 14:31 .install.dat
drwxr-xr-x 3 root root 4096 Jan 2 14:30 bin
drwxr-xr-x 3 root root 4096 Jan 2 14:30 notes

cd notes
# ls -l
drwxr-xr-x 3 root root 4096 Jan 2 14:29 90000
lrwxrwxrwx 1 root root 5 Jan 2 14:30 latest -> 90000
# cd latest/
# ls
linux
```



# Binary Directory

```

nsh-5les11-domino:/opt/ibm/domino/notes/latest/linux # ls
DominoInstall.log      dircat          kpp97rdr.so    libhttpstack.so  meter.dcx       rtfshr.so
ITLMLDE0805.SVS2     dir1int        kppctrdr.so   libibmp.so       mhtsr.so       runjava
RMEval.jar            domidx         kppicrdr.so   libicppapi.so    mifsr.so       sbinder
TTFonts              domino.dtd     kppng.so      libigif.so       misr.so        sched
TimeZones.txt         domino.ico    kpppxrdr.so   libjpeg.so       mp3sr.so       scontroller
TimeZones_Strings.txt domino.mib     kpprerdr.so   libinotes.so     mppsrs.so     senddiag
_uninst              domino.tdf    kpprzrdr.so   libirtf.so       msgsr.so       server
addtraps.sh          dw4sr.so      kpswdrdr.so   libjavacon.so    msosr.so       serversetup
admin                dw4sr.so      kpwg2rdr.so   libjnotes.so     msosr.so       serversetup.html
afsr.so              dxlsr.so      kpwmfrdr.so   libjsetdom.so    mtc            smtp
amgr                 emlsr.so      kpwpgdrdr.so  liblsxbe.so      mw6sr.so       sosr.so
asfshr.so            emxsr.so      kv.lic         liblsxlc.so      mw8sr.so       startup
assr.so              event         kvfilter.so   liblsxodbc.so    mwsr.so        statlog
autodial             events4.txt   kvqzsr.so     libndgts.so      mwsr.so        stats
awsr.so              execbin       kvhqxsr.so    libnotes.so      mwxsr.so       swfsr.so
bentofio.so         Faultanalyzer kvolefio.so   libnotes.so.sym  ndext          tarsr.so
billing              file.dcx      kvoop         libntcheck.so    net-snmpd     tcc.dcx
bindsock            fileret       kvutil.so     libprobes.so     net-snmpd.conf tifsr.so
bkfshr.so           filter        kvxconfig.ini librmstat.so     net-snmpd.sh   tnefsr.so
broker.dcx          fixup         kvxpgsa.so    librshhttp.so   notes.png      trace.dcx
ca                   foliosr.so   kvxssa.so     libservelet.so  notes_ps.awk   trends
cabsr.so            formats.ini   kvxtract.so   libsplchar.so   notesel.dcx    tstxtract
calconn             getadrs      kvxwpsa.so    libsslplus.so   nsd.sh         tunekrnl
catalog             gproxy       kuzeesr.so    libtlupdat.so   nsd2xml        txtcnu.so
cbmap.map           gsk8         kvzip.so      libudit.so       nsfdb2cfgunix.sh unisr.so
cconsole            htmsr.so     kwad.so       libuim.so        nsfsr.so       unzip.so
cfgdomserver.jar    http         l123sr.so     libwmsgtrc.so   oa2sr.so       updall
cfgdomserver.txt    hwpsr.so     lasr.so       libxmlcommon.so object          update
chartbls.ux         icm          ldap          libxmlproc.so   odbcc2.dcx     utf8sr.so
checkos.pl          icudt341.dat ldapsearch     libxrtf.so      odffssr.so     uudsr.so
chronos             imap         leiquietclean libzlib.so       odfwpsr.so     vdsr.so
clbdbir            intrcpt      libKeyViewFilter.so license         olesr.so       web
clrepl             iwsssr.so   libaftaro6.so lnsnmp          onmsr.so       wkssr.so
collect            iwpsr.so    libaftaro9.so lnsnmp.sh      oracle.dcx     wosr.so
collexp.dcx        java         libaltfltr.so lnsnmp_reboot.sh order.dcx      wp6sr.so
compact            jconsole    libbdblens.so lnsnmp_starts.sh orgconst.lss   wpmmap.so
convert            jhall.jar   libdbodbc.so  lnsnmp_stops.sh osgi            wpmr.so
csusr.so           join.dcx     libdcapi.so   logasio         pdfsr.so       xlsbsr.so
cus310.res         jpgsr.so    libdchtapi.so lotus.ini       pop3           xlsrsr.so
daosmgr            jtdsr.so    libdcrtpi.so  lotusini.tpl   properties     xlsxsr.so
davpop             jum         libdecsext.so lconst.lss     pstnsr.so     xmlschemas
db2.dcx            kpagrdr.so  libdmsecadm.so lserr.lss      qosprobe       xmlsh.so
db2errmp.xml       kpcatrdr.so libdolextn.so lsprcval.lss  qpssr.so       xmlsr.so
dbcapture          kpemfrdr.so libdomws.so   lsxbeerr.lss  qpwsr.so       xnative
dbmt              kpgifrdr.so libdomwsdxlo.so lsxsd.lss     quryset       xpsr.so
dbopen.jar         kpifcnut.so libdomwsxmlcommon.so ltsci3.tlb    rarsr.so      xsp
dcasr.so           kpifutil.so libdxlo.so     lzshr.so      rdebug         xywsr.so
dconsole.jar       kpiwpgdrdr.so libefln1271.so maps           remotesetup    yimsr.so
dctest            kpmsoadr.so libftgtr40.so mbsr.so       remotesetup.cmd z7zsr.so
decs              kpodadrdr.so libgrpemems.so mbsr.so       replica
design             kpodfrdr.so libgsk8iccs.so memcheck      router
difshr.so         kpp40rdr.so libhttprs.so  memcheck      router
diop              kpp95rdr.so
nsh-5les11-domino:/opt/ibm/domino/notes/latest/linux #

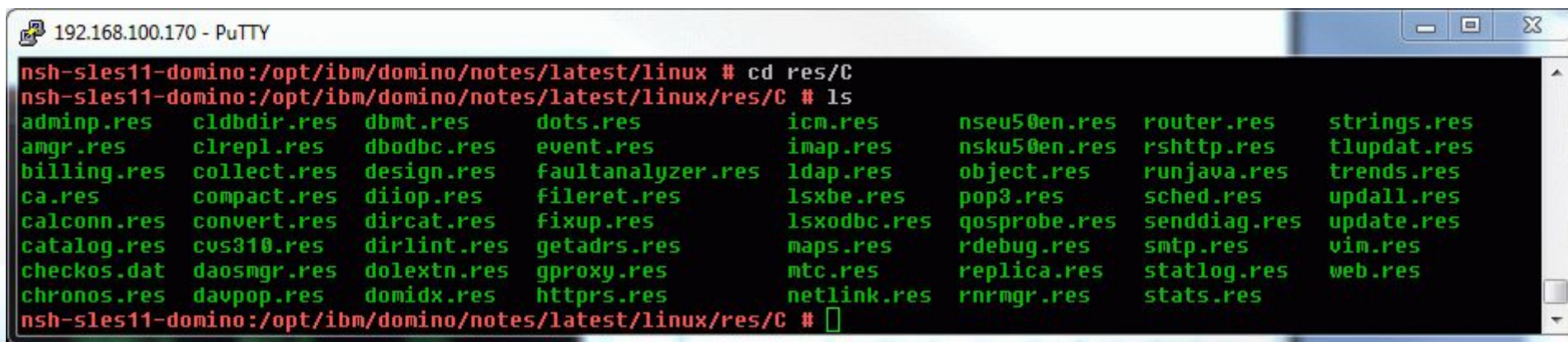
```

- Contains all Binaries and a couple of sub-directories
- Special files
  - **bindsock** - used to bind to restricted ports below 1024
  - **tunekrnl** – invoked on startup to set Domino specific kernel parameters
- Directory “**res**” contains string resources like error texts etc



## Resource Directory “res”

- Files contain string resources for Domino binaries
  - If they are missing or wrong you don't get error messages but cryptic error codes!
- Often an installation issue
- The sub-directory should be called “**res/C**”
- C is the Posix locale and fallback for all other languages
- If the directory name is something like “**en\_US..**” and your server uses a different locale like “**de\_DE..**” you will run into issues.
- Also often an issue with updates
  - If the installer writes into a different directory!



```
192.168.100.170 - PuTTY
nsh-sles11-domino:/opt/ibm/domino/notes/latest/linux # cd res/C
nsh-sles11-domino:/opt/ibm/domino/notes/latest/linux/res/C # ls
adminp.res  clbdbdir.res  dbmt.res      dots.res      icm.res       nseu50en.res  router.res    strings.res
amgr.res    clrepl.res    dbodbc.res    event.res     imap.res      nsku50en.res  rshttp.res   tlupdat.res
billing.res collect.res    design.res    faultanalyzer.res  ldap.res      object.res    runjava.res  trends.res
ca.res      compact.res   diiop.res     fileret.res   lsxbe.res     pop3.res      sched.res    updall.res
calconn.res convert.res   dircat.res    fixup.res     lsxodbc.res   qosprobe.res  senddiag.res update.res
catalog.res cvs310.res    dirlint.res   getadrs.res   maps.res      rdebug.res    smtp.res     vim.res
checkos.dat daosmgr.res  dolextn.res   gproxy.res    mtc.res       replica.res    statlog.res  web.res
chronos.res davpop.res    domidx.res    https.res     netlink.res   rnrmgr.res    stats.res
nsh-sles11-domino:/opt/ibm/domino/notes/latest/linux/res/C #
```

## .Install.dat

- .install.dat: contains installation information – on Windows this information is stored in Registry
  - This information is also used for remote server setup
  - Of special interest for partitioned servers – contains location of data directories and user names

```
add_data_directories_only = 0
asp_install_option = 0
components = ("License","Program Files","Data Files","Domino Enterprise Connection Services","Domino
Offline Services","IBM iNotes","Domino Directory Sync Services","Domino As A Windows Service","Performance
Monitoring","Resource Modeling Engine","Help","OS Integration","OS Integration Linux","IBM HTTP Server")
  data_directories {
    "/local/notesdata" {
      data_UNIX_gid = 1000
      data_UNIX_group = notes
      data_UNIX_uid = 1001
      data_UNIX_user = notes
    }
  }
installation_type = 2
isLocal = 1
kitArch = linux
opt_domino_softlink = 0
pPath = /opt/ibm/domino/notes/90000/linux
program_directory = /opt/ibm/domino
ptPath = /opt/ibm/domino
rev = 90000
start_server_setup = 0
```

## Data Directory “/local/notesdata”

- Contains the full data directory exactly like on Windows
- Ownership of the files is the user and the group used for installation ([notes:notes](#))
  - Warning: Take care when transferring or creating files with other users!!!
  - If the “notes” user cannot read or write those files because of permission issues you are in trouble!
- Best practice: Always use the “notes” user for all operations
  - “**su – notes**” switches to the user in case you are root
  - “**whoami**” tells you which user you are
  - The server cannot be started with “root” for that reason
- Recommendation: Create all file names e.g. for databases with **lower-case** without **umlauts**!!!
- **THE LINUX FILE-SYSTEM IS CASE SENSITIVE!!!**



# Linux File and Directory Permissions

- Linux (Unix) uses 3 different types of rights for 3 different types or classes
- Types
  - Read = r
  - Write = w
  - Executable = x
- Classes
  - Owner = the owner of a file
  - Group = the group who owns a file
  - World = all Others
- There are two representations
  - Text and Octal Numbers
  - Each right is defined by a bit
    - 1 = x, 2=w, 4=r



# Permission Octal Values

- 0 --- no permission
- 1 --x execute
- 2 -w- write
- 3 -wx write and execute
- 4 r-- read
- 5 r-x read and execute
- 6 rw- read and write
- 7 rwx read, write, and execute
  
- Different meanings for directories
  - Read = read directory
  - Write = write entries in directory
  - Execute = switch into directory



## List Permissions and Examples

- You can list permissions for a file via “ls -l” (long version of the list command)
  - Tip: You can also see and can change permissions in WinSCP

```
/local/notesdata # ls -l notes.ini
-rw-r--r-- 1 notes notes 2089 Jan  4 00:39 notes.ini

/opt/ibm/domino/notes/latest/linux # ls -l libnotes.so
-rwxr-xr-x 1 root root 42618137 Dec  8 08:41 libnotes.so
```

- “ls” shows:
  - File type
  - Permissions for Owner, Group, World
  - Owner and Group
  - File Size
  - File Modification TimeDate
  - File Name
- File Type:
  - regular file “-”
  - directory “d”
  - symbolic link “l”



## Change Permissions and Owner of Files and directories

- You can permission for file or directory using “chmod” command
- There are two different ways to specify the permissions
- Either octal representation or rwx notation (`[ugoa]*([-+=[rwxXst]*][ugo]))+`)
  - I prefer the octal presentation (755)

```
/etc/init.d # chmod 755 rc_domino  
/etc/init.d # chmod a+rx rc_domino
```

- You can change the owner of a file or directory using “chown” command
- Specify the user and group
- In case of a directory you might want to use -R to recurse thru sub-directories

```
/local/notesdata # chown notes:notes notes.ini  
/local # chown -R notes:notes notesdata
```



## Domino on Linux Mixed Case File-System Issues

- As long you stay with lower-case files you are save!
- Customers migrating from W32 have problems with mixed case file-names
- Cache issue with lower upper case characters for Notes and Web
  - Domino is case in-sensitive. The file-system is case-sensitive
  - This causes all sorts of issues with databases and directory-names
  - Sometimes a database is found sometimes it is not found
  - Quite inconsistent
  - Mail-files, Desktop, Agents, ....
  - There is no out of the box solution yet - still!
- Nash!Com has a (work-around-)solution based on an Extension-Manager routine
  - Free on Linux -- commercial on other platforms
  - Translates all requests to lower-case (Open, Create, Delete...)
  - Works fine if all database and directory names are converted to lower-case during migration
  - Has additional logging to trace problems (prints error codes from API calls)





# Migration from Windows to Linux -- Differences

- Some Windows specific functionality is not supported on Unix
  - Like OLE, DDE in Backend Agents
    - Frontend Agents running in Client are OK
  - Take care about OS level or Notes API level calls
    - Can be ported but need special attention
    - For example calling Windows API → More difficult to port
    - Calling C-API from **nnotes.dll** → can be ported to call **libnotes.so**
- File-System Differences
  - Drive-Letters vs Mounted File-System in “root” file-system
  - If working with relative path you might be save
  - “/” is the path separator but in most cases also “\” works
- Native C-API Applications
  - Can be ported → C-API is cross platform
  - Most vendors support Linux
  - New challenge → Porting Applications to Domino 9 64Bit



## Edit Files on Linux? -- vi?

- Default is still a very very cryptic tool called “vi”
  - Very cryptic syntax and different modes
- Invoke with file like this “**vi notes.ini**”
- Now you are in command mode and can scroll around
- Edit mode
  - Create new line press “o” or “O” for new line before or after current line
  - Insert Text into Line press “i”
  - Append Text into Line press “a”
  - Remove char “x”, Remove line “d”
  - When you are done with editing press “ESC” to go back into command mode
- Type in commands via “:” in command mode
  - Save and Exit: “:wq”
  - Exit without save “:q!”
- That is weird (“vi” is a very very old tool)
- Search for “vi cheat sheet” to get good starting point

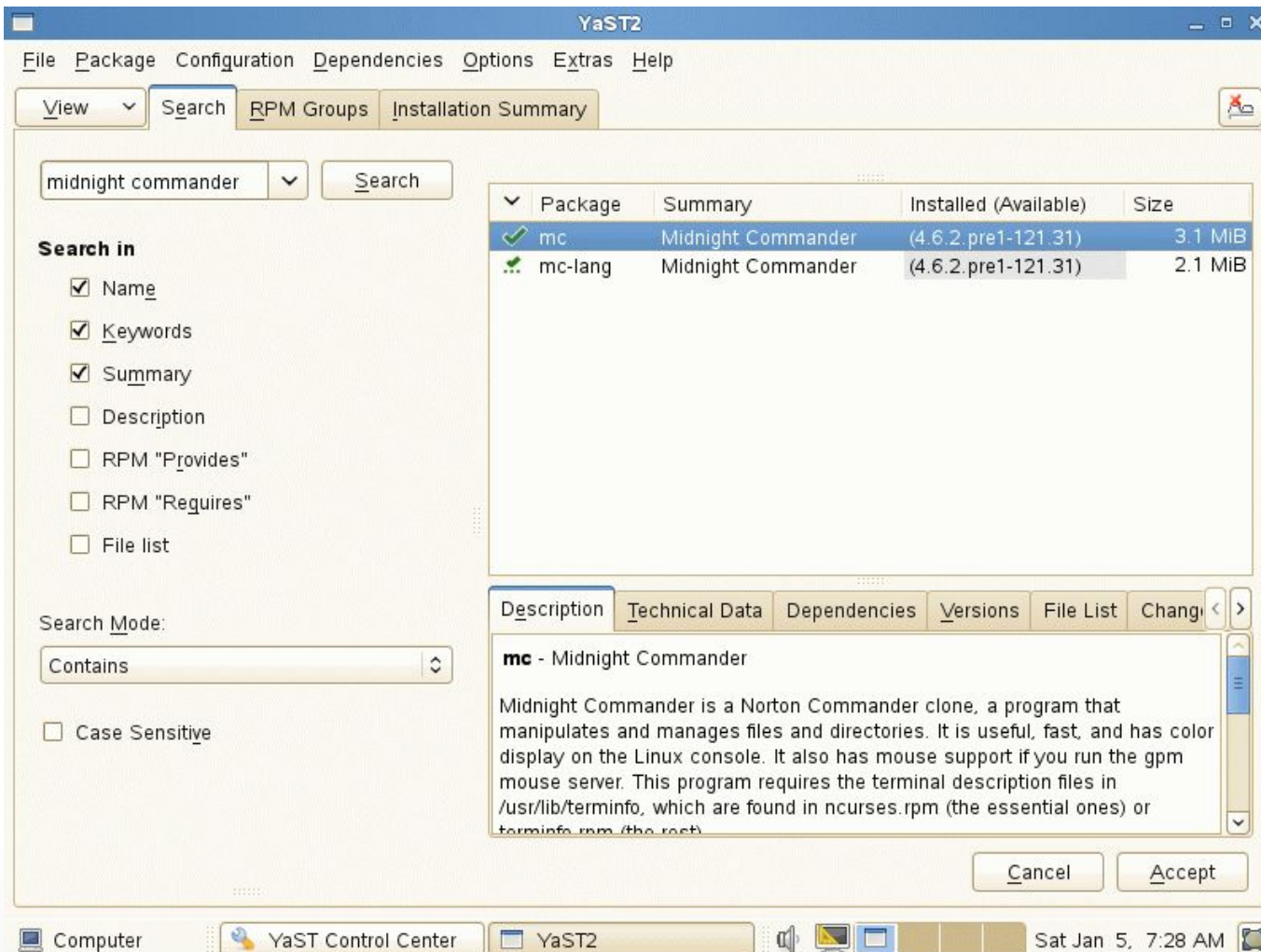


## Midnight Commander (MC)

- Midnight Commander uses a “Norton Commander” Style Text-based semi-graphics interface
  - Needs to be installed but is included in the distribution
  - Invoked via “**mc**” on command-line
- You need to switch your terminal into UTF-8 Mode for graphical chars to work depending on your locale settings
- Can be used to
  - Edit Files (much easier than using vi)
  - Copy, Rename Files
  - Change Permissions and Owner
- With Putty “MC” even has mouse support!
- Install via software tool in YaST
  - Or “yum install mc” on RHEL (installs mc-4.7.0.2-3.el6.x86\_64.rpm)



# SLES 11 - Install Software – Midnight Commander



- Run YaST Software Install
- Search for “Midnight Commander”
- Select Packet
- Dependencies are automatically resolved
  - See smaller checkmark
- Click “Accept”
- Installs from “DVD” if still mounted

# Midnight Commander UI – Let's have a Look

Left	File	Command	Options	Right
<-	/local/notesdata			<- /opt/ibm/domino/notes/latest/linux
'n	Name	Size	Modify time	'n
UP--DIR		Jan 5 13:40		UP--DIR
/IBM_TECHNICAL_SUPPORT	4096	Jan 5 13:45		/TTFonts
/dfc	4096	Jan 5 13:41		4096 Jan 5 13:41
/domino	4096	Jan 5 13:42		/_uninst
/etc	4096	Jan 5 13:41		4096 Jan 5 13:41
/help	4096	Jan 5 13:41		/gsk8
/iNotes	4096	Jan 5 13:41		4096 Jan 5 13:41
/mail	4096	Jan 5 13:46		/jvm
/properties	4096	Jan 5 13:41		/license
/rmeval	4096	Jan 5 13:41		4096 Jan 5 13:41
AgentRunner.nsf	327680	Jan 5 13:46		/ndext
*DomShrct.sh	65	Jan 5 13:42		4096 Jan 5 13:41
*Domino8.lic	892	Oct 31 2008		/osgi
Forms9_x.ntf	393216	Jan 5 13:46		4096 Jan 5 13:41
JOBSCHED.NJF	329	Jan 5 13:47		/properties
PwdResetSample.nsf	327680	Jan 5 13:46		4096 Jan 5 13:41
*TraceSettings.properties	1614	Nov 22 2006		/res
activity.ntf	1658880	Jan 5 13:46		4096 Jan 5 13:41
admin.id	4515	Jan 5 13:46		/xmlschemas
admin4.ntf	2883584	Jan 5 13:46		4096 Jan 5 13:41
*afrikaan.dic	634975	Jul 1 2010		/xsp
alog4.ntf	327680	Jan 5 13:46		4096 Jan 5 13:41
*arabic.dic	448087	May 27 2009		*DominoInstall.log
archlg50.ntf	411648	Jan 5 13:46		159131 Jan 5 13:42
*aus.dic	690753	Jul 1 2010		*ITLMLDE0805.SYS2
autosave.ntf	262144	Jan 5 13:46		50 Jul 14 2008
billing.ntf	172032	Jan 5 13:46		*RMEval.jar
*binary.gif	905	Aug 21 1996		1662971 Dec 8 09:05
bookmark.ntf	5505024	Jan 5 13:46		*TimeZones.txt
*brasil.dic	490948	Jul 1 2010		13050 Mar 28 2008
*browser.cnf	14729	May 16 2011		*TimeZones.Strings.txt
				11259 Mar 28 2008
				*addtraps.sh
				4378 May 25 2012
				*adminp
				1133115 Dec 8 08:42
				*afsr.so
				15396 Dec 18 2008
				*amgr
				151501 Dec 8 08:47
				*asfsr.so
				12564 Dec 18 2008
				*assr.so
				38916 Dec 18 2008
				*autodial
				15857 Dec 8 08:42
				*awsr.so
				101112 Dec 18 2008
				*bentofio.so
				20540 Dec 18 2008
				*billing
				29954 Dec 8 08:42
				*bindsock
				9880 Dec 8 08:42
				*bkfsr.so
				17364 Dec 18 2008
				*broker.dcx
				36336 Dec 8 08:42
				*ca
				65426 Dec 8 08:43
				UP--DIR

9680M/15G (61%)

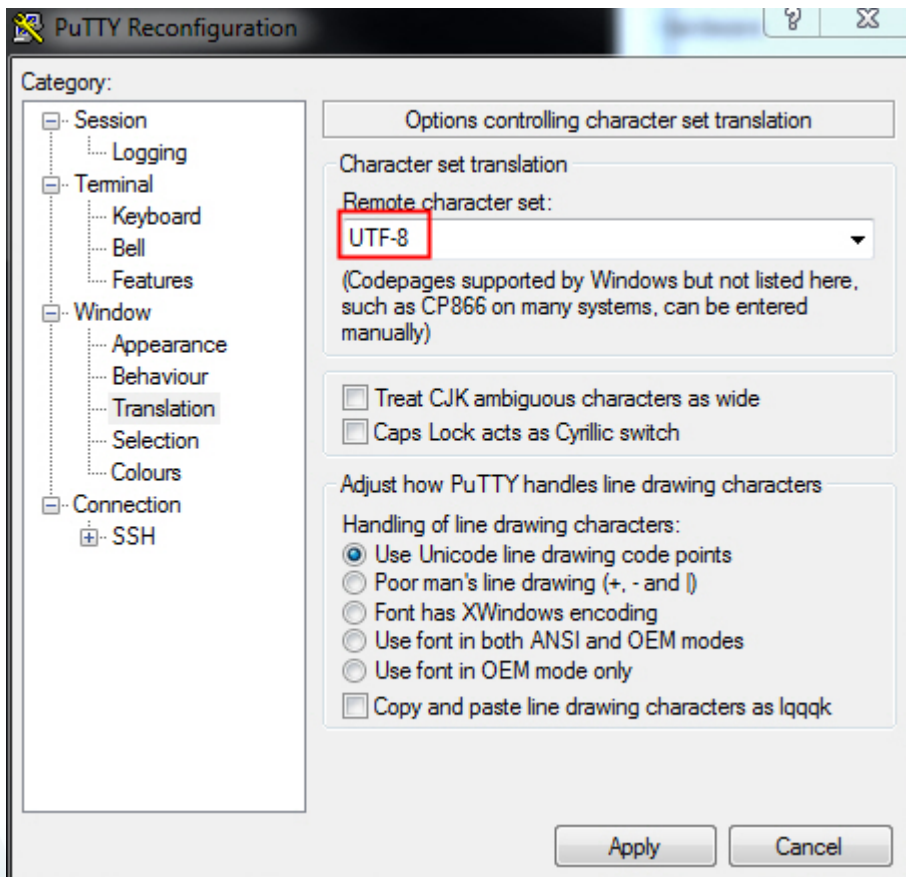
Hint: Completion works on all input lines in all dialogs. Just press M-Tab.

[notes@nsh-rhel6-domino notesdata]\$

1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

## TIP - Putty Charset – UTF-8

- For Line Drawings and Umlauts you need UTF-8 terminal settings
- Click “Translation” and set “Remote character set”



# Linux “Locale”

- The Linux Locale defines the language settings for your user
- Basic setting for the locale is the “LANG” variable
  - Defined in the profile of the user (.profile file in home directory)
- Depending on the LANG variable Domino defines certain settings
  - Clock Type, Decimal Point, Server Language, Language ID (CSID)
- Current SLES and RHEL Servers use Unicode Locale
  - Example: **LANG=en\_US.UTF-8**, **LANG=de\_DE.UTF-8**
  - Check user's locale via “**locale**” command

