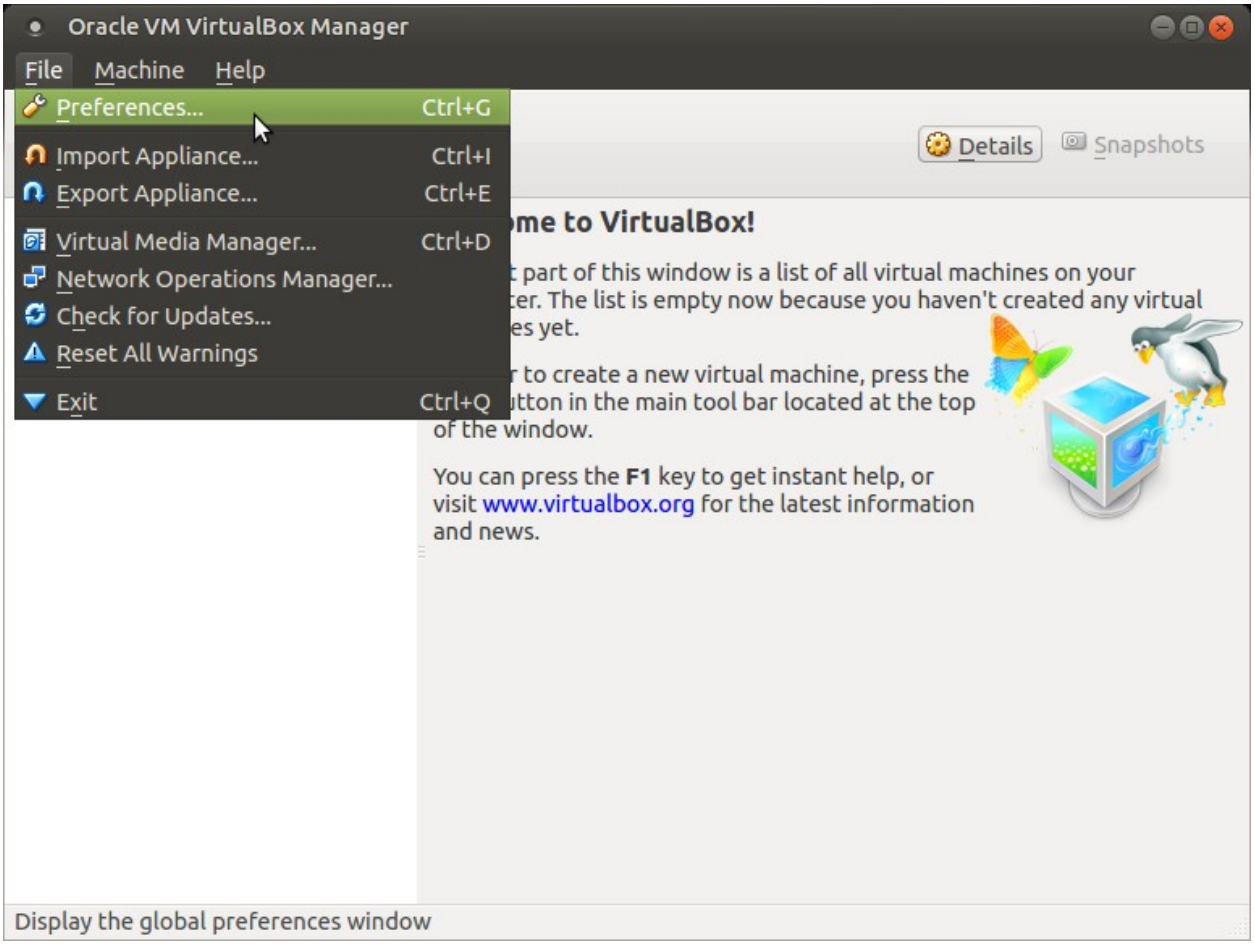
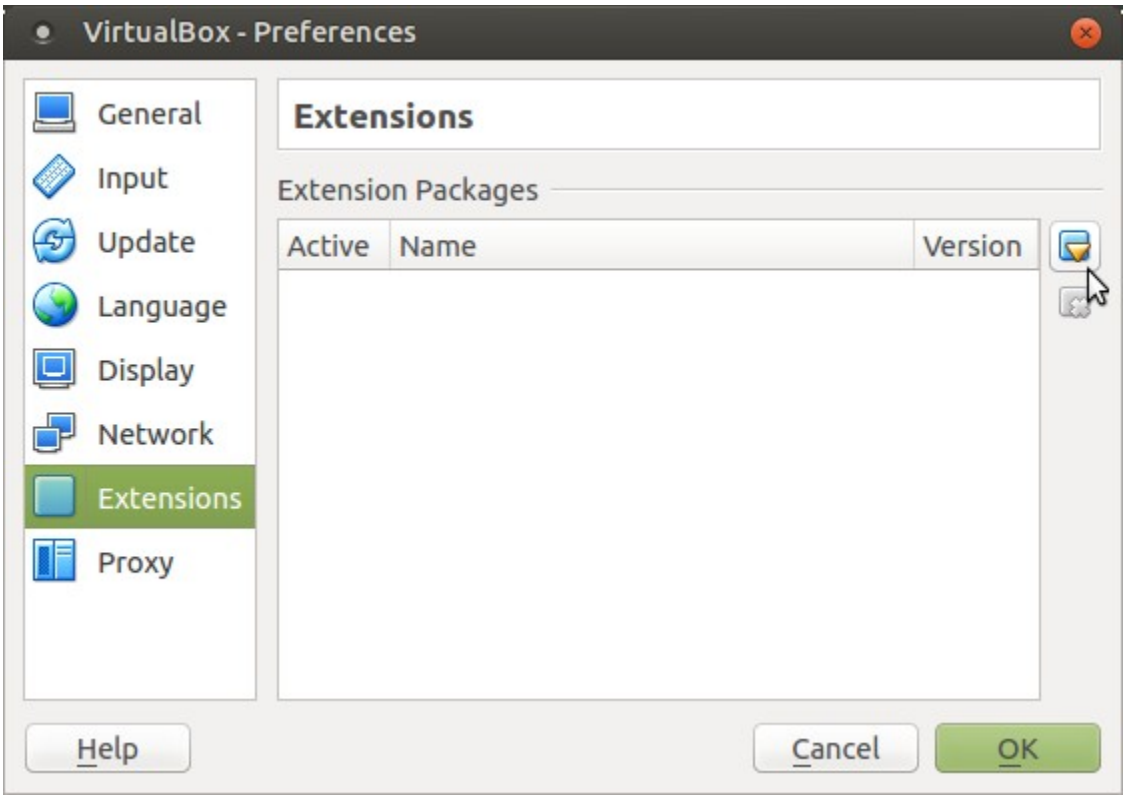
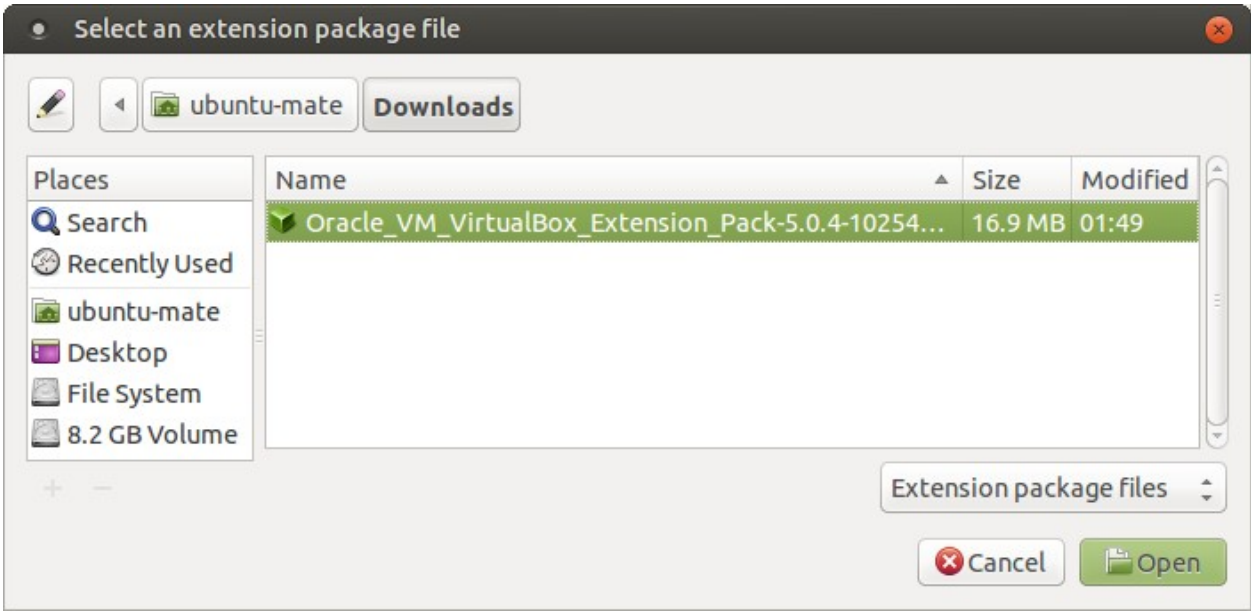
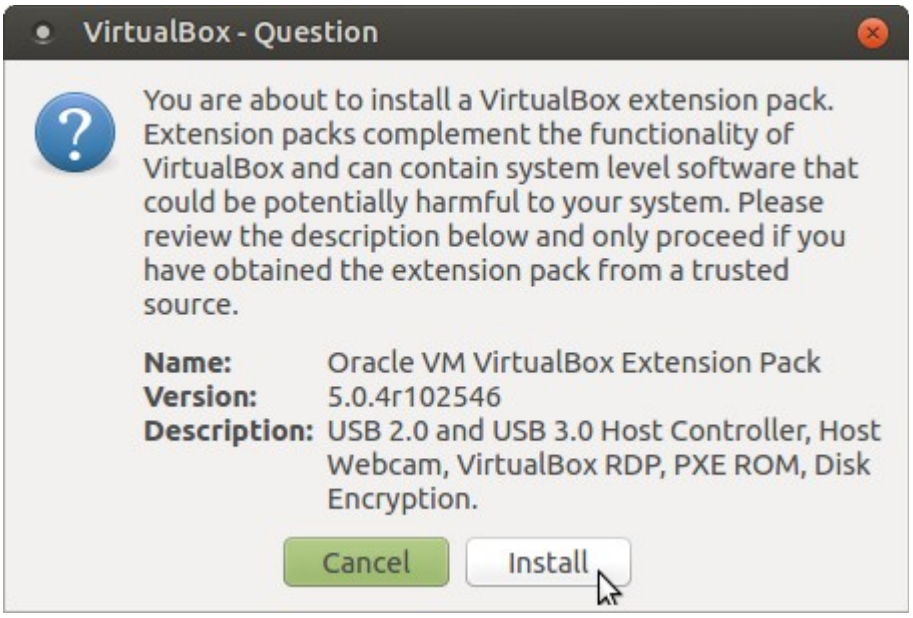
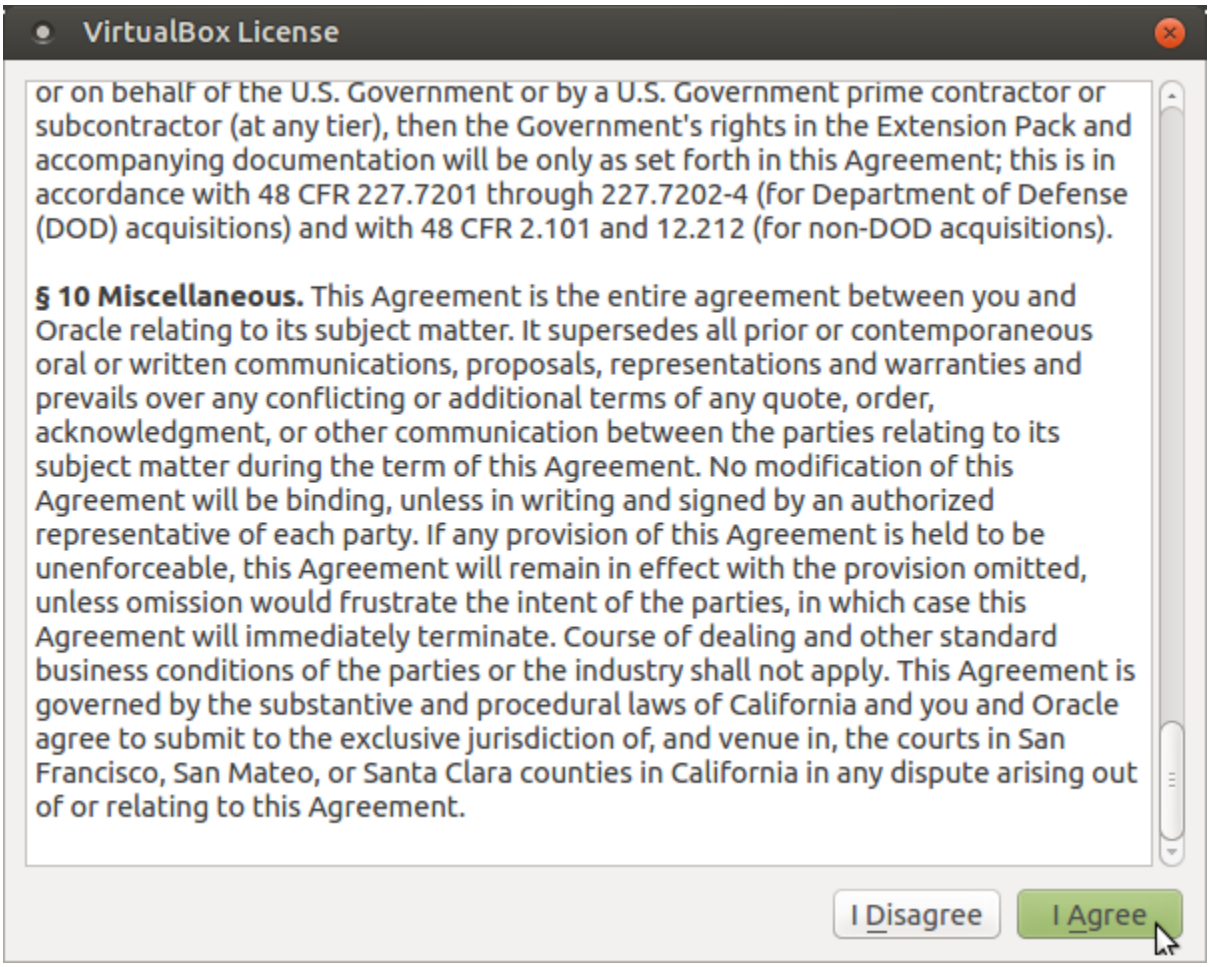
Chapter 1: Setting up Your Environment