```
Locale
LANG=en_US.UTF-8
LC_CTYPE="en_US.UTF-8"
LC_NUMERIC="en_US.UTF-8"
LC_TIME="en_US.UTF-8"
LC_COLLATE="en_US.UTF-8"
LC_MONETARY="en_US.UTF-8"
LC_MESSAGES="en_US.UTF-8"
...
LC_ALL=
```



# Check Domino Server Locale

- You can check locale and timezone settings via Domino server console command
  - “Show Locale”
  - “Show Timezone”
- Let's have a look

```
show locale
```

```
Region:    de [German]  
Collation: de [German]  
CSID:      AB (Hex)
```

```
show timezone
```

```
Standard Time: GMT+1:00  
DST:           Observed  
DST Begin:     Month[ 3] Week[-1] Weekday[Sunday]  
DST End:       Month[10] Week[-1] Weekday[Sunday]
```





# How to automatically start the Domino Server

- Starting the Domino Server from desktop does not really work in production environments
  - We need a kind of background process like a service on Windows
- Redirect console output stream to a file for problem analysis
  - some debug messages are only written to console
  - crash info will only written to console
- Redirect console input stream from a file to allow local console
  - Example: `/opt/lotus/bin/server < console.in >> server.log 2>&1 &`
  - Attach to input and output files for a kind of "life console"
  - More a troubleshooting mode. Better use remote console in Admin Client



# Nash!Com Domino Start Script for Linux, AIX, Solaris

- Free cross platform start script
  - <http://www.nashcom.de/nshweb/pages/startscript.htm>
  - More than a start script.
  - Allows to start/stop
  - Monitor / Live Console
  - Troubleshoot your server (different options for NSD)
  - Archives log files
  - Cleanup resources low-level
- Fill out a form to get the start script by mail
  - <http://www.nashcom.de/nshweb/pages/startscript.htm>
- Will demo how to install and how to use
  - But first check the components



# Start Script Components

- a.) Start script: **/etc/init.d/rc\_domino**
  - Main entry point for the script
  - One instance per partition
  - Contains the user name for the Domino server
    - By default “notes”
    - By default based on the user name the corresponding config file is used
- b.) Config file: **/etc/sysconfig/rc\_domino\_config\_notes**
  - Contains the configuration for the server
- c.) Main script logic: **/opt/ibm/domino/rc\_domino\_script**
  - Contains the full logic of the script with all functionality
  - Invoked by **rc\_domino** script
- The current start script is still by default configured for Domino 8.5.x
  - You need to change the configuration in **rc\_domino** and **rc\_domino\_config\_notes**
  - Change the binary file location to “**/opt/ibm/domino**” if you used the new defaults



## a.) rc\_domino

```
#!/bin/sh
# change this to #!/bin/ksh for AIX and Solaris
#####
# RC RunLevel Entry Point
#####
# Start/Stop Script for Domino on xLinux/zLinux/AIX/Solaris
# 2005-2013 Copyright by Daniel Nashed, feedback domino_unix@nashcom.de
# You may use and distribute the unmodified version of this script.
# Use at your own risk. No implied or specific warranties are given.
# You may change it for your own usage only
# Version 2.6 03.01.2013
#####
# chkconfig: 345 66 19
# description: Lotus Domino Server

### BEGIN INIT INFO
# Provides: rc_domino
# Required-Start: $remote_fs $syslog $network
# Required-Stop: $remote_fs $syslog
# Default-Start: 3 5
# Default-Stop: 0 1 2 6
# Short-Description: IBM Lotus Domino Server (notes)
# Description: IBM Lotus Domino Server (notes)
# Start/Stop Script V2.6 for xLinux/zLinux/AIX/Solaris
# 2005-2013 Copyright by Daniel Nashed (domino_unix@nashcom.de)

### END INIT INFO

# Optional get the name from script name e.g. 'domino_notes1'
#DOMINO_USER=`basename $0 | cut -f 2 -d _`

# Set default user to "notes" if no user is specified
if [ -z "$DOMINO_USER" ] ; then
    DOMINO_USER=notes
fi
```



## b.) rc\_domino\_config\_notes

```
# mandatory configuration

LOTUS=/opt/ibm/lotus
# change for Domino 9 --> LOTUS=/opt/ibm/domino
DOMINO_DATA_PATH=/local/notesdata
DOMINO_SHUTDOWN_TIMEOUT=600
DOMINO_CONFIGURED="yes"

# -- LANG setting on OS level that should be used.
# new default is to use what is specified in user profile.
#DOMINO_LANG=en_US.UTF-8
#DOMINO_LANG=de_DE.UTF-8
#DOMINO_LANG=en_US
#DOMINO_LANG=de_DE

# -- remove loadmon.ncf on startup
DOMINO_RESET_LOADMON="yes"

# -- run NSD before killing the Domino server when DOMINO_SHUTDOWN_TIMEOUT has been reached
DOMINO_NSD_BEFORE_KILL="yes"

# -- Shared DPOOLSIZE for Linux Tuning
#DOMINO_SHARED_DPOOLSIZE=20971520

# -- remove temp-files on startup
#DOMINO_REMOVE_TEMPFILES="yes"

# -- Domino Server Name if different from Linux/UNIX username
#DOMINO_SERVER=$DOMINO_USER

# -- Start Script Debugging
#DOMINO_DEBUG_MODE="yes"
...
```



## c.) rc\_domino\_script

```
#!/bin/sh
# change this to #!/bin/ksh for AIX and Solaris
#####
# Main Start Script Logic
#####
# Start/Stop Script for Domino on xLinux/zLinux/AIX/Solaris
# 2005-2013 Copyright by Daniel Nashed, feedback domino_unix@nashcom.de
# You may use and distribute the unmodified version of this script.
# Use at your own risk. No implied or specific warranties are given.
# You may change it for your own usage only
# Version 2.6 03.01.2013
#####

# Determine Notes/OS level user
DOMINO_USER=$LOGNAME

if [ -z "$DOMINO_USER" ]; then
    echo "Empty login name. Please check your configuration"
    exit 1
fi

DOMINO_CONFIG_FILE=/etc/sysconfig/rc_domino_config_$DOMINO_USER

# Include config file if a exists and is readable
if [ -r "$DOMINO_CONFIG_FILE" ]; then
    . $DOMINO_CONFIG_FILE
    echo "Using Domino config File " $DOMINO_CONFIG_FILE
fi

# --- Configuration per Domino Partition - if not already specified in separate config file ---

if [ -z "$DOMINO_CONFIGURED" ]; then
    # Use configuration in this routine if no external configuration specified
    # Either in environment or in external config file
fi
```



## Install and run Start Script

- Transfer Files to software directory via WinSCP
- copy **rc\_domino\_script** into **/opt/ibm/domino**  
copy **rc\_domino** into **/etc/init.d**  
copy **rc\_domino\_config\_notes** into **/etc/sysconfig**

```
# cd /local/software/startscript
# cp rc_domino_script /opt/ibm/domino
# chmod 755 /opt/ibm/domino/rc_domino_script
# cp rc_domino /etc/init.d/
# chmod 755 /etc/init.d/rc_domino
# cp rc_domino_config_notes /etc/sysconfig
# chown notes:notes /etc/sysconfig/rc_domino_config_notes
```

- Copy on Linux → cp
- Change modus (executable and readable) chmod 755 file
- Change owner and group to **notes:notes** → chown **notes:notes**
- D9: Change binary location in rc\_domino and rc\_domino\_config\_notes



## Start the Server in Background

- On SLES any user can start services if execution control allows
- On RHEL only root can start services
  - Because a “lock” directory for service control is only writable by root
  - Workaround: sudo to start certain operations that need root permissions – needs to be setup
- Invoke the main script “**rc\_domino**” with the “**start**” option
  - Manual start in background
  - Check with “**status**” if the server is running
  - Use “**monitor**” to see a kind of “**live console**”
  - Attaches to the input and output files and “simulates” a console

```
# /etc/init.d/rc_domino start
Switching to notes
Using Domino config File /etc/sysconfig/rc_domino_config_notes
Removed LoadMon-Data '/local/notesdata/loadmon.ncf'
Starting Domino for xLinux (notes)
done PID is 31971
```

done





# Boot-Process and Run-Levels

- Runlevels are used to provide different level of services
  - Different services are started depending on runlevel
  
- Runlevel
  - 0 - Halt System
  - 1 - Single User Mode
  - 2 - No Network (similar to runlevel 1)
  - **3 - With Networking, Standard Services and Applications**
  - 4 - Unused
  - **5 - Same as run-level 3 + X-Window (xdm)**
  - 6 - Reboot
  - Domino is started in runlevel 3 or 5
  - Servers usually use runlevel 3
  - You can switch runlevels via "init <n>"



## Enable Domino on Startup

- The start script is the same for SLES, RHEL
  - Works for CentOS (unsupported) SLES, RHEL, AIX and Solaris
  - It contains script logic for each platform
- Install command to list the server in the right run-levels depend on the platform
  - SLES → **insserv /etc/init.d/rc\_domino**
  - RHEL → **chkconfig --add rc\_domino**
  - This will automatically create the start (“S”) and stop/kill (“K”) links in the rc-system
  - See example blow:

```
/etc/init.d # find . -name "*rc_domino*"
./rc_domino
./rc5.d/S08rc_domino
./rc5.d/K01rc_domino
./rc3.d/S08rc_domino
./rc3.d/K01rc_domino
```



# Useful Commands for Linux Start/Stop

- **shutdown -h 0**
  - 0=Shutdown immediately
  - Will terminate all running services like Domino (start script)
  
- **shutdown -r 0**
  - Will reboot the server
  
- **init 3**
  - Will bring the server into text mode
  
- **init 5**
  - Will bring the server into graphical mode



## Useful Commands – Let's take a look on the Live System

- **“find”**
  - searches for files
  - Syntax: `find “start-point” -name “expression”`
  - Example: `find . -name “*.nsf”`
  
- **ps -ef**
  - Shows list of all processes
  
- **| (“pipe”)**
  - Pipe sends output from one command to another command
  
- **grep**
  - Finds information in files or output streams
  - Example: `ps -ef|grep domino`
  
- **tail -f filename**
  - Lists the end of an file and continues with output when the file changes



# Typical Linux Commands

- Shell commands are similar to DOS command window
  - But most commands have different names
  - Use “man” command to find out about syntax details and options (e.g. “man ls”)
- **ls** - lists content of a directory (e.g. ls -l)
- **cd** - switch directory
- **pwd** - prints current working directory
- **mv** - move (rename) file
- **cp** - copy file
- **mkdir** - creates a new directory
- **rm** - removes files (e.g. rm -r mydir)
- **cat** - lists content of a file
- **more** - lists content page by page
- **uptime** – shows how long the machine is up



# Network Commands

## ■ netstat -an

- Shows network connections and listening ports

```
netstat -an|grep tcp
tcp        0      0 0.0.0.0:1352          0.0.0.0:*            LISTEN
tcp        0      0 0.0.0.0:22           0.0.0.0:*            LISTEN
tcp        0      0 127.0.0.1:25         0.0.0.0:*            LISTEN
tcp        0      0 192.168.100.170:22   192.168.100.1:55856  ESTABLISHED
tcp        0      0 192.168.100.170:22   192.168.100.1:54395  ESTABLISHED
tcp        0      0 :::22               :::*                 LISTEN
tcp        0      0 :::1:25             :::*                 LISTEN
```

## ■ ifconfig

- Shows network configuration

```
ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0C:29:A0:6F:76
          inet addr:192.168.100.170  Bcast:192.168.100.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fea0:6f76/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1279  errors:0  dropped:0  overruns:0  frame:0
          TX packets:1059  errors:0  dropped:0  overruns:0  carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:134388 (131.2 Kb)  TX bytes:195442 (190.8 Kb)
```



## Bind Services to Specify IP Address

- By default Domino listens on all IP Addresses
  - For a single partition this would be OK
  - But for example postfix by default listens on the loopback IP address (127.0.0.1)
- Bind Domino to the service IP address via notes.ini settings
- Bind HTTP using Server.Doc Settings / HTTP Tab
  - “Bind to host name: Enabled” → or use Internet Sites accordingly

```
TCPIP_TcpIpAddress=0,192.168.100.170:1352
SMTPNotesPort=TCPIP
LDAPNotesPort=TCPIP
POP3NotesPort=TCPIP
IMAPNotesPort=TCPIP
```



# Install Servertasks and Extension Managers

- Install Nash!Com mixed case tool
- Install a sample work-load servertask
- Examples how to install any kind of C-API based application
  - This will help to understand how other add-on software can be installed and checked
- Normal binaries have no extension
- Library files like Extension Managers have the extension “.so”
  - On Windows it would be called .dll
  - Usually prefixed with “lib” example: **libnotes.so** is the main Notes LIB
- Shell Scripts are usually called “sh”
  - But they don't have to
  - Shell Scripts are a bit similar to “batch” files on Windows but much more flexible





# Install Nash!Com Mixed Case Extension Manager

- Switch to root user
  - “su -” command switches to a different user
    - The “-” does load the environment for the user like for a normal login
    - If you do not specify a user, “root” is assumed.
    - If you switch from root to another user no password is needed!
- Copy .so file to IBM binary directory
- Make it executable via **chmod 755** (all rights to root, read and execute for all)

```
su -  
Password:  
Directory: /root  
Fri Jan 4 02:10:25 CET 2013  
  
# cp libnsnextlo.so /opt/ibm/domino/notes/latest/linux/  
# chmod 755 /opt/ibm/domino/notes/latest/linux/libnsnextlo.so
```



# Install Nash!Com Mixed Case Extension Manager

- Add the following Lines to notes.ini
- Best would be to use “set config ..”
  - But you can also edit notes.ini directly when the server is down
- **extmgr\_addins=libnshextlo.so**
  - will load the Extension Manager on next Server start
- **NshextloOptions=4**
  - Will enable lower-case translation for incoming requests
- When the server starts you should see a copyright message
  - This tells you that the extension manager is loaded

```
extmgr_addins=libnshextlo.so  
nshextloOptions=4
```



# Install Servertask

- Switch to root user
- Copy binary file to IBM binary directory
- Make it executable via **chmod 755** (all rights to root, read and execute for all)
- Switch to binary containing servertask links **cd /opt/ibm/lotus/bin**
- Create a “symbolic link” to internal startup script for servertask (“ln -s”)

```
# cp nshload /opt/ibm/domino/notes/latest/linux/  
# chmod 755 /opt/ibm/domino/notes/latest/linux/nshload  
  
# cd /opt/ibm/domino/bin  
# ln -s tools/startup nshload  
  
# ls -l nshload  
lrwxrwxrwx 1 root root 13 Jan  4 02:12 nshload -> tools/startup
```



## Symbolic Links on Linux

- Symbolic link (or soft-link) creates a “pointer” that links to the original file
- Link can be used instead of the file itself in the new directory position
- You should not use links for Domino Data!
- But it is used for binaries
  - like the latest link for the current set of binaries and the startup links
- Command **ln -s “new\_name” “existing\_name”** generates the link
- You can see symbolic links via **ls -l**



# Linux Performance Tuning / Monitoring



- The following slides give you an overview of Linux specify performance tuning
  - It's not a complete list of all tuning options
  - The basic Domino Tuning options remain the same
- Focus is on the Linux specific part

## Auto Tuning - tunekrnl

- When you start the server the “**tunekrnl**” binary will automatically tune kernel parameters
  - tunekrnl runs with “root” permission because it has a special permission bit set
- Auto configuration example RHEL 6.3
  - /proc/sys/kernel/sem has been set to "250 256000 32 1024".
  - /proc/sys/net/ipv4/tcp\_fin\_timeout has been set to "15".
  - /proc/sys/net/ipv4/tcp\_max\_syn\_backlog has been set to "16384".
  - /proc/sys/net/ipv4/tcp\_tw\_reuse has been set to "1".
  - /proc/sys/net/ipv4/ip\_local\_port\_range has been set to "1024 65535".
- There is nothing you need to change
  - The information is logged into the server output-log



## Linux Security Limits

- Some resources like number of open files, processes, memory, file-space can be restricted on Linux level per user for security reasons
  - Most of the settings are OK by default in current releases
- Security Limits are enforced when switching to the “notes” user via “su -”
  - In earlier Linux versions you had to modify the “pam” configuration (pluggable authentication modules) to include “pam\_limits.so”
- Edit the **/etc/security/limits.conf** file and ensure you have at least the following limits set for your Domino server user “notes”
  - Tip: If you plan multiple partitions you could use “\*” instead of the “notes” user
  - **vi /etc/security/limits.conf**

```
notes soft nofile 49152
notes hard nofile 49152

notes soft nproc 12500
notes hard nproc 12500

notes soft memlock -1
notes hard memlock -1
```



# Check Security Limits

- Login again via “**su – notes**”
- Check Security Limits via “**limits -a**” for soft limits
- Check Security Limits via “**limits -aH**” for hard limits
- TIP: security limits and environment settings are listed in the start script output

```
# ulimit -aH
core file size          (blocks, -c) unlimited
data seg size          (kbytes, -d) unlimited
scheduling priority    (-e) 0
file size              (blocks, -f) unlimited
pending signals        (-i) 14873
max locked memory      (kbytes, -l) unlimited
max memory size        (kbytes, -m) unlimited
open files             (-n) 49152
pipe size              (512 bytes, -p) 8
POSIX message queues   (bytes, -q) 819200
real-time priority     (-r) 0
stack size             (kbytes, -s) unlimited
cpu time               (seconds, -t) unlimited
max user processes     (-u) 12500
virtual memory         (kbytes, -v) unlimited
file locks             (-x) unlimited
```





## Some General Performance Settings

- **Server\_Pool\_Tasks=50**
  - Maximum number of initial thread-pool tasks (IOCP threads)
  
- **Server\_Max\_Concurrent\_Trans= Server\_Pool\_Tasks \* Domino Ports**
  - Number of concurrent I/O threads to run (throttle to reduce CPU usage and Context-Switches)
  - Example: **Server\_Max\_Concurrent\_Trans=50**
  
- Always tune both at the same time !
  
- **NSF\_DbCache\_MaxEntries**
  - In case of high statistical value for **DbCache.OvercrowdingRejections** set it either the maximum number of concurrent users or the maximum number of databases open (whatever is higher)
  - Example: **NSF\_DbCache\_MaxEntries=3000**



# Important Server Settings

- Increase Shared Memory Maximum Size for Domino 32bit on 64bit OS to 3 GB
  - **ConstrainedSHMSizeMB=3072**
  
- Default for many pools is too small
  - **EVENT\_POOL\_SIZE=41943040**
  - **CATALOG\_POOL\_SIZE\_MB=100**
  - **dirman\_poolsize\_mb=100**
  - **nsf\_monitor\_pool\_size\_mb=200**
  
- Separate Update FT Thread
  - **UPDATE\_FULLTEXT\_THREAD=1**
  
- Router Optimization
  - **RouterMaxConcurrentDeliverySize=1048576**
  - **Disable\_BCC\_group\_expansion=1**



## View Rebuild Directory

- By default Domino uses a memory optimized way to rebuild views
- You can specify a directory (e.g. on system disk) for optimized view rebuild
- On Linux you can put temp-files and view rebuild files into **tempfs**
- **tempfs** is a kind of virtual file-system optimized for temporary files that exist only for a short period of time.
  - Similar to a RAM drive but not reserving memory and self organized in Virtual Memory
  - Changes are only written to disk if memory is needed by the server
    - It would swap to disk if space is needed → ensure you have sufficient SWAP space
  - Tempfs is enabled by default with half the size of the physical memory
    - Located in **/dev/shm**
- Notes.ini
  - **view\_rebuild\_dir=/dev/shm/**
  - You cannot create sub-directories because for each machine start tmpfs is empty!



## Write Temp Directory and Log Files into tempfs too

- Temp Directory, Log and also the server console.log can be moved to tempfs or other file-systems
  - TIP: Start Script has options to create sub-directories in the tempfs file-system
- notes.ini
  - **debug\_outfile=/dev/shm/notes/console.log** (sub-directory is automatically created)
  - **view\_rebuild\_dir=/dev/shm/notes/view\_rebuild/**
  - **notes\_tempdir=/tmp/notes/tempdir** (instead of data directory, could be also located in tempfs)
  - **logfile\_dir=/local/log/notes/IBM\_TECHNICAL\_SUPPORT**
- Start Script Variables in **rc\_domino\_config\_notes**
  - **DOMINO\_VIEW\_REBUILD\_DIR="/dev/shm/\$DOMINO\_USER/view\_rebuild"**
  - **DOMINO\_TEMP\_DIR="/tmp/\$DOMINO\_USER/tempdir"**
  - **DOMINO\_LOG\_PATH="/local/log/\$DOMINO\_USER/IBM\_TECHNICAL\_SUPPORT"**
  - **DOMINO\_LOG\_DIR="/local/log/\$DOMINO\_USER"**
  - **DOMINO\_LOG\_BACKUP\_DIR="/local/log/\$DOMINO\_USER/backup"**



# Linux File Systems

- Linux does “mount” file-systems into the “root” file-system
  - You can mount separate disks/file-systems on every level of the file-system tree
  
- You should have separate file-systems / disks for
  - **Root file-system**
  - **Swap** → at least the size of your RAM or better two times your RAM if you use tempfs
  - **/var** → used by the system for logging etc
  - **/opt** → if your root file-system is quite small else it would be OK to have the static binaries in root
  
  - **Domino data (NSF)**
  - **Translog (TXN)**
  - **DAOS (NLO)**
  - **FT Index Directory** since 8.5.3 if you have a lot of FT Indexing on your server
    - notes.ini FTBasePath=/local/notes/fulltext



## Example File-System Configuration for a Domino Server

- **/local/notes/notesdata**
- /local/translog
- /local/daos
- /local/fulltext
  
- You could have also a separate directory for archive databases or cluster replicas to split file-systems
  
- Create File-Systems via YaST on SLES
  - Very straight forward
  - **SLES 11 SP2** still only supports **ext3** (only read-only migration support for ext4)
  - **RHEL 6.x** supports **ext4** and switched the default to ext4!
    - Claims to have better performance
    - Known Issue: Currently ext4 is not shown in the Domino platform stats!



# Check File-System Space

- “df -h”

- Disk free shows all file-systems
- -h means human readable format (sizes in KB/MB/GB)

- Stats shown

- File-System internal Device Name
- Size
- Used
- Available
- Use in %
- Mount Point

```
df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda2       19G   7.5G   9.9G  43% /
devtmpfs        1.5G  144K   1.5G   1% /dev
tmpfs           1.5G  100K   1.5G   1% /dev/shm
/dev/sr0        3.1G   3.1G    0 100% /media/SLES-11-SP2-DVD-x86_6407551
/dev/sdb1       9.9G  151M   9.2G   2% /local
```



# SLES 11 / RHEL 6.x Performance Issue / RunFaster=1

- SPR# PHEY8RJHXR fixed in 8.5.3 FP2
  - Fixes a timing issue with the CFQ process scheduler introduced in
  - Caused response time issues with transactions – up to 100 ms delay
  - This fix changes semaphore handling for the server thread pool
  - In SLES 11 SP2 use the following in addition to improve performance
    - `echo NO_FAIR_SLEEPERS > /sys/kernel/debug/sched_features`
  - In earlier releases (SLES 11 SP1 + RHEL 6.x) with CFQ you might want to use
    - `echo "0" > /proc/sys/kernel/sched_features`
  - And you need 8.5.3 FP2 or higher to fix the issue
  - This will fix the 100 ms delays completely
  - Performance Test - 30 threads / 100 documents / attachment size 2 MB

	no network	without fix	fix + fair sleeper	fix + no fair sleeper
elapsed time (sec)	56	828	78	68
response time client (ms)	2	40-60	5	3





# Linux File-System Tuning

- Use your favorite journaled file-system ext3, ext4, Reiser FS, XFS, ...
- Disable write of meta information via mount option `-noatime`
  - Change in **`/etc/fstab`**
    - Contains an entry for each file-system to mount
- A real `Runfaster=1` Parameter:
  - Change the default scheduler from CFQ (complete fair queuing) to NOOP
  - CFQ tries to optimize disk access by reordering requests
    - But it would be better to send it to a SAN, RAID controller directly
    - Tests have shown that this works better for almost all SAN or local disk configurations
    - Dramatical improvement!
    - See next slides for details
  - Disable per device
    - `echo noop > /sys/block/hda/queue/scheduler`
  - Disable globally via kernel boot parameter
    - Edit `/boot/grub/grub.conf` and enter in kernel line `elevator=noop`.



# Linux Performance CFQ vs noop

- Read-Test - 80 thread to read 32000 docs each
  - 80 separate local databases on the server with small documents
- Result:
  - 51 sec with CFQ scheduler
  - 28 sec with noop scheduler
  - 19 sec all data in cache
- Write Test - 80 threads creating 2000 docs each
  - 80 separate local databases on the server
- Result:
  - 132 sec with CFQ
  - 42 sec with noop
- Environment: SLES11 SP2 with local RAID10 disks
- Test-Tool: `iostat -x 2` → check the improvement in the “await” column



# Troubleshooting



- This section focuses on Linux specific Troubleshooting
- Not a complete troubleshooting guide but provides the parts that are different in the Linux world
  
- NSD
- System Monitoring
- Disk Monitoring

## NSD – Notes System Diagnostics

- NSD is invoked automatically in case of a server crash
- Implemented as a shell script and leverages the GNU debugger (**gdb**)
  - “**gdb**” is installed by default on current SLES and RHEL servers and dumps call-stacks
- Can be manually invoked
  - For example in case of a hang
  - Switch to data directory and run **/opt/ibm/domino/bin/nsd <options>**
- You can also use the start script
  - **/etc/init.d/rc\_domino nsd | fullnsd | hang | kill**
- Kill is used to kill the server and free resources in case of a crash, hang, etc
  - But it could happen that NSD cannot cleanup all resources
  - Third party software, not successfully registered resources
  - TIP : “**cleanup**” function of Start Script removes all processes, shared memory, MQs and semaphores
    - “cleanup” is “last resort” in some cases



# top – System Utilization and Processes

```

notes@nsh-rhel6-domino:/opt/ibm/domino/notes/latest/linux
top - 23:31:05 up 11:00, 4 users, load average: 3.56, 0.83, 0.27
Tasks: 186 total, 15 running, 171 sleeping, 0 stopped, 0 zombie
Cpu(s): 15.5%us, 83.9%sy, 0.0%ni, 0.0%id, 0.0%wa, 0.0%hi, 0.6%si, 0.0%st
Mem: 1923588k total, 1847948k used, 75640k free, 54524k buffers
Swap: 4128760k total, 88k used, 4128672k free, 1173844k cached

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
  413 notes     20   0 145m  20m 3564 R 16.7  1.1   0:02.07 calconn
  361 notes     20   0 146m  21m 3584 R 16.1  1.1   0:02.17 update
  414 notes     20   0 148m  23m 3576 R 16.1  1.3   0:01.93 sched
  418 notes     20   0 145m  20m 3580 R 16.1  1.1   0:01.81 rnrmgr
  415 notes     20   0 137m  20m 3692 R 15.8  1.1   0:01.97 ldap
  419 notes     20   0 146m  21m 3572 R 15.8  1.1   0:01.98 daosmgr
  363 notes     20   0 145m  20m 3568 R 15.5  1.1   0:02.03 replica
  364 notes     20   0 143m  17m 3708 R 14.8  0.9   0:02.01 router
  365 notes     20   0 141m  23m 3904 R 14.8  1.3   0:02.05 amgr
  411 notes     20   0 139m  21m 3616 R 14.8  1.1   0:01.89 adminp
32057 notes     20   0 168m  52m 20m R 14.2  2.8   0:09.32 event
  348 notes     20   0 12832 3712 2508 D 13.2  0.2   0:04.52 file
   38 root       20   0   0     0   0 R  8.4  0.0   0:04.45 kswapd0
   22 root       20   0   0     0   0 R  1.3  0.0   0:08.74 kblockd/0
31964 notes     20   0 199m  72m 36m S  1.3  3.8   0:16.66 server
  466 notes     20   0 15032 1348 980 R  0.6  0.1   0:00.14 top
31966 notes     20   0 152m  28m 7288 S  0.6  1.5   0:04.00 fileret
  448 root       20   0   0     0   0 S  0.3  0.0   0:04.59 jbd2/dm-0-8
 1541 root       20   0 80020 3668 2824 S  0.3  0.2   0:00.40 NetworkManager
 1848 root       20   0 78668 3204 2368 S  0.3  0.2   0:00.26 master
 3912 root       20   0 441m 1764 1272 S  0.3  0.1   0:01.78 automount
31807 notes     20   0 97820 1816 876 S  0.3  0.1   0:00.20 sshd
   1 root       20   0 19348 1476 1204 S  0.0  0.1   0:03.21 init
   2 root       20   0   0     0   0 S  0.0  0.0   0:00.09 kthreadd
   3 root       RT   0   0     0   0 S  0.0  0.0   0:02.73 migration/0
   4 root       20   0   0     0   0 S  0.0  0.0   0:02.14 ksoftirqd/0
   5 root       RT   0   0     0   0 S  0.0  0.0   0:00.00 migration/0
   6 root       RT   0   0     0   0 S  0.0  0.0   0:00.73 watchdog/0
   7 root       RT   0   0     0   0 S  0.0  0.0   0:01.26 migration/1
   8 root       RT   0   0     0   0 S  0.0  0.0   0:00.00 migration/1
   9 root       20   0   0     0   0 S  0.0  0.0   0:01.12 ksoftirqd/1
  10 root       RT   0   0     0   0 S  0.0  0.0   0:00.68 watchdog/1
  11 root       20   0   0     0   0 S  0.0  0.0   0:04.71 events/0

```

## ■ Shows

- Processes
- Memory Utilization
- File System Cache
- Swap Utilization
- CPU Utilization
- Load Average
- Wait I/O

## ■ Load Average

- Indicator how busy the machine is
  - Last minute
  - 5 Minutes
  - 15 Minutes
- Should be below the number of CPUs/cores

## Linux vmstat – Main Performance Indicator

- **vmstat <interval>** e.g. **vmstat 1** prints stats every second
- **r** = Processes/threads waiting for CPU or running
  - should be less than 1,5 \* number of CPUs
- **b** = Processes/threads waiting for I/O
  - should be less than number of CPUs
- **us** = % CPU in “user mode”
- **sy** = % CPU in “system mode” (kernel operations)
- **cs** = Context switches (how often the CPU is “switched from thread to thread”)
  - Should be much more than 10000 per partition
- **wa** = % the system is waiting for I/O
  - Should not be much more than 30% else you system is I/O bound
  - In that case we need other tools to measure disk performance in more detail (see next slides)

```
vmstat 1
procs -----memory----- --swap--  -----io----- --system--  -----cpu-----
 r  b   swpd   free   buff  cache   si   so    bi    bo    in   cs us sy id wa st
 2  0     0 641168 31464 580700   0   0   2012  1212  732 1035 10  5 74 11  0
 1  2     0 622444 31492 599740   0   0   4012   420 1267 1719  7 25 26 42  0
 3  0     0 614136 31492 607964   0   0   4924    24 1271 1827  5 22  5 67  0
```



# Linux Level I/O Performance Measurement

- Domino Platform Statistics are your friend
  - Can be used for longer term monitoring via collect task into statrep.nsf
  - But they are updated every 60 seconds and collected usually every 10 minutes
    - See Platform Statistics Disk Values below
  - Not all information is included – for example “await” on Linux (disk queue response time)
  - TIP: events4.nsf contains documentation for platform stats & how they are measured per platform
- For troubleshooting you should use Linux level statistics
  - vmstat (see details next slide)

```
Platform.LogicalDisk.1.AssignedName = sda
Platform.LogicalDisk.1.AvgQueLen = 11.89
Platform.LogicalDisk.1.AvgQueLen.Avg = 11.89
Platform.LogicalDisk.1.AvgQueLen.Peak = 11.89
Platform.LogicalDisk.1.PctUtil = 95.63
Platform.LogicalDisk.1.PctUtil.Avg = 95.63
Platform.LogicalDisk.1.PctUtil.Peak = 95.63
Platform.LogicalDisk.1.ServiceTimeinmsecs = 8.35
Platform.LogicalDisk.1.ServiceTimeinmsecs.Avg = 8.35
Platform.LogicalDisk.1.ServiceTimeinmsecs.Peak = 8.35
```



## Linux Native I/O Stats “iostat”

- iostat provides more detailed information about the current I/O statistics
  - Output by device (e.g. sda = first disk)
  - Example shows just one value for one disk
  - TIP: You can filter via grep – e.g. “iostat -x 2 |grep sda”
- **%util** = Disk Utilisation in % → Values above 90% are an indicator for a busy disk
- **r/s** = Disk reads per second
- **w/s** = Disk writes per second
- **svctm** = Disk services time in ms (how fast the device responds)
- **await** = Time the whole request needs (application to disk queue, disk and back)
  - This is the most important statistic and key indicator (should be < 10 ms)

```
# iostat -x 2
```

Device:	rrqm/s	wrqm/s	r/s	w/s	rsec/s	wsec/s	avgrq-sz	avgqu-sz	await	svctm	%util
sda	0.00	2024.50	0.00	762.00	0.00	22268.00	29.22	0.86	1.13	0.38	28.80

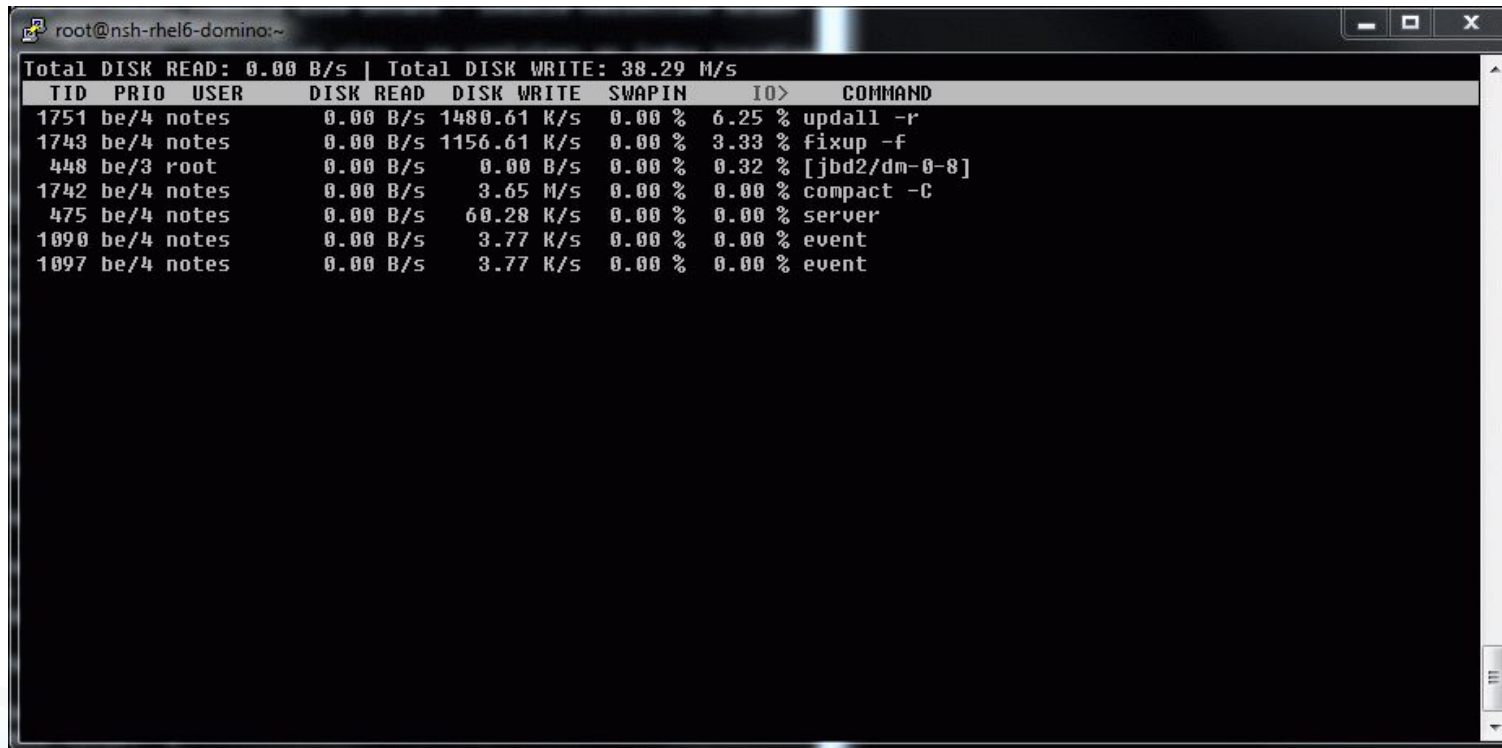
- Let's have a live look into the server





## iostat – Current I/O Load by Process

- Can be helpful to figure out which process generates most I/O
- You might need to separate install it
- Needs root permission



```
root@nsh-rhel6-domino:~  
Total DISK READ: 0.00 B/s | Total DISK WRITE: 38.29 M/s  
TID  PRIO  USER      DISK READ  DISK WRITE  SWAPIN     IO>   COMMAND  
1751 be/4  notes     0.00 B/s  1480.61 K/s  0.00 %    6.25 %  updall -r  
1743 be/4  notes     0.00 B/s  1156.61 K/s  0.00 %    3.33 %  fixup -f  
448  be/3  root      0.00 B/s    0.00 B/s  0.00 %    0.32 %  [jbd2/dm-0-8]  
1742 be/4  notes     0.00 B/s    3.65 M/s  0.00 %    0.00 %  compact -C  
475  be/4  notes     0.00 B/s    60.28 K/s  0.00 %    0.00 %  server  
1090 be/4  notes     0.00 B/s    3.77 K/s  0.00 %    0.00 %  event  
1097 be/4  notes     0.00 B/s    3.77 K/s  0.00 %    0.00 %  event
```



# Notes Client Setup



- Two different setup types
  - RPM Packages for SuSE and RedHat Enterprise Desktop
  - Debian Packages for Ubuntu
  
- On Ubuntu you just click on the extracted Debian packages to get the client installed
  
- With RPM you have to install manually
  - With the current 9.0 Social Edition Beta Client you have to install some deprecated LIBs before you can install the client
    - RPM will give you the name of the missing packages
  
  - Works with SLES 11 SP2 64bit with 32bit LIBs installed
    - Currently not supported – Only Redhat Desktop is supported in 64bit Mode
  
  - Demo Install SLES 11 SP2
  
  - Bonus-Slide-Pack: Ubuntu 12.04 LTS Install including Client
    - Planned support for 12.04 LTS with Notes 9.0 Social Edition
    - For the current Beta only 32bit is supported

# Default Directories for Notes 9.0 Beta on Linux

- **/opt/ibm/notes**
  - Notes product and binary files installation directory
  
- **/opt/ibm/notes/framework**
  - Eclipse base directory
  
- **/opt/ibm/notes/data/shared**
  - Shared Directory (NTFs, Dictionaries, Helpfiles)
  - Configured automatically via notes.ini SharedDataDirectory (NTFs etc)
  - notes.ini with initial information -> **/opt/ibm/notes/data/notes.ini**
    - Will be used to setup new users
  
- **/home/nsh/ibm/notes/data**
  - After configuration every user has his own “data directory” in “ibm/notes/data” below his home dir
  
- Take care: Old standard location in 8.5.x still contains “lotus”



# Extract Software and Install

- Switch to “root” user for installation (**su -**)
- Extract software using “tar”
- Install software using “**rpm -i <package name>**”
  - See missing packages and install using YaST → ensure you install 32bit LIBs!
  - Search for the packages in the same way we did earlier for “Midnight Commander”

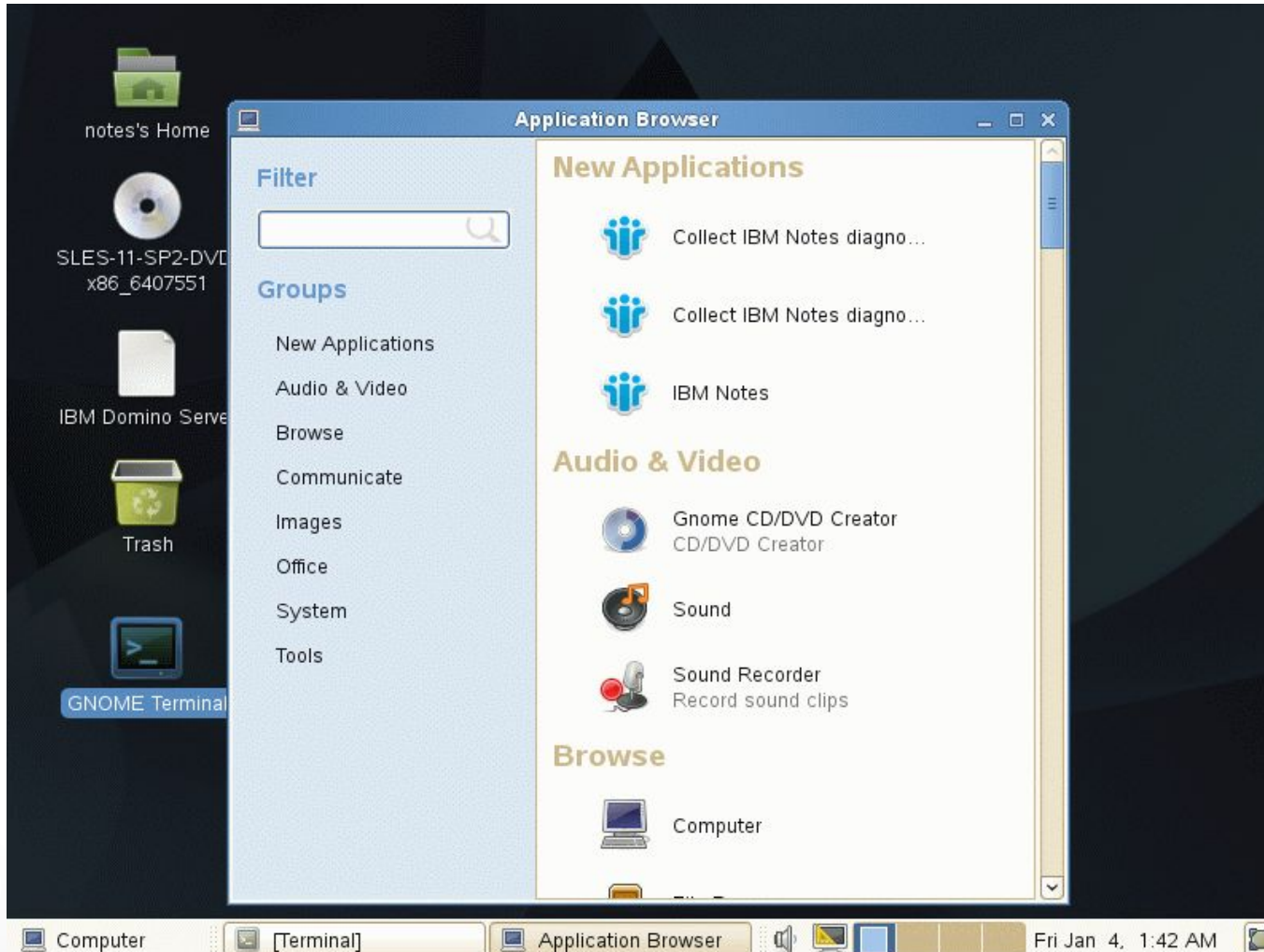
```
/local/software # tar -xvf notes90se_notes_linux_rpm_public_beta_prod.tar

ibm_activities-9.0.i586.rpm
ibm_cae-9.0.i586.rpm
ibm_feedreader-9.0.i586.rpm
ibm_notes-9.0.i586.rpm
ibm_opensocial-9.0.i586.rpm
ibm_sametime-9.0.i586.rpm
license.tar
pub_ibm_notes.gpg
smartupgrade.sh