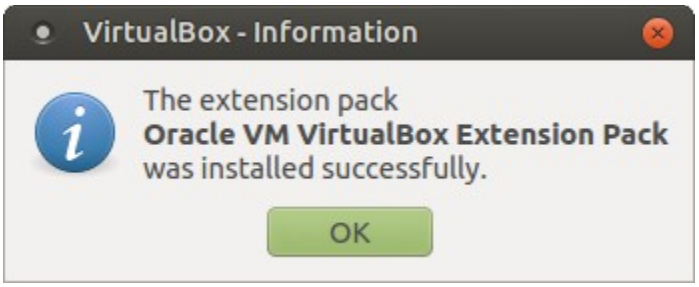


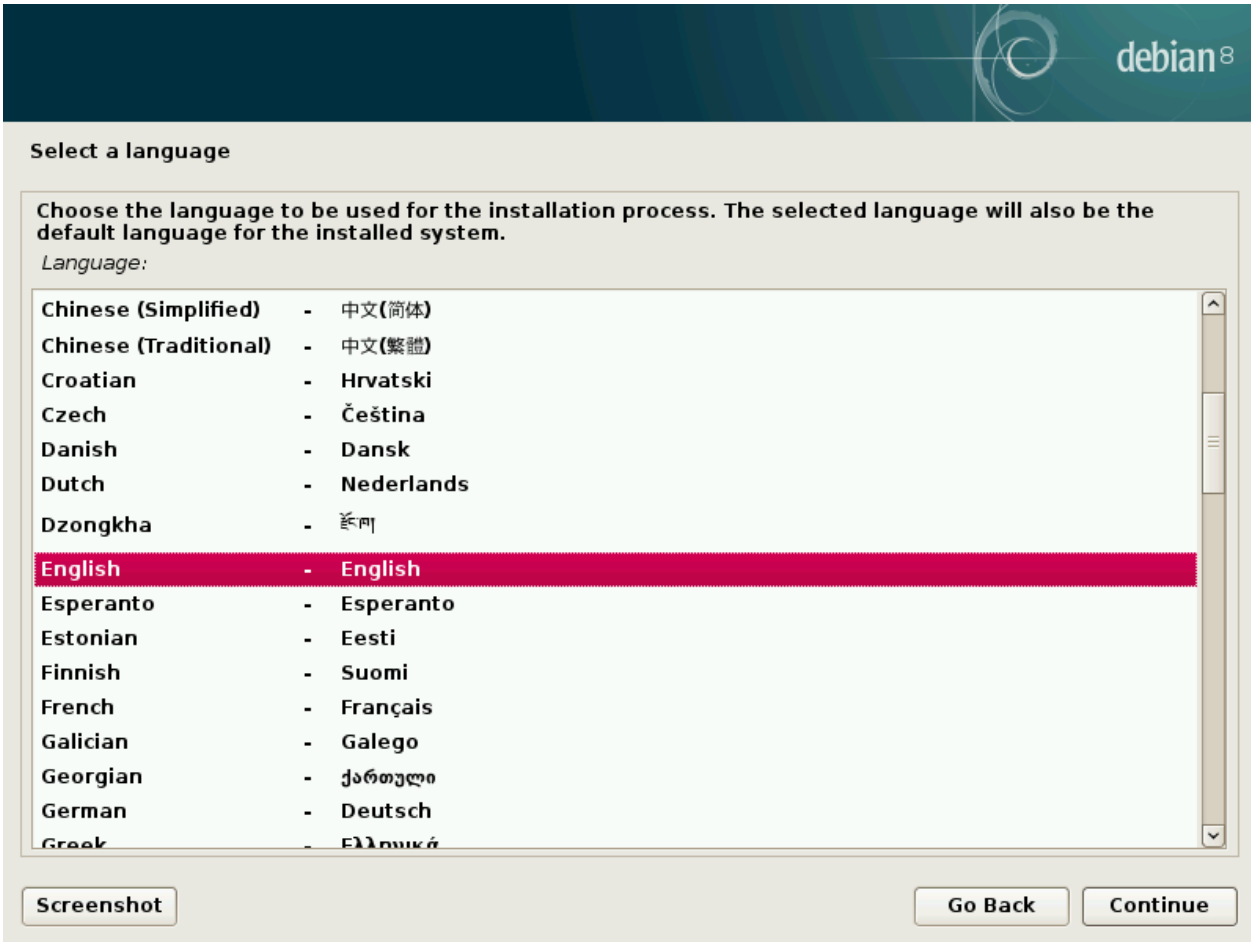

VirtualBox - Preferences
General
Input
Update
Language
Display
Network
Extensions
Proxy
Extensions
Extension Packages
Active
Name
Version
Help
Cancel
OK

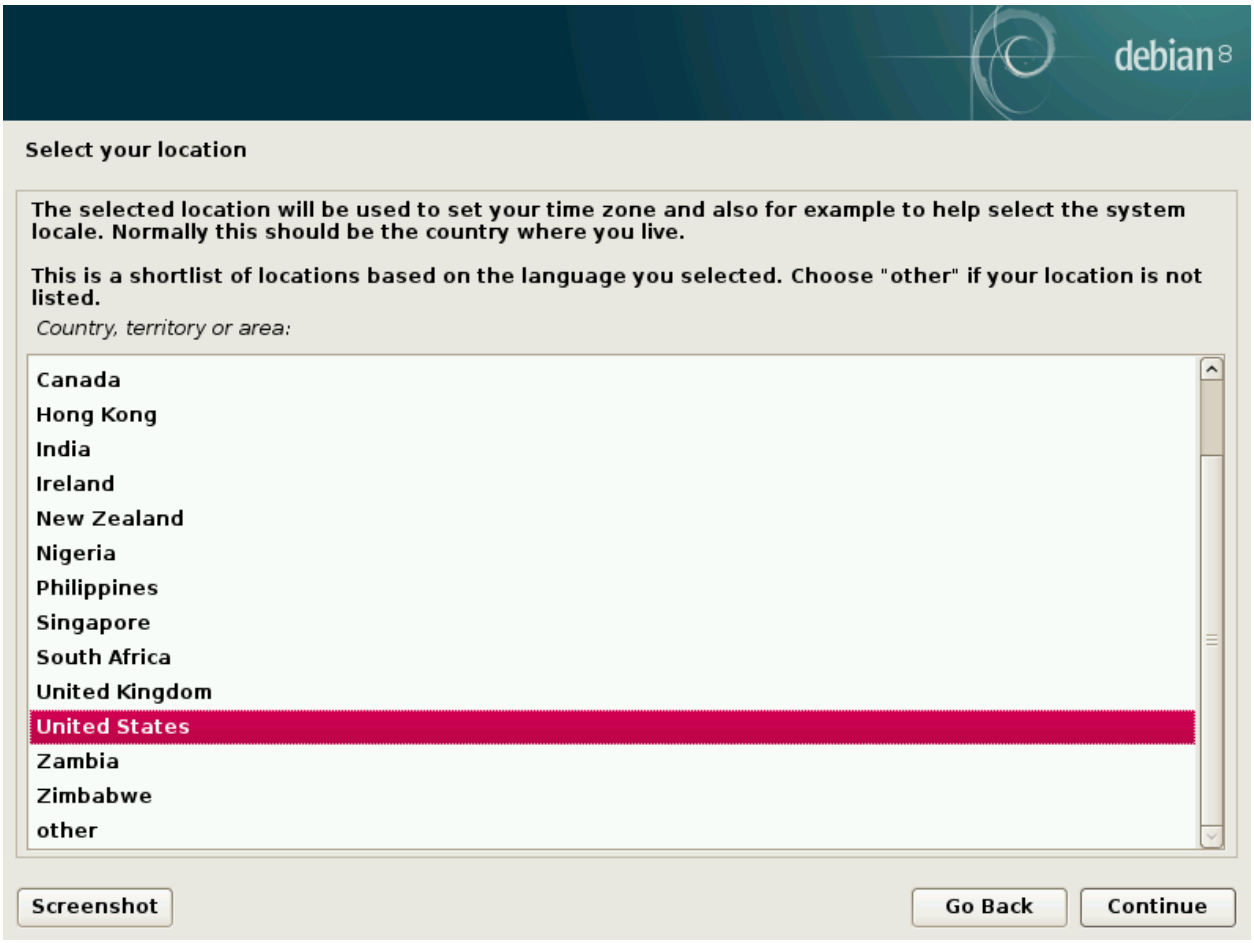

Select an extension package file
ubuntu-mate
Downloads
Places
Search
Recently Used
ubuntu-mate
Desktop
File System
8.2 GB Volume
Name
Size
Modified
Oracle_VM_VirtualBox_Extension_Pack-5.0.4-10254...
16.9 MB
01:49
Extension package files
Cancel
Open

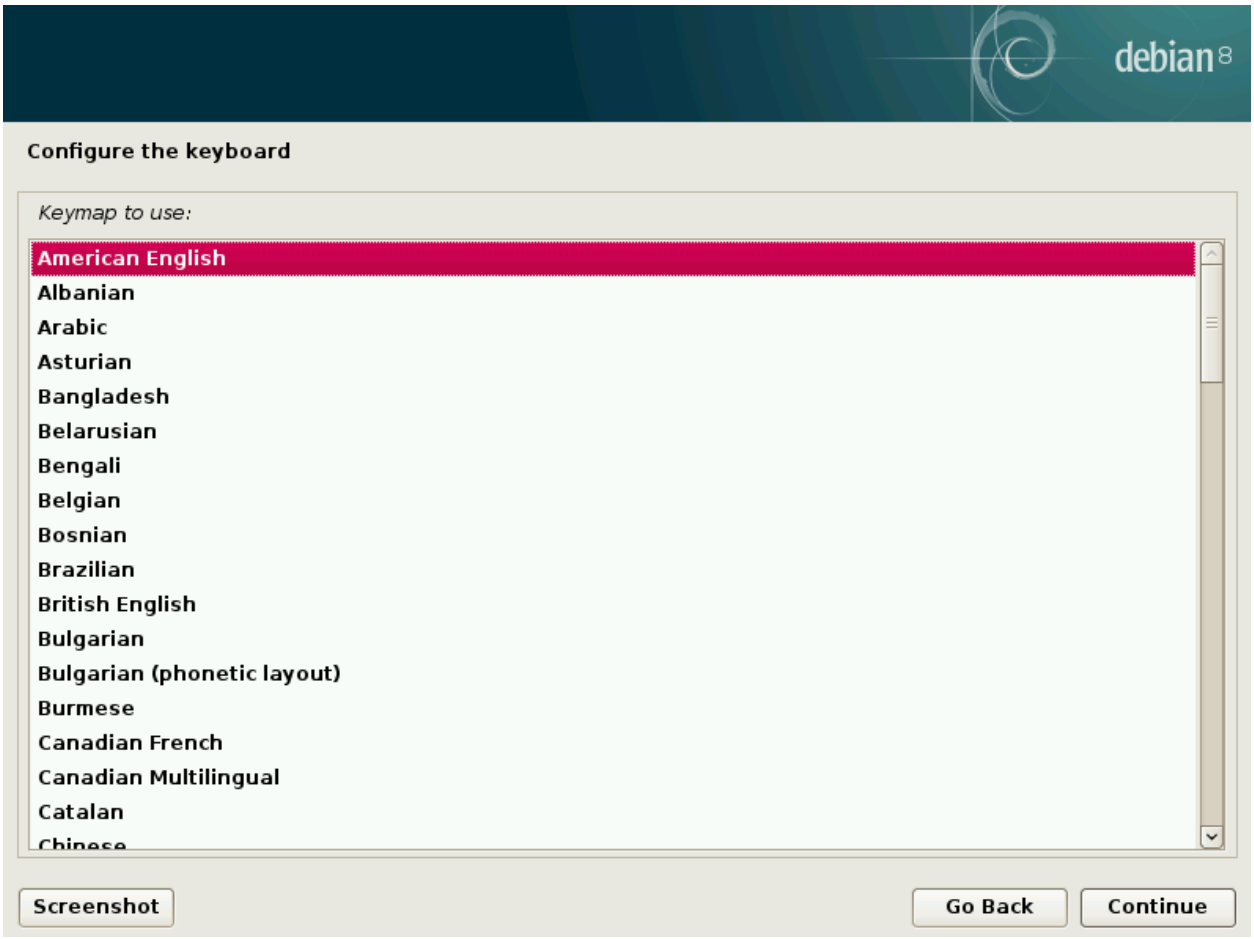

VirtualBox - Question
You are about to install a VirtualBox extension pack. Extension packs complement the functionality of VirtualBox and can contain system level software that could be potentially harmful to your system. Please review the description below and only proceed if you have obtained the extension pack from a trusted source.
Name: Oracle VM VirtualBox Extension Pack
Version: 5.0.4r102546
Description: USB 2.0 and USB 3.0 Host Controller, Host Webcam, VirtualBox RDP, PXE ROM, Disk Encryption.
Cancel
Install