/local/software # rpm -i ibm_notes-9.0.i586.rpm
warning: ibm_notes-9.0.i586.rpm: Header V3 DSA signature: NOKEY, key ID 34f9ae75
error: Failed dependencies:
 libgnomeprint-2-2.so.0 is needed by ibm_notes-9.0-20121208.0914.i586
 libgnomeprintui-2-2.so.0 is needed by ibm_notes-9.0-20121208.0914.i586
 libgnomeui-2.so.0 is needed by ibm_notes-9.0-20121208.0914.i586
```

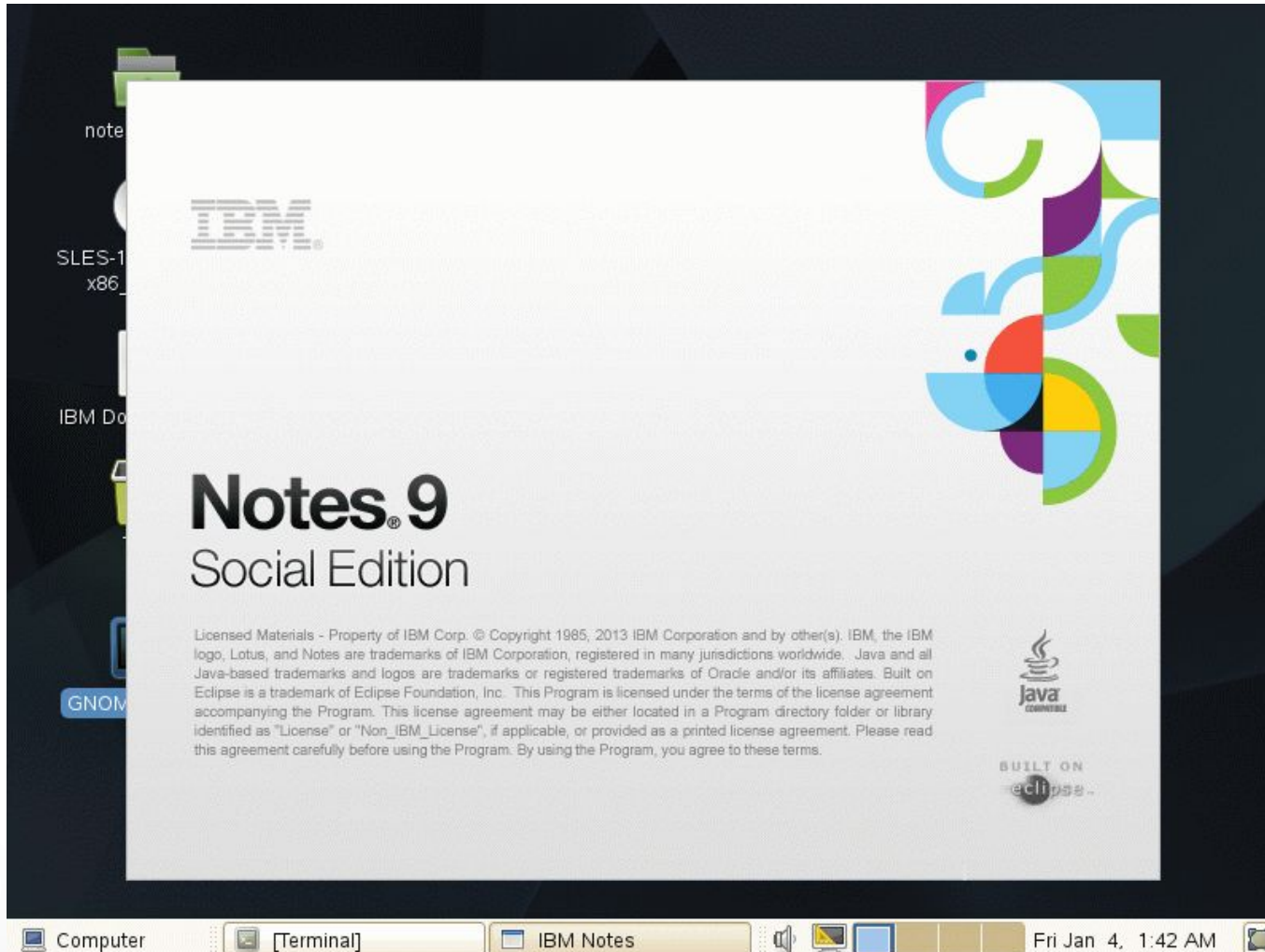


# Menu Entries after install



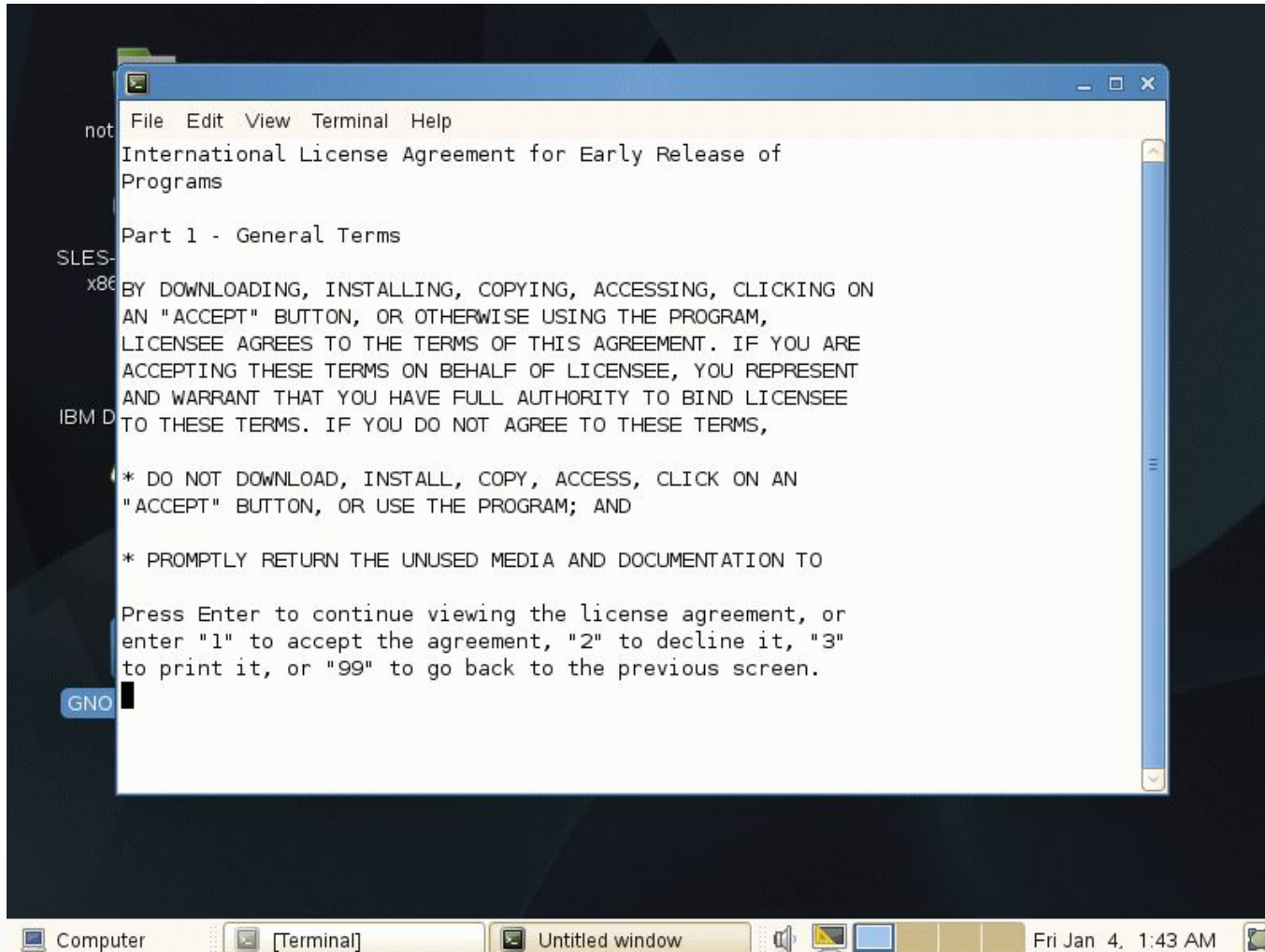
- Click “IBM Notes”

# Notes Client Splash Screen



■ :-)

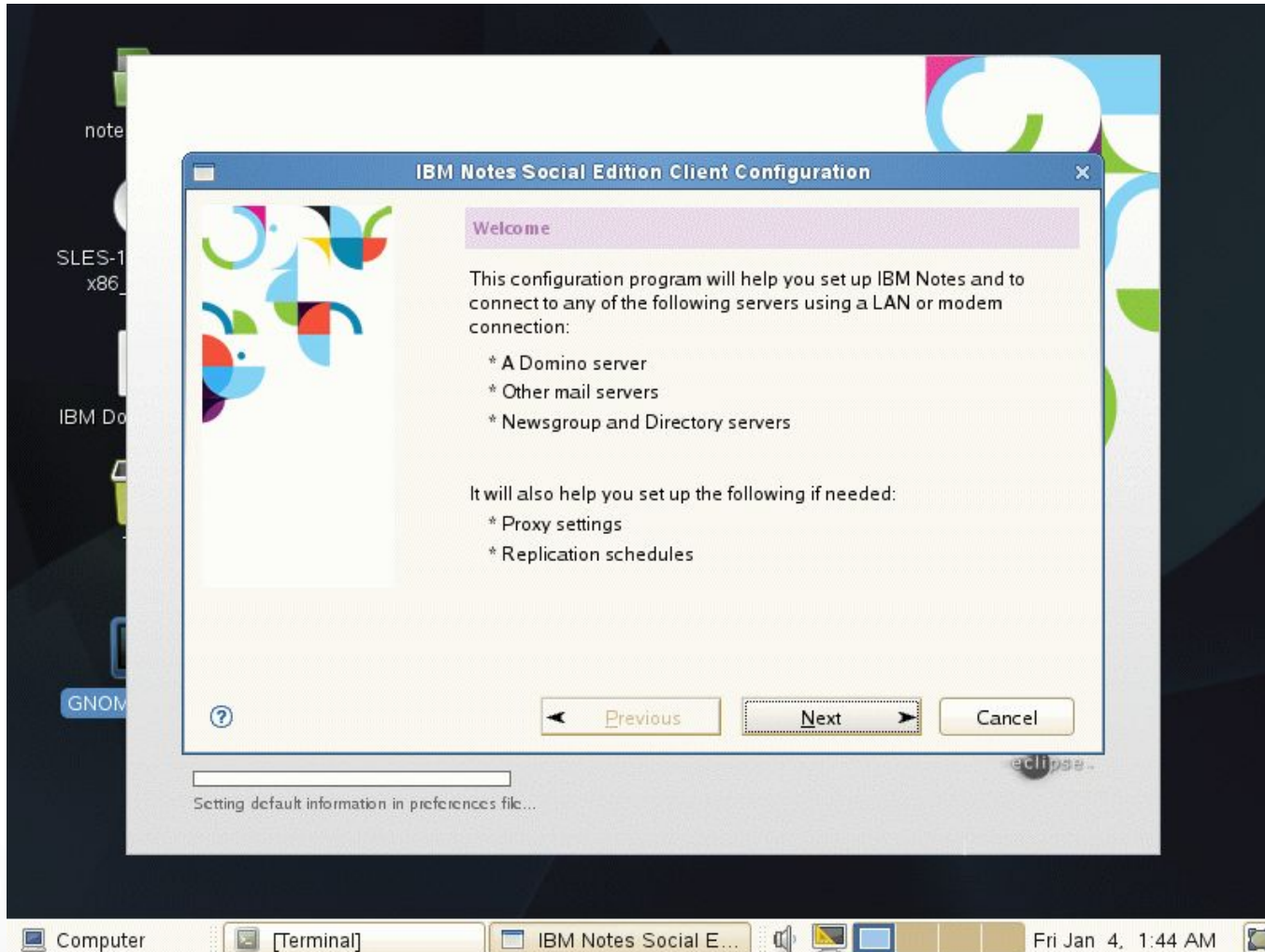
# License Terms...



- Confirm the License Terms with “1”



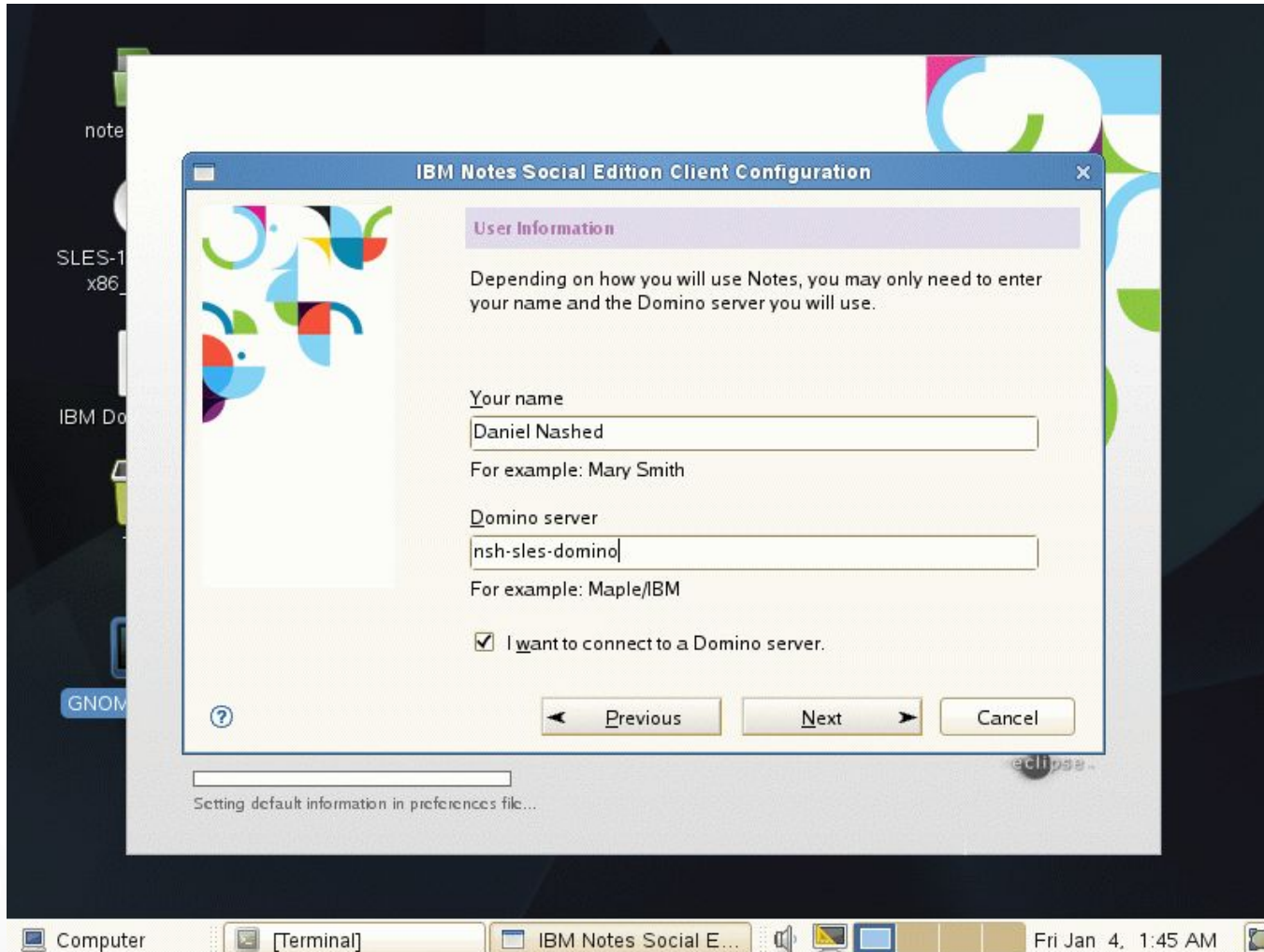
# Client Configuration



- Click “Next”

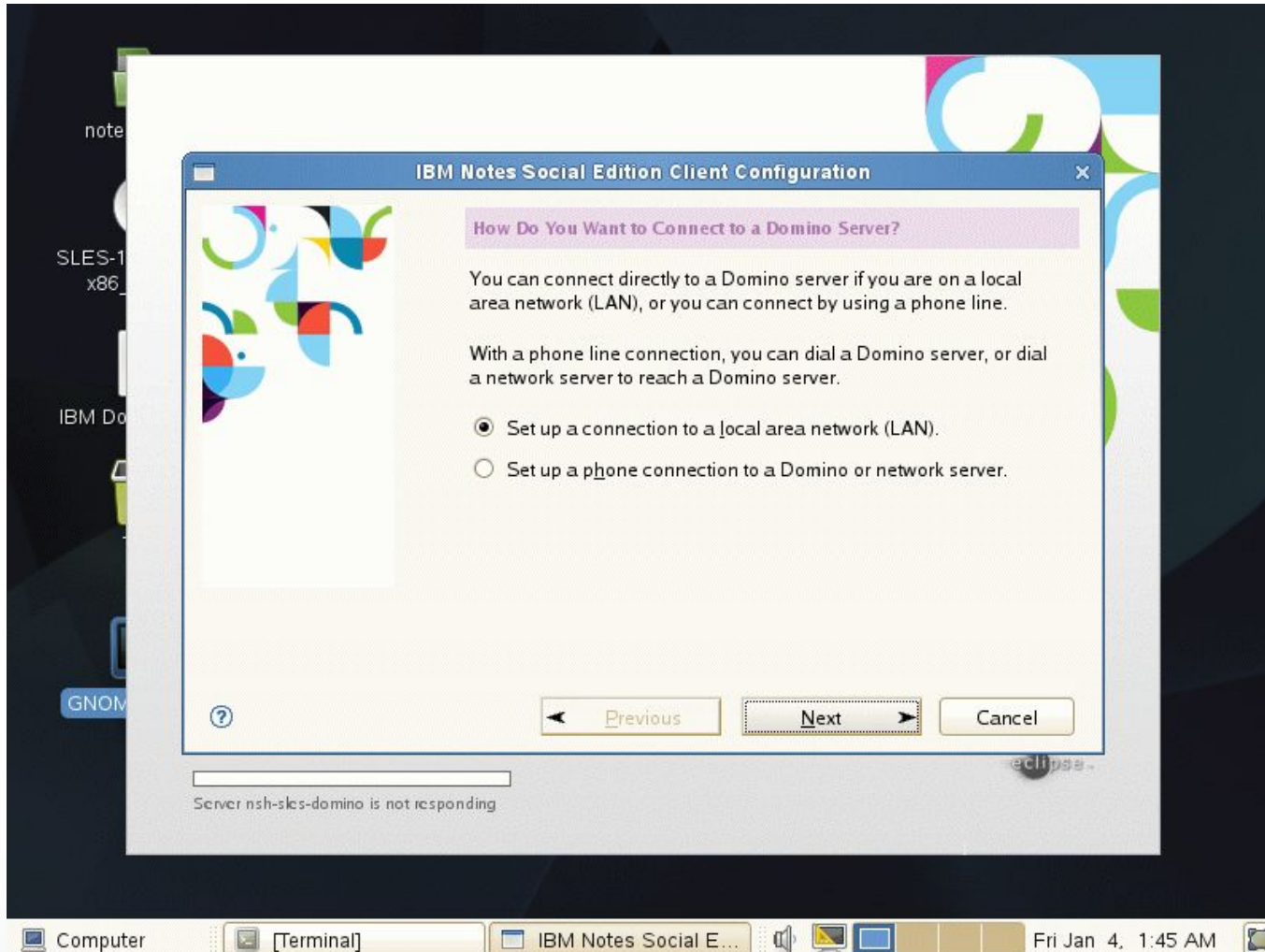


# Client Configuration



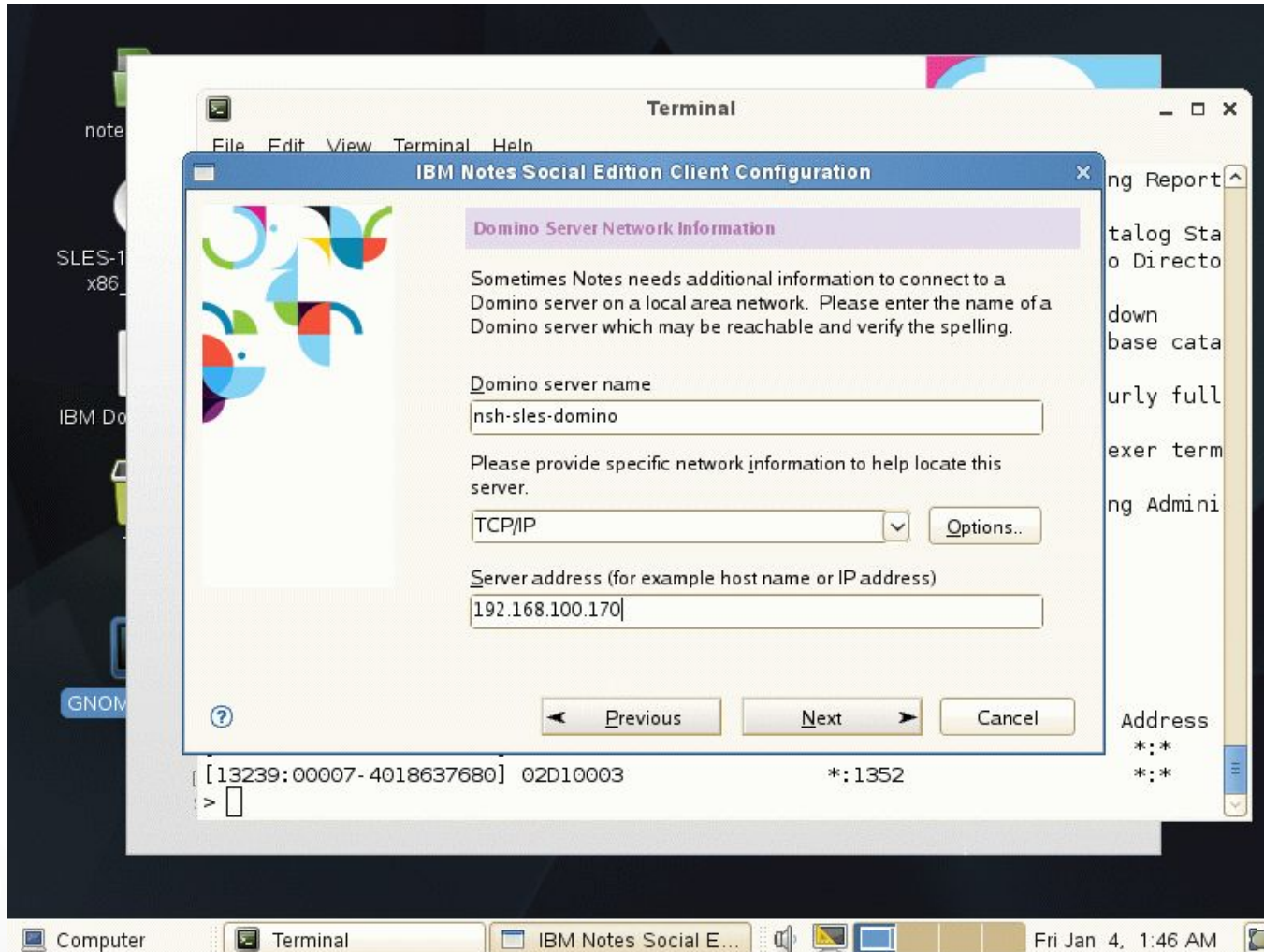
- Enter registered user
- Enter Server Name
- Press “Next”

# Client Configuration



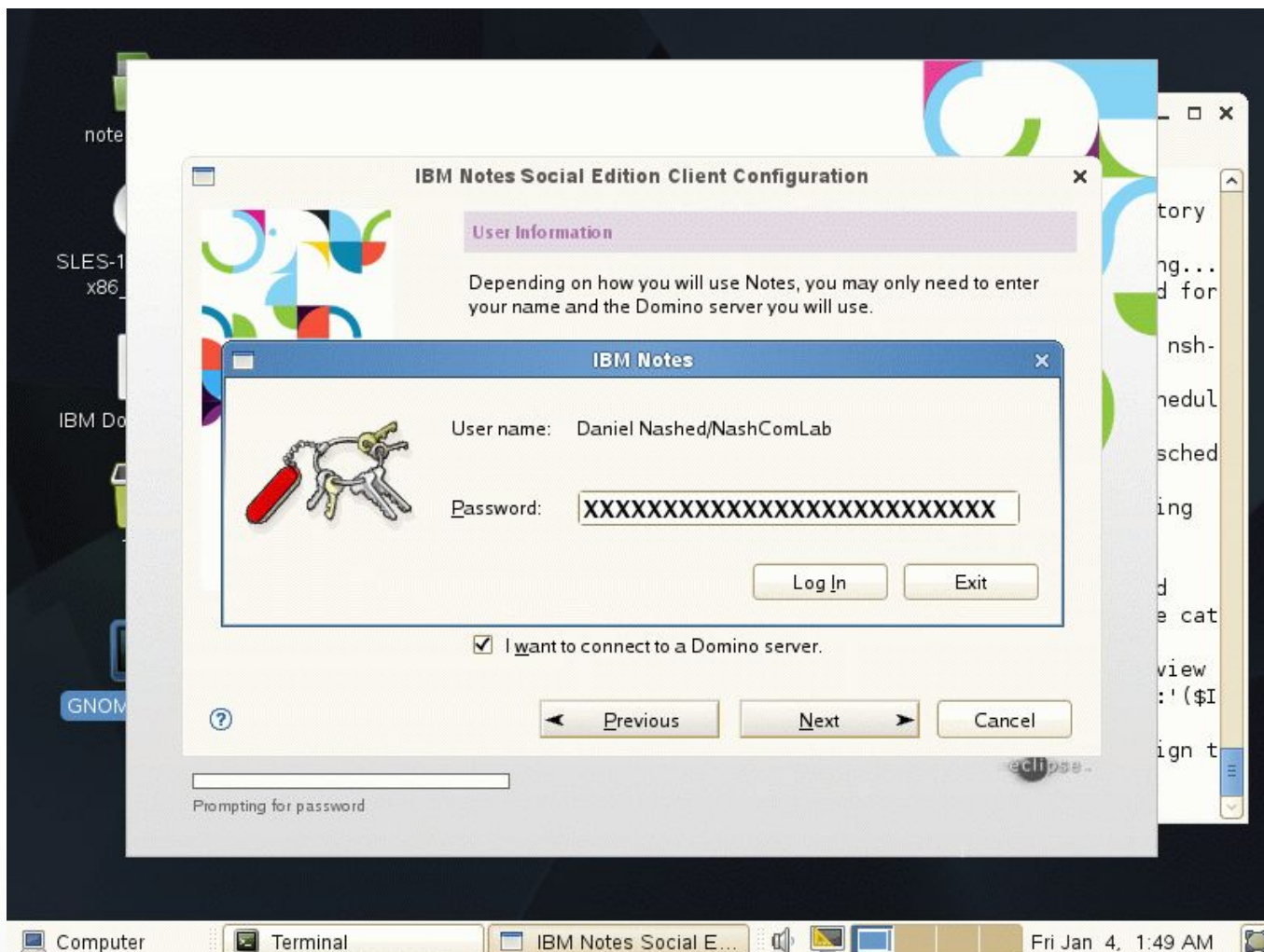
- Press “Next”

# Client Configuration



- In case you have no name resolution type in the IP
- Press "Next"

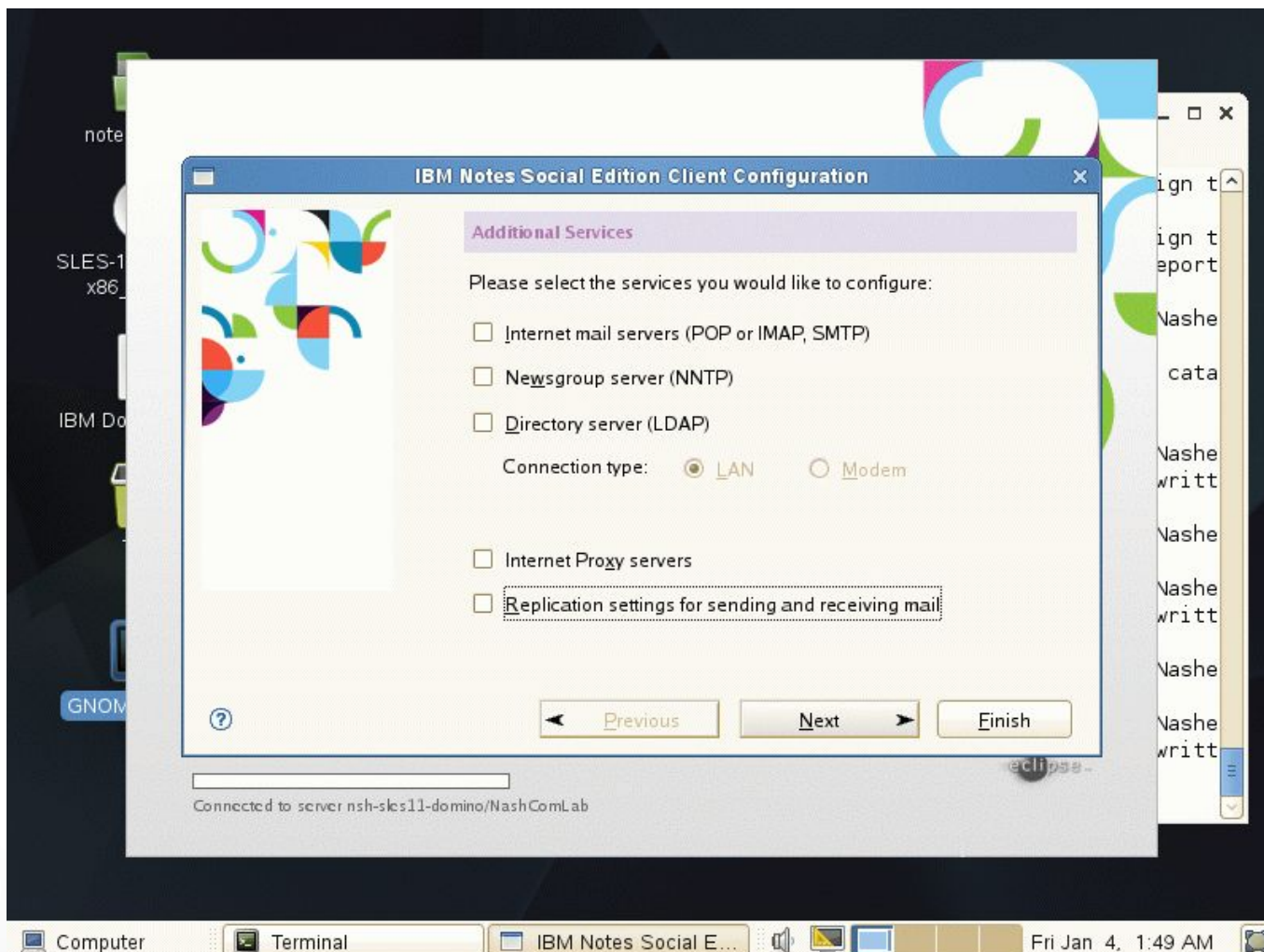
# Client Configuration



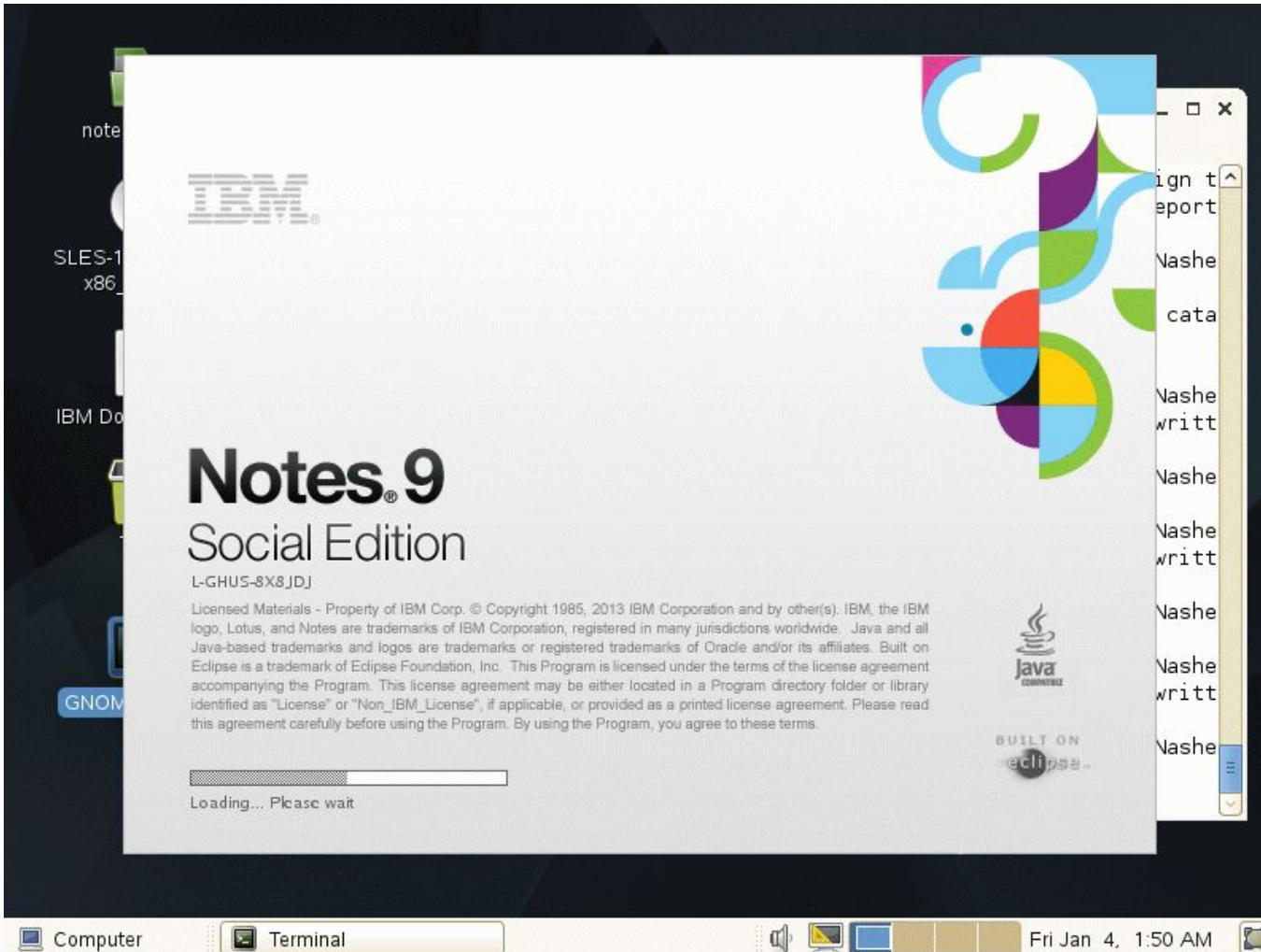
- ID should be downloaded automatically because we registered the user keeping the user.id in the person.doc
- In production environments you would leverage ID-Vault

# Client Configuration

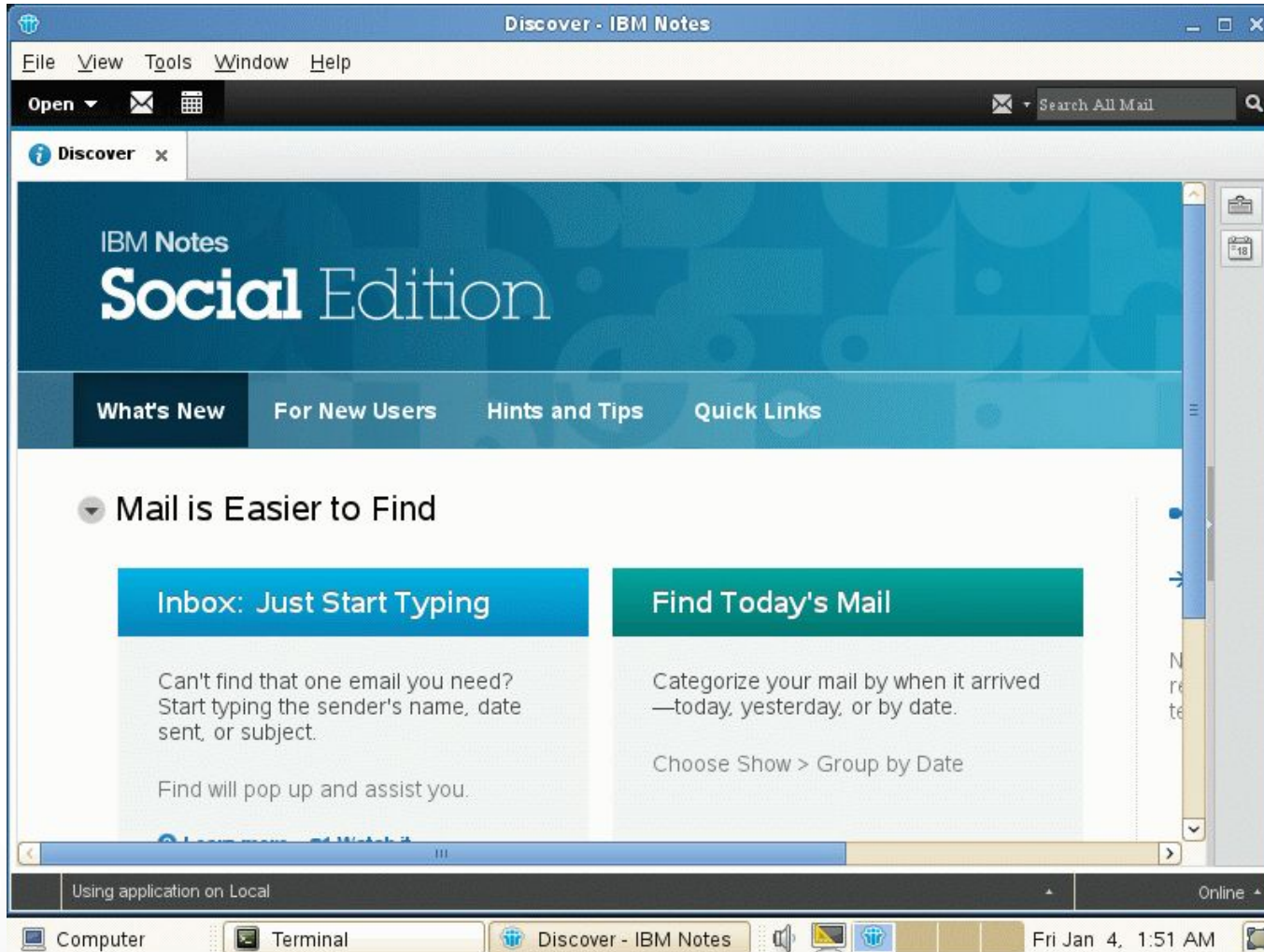
- Press “Next”



# First Notes Client Start

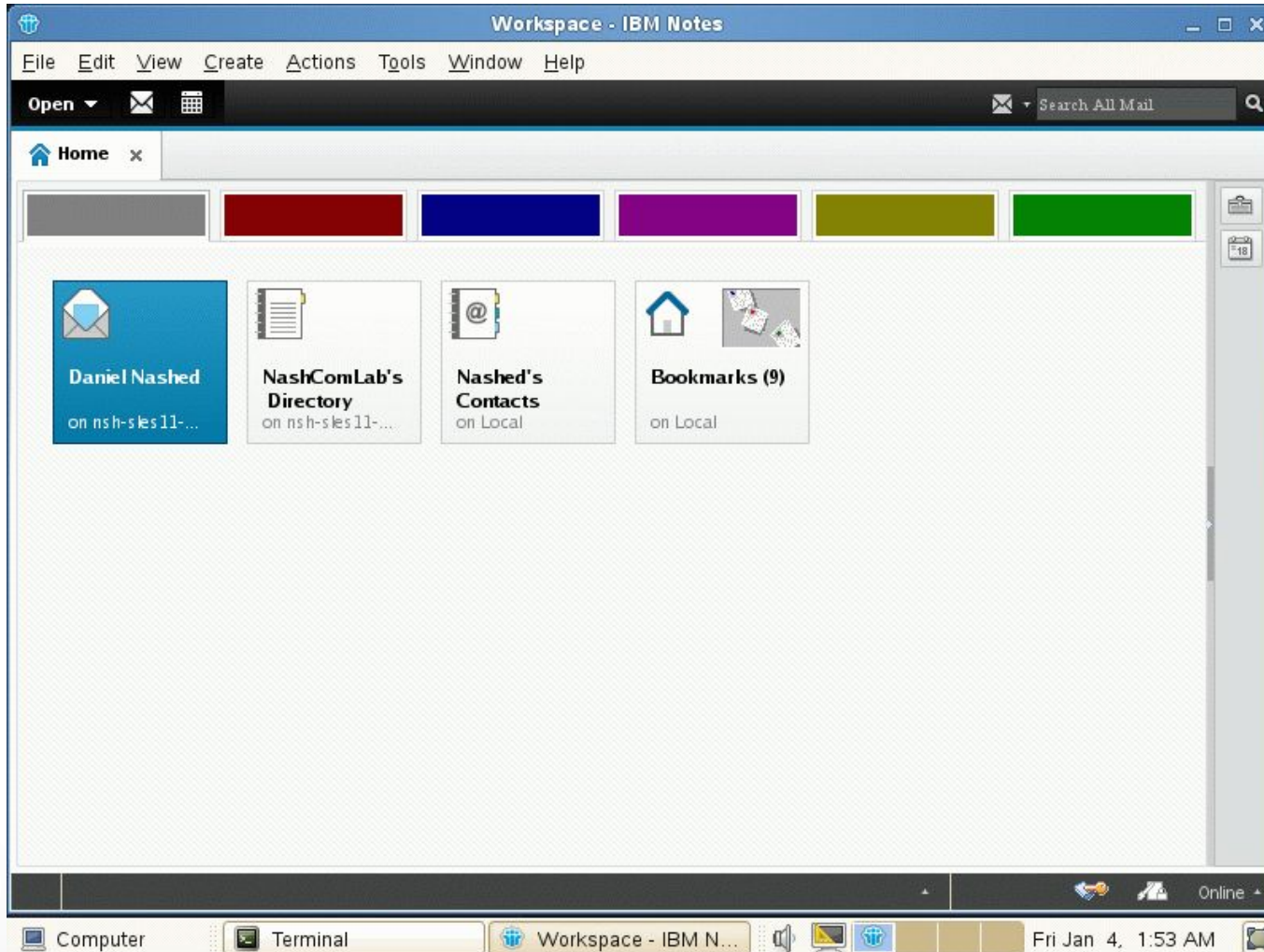


# New Welcome Screen



- Almost Same Look & Feel you know from Windows

# Desktop is still there...



- Almost Same Look & Feel you know from Windows



# Linuxfest Returns!

**Back for another informative all-inclusive Linux session in 2013  
Join Bill Malchisky, Wes Morgan, and guest Daniel Nashed!**

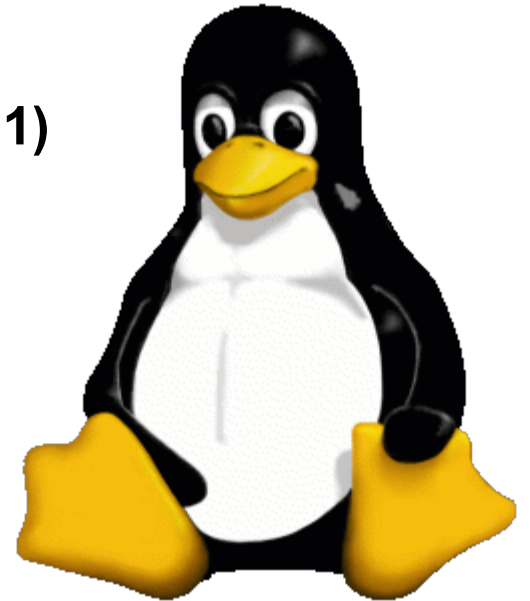
When: Thursday, 31 January

Where: **Dolphin Hotel - Sum Chow's (Next to Picabu, Level 1)**

Time: 12:15 - 1:30 pm

Other: Bring your box lunch!

We're not in the program guide, so mark your calendar, or  
See our listing in the ConnectOsphere agenda Notes app



*\*\*Special thanks to Red Hat for providing our session swag!\*\**

## Q&amp;A



- Thanks for your attention!
  - Please fill out your evaluations!
  
- Questions?
  - Now, find me later at the conference or contact me offline
  
- Contact
  - [nsh@nashcom.de](mailto:nsh@nashcom.de)
  - <http://www.nashcom.de>
  - <http://blog.nashcom.de>
  - +49 172 2141912

## Appendix: Additional Slides



- RHEL 6.3 Install & Configuration
- Notes Client on Ubuntu 12.04 LTS

# Boot Screen