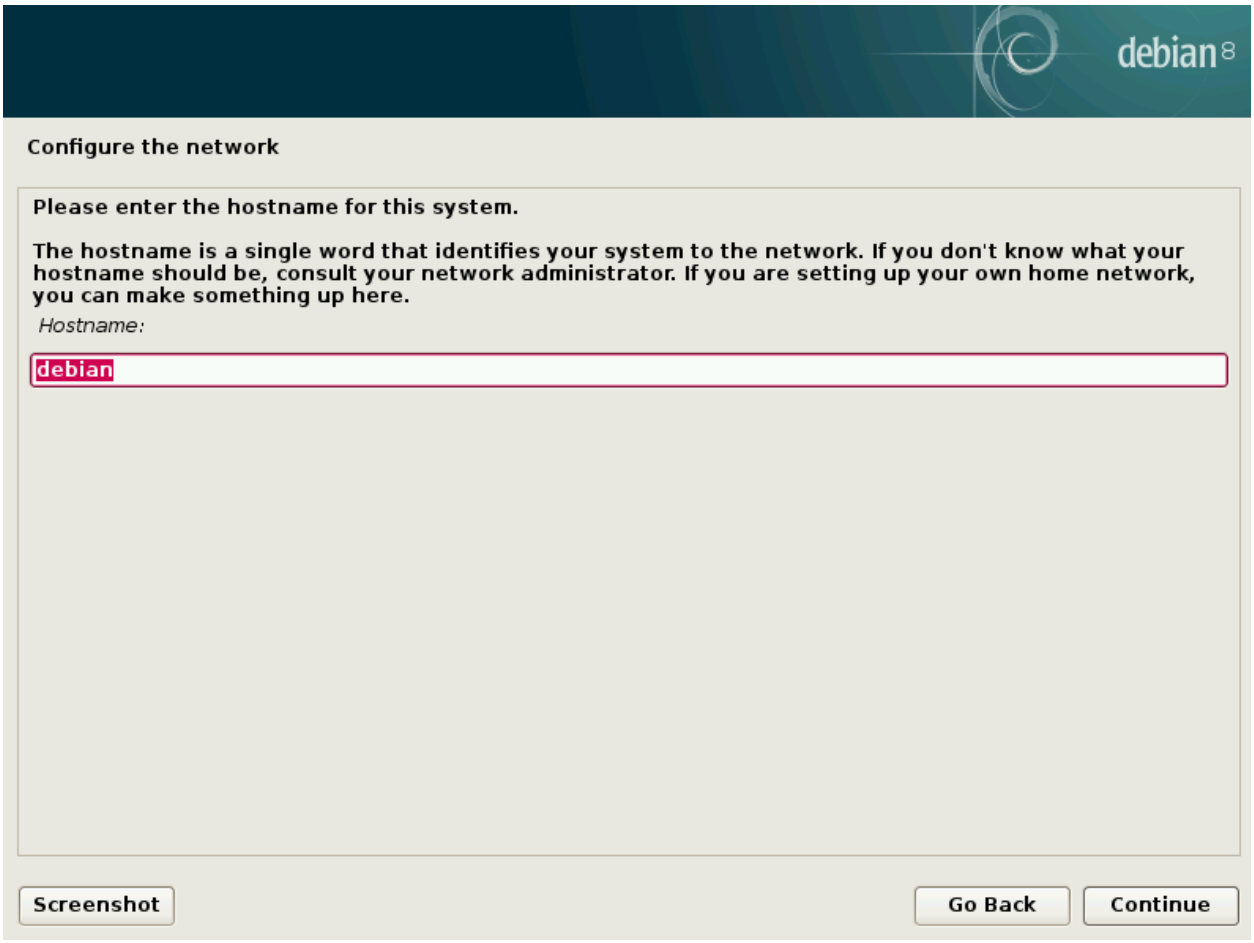

VirtualBox License
or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), then the Government's rights in the Extension Pack and accompanying documentation will be only as set forth in this Agreement; this is in accordance with 48 CFR 227.7201 through 227.7202-4 (for Department of Defense (DOD) acquisitions) and with 48 CFR 2.101 and 12.212 (for non-DOD acquisitions).
§ 10 Miscellaneous. This Agreement is the entire agreement between you and Oracle relating to its subject matter. It supersedes all prior or contemporaneous oral or written communications, proposals, representations and warranties and prevails over any conflicting or additional terms of any quote, order, acknowledgment, or other communication between the parties relating to its subject matter during the term of this Agreement. No modification of this Agreement will be binding, unless in writing and signed by an authorized representative of each party. If any provision of this Agreement is held to be unenforceable, this Agreement will remain in effect with the provision omitted, unless omission would frustrate the intent of the parties, in which case this Agreement will immediately terminate. Course of dealing and other standard business conditions of the parties or the industry shall not apply. This Agreement is governed by the substantive and procedural laws of California and you and Oracle agree to submit to the exclusive jurisdiction of, and venue in, the courts in San Francisco, San Mateo, or Santa Clara counties in California in any dispute arising out of or relating to this Agreement.
I Disagree
I Agree

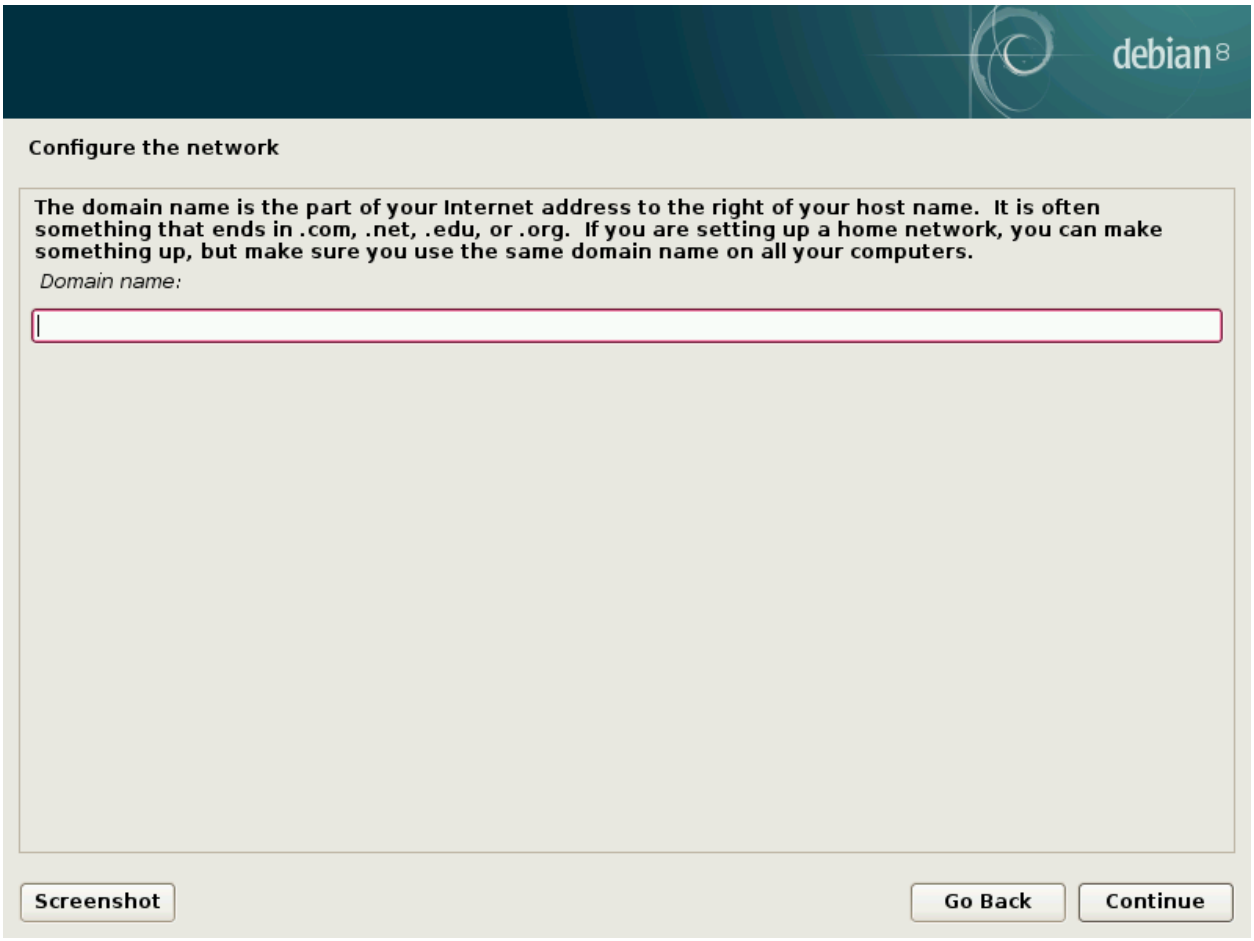

VirtualBox - Information
The extension pack
Oracle VM VirtualBox Extension Pack
was installed successfully.
OK

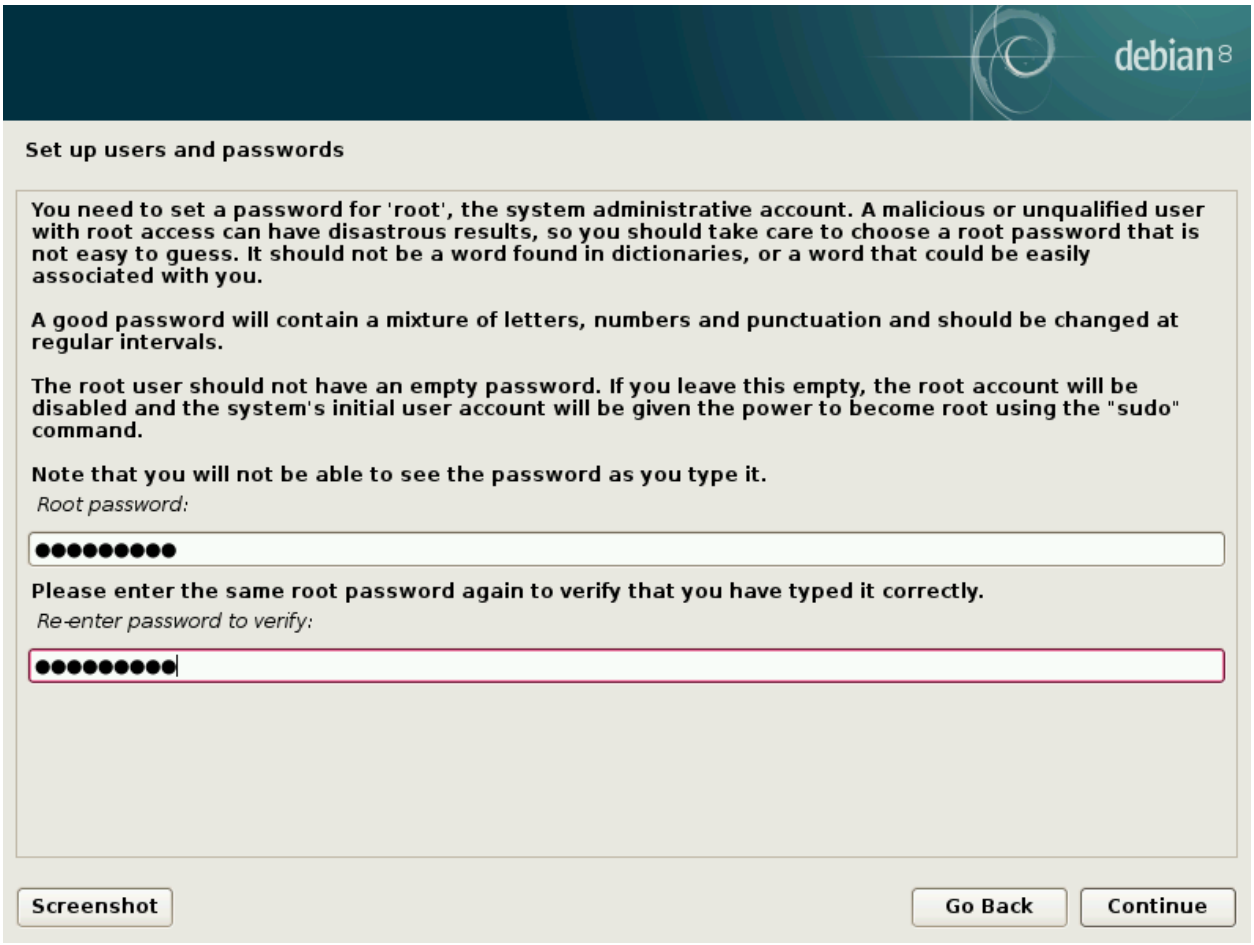

debian 8
Select a language
Choose the language to be used for the installation process. The selected language will also be the default language for the installed system.
Language:
Chinese (Simplified) - 中文(简体)
Chinese (Traditional) - 中文(繁體)
Croatian - Hrvatski
Czech - Čeština
Danish - Dansk
Dutch - Nederlands
Dzongkha - རྫོང་ཁ
English - English
Esperanto - Esperanto
Estonian - Eesti
Finnish - Suomi
French - Français
Galician - Galego
Georgian - ქართული
German - Deutsch
Greek - Ελληνικά
Screenshot
Go Back
Continue