```
Welcome to Red Hat Enterprise Linux 6.3!  
  
[ ] Install or upgrade an existing system  
[ ] Install system with basic video driver  
[ ] Rescue installed system  
[ ] Boot from local drive  
[ ] Memory test
```

Press [Tab] to edit options

Automatic boot in 57 seconds...

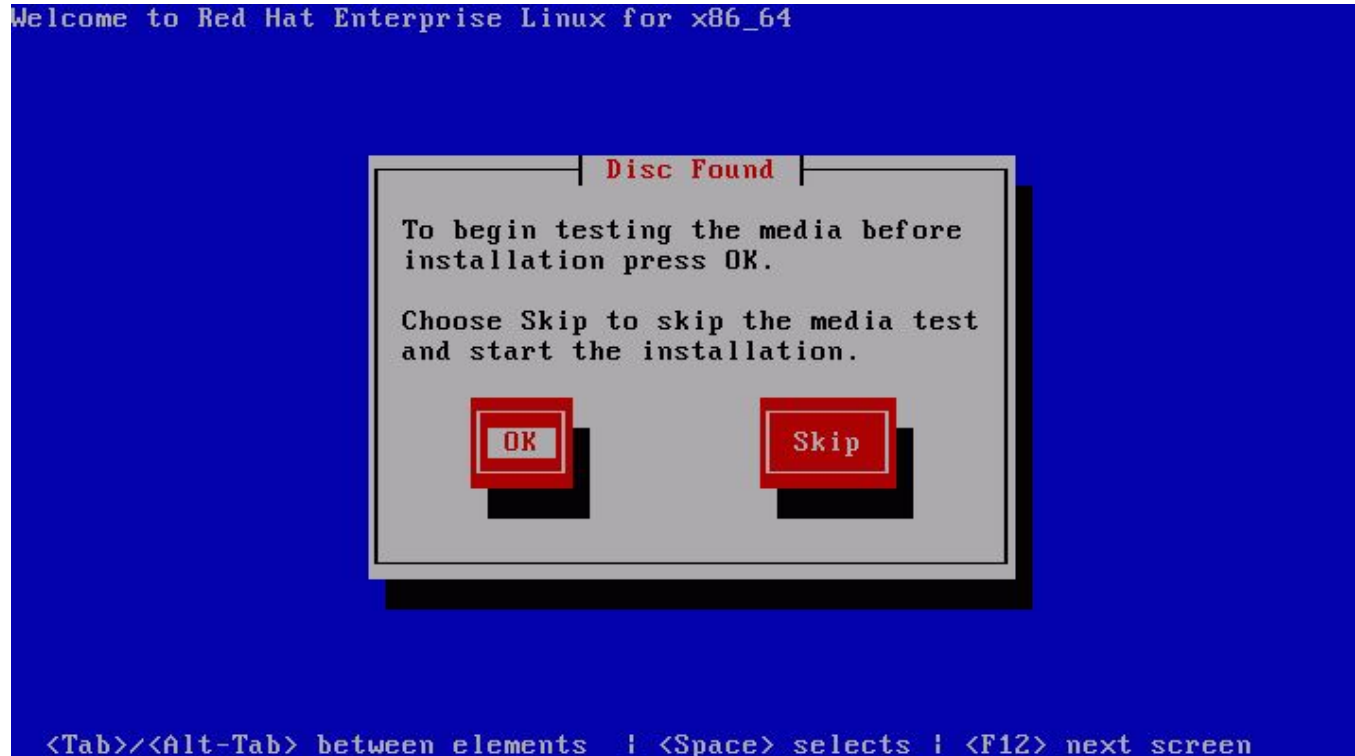
**RED HAT®  
ENTERPRISE LINUX® 6**



- Select “Install or upgrade and existing system”

Copyright © 2003-2010 Red Hat, Inc. and others. All rights reserved.

# Media Test



- Skip Media Test unless you downloaded the image and did not check the checksum
- Click “Next”

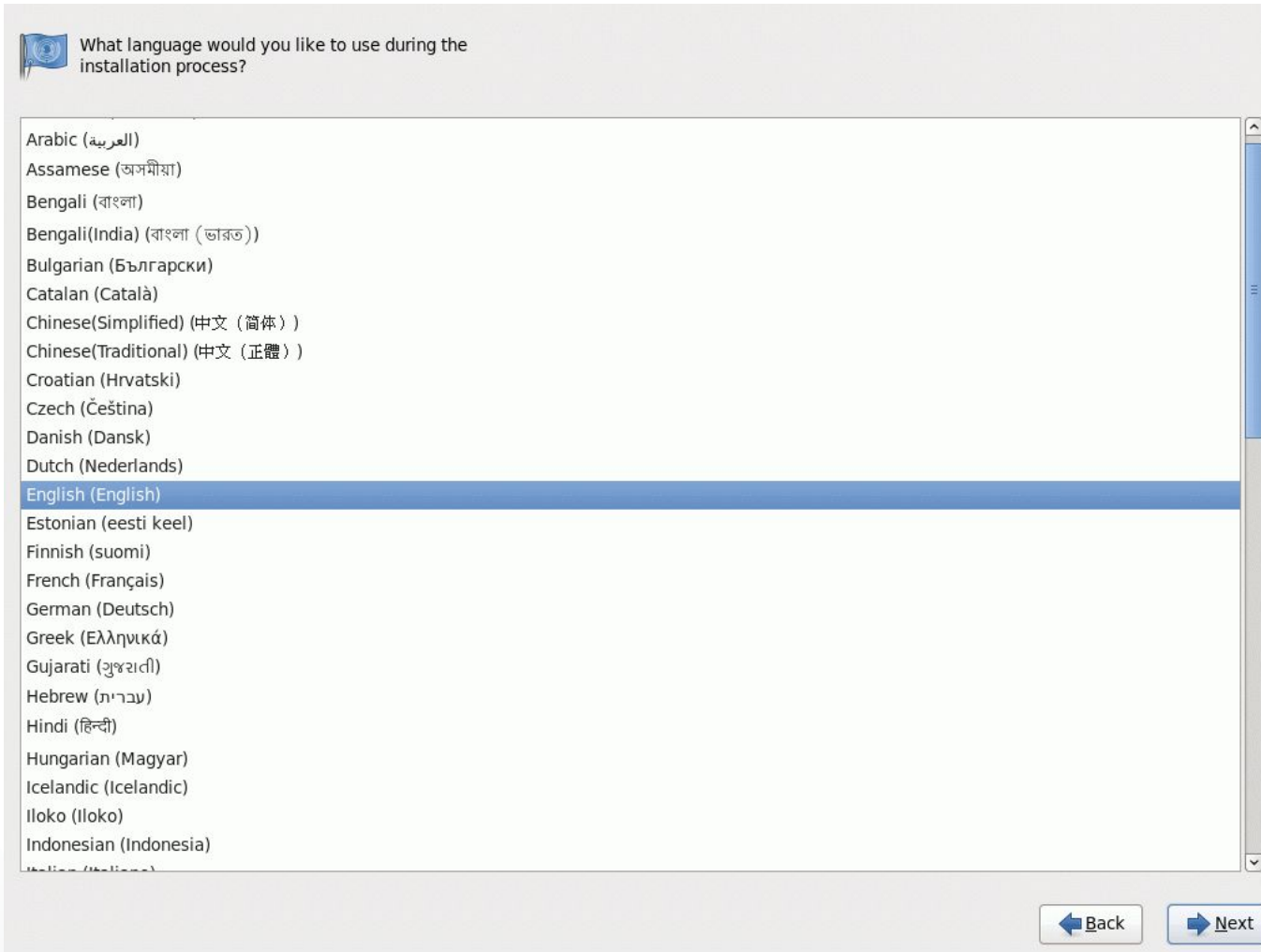


# RedHat Entry Screen

- Click "Next"

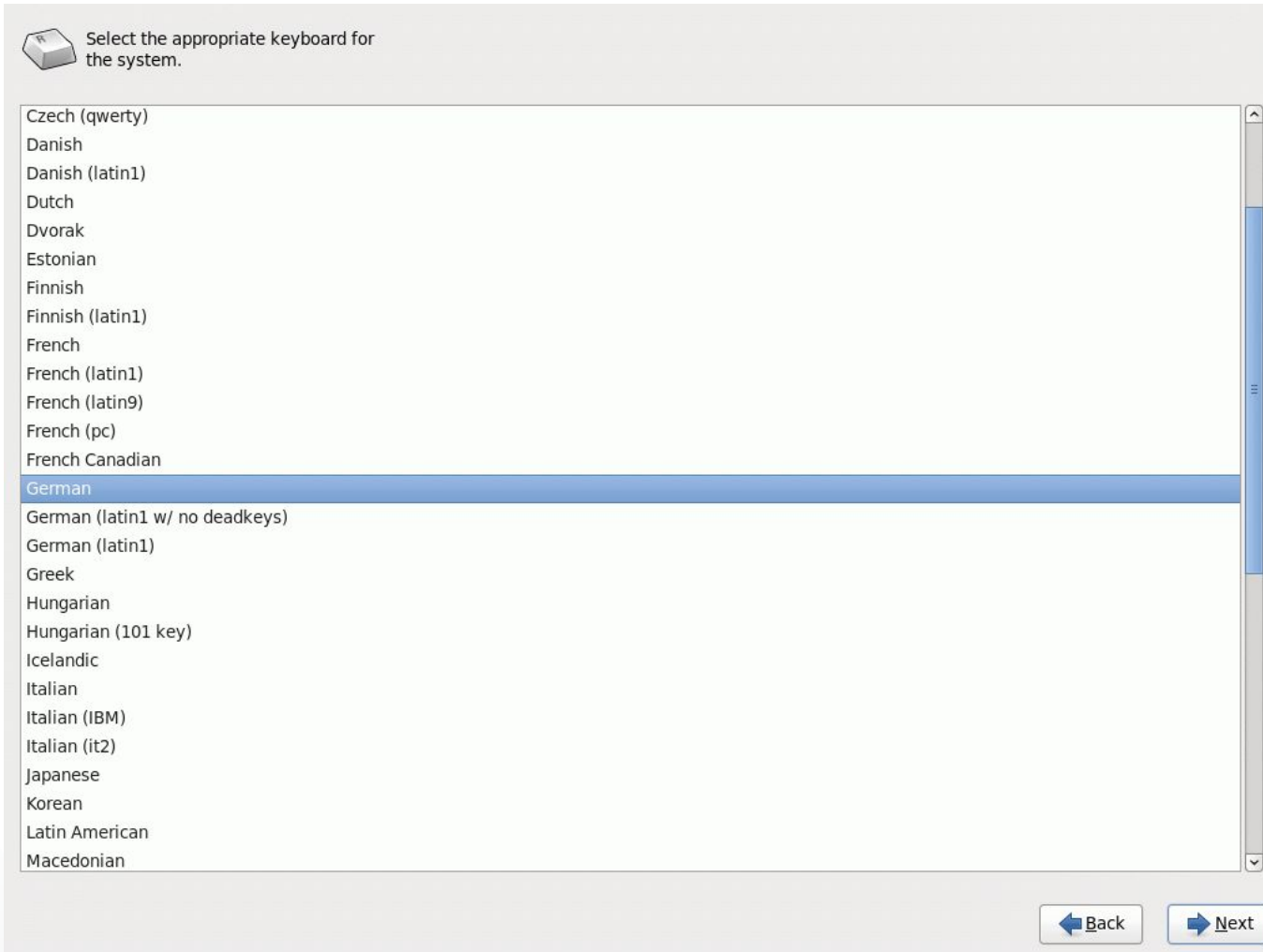


# Install Language Select



- Select your Language
- Press “Next”

# Keyboard Select



- Select your Keyboard Layout
- Press “Next”





# Storage Devices

What type of devices will your installation involve?

**Basic Storage Devices**

- Installs or upgrades to typical types of storage devices. If you're not sure which option is right for you, this is probably it.

**Specialized Storage Devices**

- Installs or upgrades to enterprise devices such as Storage Area Networks (SANs). This option will allow you to add FCoE / iSCSI / zFCP disks and to filter out devices the installer should ignore.

[← Back](#) [Next →](#)

- Select “Basic Storage Devices”
- Press “Next”


# Discard Disk Data

- Click “Yes discard any data”
- It's a new disk





# Hostname

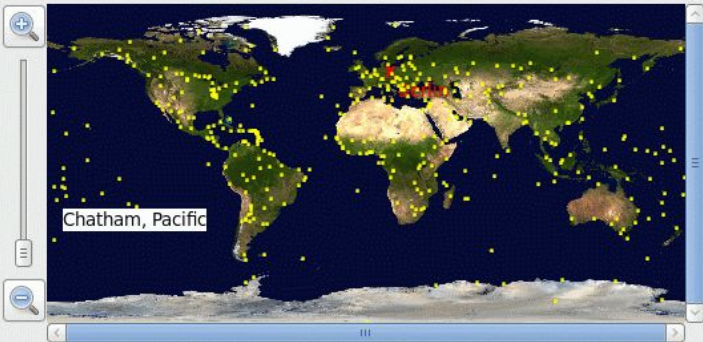
 Please name this computer. The hostname identifies the computer on a network.

Hostname:

- Type in Hostname
- Press “Next”

# Select Timezone

Please select the nearest city in your time zone:



Selected city: Berlin, Europe

Europe/Berlin


System clock uses UTC

[Back](#) [Next](#)

- Select your Timezone
- Press “Next”



# Root Password

 The root account is used for administering the system. Enter a password for the root user.

Root Password:

Confirm:

[← Back](#)






[→ Next](#)

- Type in a new, secure “root” password
- Type “Next”




# Disk Installation Type

Which type of installation would you like?

-  **Use All Space**  
Removes all partitions on the selected device(s). This includes partitions created by other operating systems.  
**Tip:** This option will remove data from the selected device(s). Make sure you have backups.
-  **Replace Existing Linux System(s)**  
Removes only Linux partitions (created from a previous Linux installation). This does not remove other partitions you may have on your storage device(s) (such as VFAT or FAT32).  
**Tip:** This option will remove data from the selected device(s). Make sure you have backups.
-  **Shrink Current System**  
Shrinks existing partitions to create free space for the default layout.
-  **Use Free Space**  
Retains your current data and partitions and uses only the unpartitioned space on the selected device(s), assuming you have enough free space available.
-  **Create Custom Layout**  
Manually create your own custom layout on the selected device(s) using our partitioning tool.

- Encrypt system
- Review and modify partitioning layout

 Back  Next

- Keep default option
- Works fine for a new disk and existing data, you don't want to delete
- Press “Next”

# Confirm Disk Changes

- Select “Write changes to disk”



# Select Server Type and Options

The default installation of Red Hat Enterprise Linux is a basic server install. You can optionally select a different set of software now.

Basic Server

Database Server

Web Server

Identity Management Server

Virtualization Host

Desktop

Software Development Workstation

Minimal

Please select any additional repositories that you want to use for software installation.

High Availability

Load Balancer

Red Hat Enterprise Linux

Resilient Storage

+ Add additional software repositories

Modify repository

You can further customize the software selection now, or after install via the software management application.

Customize later  Customize now

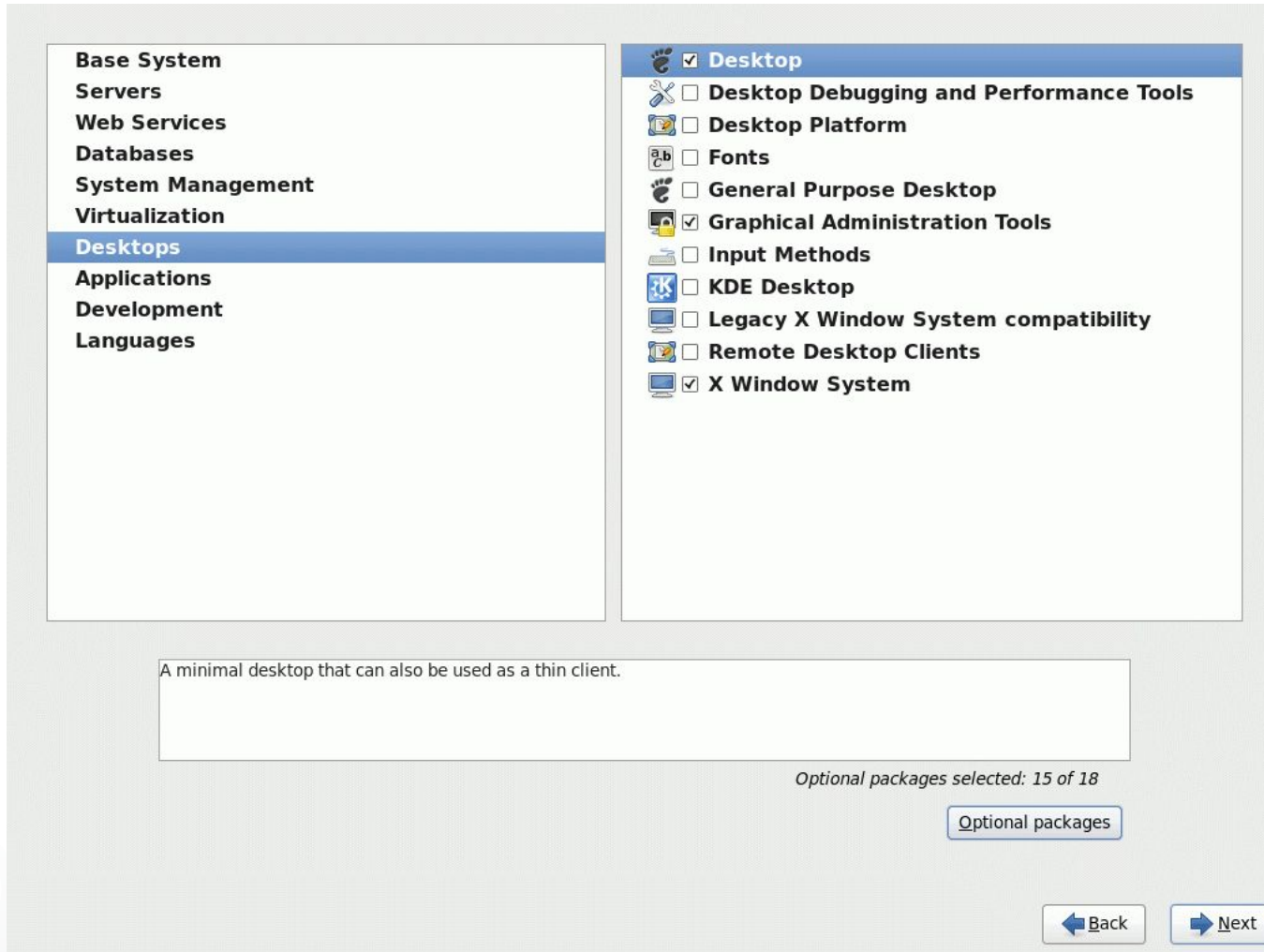
Back

Next

- Select “Basic Server”
- Select “Customize now”
- Press “Next”



# Select Desktop Options for X11 and Admin Tools



Base System  
Servers  
Web Services  
Databases  
System Management  
Virtualization  
**Desktops**  
Applications  
Development  
Languages

Desktop  
 Desktop Debugging and Performance Tools  
 Desktop Platform  
 Fonts  
 General Purpose Desktop  
 Graphical Administration Tools  
 Input Methods  
 KDE Desktop  
 Legacy X Window System compatibility  
 Remote Desktop Clients  
 X Window System

A minimal desktop that can also be used as a thin client.

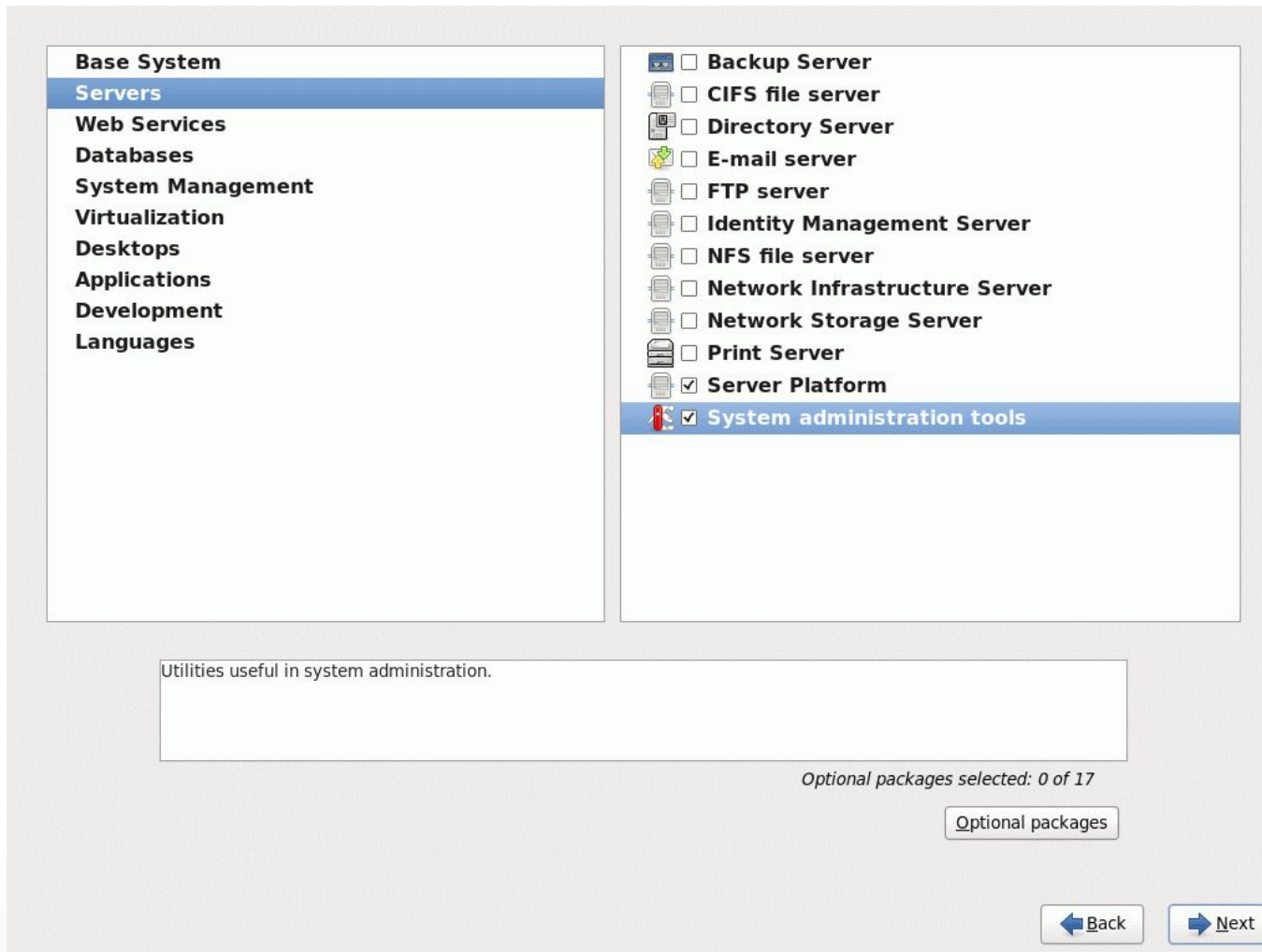
Optional packages selected: 15 of 18

Optional packages

Back Next

- Select
  - Desktop
  - X Window System
  - Graphical Administration Tools
- Press “Next”

# Select Server Options



**Base System**

**Servers**

**Web Services**

**Databases**

**System Management**

**Virtualization**

**Desktops**

**Applications**

**Development**

**Languages**

- Backup Server
- CIFS file server
- Directory Server
- E-mail server
- FTP server
- Identity Management Server
- NFS file server
- Network Infrastructure Server
- Network Storage Server
- Print Server
- Server Platform
- System administration tools

Utilities useful in system administration.

Optional packages selected: 0 of 17

Optional packages

Back Next

- Select “Server”
- Select
  - System administration tools



# Installation ...



Packages completed: 22 of 890

Installing **glibc-common-2.12-1.80.el6.x86\_64** (107 MB)  
Common binaries and locale data for glibc

← Back    Next →



# Installation Done

- Select “Reboot”



Congratulations, your Red Hat Enterprise Linux installation is complete.

Please reboot to use the installed system. Note that updates may be available to ensure the proper functioning of your system and installation of these updates is recommended after the reboot.



# Welcome to Configuration

- Welcome
- License Information
- Set Up Software Updates
- Create User
- Date and Time
- Kdump

## Welcome

There are a few more steps to take before your system is ready to use. The Setup Agent will now guide you through some basic configuration. Please click the "Forward" button in the lower right corner to continue



- Click "Forward"



# License Information

- Welcome
- License Information
- Set Up Software Updates
- Create User
- Date and Time
- Kdump

## License Information

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- Yes, I agree to the License Agreement
- No, I do not agree

Back

Forward

- Agree to License Terms
- Press "Forward"



# Setup Software Updates

Welcome  
License  
Information  
▶ Set Up Software  
Updates  
Create User  
Date and Time  
Kdump

## Set Up Software Updates



**The network connection on your system is not active. Your system cannot be set up for software updates at this time.**

This system will **not** be able to successfully receive software updates, including security updates, from Red Hat without connecting to a Red Hat Network server.

To keep your system updated, secure, and supported, please register this system at your earliest convenience.

You may access the RHN registration tool by running **RHN Registration** in the **System > Administration** menu.  
You may access the software update tool by running **Software Update** in the **System > Administration** menu.

[Why Should I Connect to RHN? ...](#)

[Back](#)

[Forward](#)

- You might need to skip this step because you are not yet connected to the network
- Click “Forward”

# Create User

**Welcome**  
**License Information**  
**Set Up Software Updates**  
▶ **Create User**  
**Date and Time**  
**Kdump**

## Create User

You must create a 'username' for regular (non-administrative) use of your system. To create a system 'username', please provide the information requested below.

Username:

Full Name:

Password:

Confirm Password:

If you need to use network authentication, such as Kerberos or NIS, please click the Use Network Login button.

If you need more control when creating the user (specifying home directory, and/or UID), please click the Advanced button.

- Type in user details
  - Username
  - Full Name
  - Password
- Click “Forward”



# Date and Time

Welcome  
License  
Information  
Set Up Software  
Updates  
Create User  
► Date and Time  
Kdump

## Date and Time

Please set the date and time for the system.

Date and Time

Current date and time: Sat 05 Jan 2013 11:39:15 AM CET

Synchronize date and time over the network

Manually set the date and time of your system:

**Date**

January				2013		
Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

**Time**

Hour: 11

Minute: 24

Second: 13

Back

Forward

- Check Date & Time
- Click “Forward”

# Kdump – Kernel Dump

Welcome  
License  
Information  
Set Up Software  
Updates  
Create User  
Date and Time  
› Kdump

## Kdump

Kdump is a kernel crash dumping mechanism. In the event of a system crash, kdump will capture information from your system that can be invaluable in determining the cause of the crash. Note that kdump does require reserving a portion of system memory that will be unavailable for other uses.

Enable kdump?

Total System Memory (MB): 2006

Kdump Memory (MB):

Usable System Memory (MB): 1878

Advanced kdump configuration

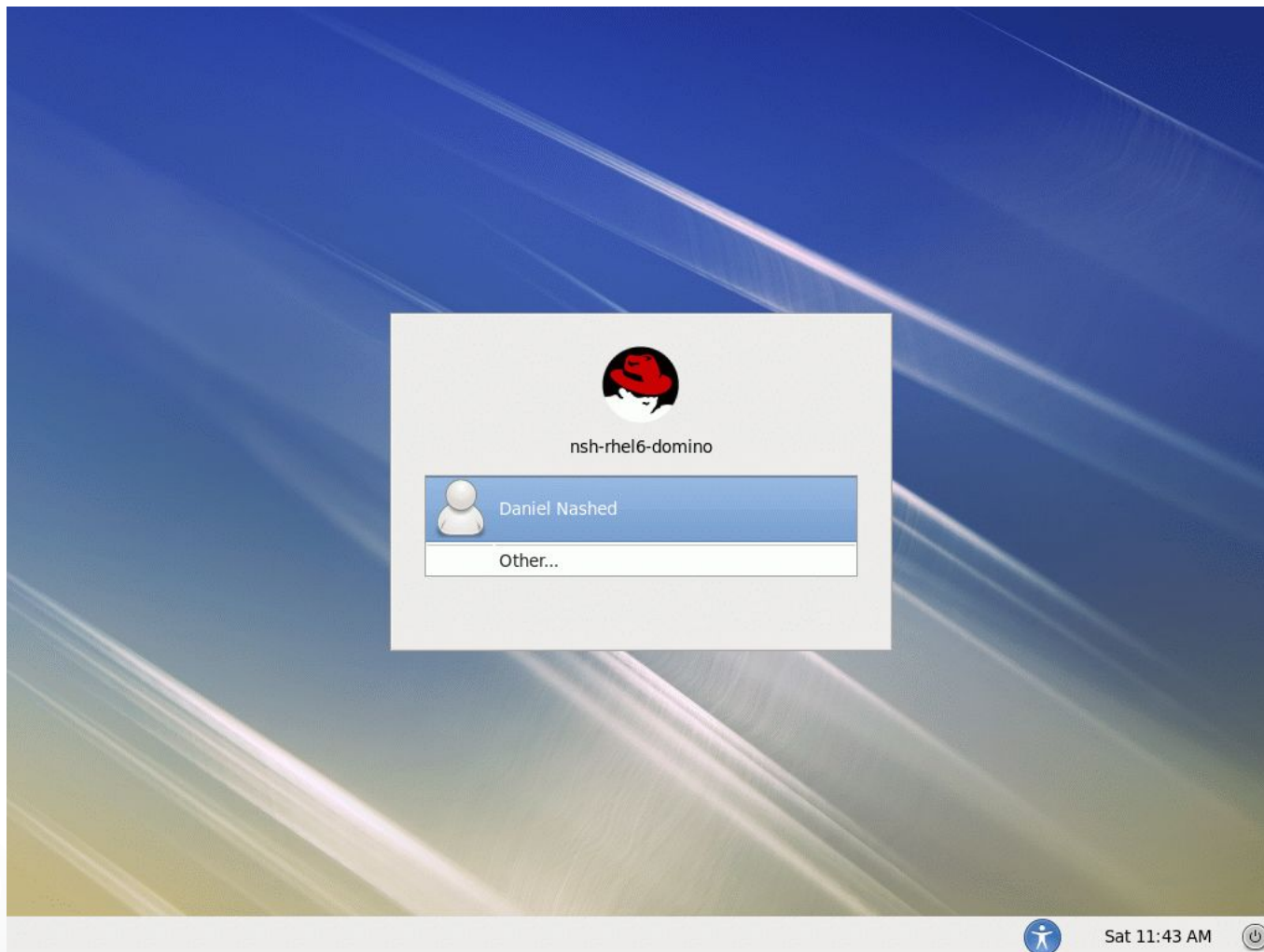
```
# Configures where to put the kdump /proc/vmcore files
#
# This file contains a series of commands to perform (in order) when a
# kernel crash has happened and the kdump kernel has been loaded. Di
# this file are only applicable to the kdump initramfs, and have no effect
# the root filesystem is mounted and the normal init scripts are proces
#
# Currently only one dump target and path may be configured at once
# if the configured dump target fails, the default action will be preforme
# the default action may be configured with the default directive below
# configured dump target succeeds
#
# Basics commands supported are:
# path <path>          - Append path to the filesystem device which y
#                      dumping to. Ignored for raw device dumps.
#                      If unset, will default to /var/crash.
#
```

Back

Finish

- Enable default Options for Kdump
- Click “Finish”

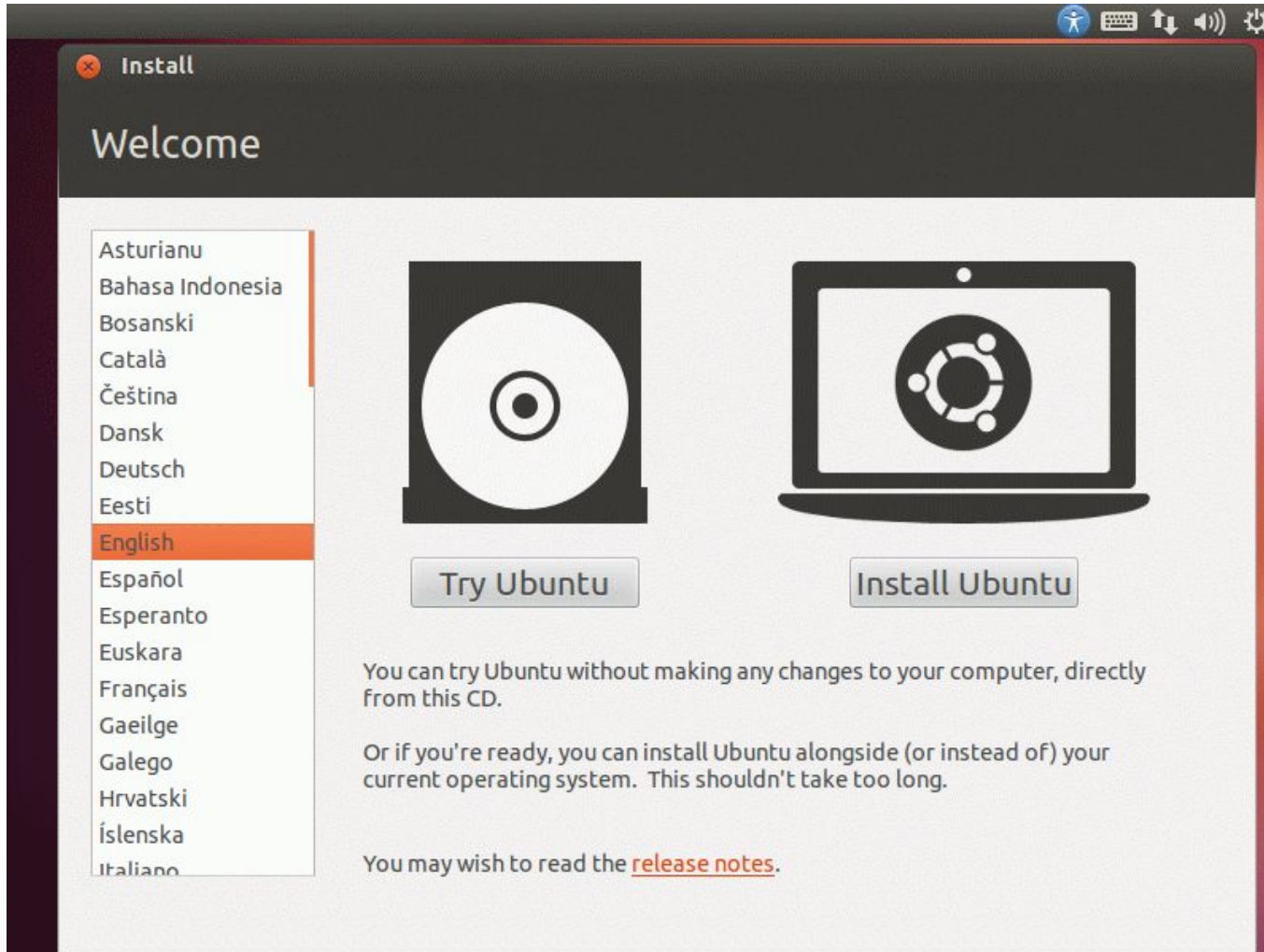
# First Login



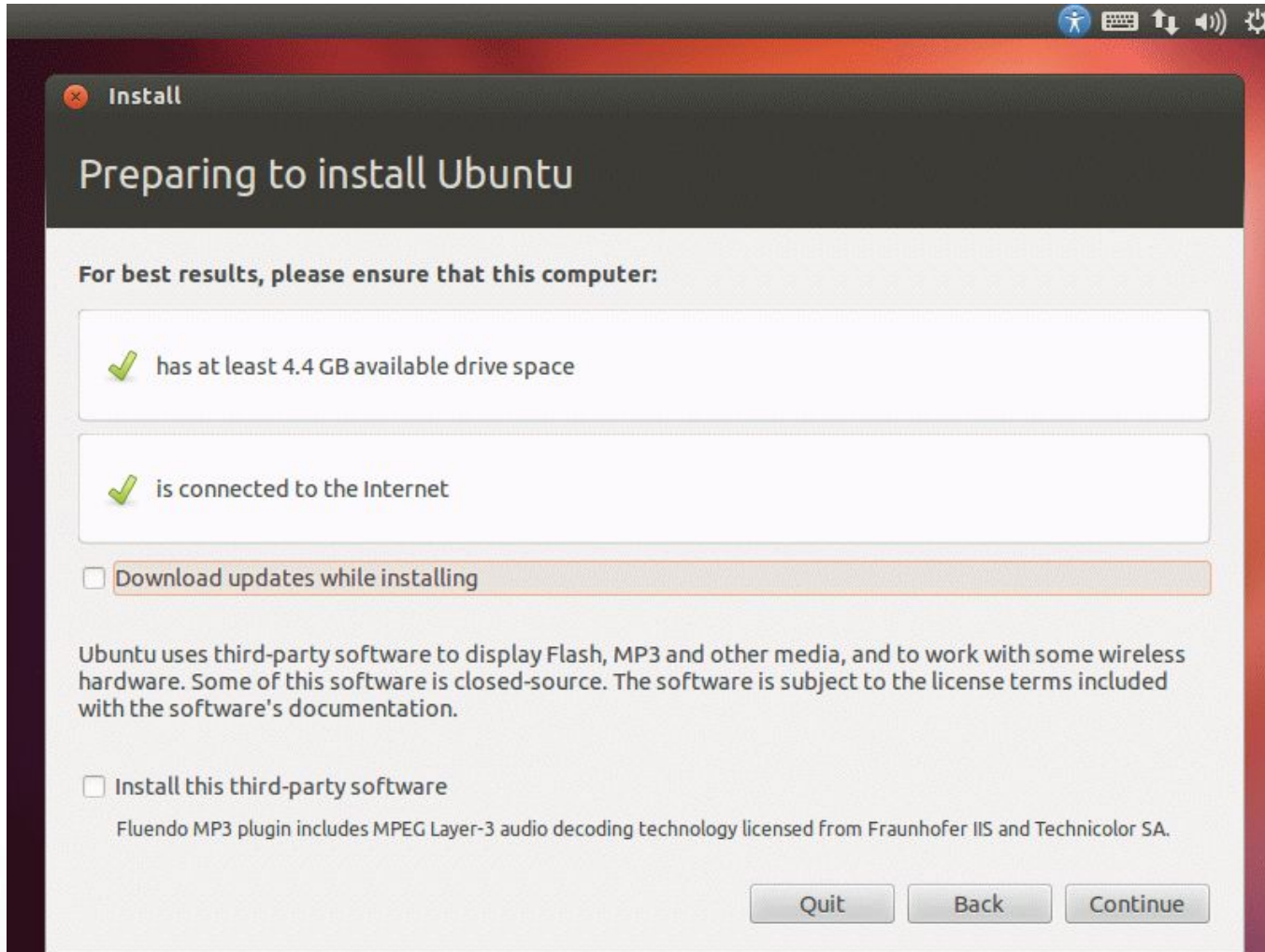
- Select User
- Type in Password

# Ubuntu Install Welcome Screen

- Select “Install Ubuntu”

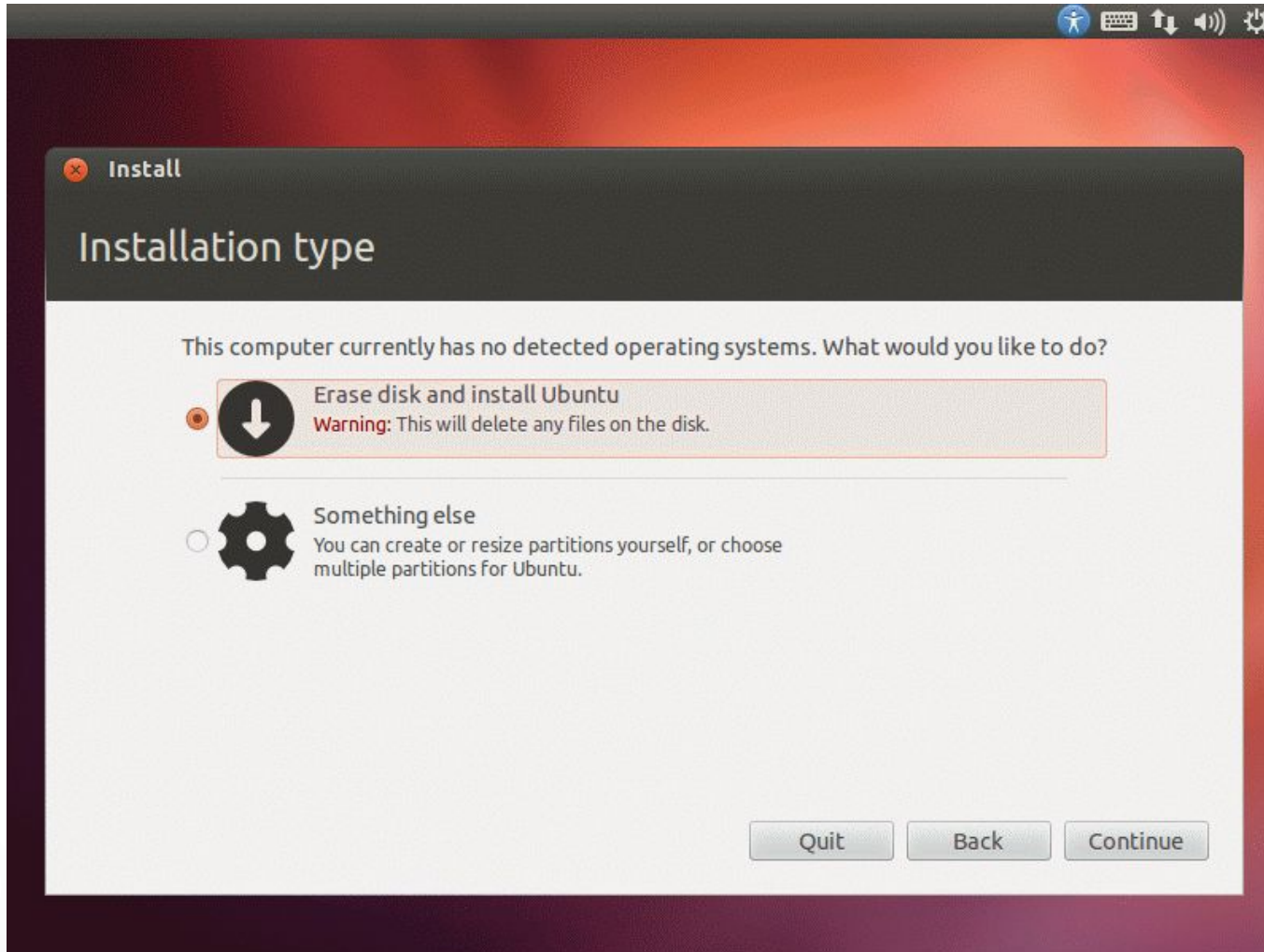


# Install Preparation



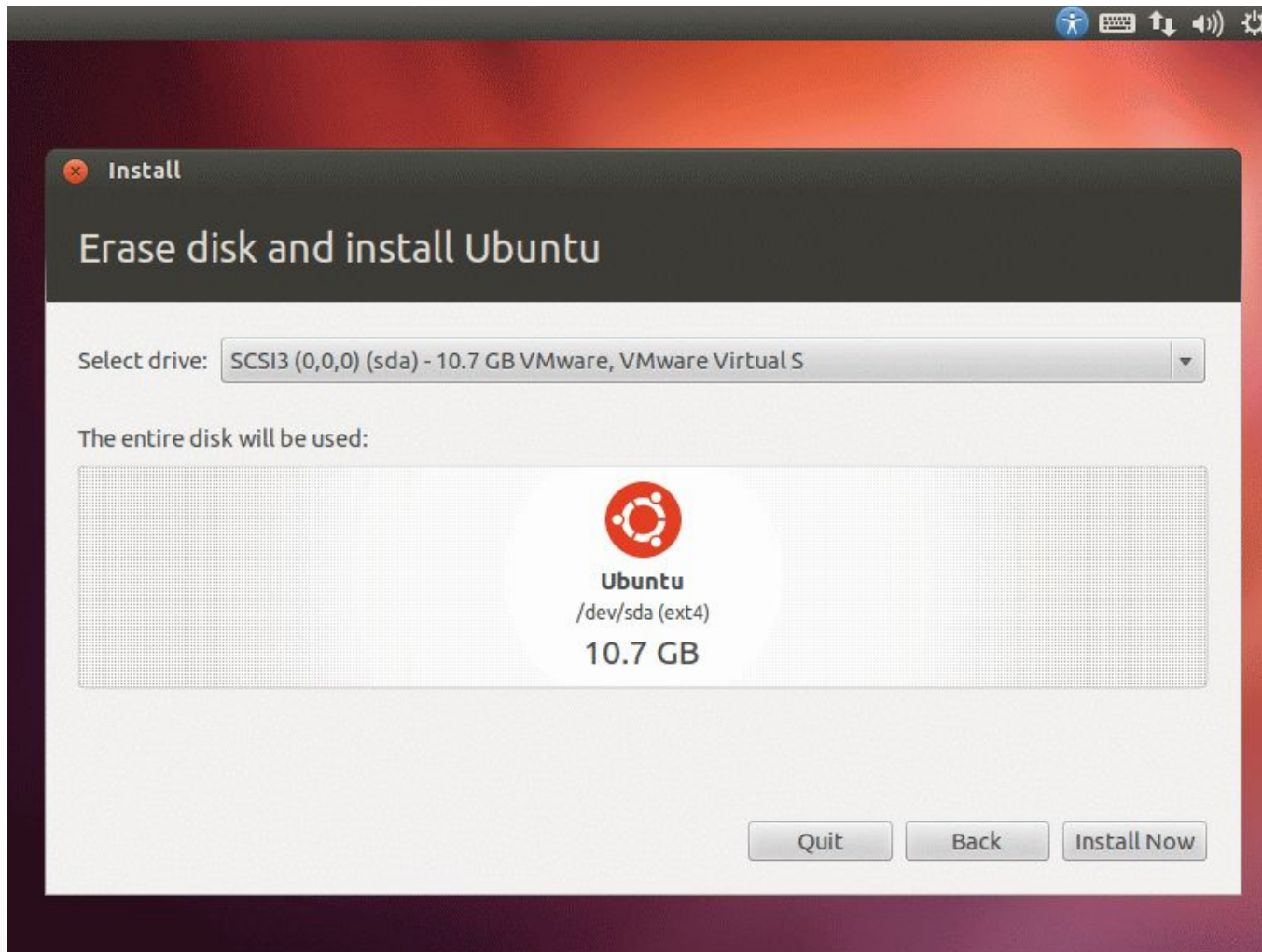
- Ensure you have sufficient space and Internet Connection
- You might select “Download updates while installing”
- Click “Continue”

# Install Type



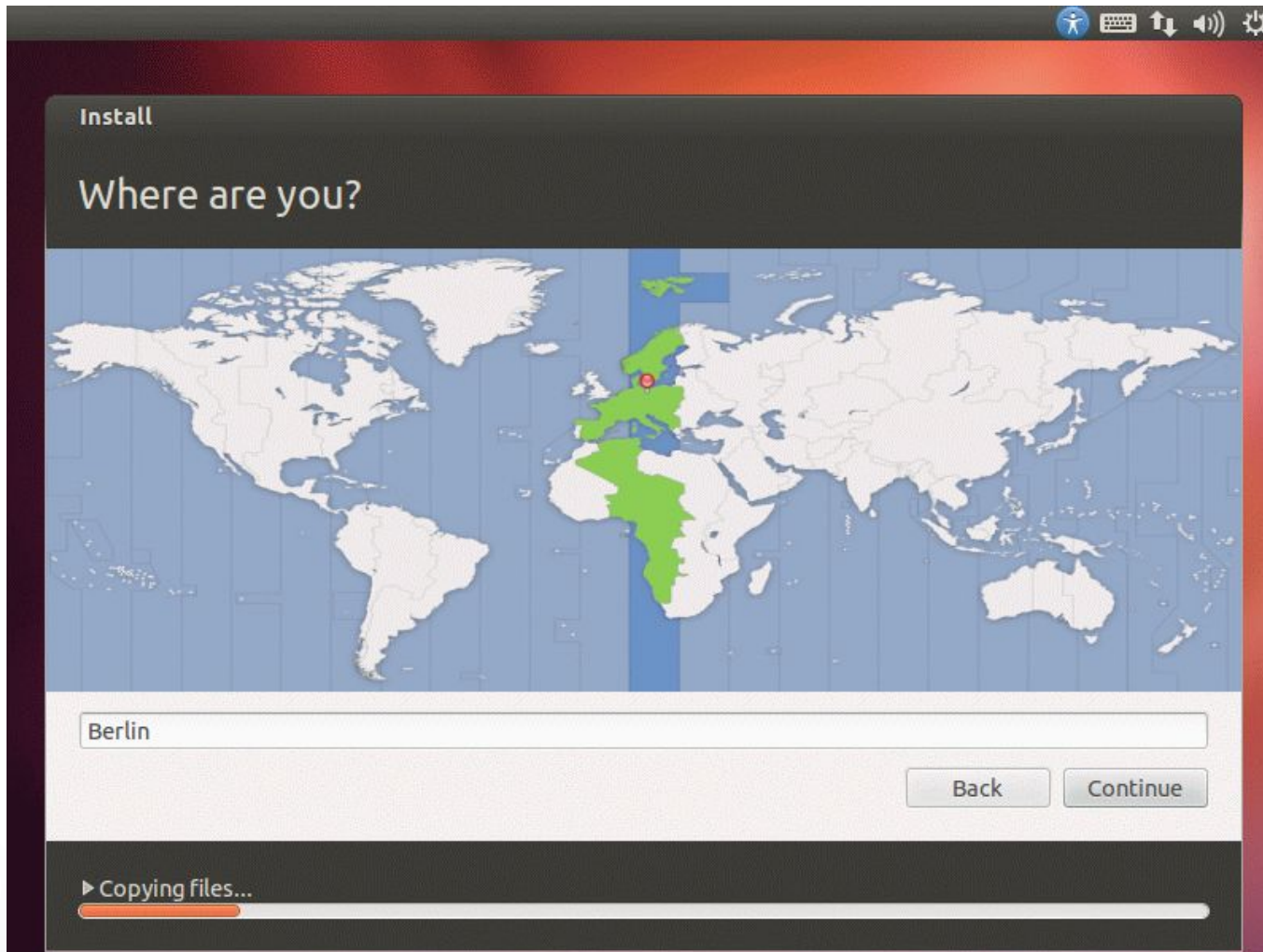
- Click “Erase disk and install Ubuntu”
- Click “Continue”

# Erase Disk and install Ubuntu



- Free Disk is selected
- Press “Install Now”

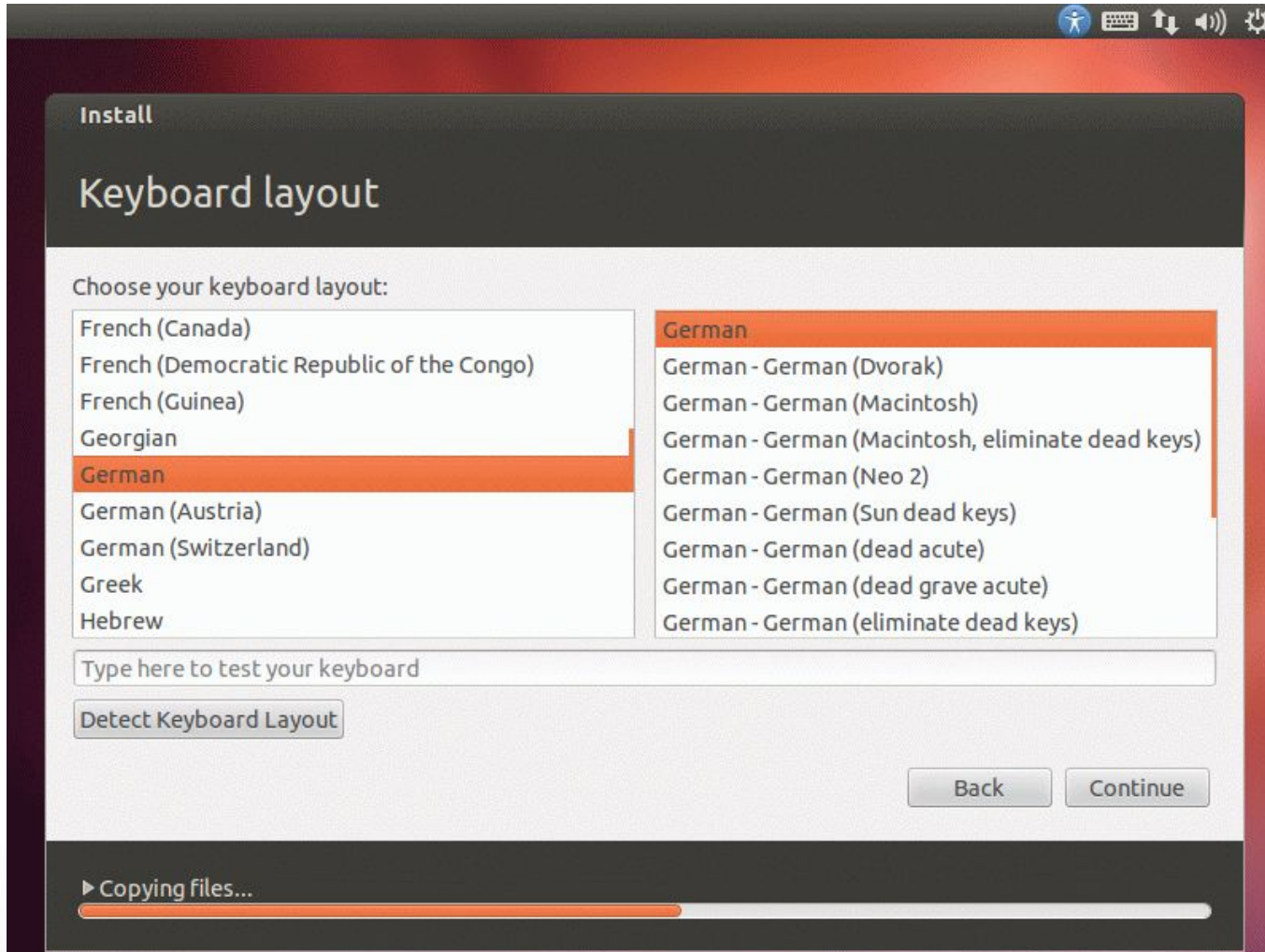
# Select Timezone



- Select your Timezone
- Click “Continue”

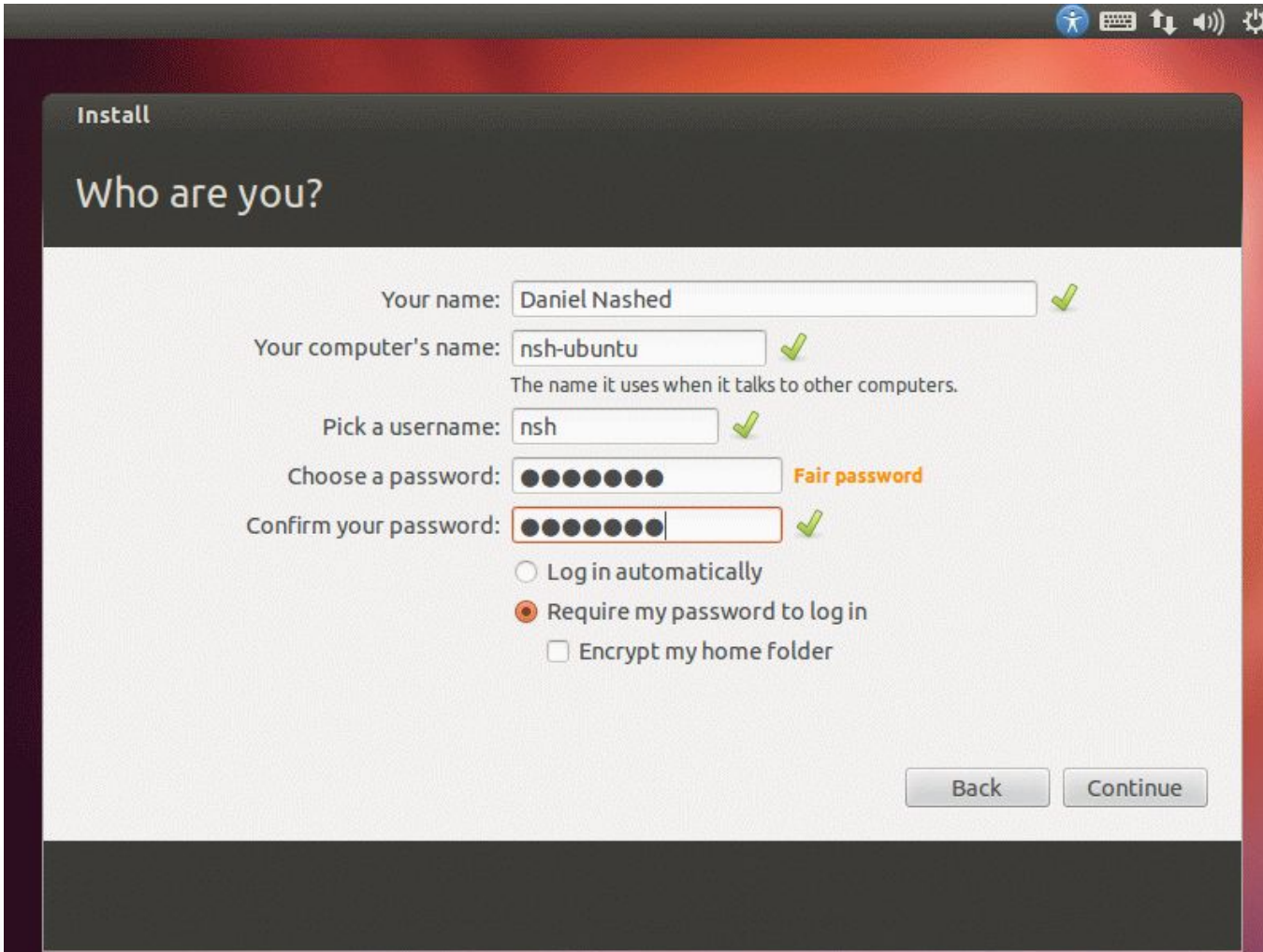


# Select your Keyboard Layout



- Select your keyboard layout
- Click “Continue”

# Create User Account



Install

## Who are you?

Your name:  ✓

Your computer's name:  ✓  
The name it uses when it talks to other computers.

Pick a username:  ✓

Choose a password:  Fair password

Confirm your password:  ✓

Log in automatically

Require my password to log in

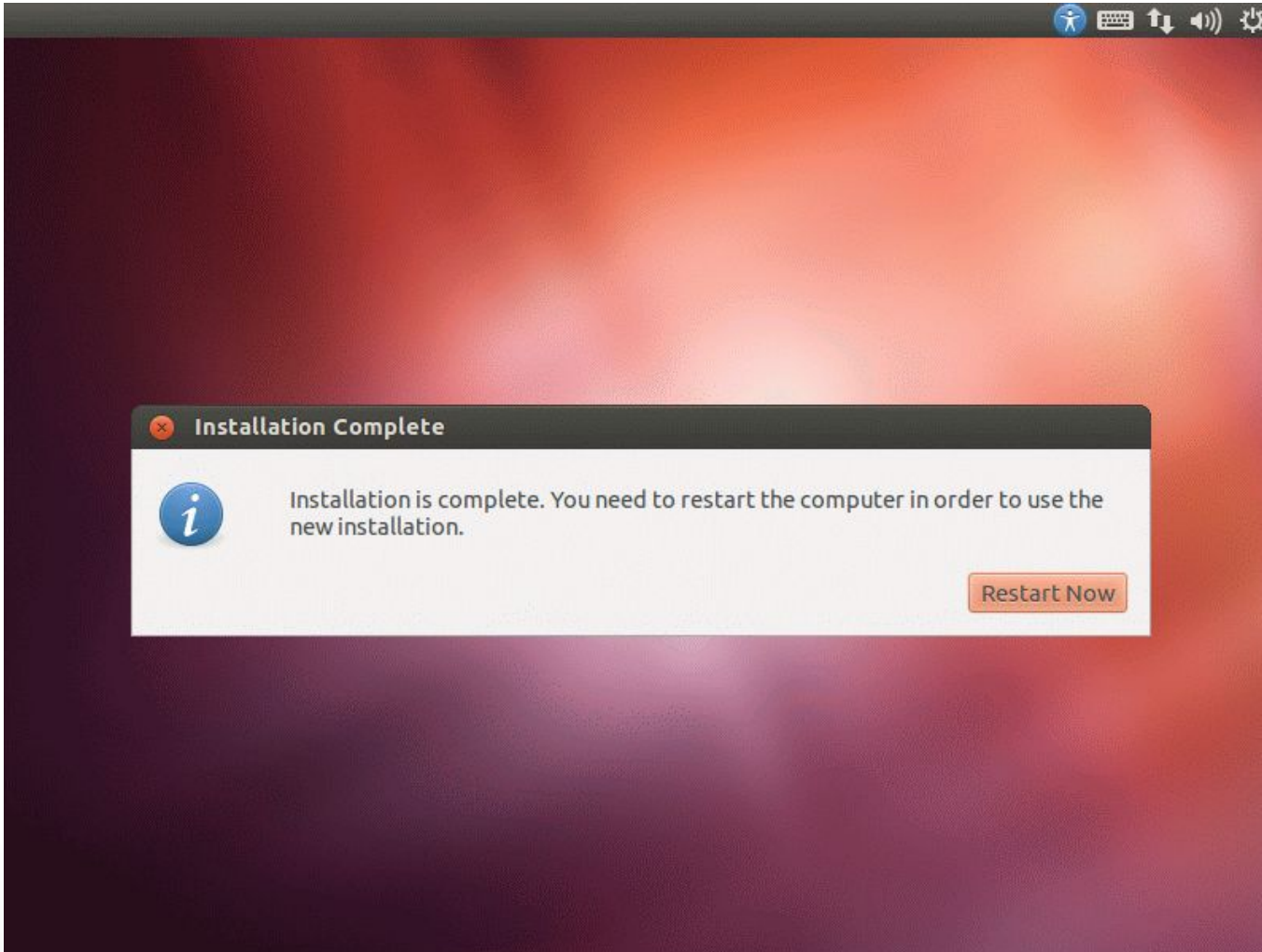
Encrypt my home folder

- Enter
  - Fullname
  - Computer Name
  - Username
  - Password
- Click “Continue”
- There is no “root” account on Ubuntu
- You can “sudo” with your account for administration purposes

# Installation ...



# Installation Complete



- Click “Restar Now”



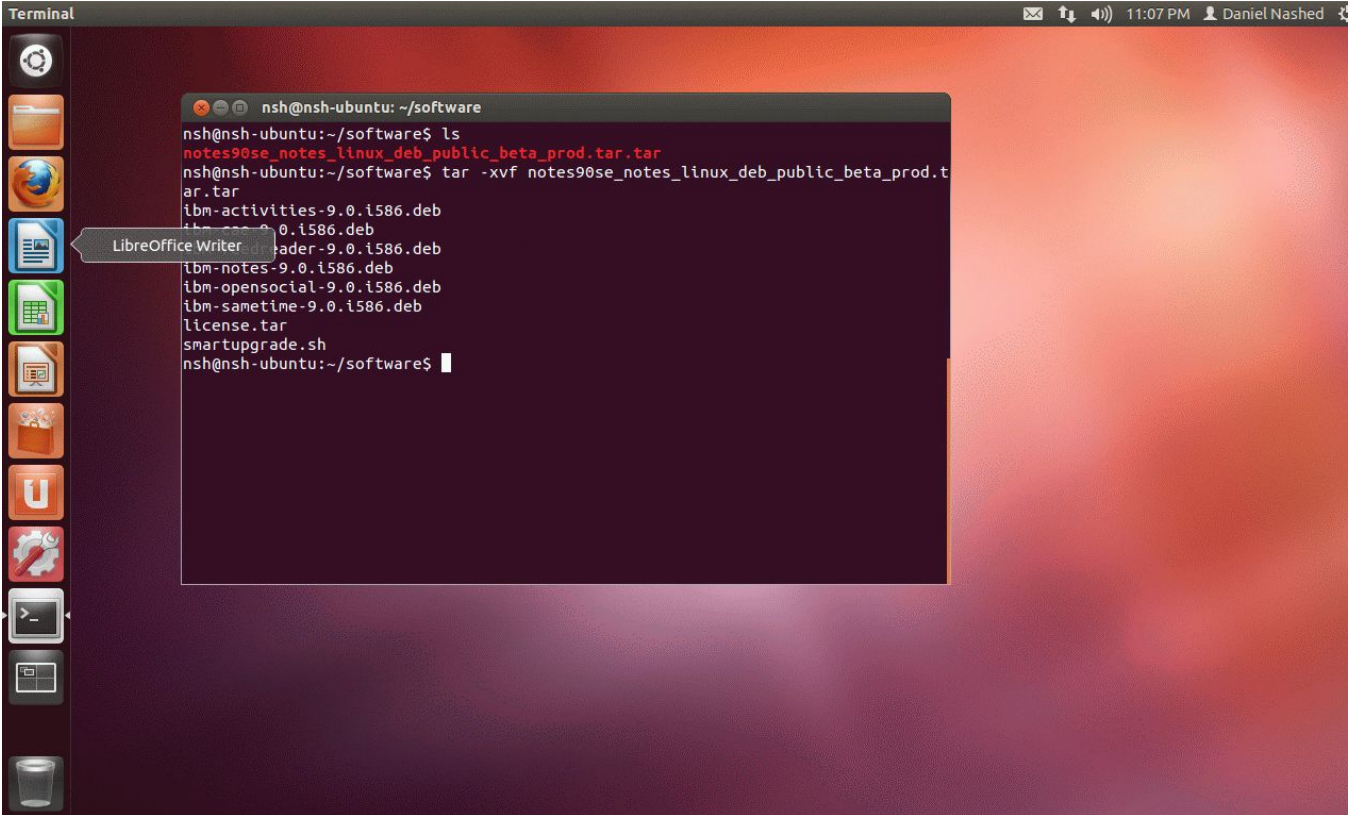
# Install Secure Shell Server (sshd)