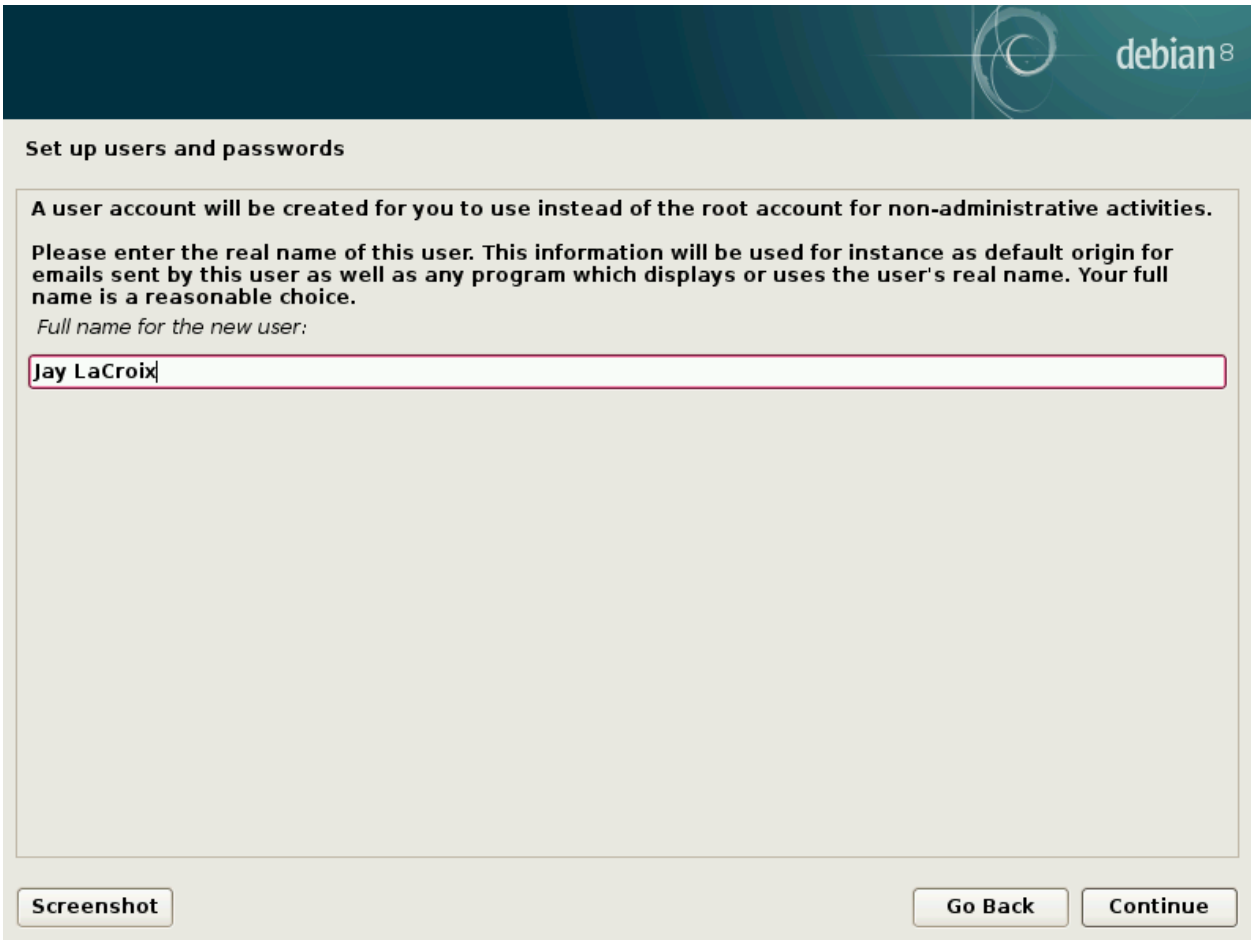

debian 8
Select your location
The selected location will be used to set your time zone and also for example to help select the system locale. Normally this should be the country where you live.
This is a shortlist of locations based on the language you selected. Choose "other" if your location is not listed.
Country, territory or area:
Canada
Hong Kong
India
Ireland
New Zealand
Nigeria
Philippines
Singapore
South Africa
United Kingdom
United States
Zambia
Zimbabwe
other
Screenshot
Go Back
Continue

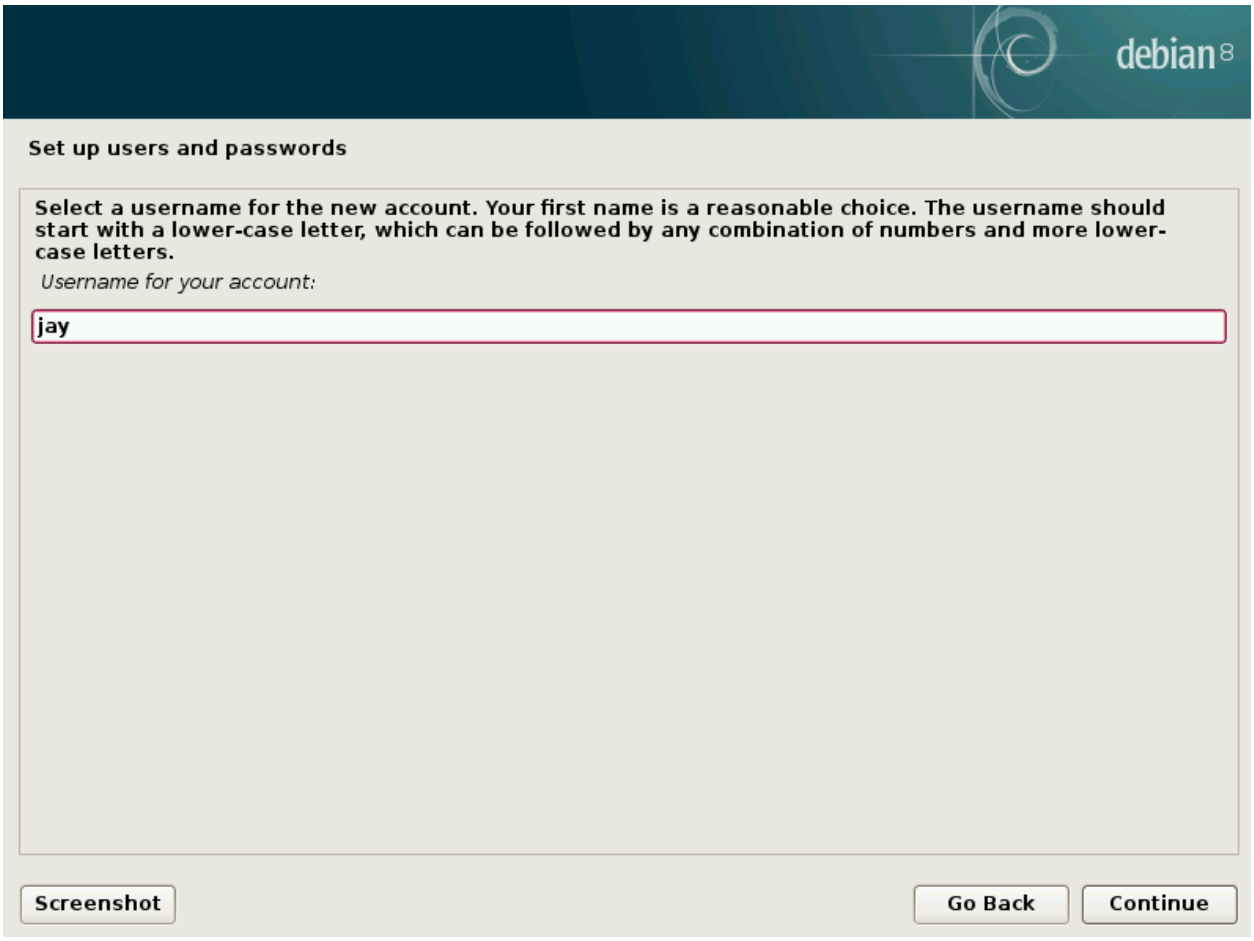

debian 8
Configure the keyboard
Keymap to use:
American English
Albanian
Arabic
Asturian
Bangladesh
Belarusian
Bengali
Belgian
Bosnian
Brazilian
British English
Bulgarian
Bulgarian (phonetic layout)
Burmese
Canadian French
Canadian Multilingual
Catalan
Chinese
Screenshot
Go Back
Continue

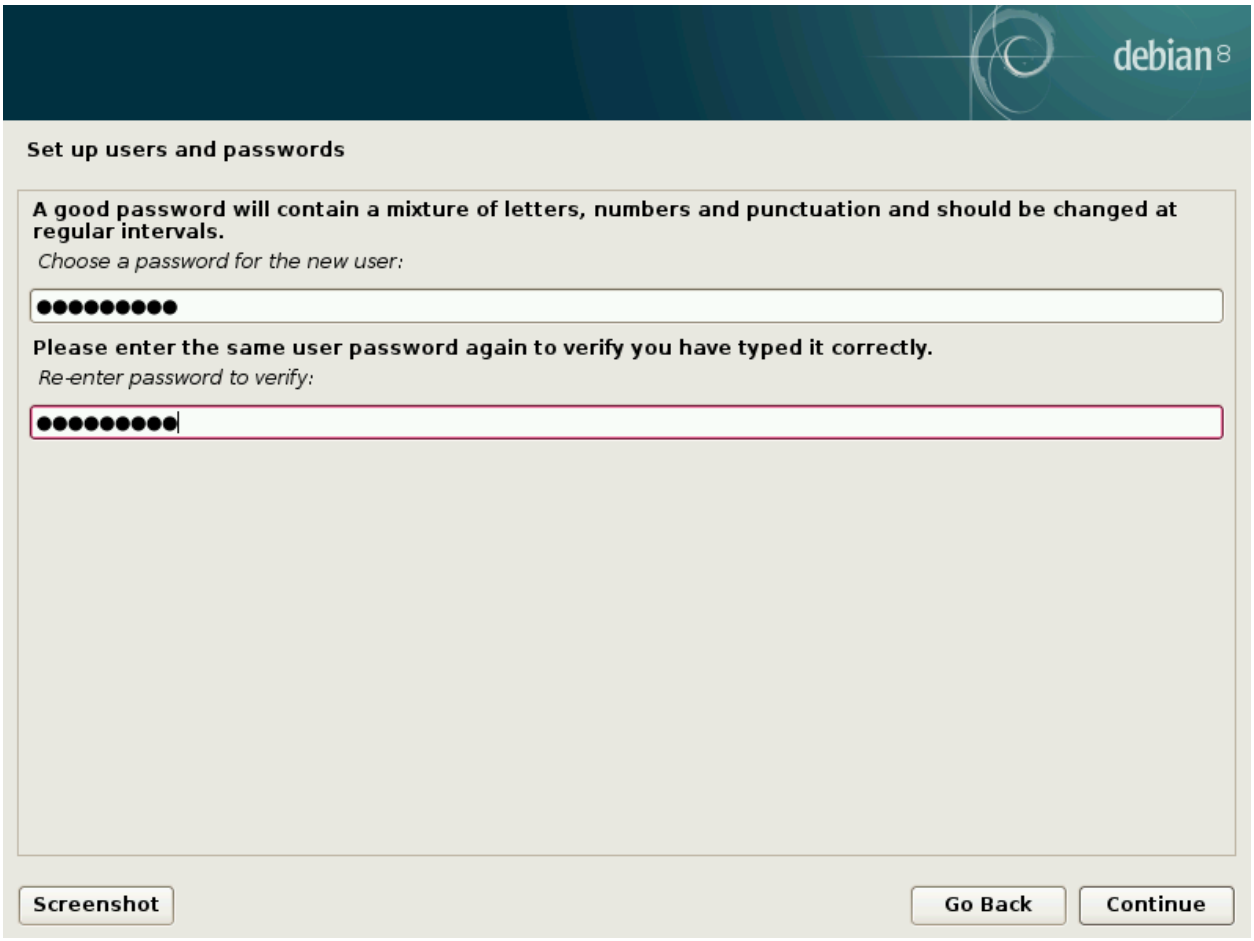

debian 8
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
debian
Screenshot
Go Back
Continue

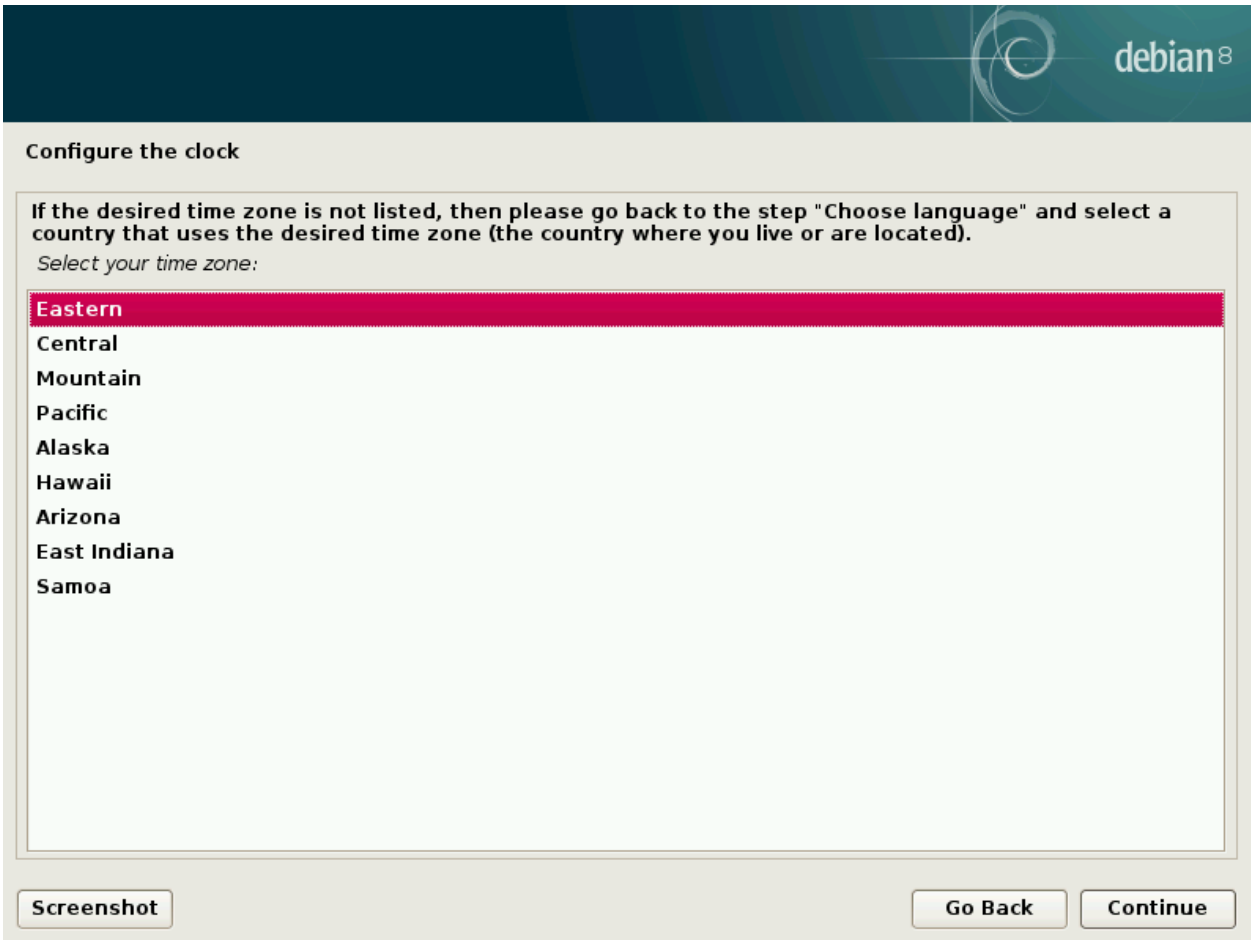

debian 8
Configure the network
The domain name is the part of your Internet address to the right of your host name. It is often something that ends in .com, .net, .edu, or .org. If you are setting up a home network, you can make something up, but make sure you use the same domain name on all your computers.
Domain name:
Screenshot
Go Back
Continue

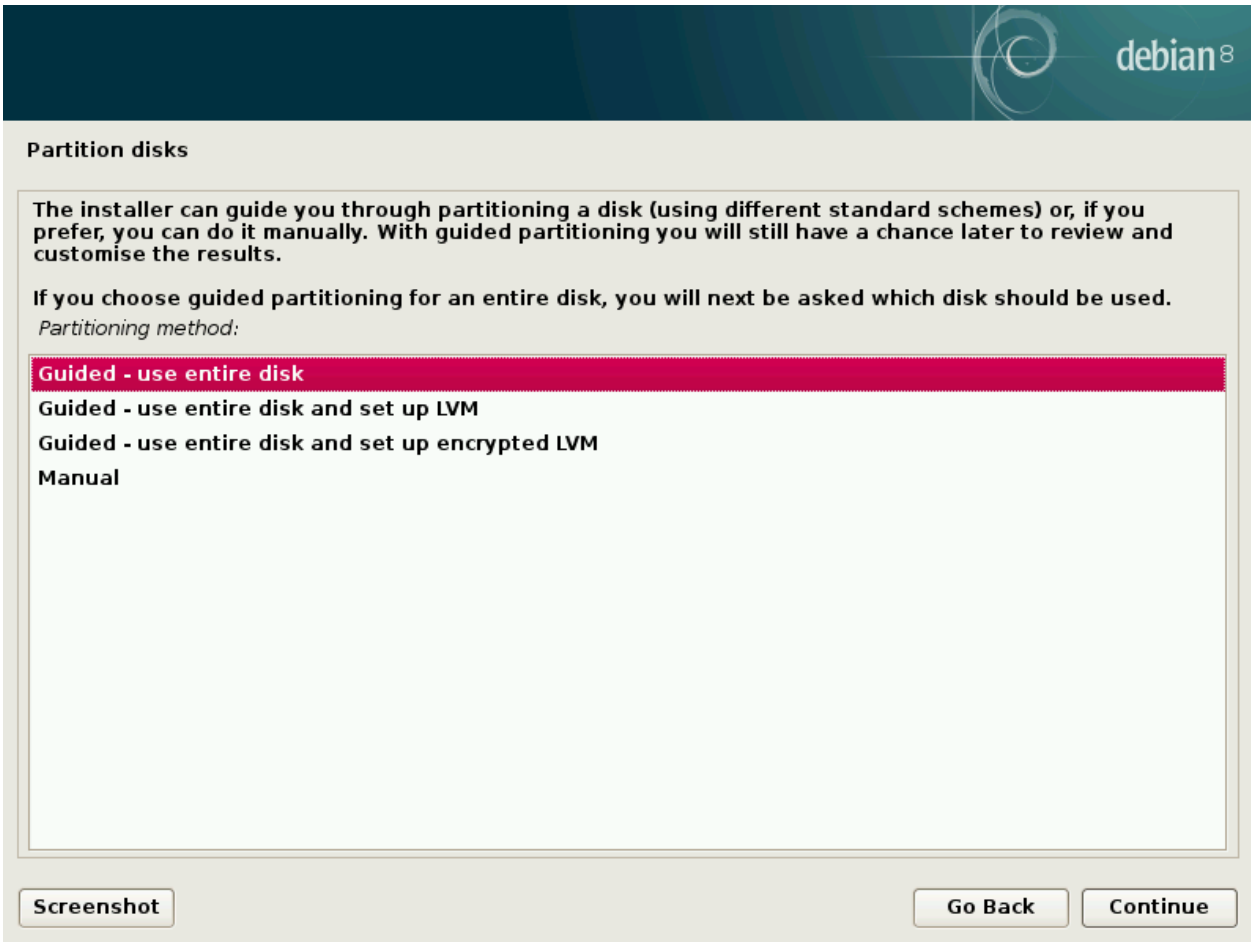

debian 8
Set up users and passwords
You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

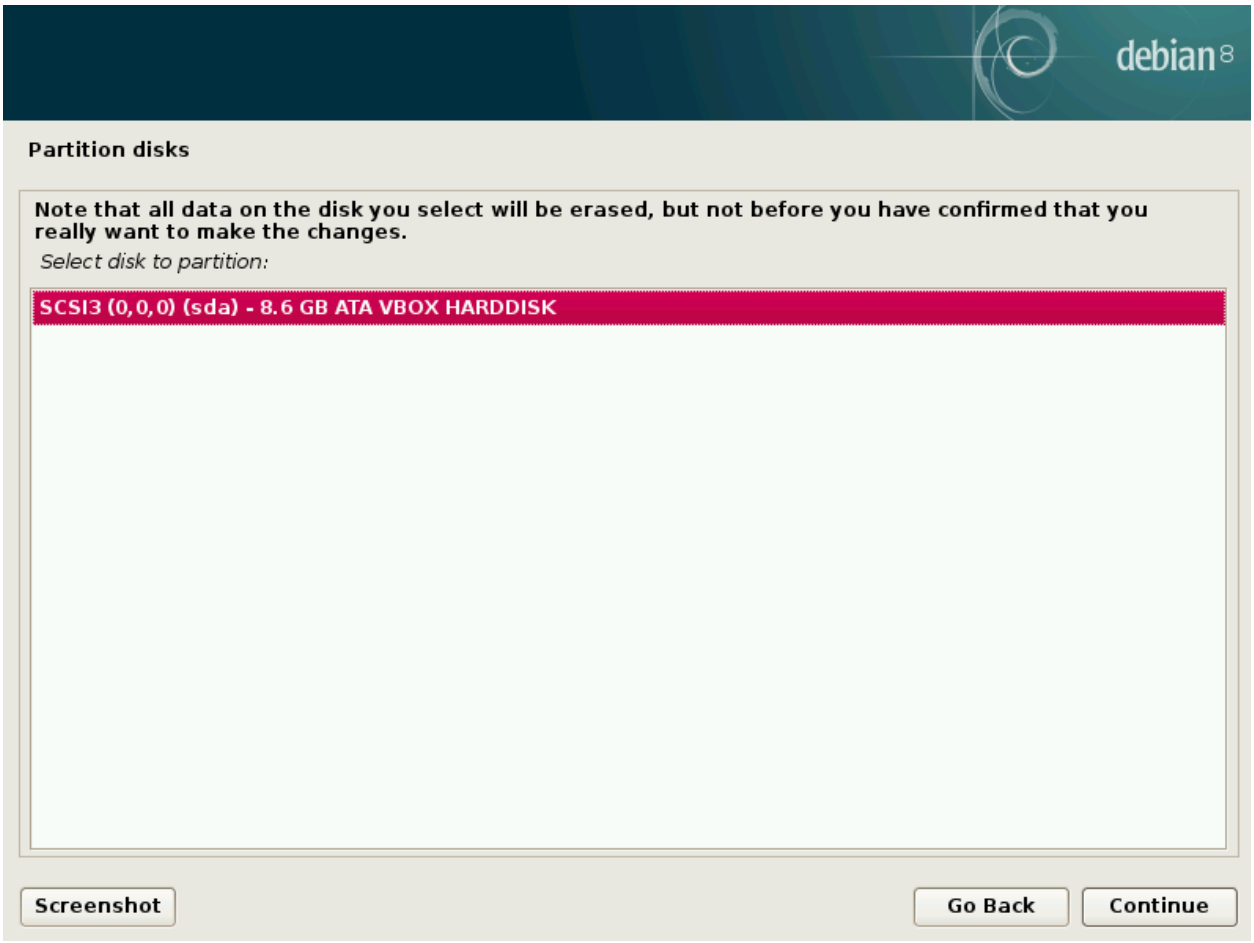

debian 8
Set up users and passwords
A user account will be created for you to use instead of the root account for non-administrative activities.
Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice.
Full name for the new user:
Jay LaCroix
Screenshot
Go Back
Continue

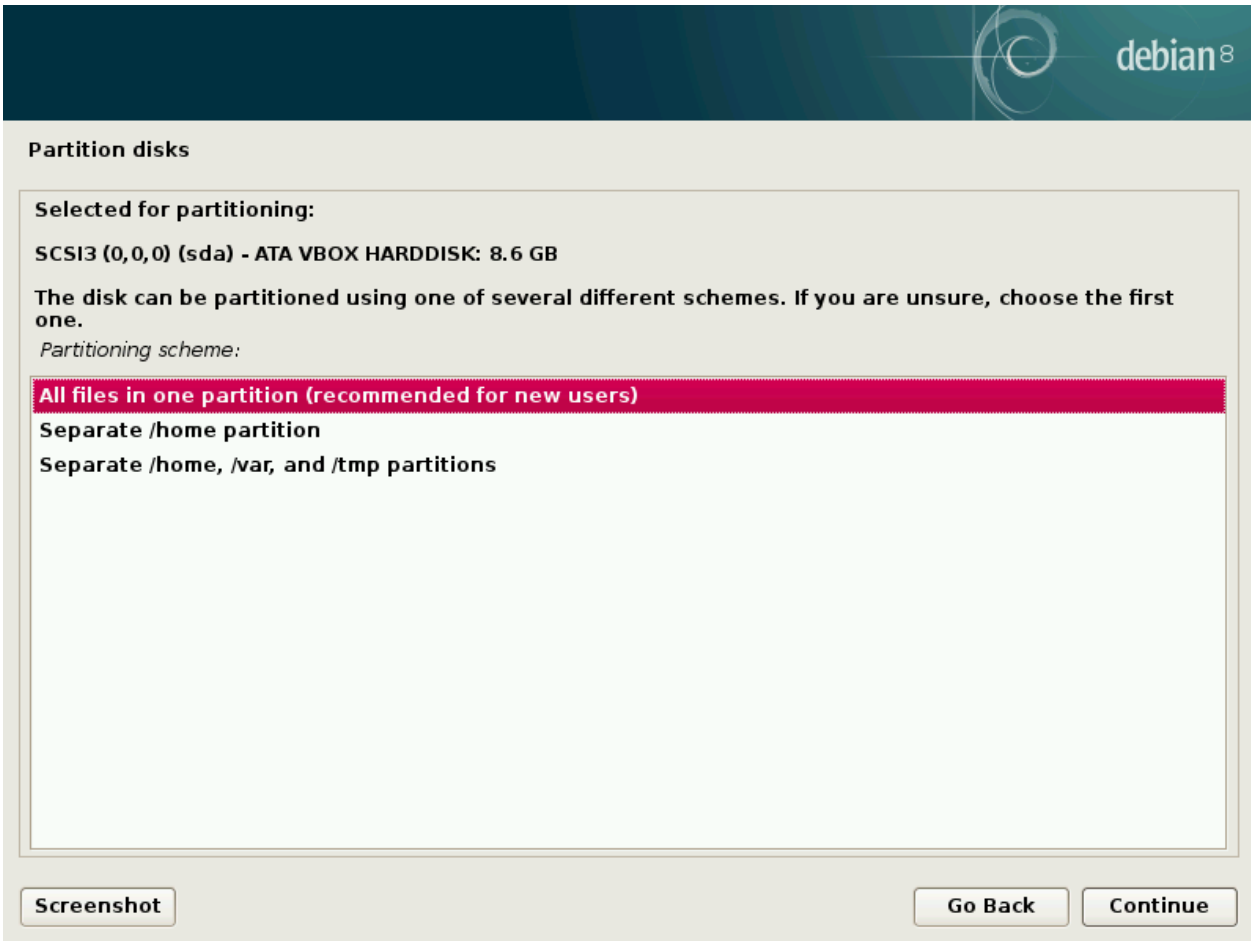

debian 8
Set up users and passwords
Select a username for the new account. Your first name is a reasonable choice. The username should start with a lower-case letter, which can be followed by any combination of numbers and more lower-case letters.
Username for your account:
jay
Screenshot
Go Back
Continue

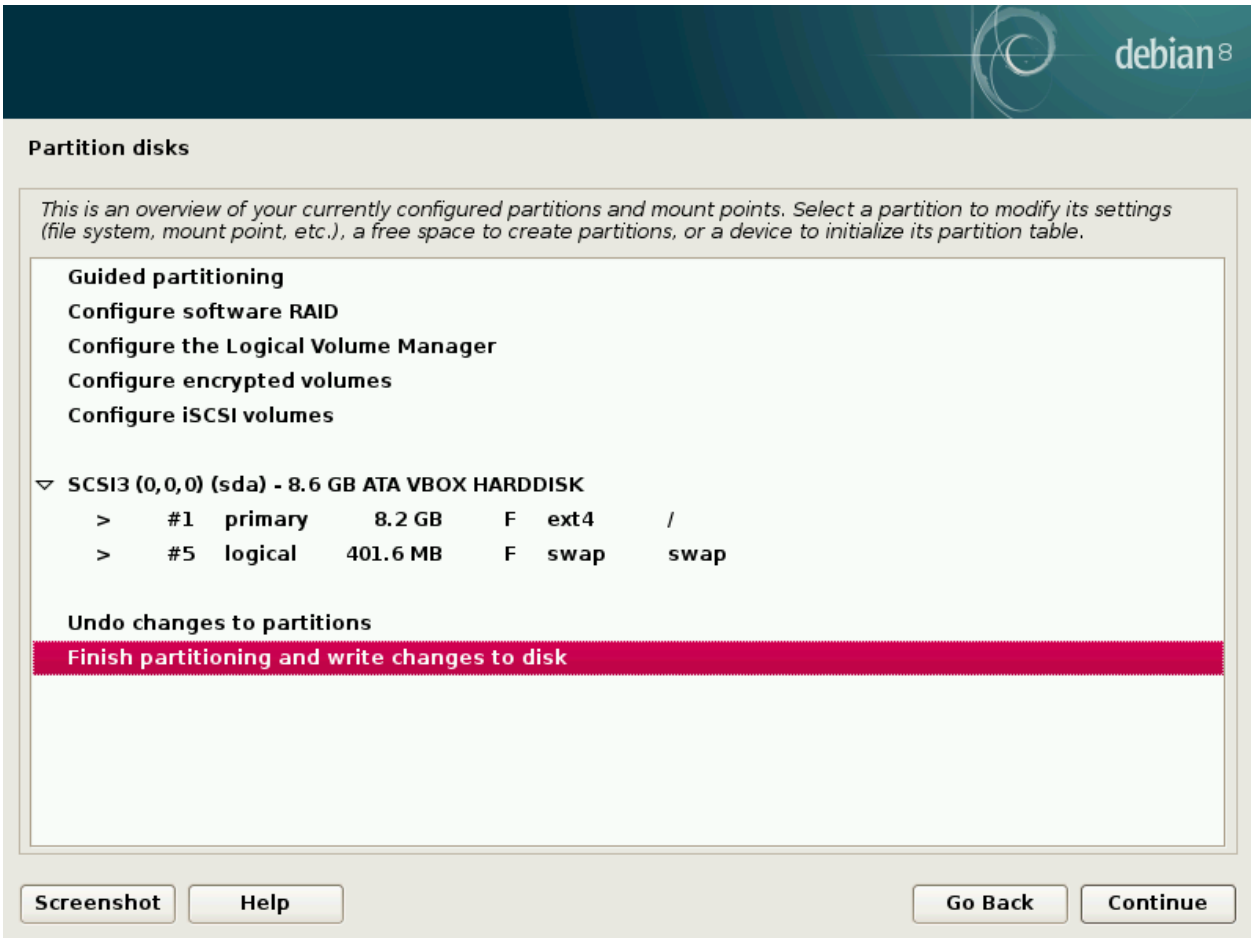

debian 8
Set up users and passwords
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
Choose a password for the new user:
Please enter the same user password again to verify you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