```
Terminal
nsh@nsh-ubuntu: ~
nsh@nsh-ubuntu:~$ sudo apt-get install openssh-server
[sudo] password for nsh:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-3.2.0-29 linux-headers-3.2.0-29-generic-pae
Use 'apt-get autoremove' to remove them.
The following extra packages will be installed:
  LibreOffice Writer
  Sshguard
  rssh molly-guard openssh-blacklist openssh-blacklist-extra monkeysphere
The following NEW packages will be installed:
  openssh-server ssh-import-id
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 348 kB of archives.
After this operation, 891 kB of additional disk space will be used.
Do you want to continue [Y/n]? y
Get:1 http://de.archive.ubuntu.com/ubuntu/ precise/main openssh-server i386 1:5.9p1-5ubuntu1 [342 kB]
Get:2 http://de.archive.ubuntu.com/ubuntu/ precise/main ssh-import-id all 2.10-0ubuntu1 [6,598 B]
Fetched 348 kB in 1s (248 kB/s)
Preconfiguring packages ...
Selecting previously unselected package openssh-server.
(Reading database ... 168168 files and directories currently installed.)
Unpacking openssh-server (from ../openssh-server_1%3a5.9p1-5ubuntu1_i386.deb) ...
Selecting previously unselected package ssh-import-id.
Unpacking ssh-import-id (from ../ssh-import-id_2.10-0ubuntu1_all.deb) ...
Processing triggers for ureadahead ...
ureadahead will be reprofiled on next reboot
Processing triggers for ufw ...
Processing triggers for man-db ...
Setting up openssh-server (1:5.9p1-5ubuntu1) ...
Creating SSH2 RSA key; this may take some time ...
Creating SSH2 DSA key; this may take some time ...
Creating SSH2 ECDSA key; this may take some time ...
```

- Run  
  
Sudo apt-get install openssh-server
- See screen

# Extract Notes Client Install Files

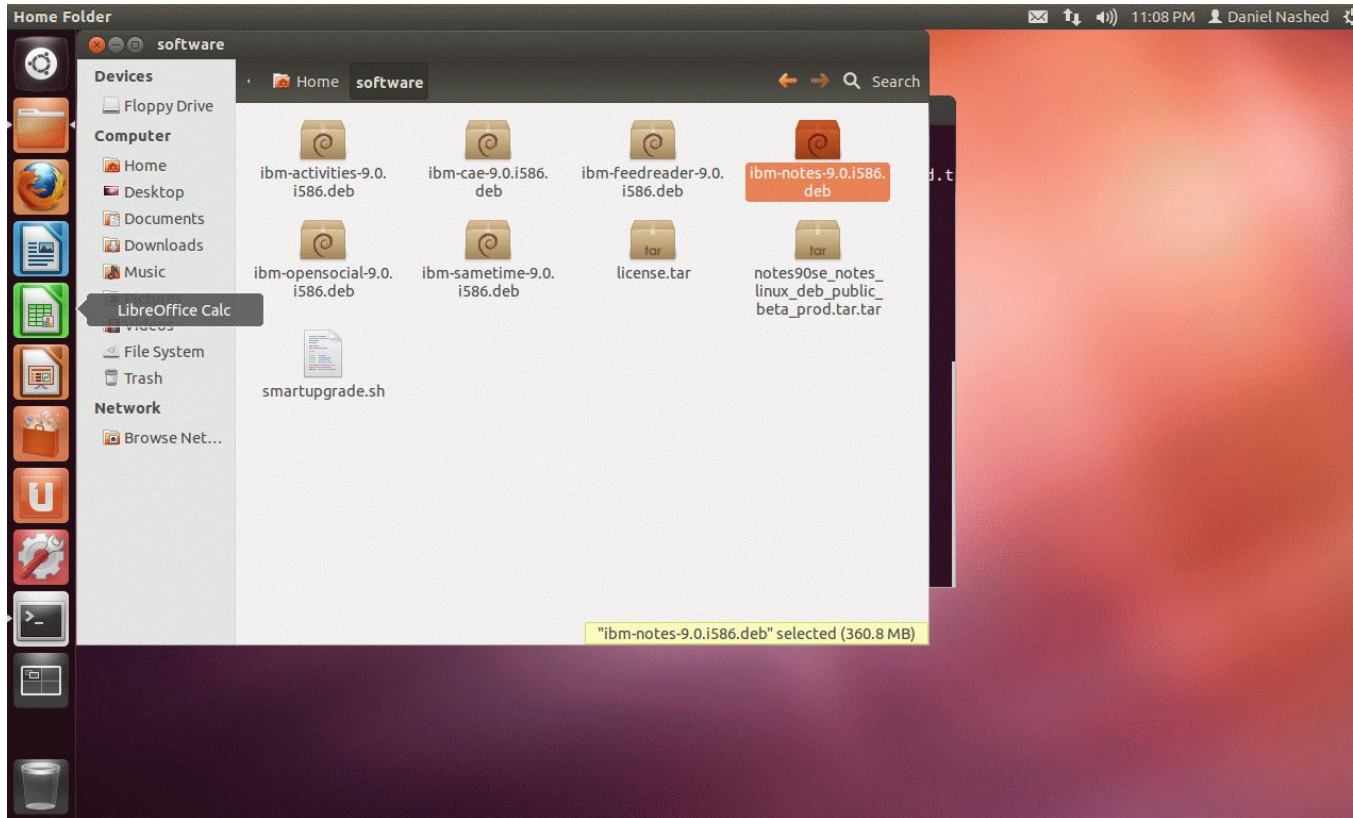
- Use tar -xvf to extract files



The image shows a terminal window on an Ubuntu system. The user is in the directory ~/software and has run the command 'ls' to list the contents of the directory. The output shows a tar archive named 'notes90se\_notes\_linux\_deb\_public\_beta\_prod.tar.tar' and several .deb files. The user then runs the command 'tar -xvf notes90se\_notes\_linux\_deb\_public\_beta\_prod.tar.tar' to extract the files. The output of the extraction command lists the files being extracted: 'ibm-activities-9.0.i586.deb', 'ibm-...-9.0.i586.deb', 'ibm-...-9.0.i586.deb', 'ibm-notes-9.0.i586.deb', 'ibm-opensocial-9.0.i586.deb', 'ibm-sametime-9.0.i586.deb', 'license.tar', and 'smartupgrade.sh'. The terminal prompt is now 'nsh@nsh-ubuntu:~/software\$'.

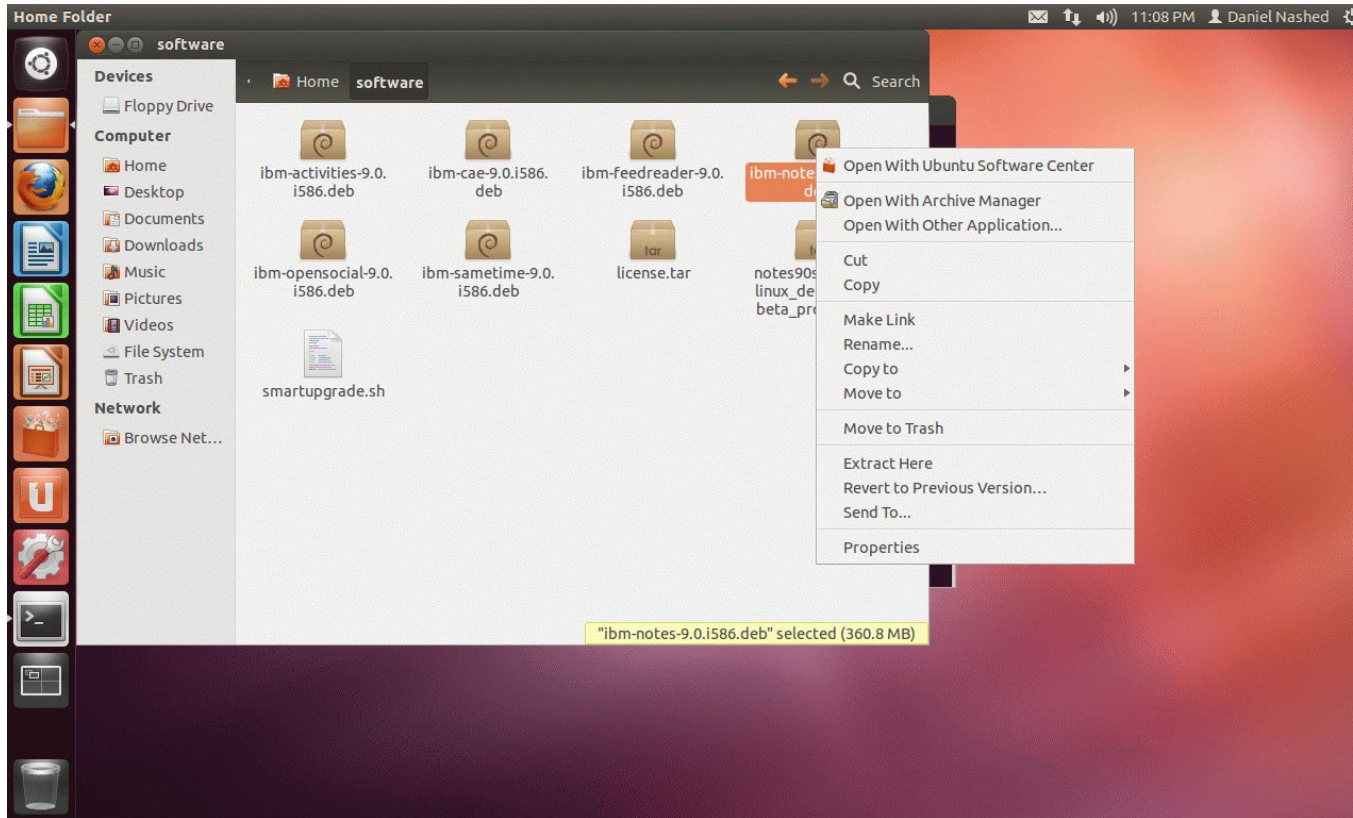
```
Terminal 11:07 PM Daniel Nashed
nsh@nsh-ubuntu: ~/software
nsh@nsh-ubuntu:~/software$ ls
notes90se_notes_linux_deb_public_beta_prod.tar.tar
nsh@nsh-ubuntu:~/software$ tar -xvf notes90se_notes_linux_deb_public_beta_prod.t
ar.tar
ibm-activities-9.0.i586.deb
ibm-...-9.0.i586.deb
ibm-...-9.0.i586.deb
ibm-notes-9.0.i586.deb
ibm-opensocial-9.0.i586.deb
ibm-sametime-9.0.i586.deb
license.tar
smartupgrade.sh
nsh@nsh-ubuntu:~/software$
```

# Install Notes Client Debian Packages



- Click on the Package to install Packages

# Install Notes Client Debian Packages

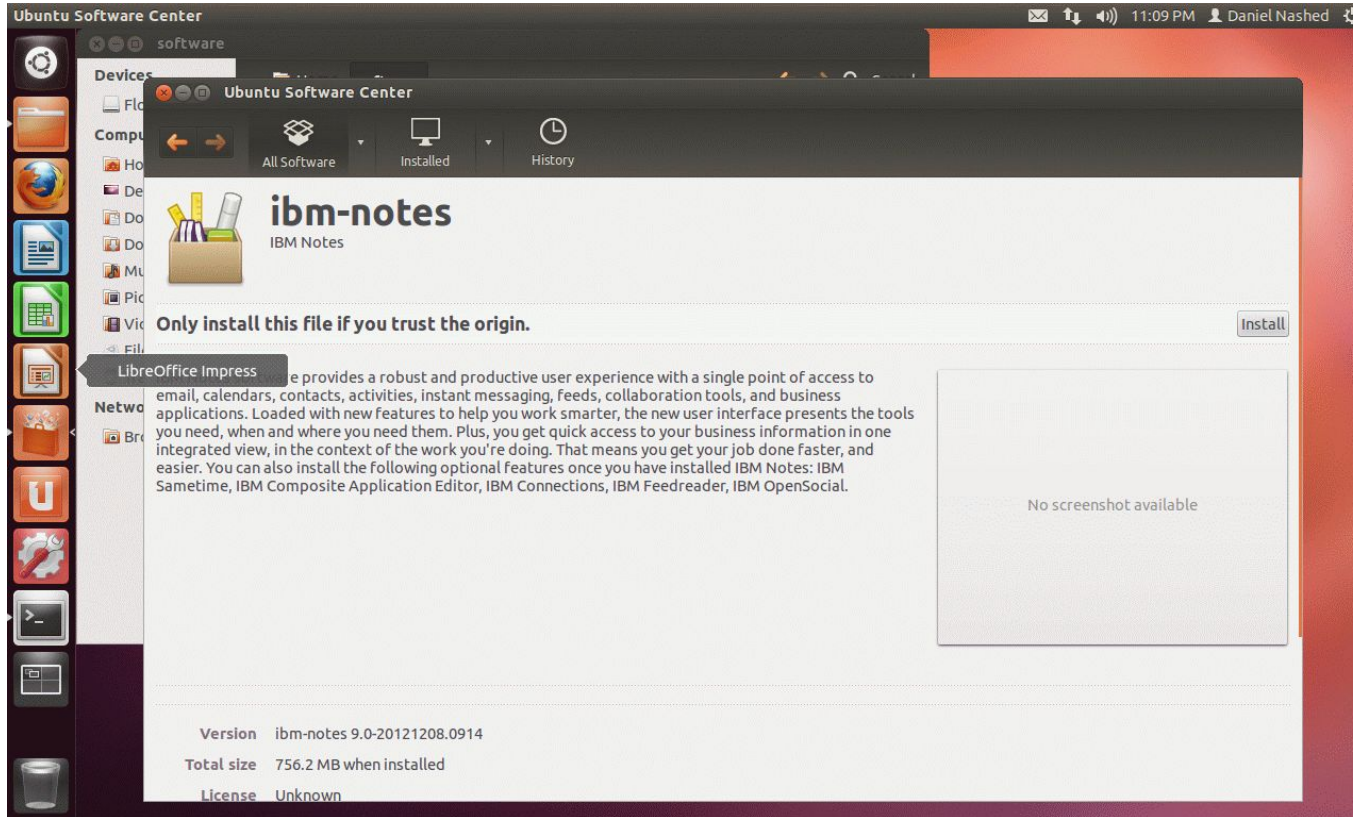


- Right click and select “Open With Archive Manager”



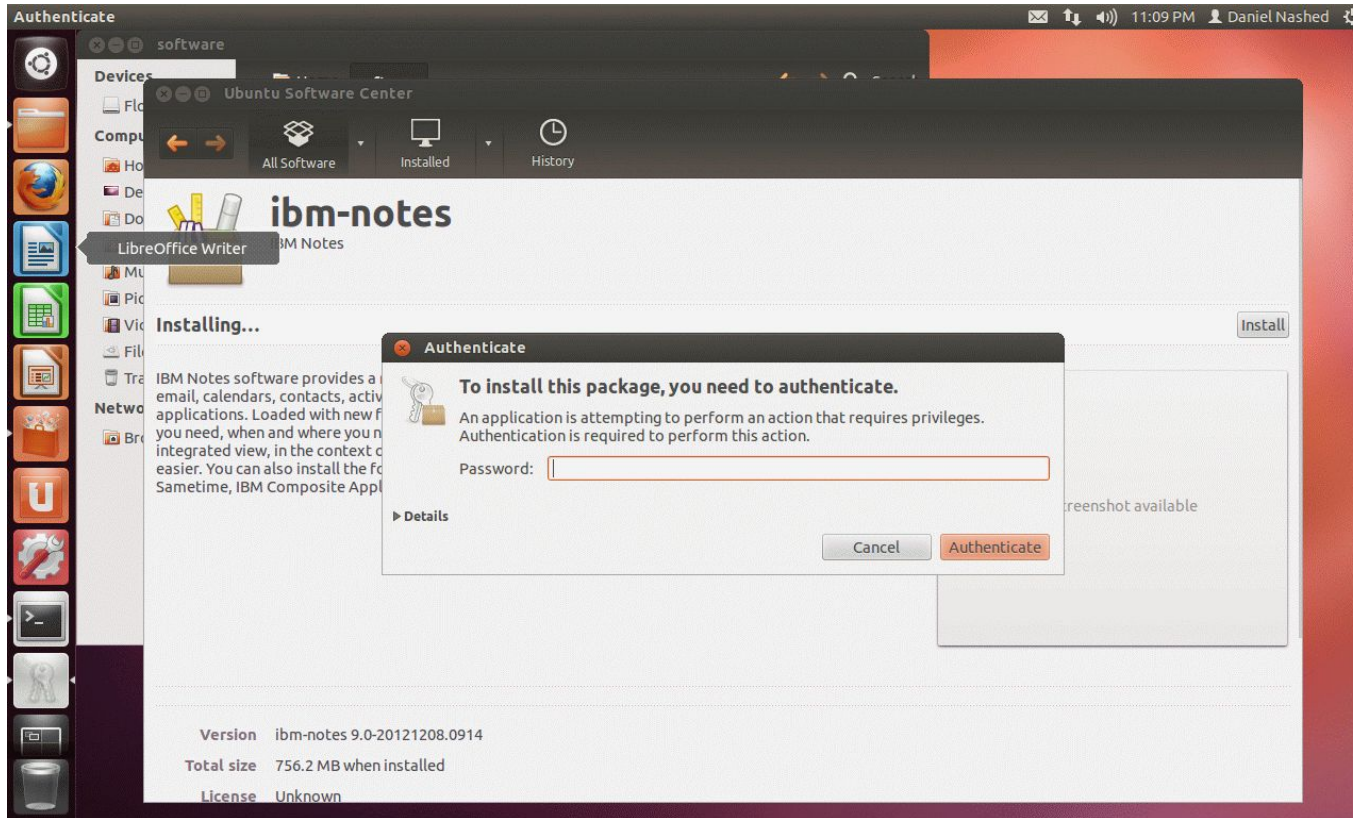
# Install Notes Client Debian Packages

- Click “Install”



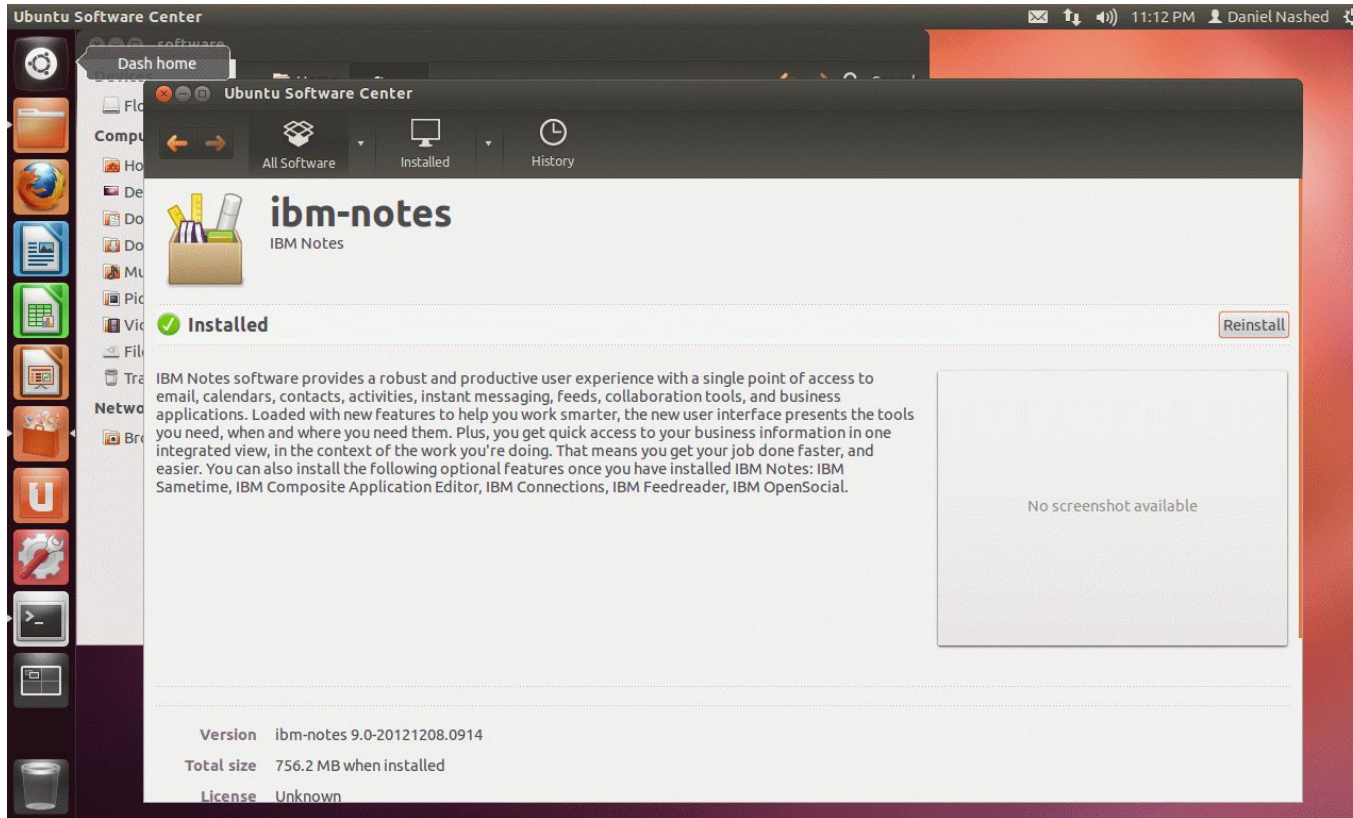
# Install Notes Client Debian Packages

- Type in Admin Password

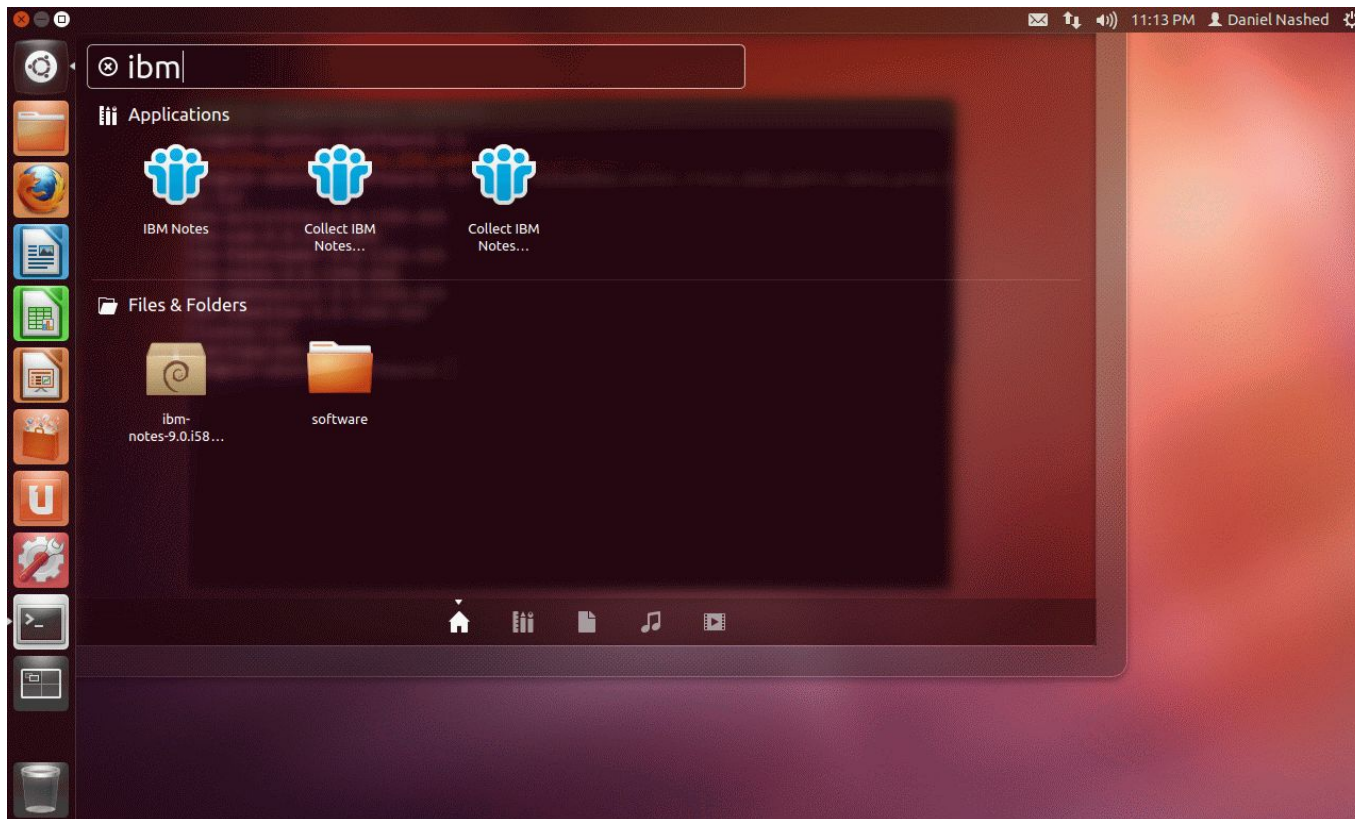


# Install Notes Client Debian Packages - Done

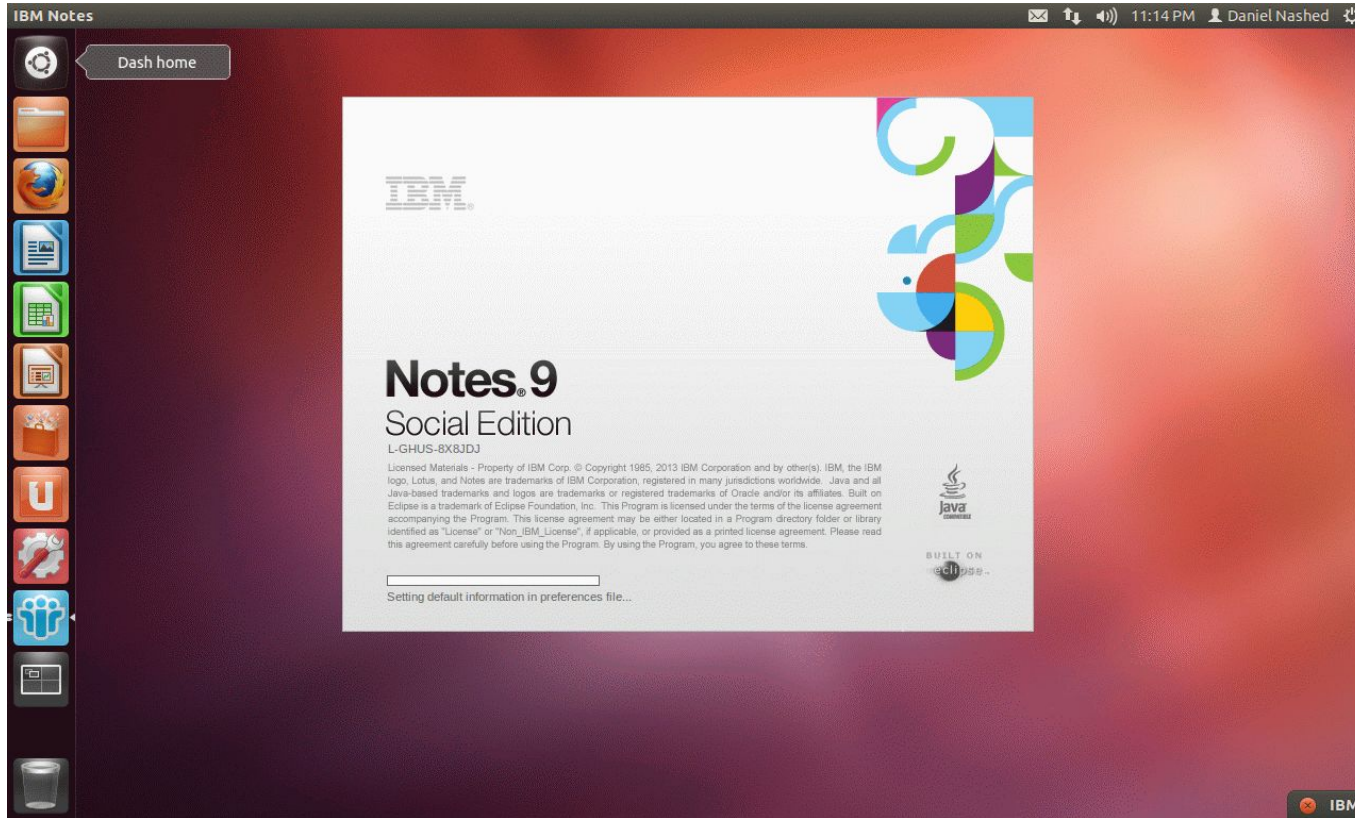
- Installation Done



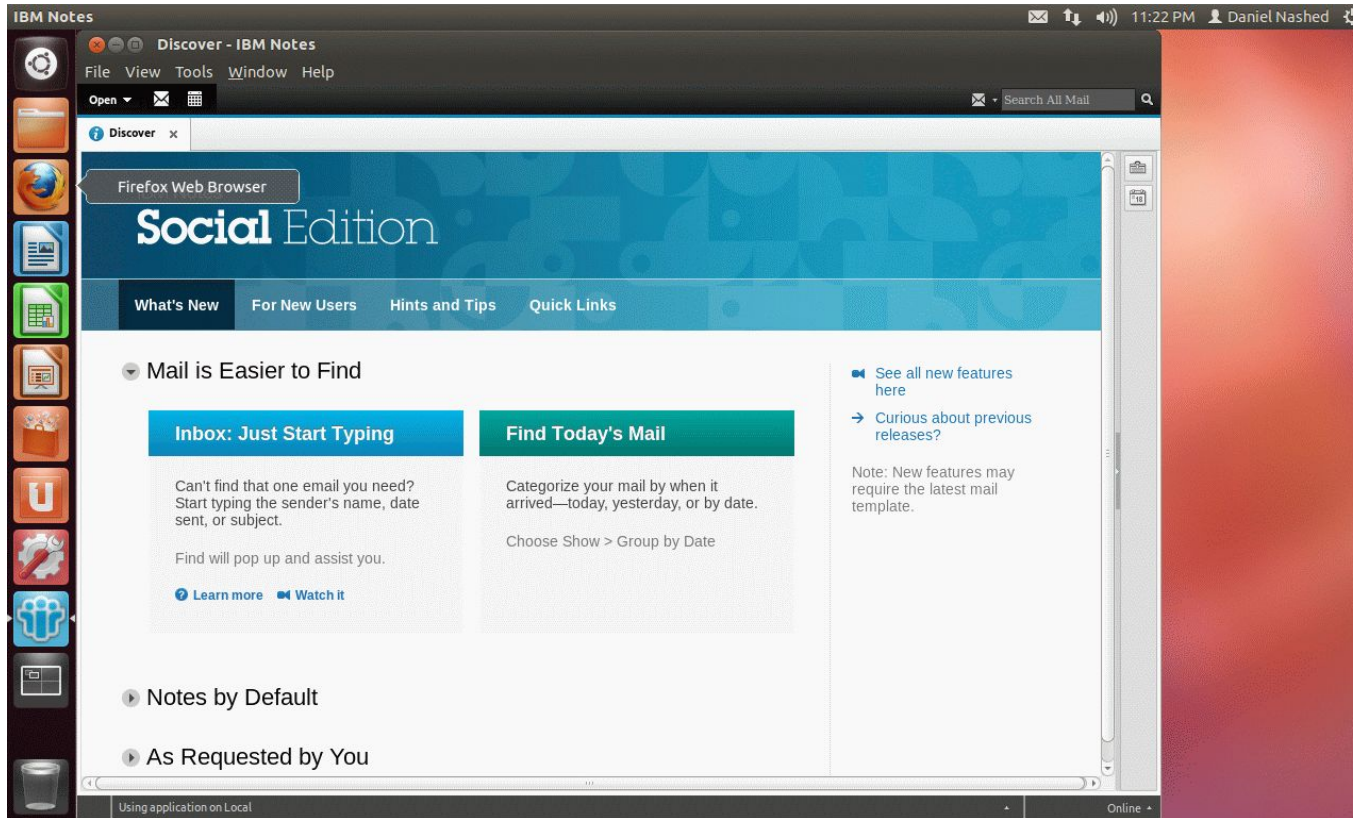
# Installed Notes Client in Ubuntu Menu



# Notes 9 Social Edition Beta Splash Screen on Ubuntu



# Notes 9 Social Edition Beta Welcome Screen



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