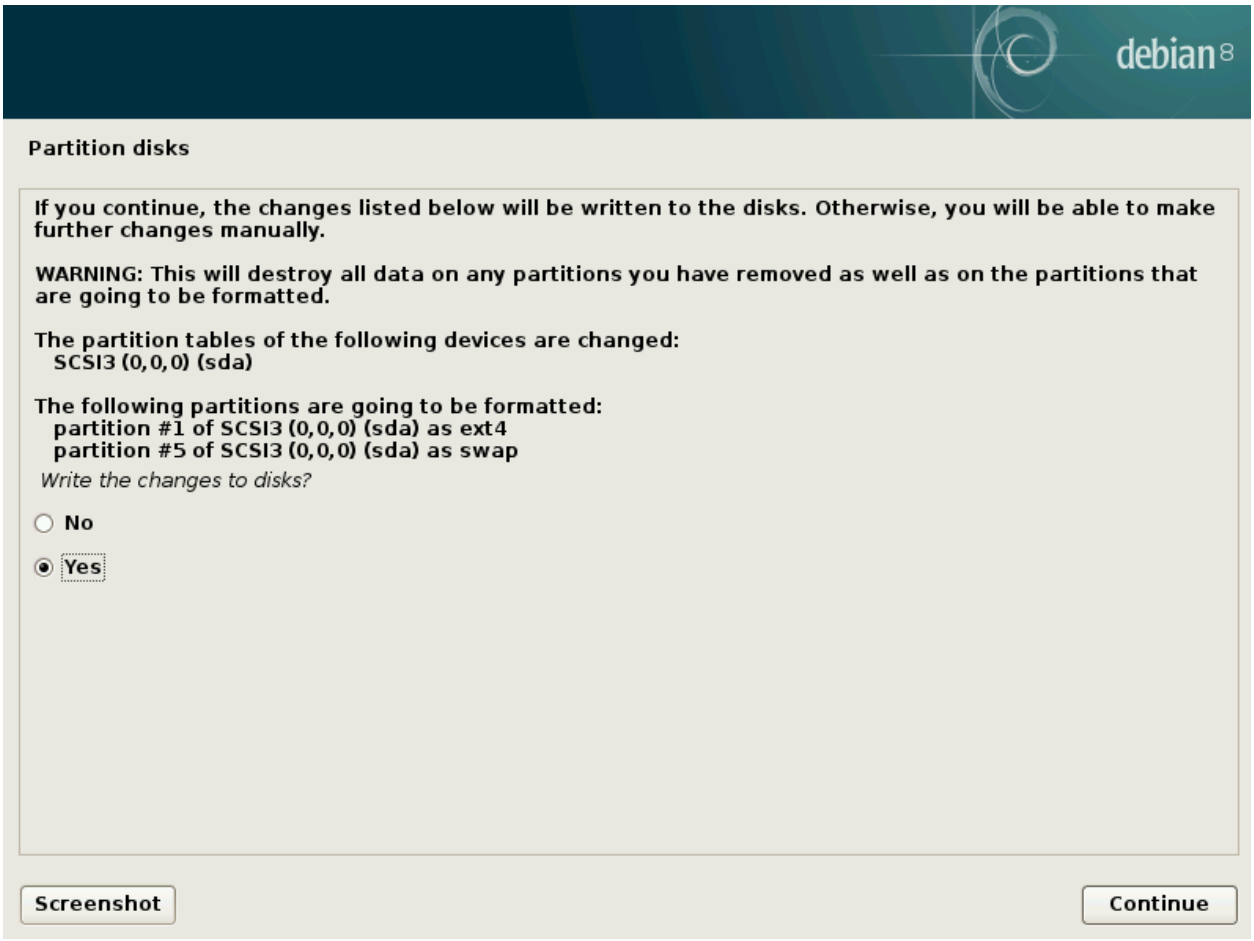

debian 8
Configure the clock
If the desired time zone is not listed, then please go back to the step "Choose language" and select a country that uses the desired time zone (the country where you live or are located).
Select your time zone:
Eastern
Central
Mountain
Pacific
Alaska
Hawaii
Arizona
East Indiana
Samoa
Screenshot
Go Back
Continue

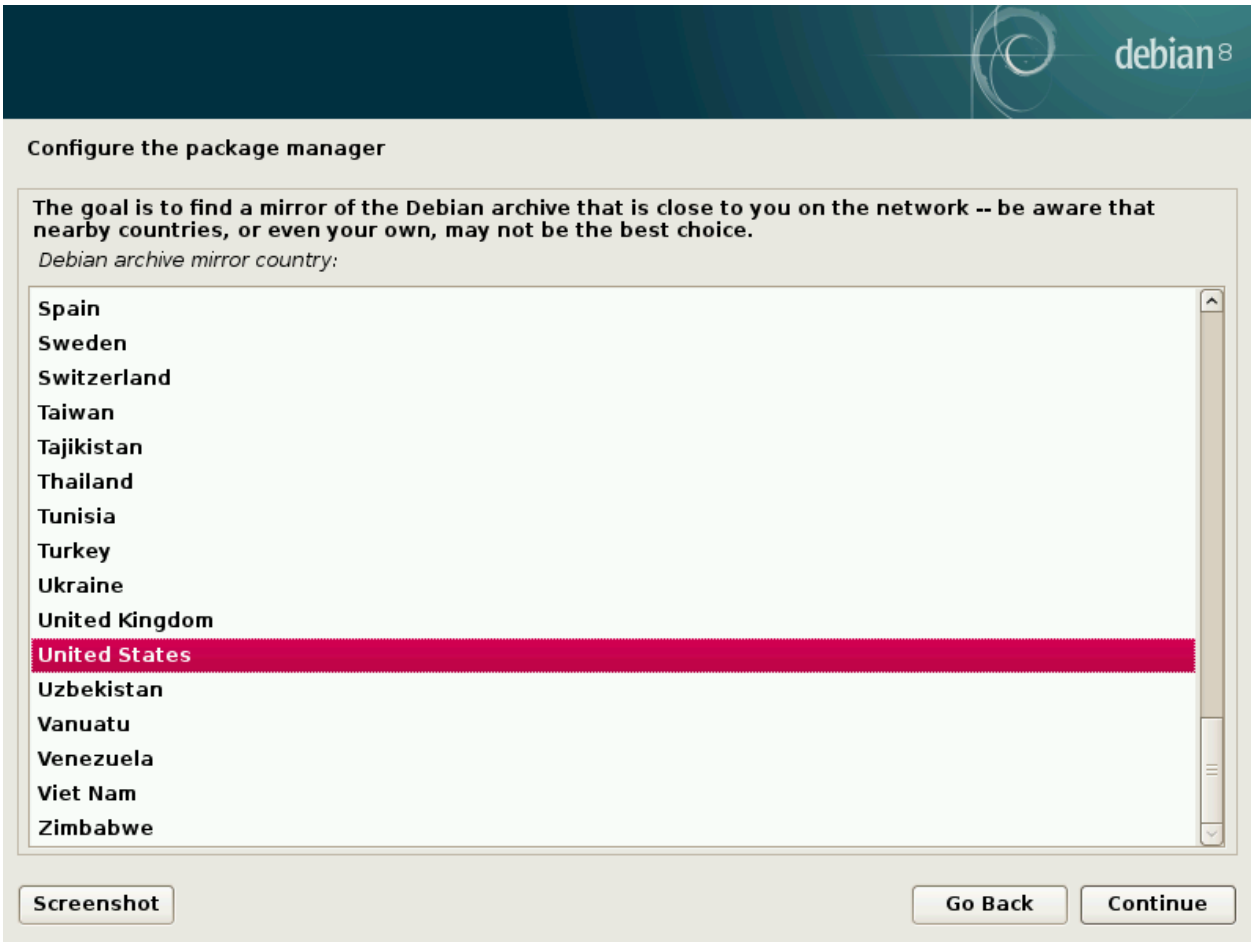

debian 8
Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
Screenshot
Go Back
Continue

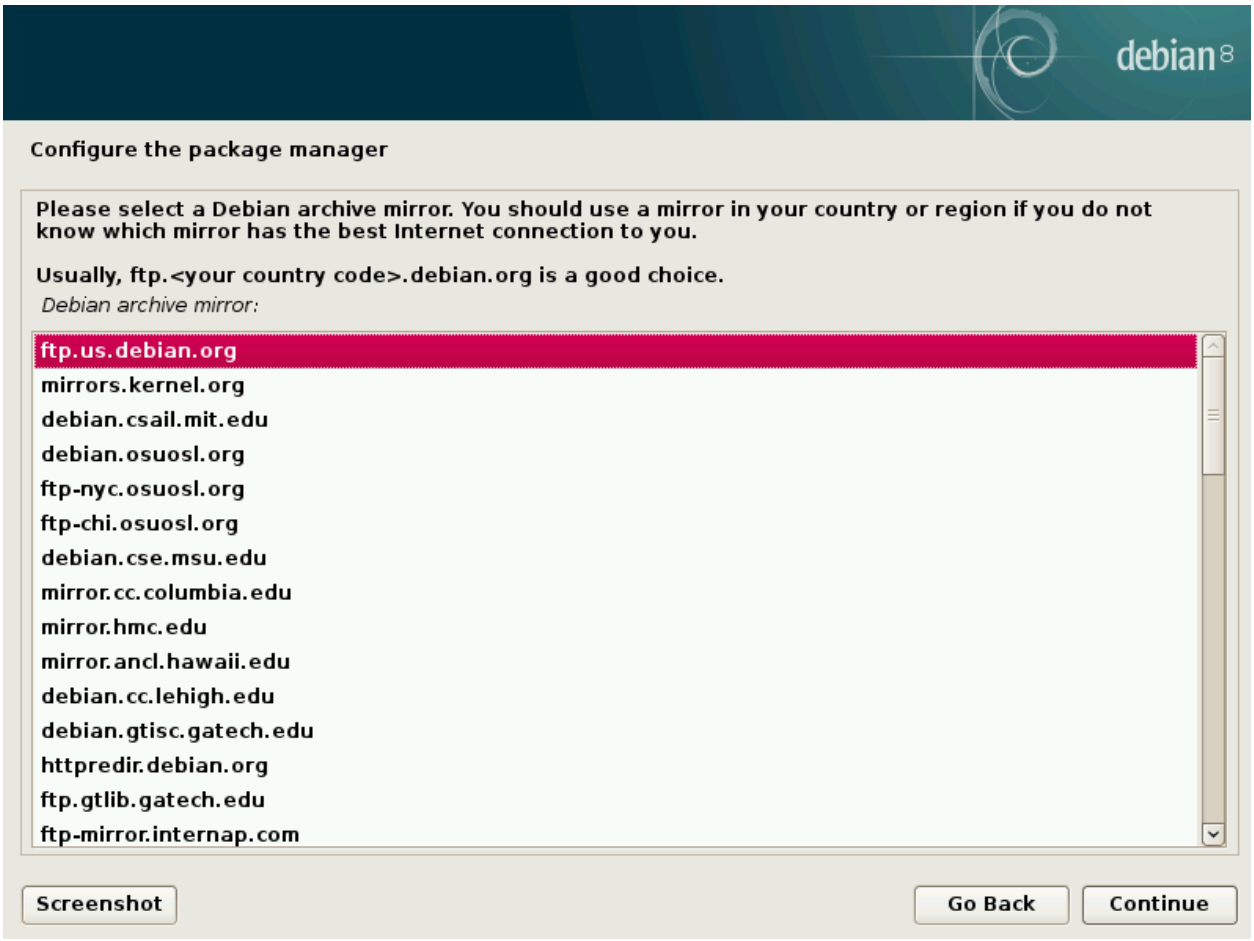

debian 8
Partition disks
Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.
Select disk to partition:
SCSI3 (0,0,0) (sda) - 8.6 GB ATA VBOX HARDDISK
Screenshot
Go Back
Continue

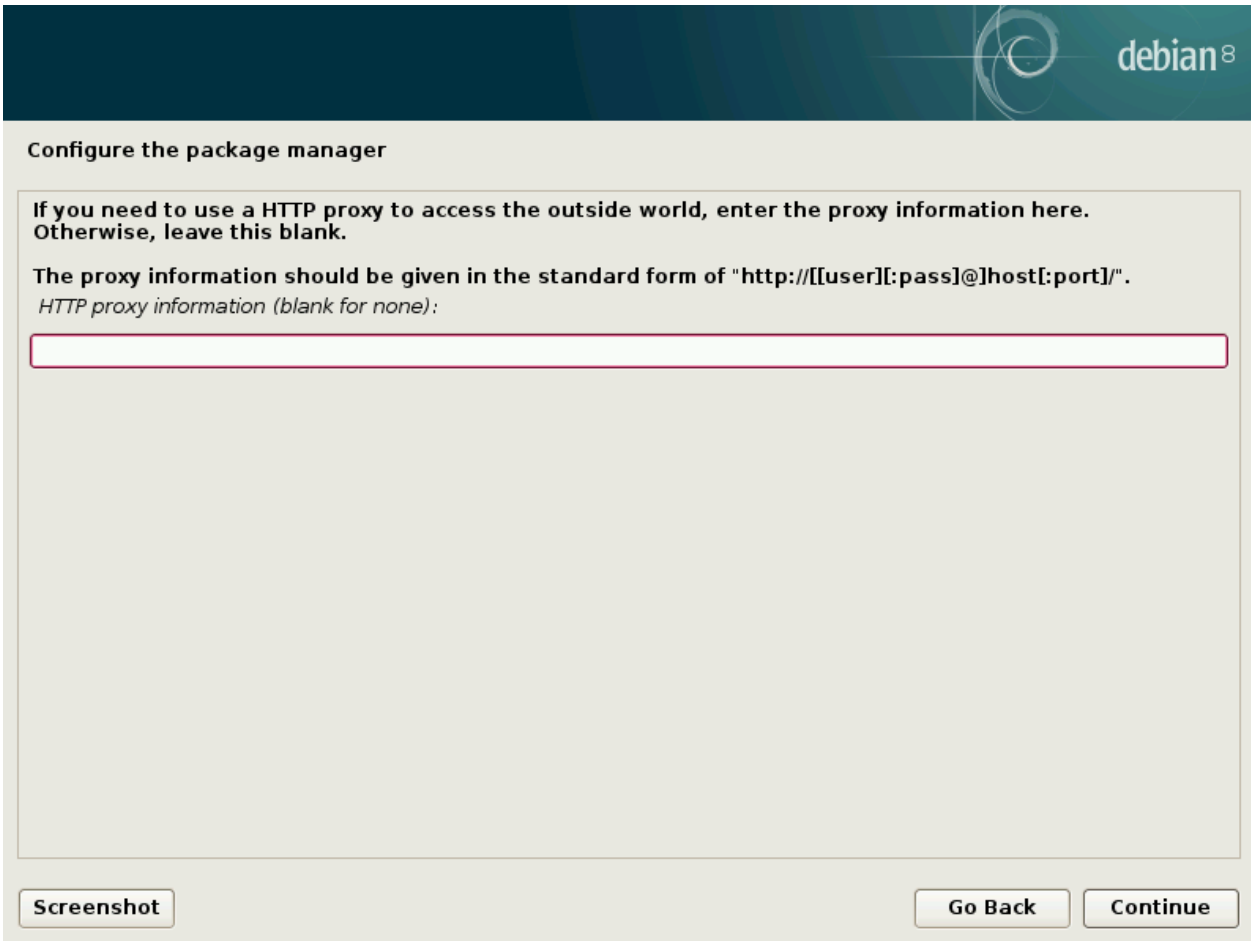

debian 8
Partition disks
Selected for partitioning:
SCSI3 (0,0,0) (sda) - ATA VBOX HARDDISK: 8.6 GB
The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.
Partitioning scheme:
All files in one partition (recommended for new users)
Separate /home partition
Separate /home, /var, and /tmp partitions
Screenshot
Go Back
Continue

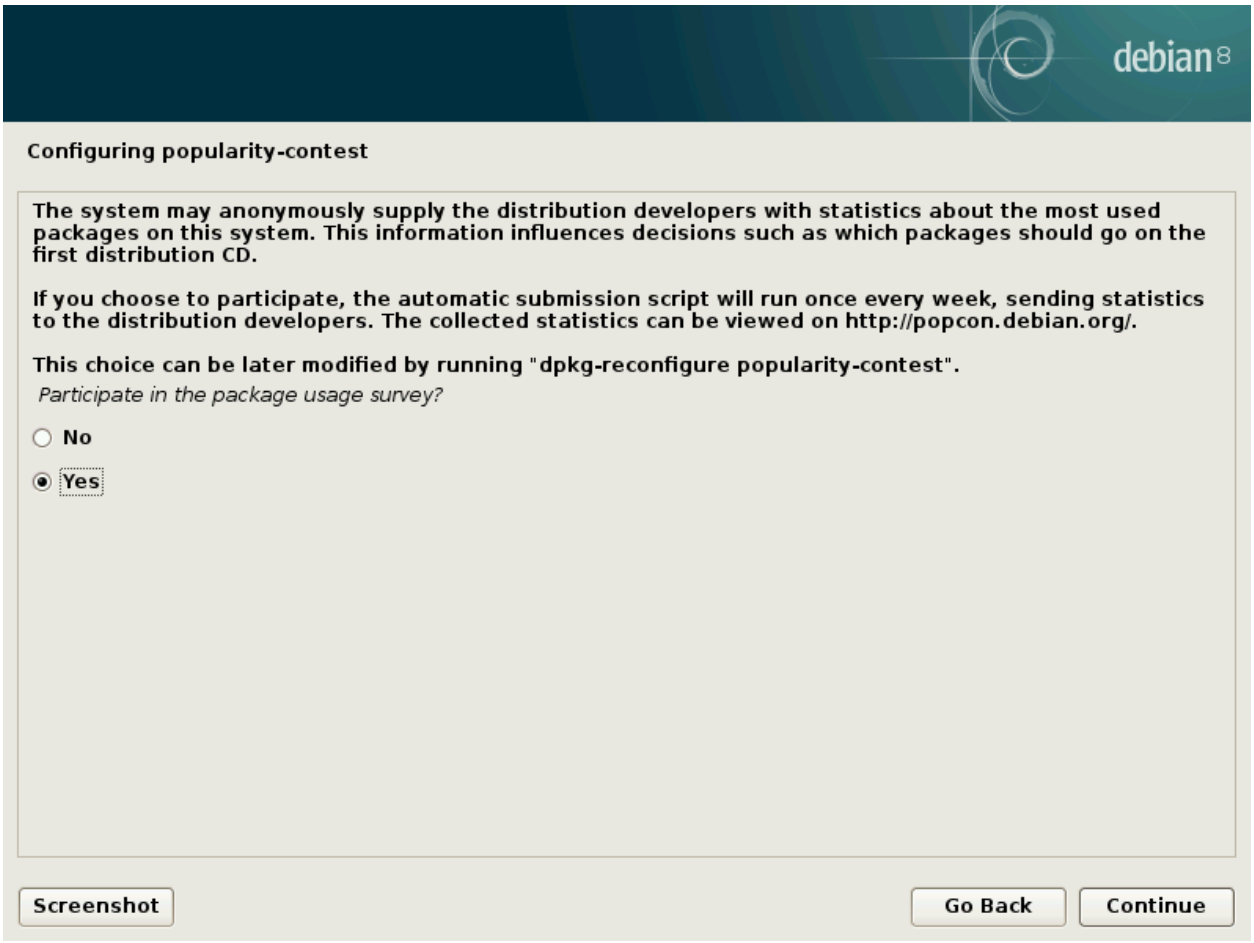

debian 8
Partition disks
This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.
Guided partitioning
Configure software RAID
Configure the Logical Volume Manager
Configure encrypted volumes
Configure iSCSI volumes
SCSI3 (0,0,0) (sda) - 8.6 GB ATA VBOX HARDDISK
> #1 primary 8.2 GB F ext4 /
> #5 logical 401.6 MB F swap swap
Undo changes to partitions
Finish partitioning and write changes to disk
Screenshot
Help
Go Back
Continue

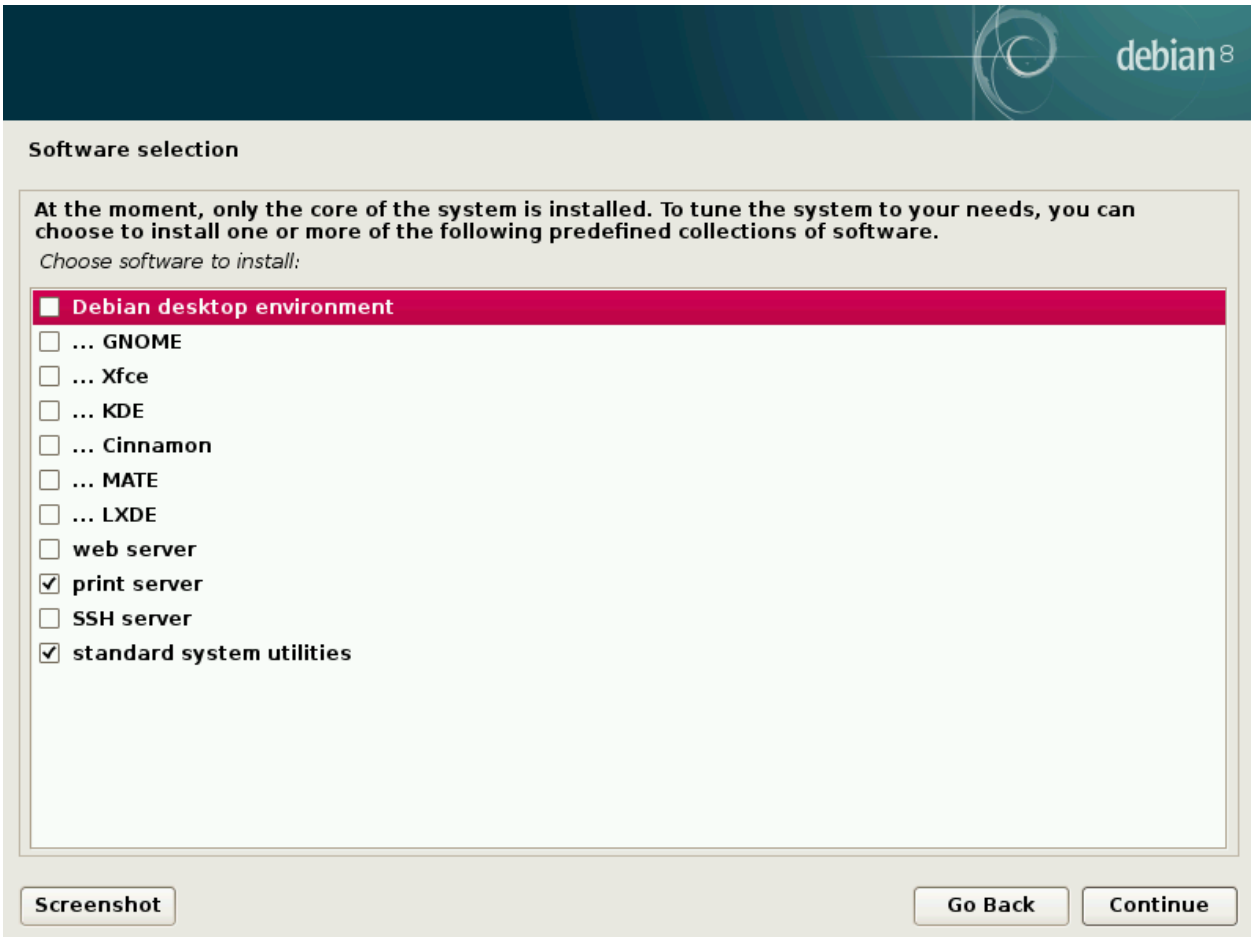

debian 8
Partition disks
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that are going to be formatted.
The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)
The following partitions are going to be formatted:
partition #1 of SCSI3 (0,0,0) (sda) as ext4
partition #5 of SCSI3 (0,0,0) (sda) as swap
Write the changes to disks?
No
Yes
Screenshot
Continue

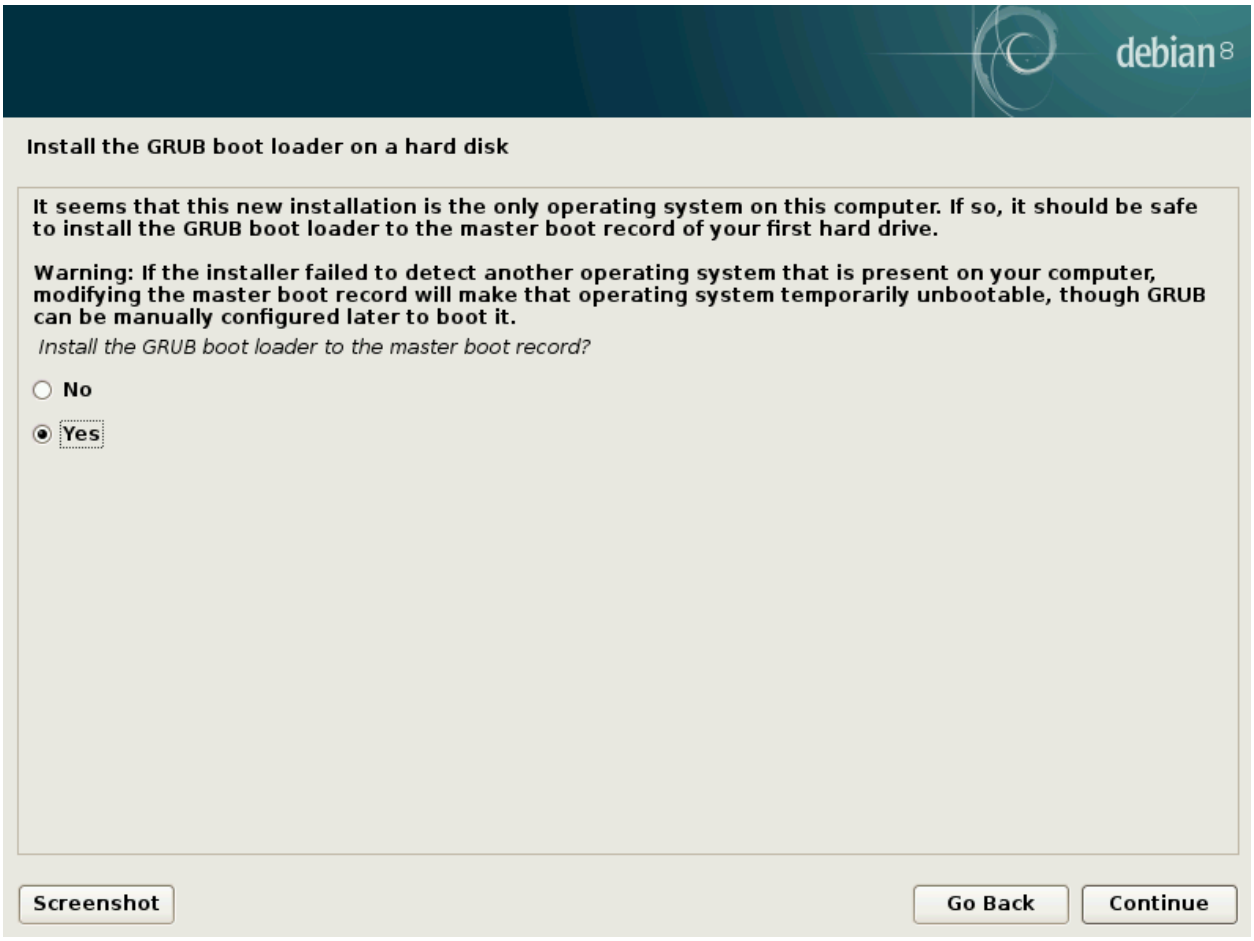

debian 8
Configure the package manager
The goal is to find a mirror of the Debian archive that is close to you on the network -- be aware that nearby countries, or even your own, may not be the best choice.
Debian archive mirror country:
Spain
Sweden
Switzerland
Taiwan
Tajikistan
Thailand
Tunisia
Turkey
Ukraine
United Kingdom
United States
Uzbekistan
Vanuatu
Venezuela
Viet Nam
Zimbabwe
Screenshot
Go Back
Continue

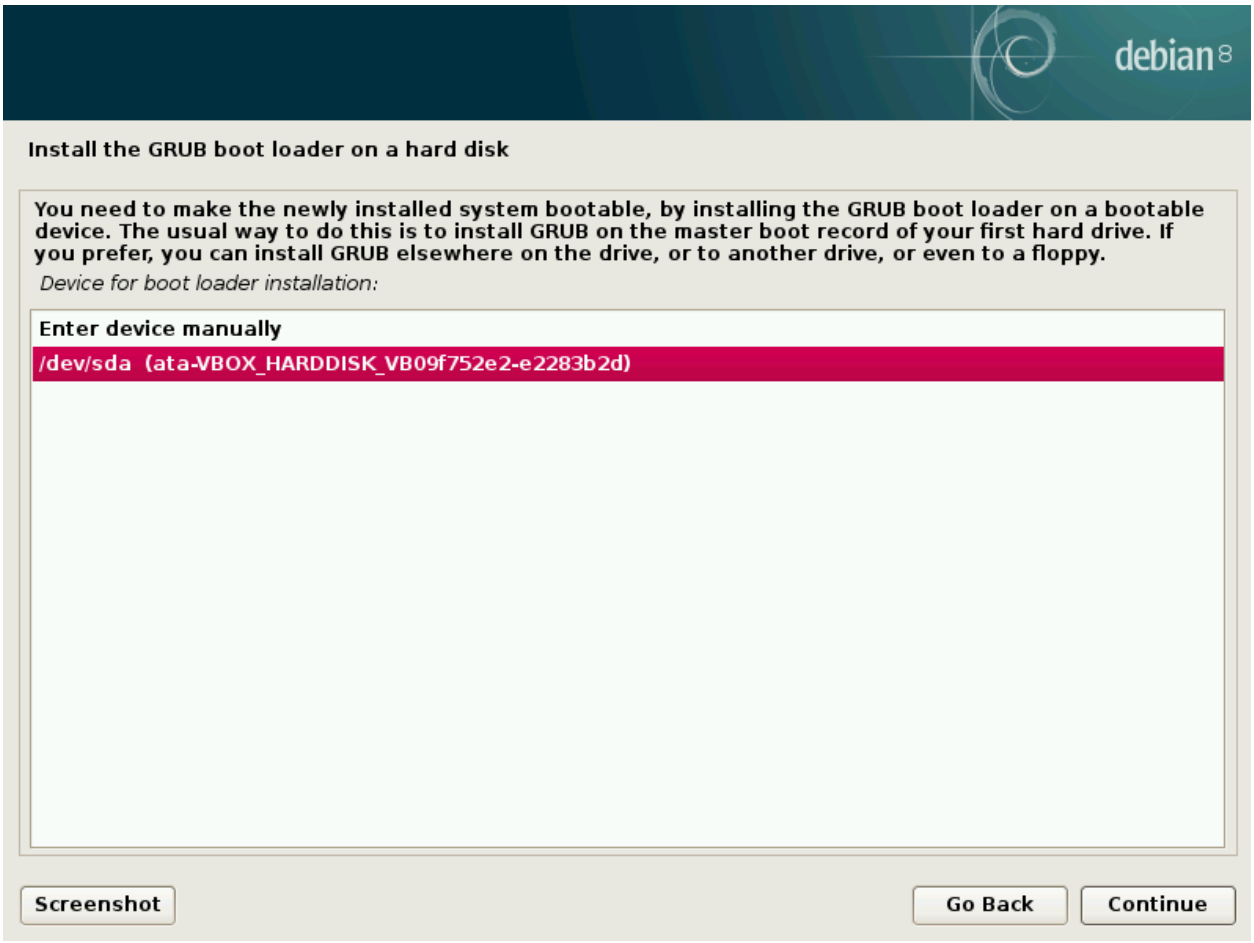

debian 8
Configure the package manager
Please select a Debian archive mirror. You should use a mirror in your country or region if you do not know which mirror has the best Internet connection to you.
Usually, ftp.<your country code>.debian.org is a good choice.
Debian archive mirror:
ftp.us.debian.org
mirrors.kernel.org
debian.csail.mit.edu
debian.osuosl.org
ftp-nyc.osuosl.org
ftp-chi.osuosl.org
debian.cse.msu.edu
mirror.cc.columbia.edu
mirror.hmc.edu
mirror.ancl.hawaii.edu
debian.cc.lehigh.edu
debian.gtisc.gatech.edu
httpredir.debian.org
ftp.gtlib.gatech.edu
ftp-mirror.internap.com
Screenshot
Go Back
Continue

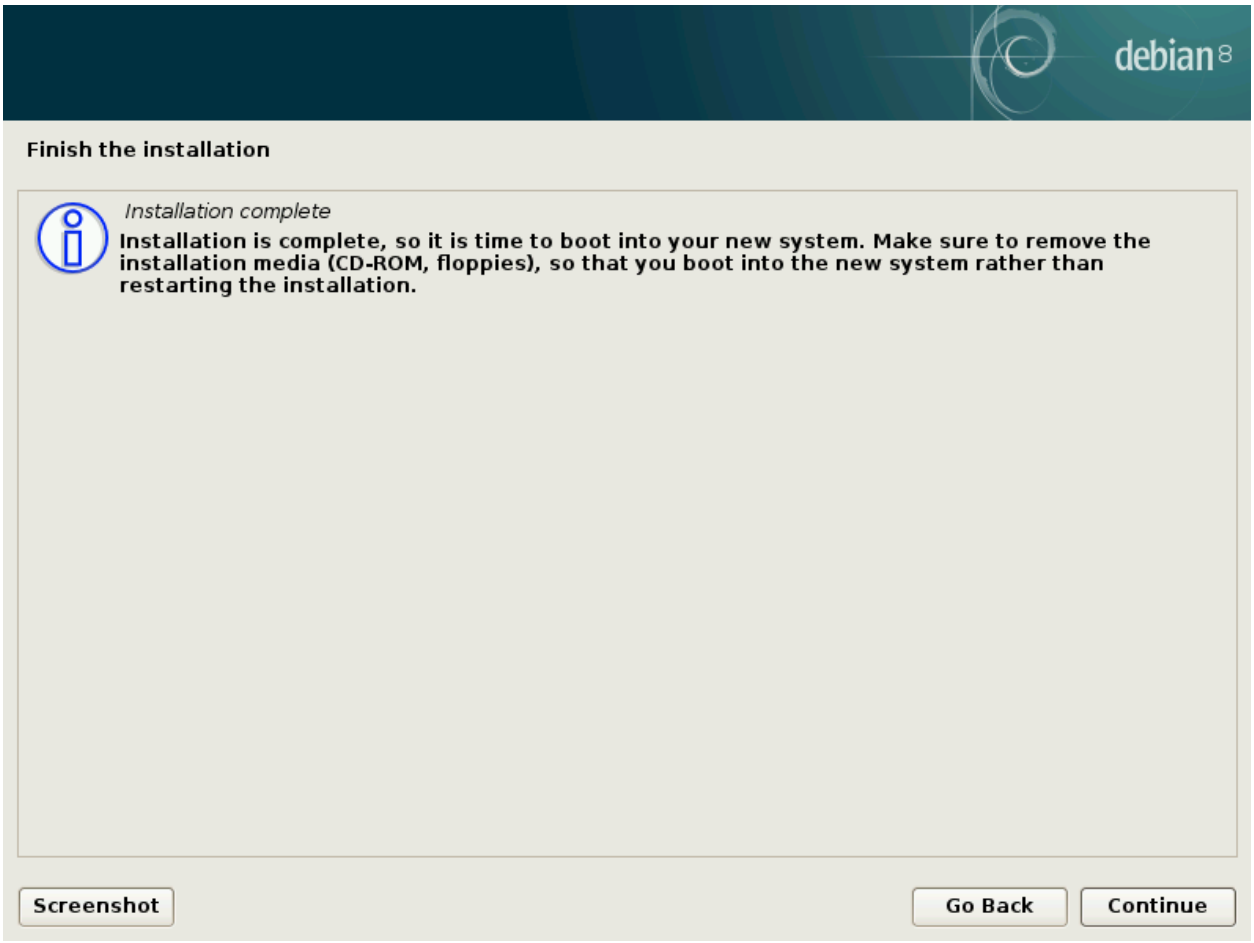

debian 8
Configure the package manager
If you need to use a HTTP proxy to access the outside world, enter the proxy information here.
Otherwise, leave this blank.
The proxy information should be given in the standard form of "http://[[user][:pass]@]host[:port]/".
HTTP proxy information (blank for none):
Screenshot
Go Back
Continue

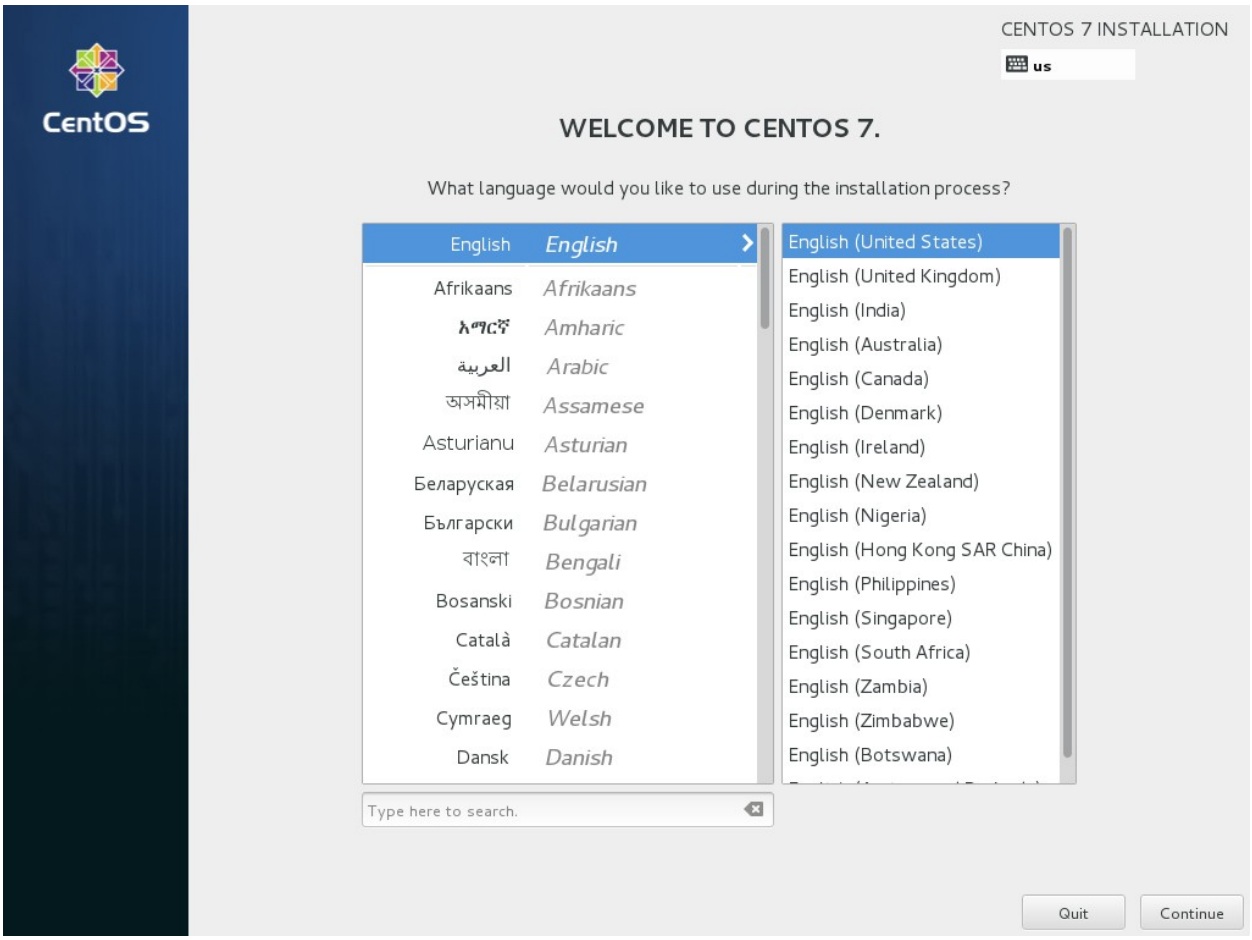

debian 8
Configuring popularity-contest
The system may anonymously supply the distribution developers with statistics about the most used packages on this system. This information influences decisions such as which packages should go on the first distribution CD.
If you choose to participate, the automatic submission script will run once every week, sending statistics to the distribution developers. The collected statistics can be viewed on http://popcon.debian.org/.
This choice can be later modified by running "dpkg-reconfigure popularity-contest".
Participate in the package usage survey?
No
Yes
Screenshot
Go Back
Continue

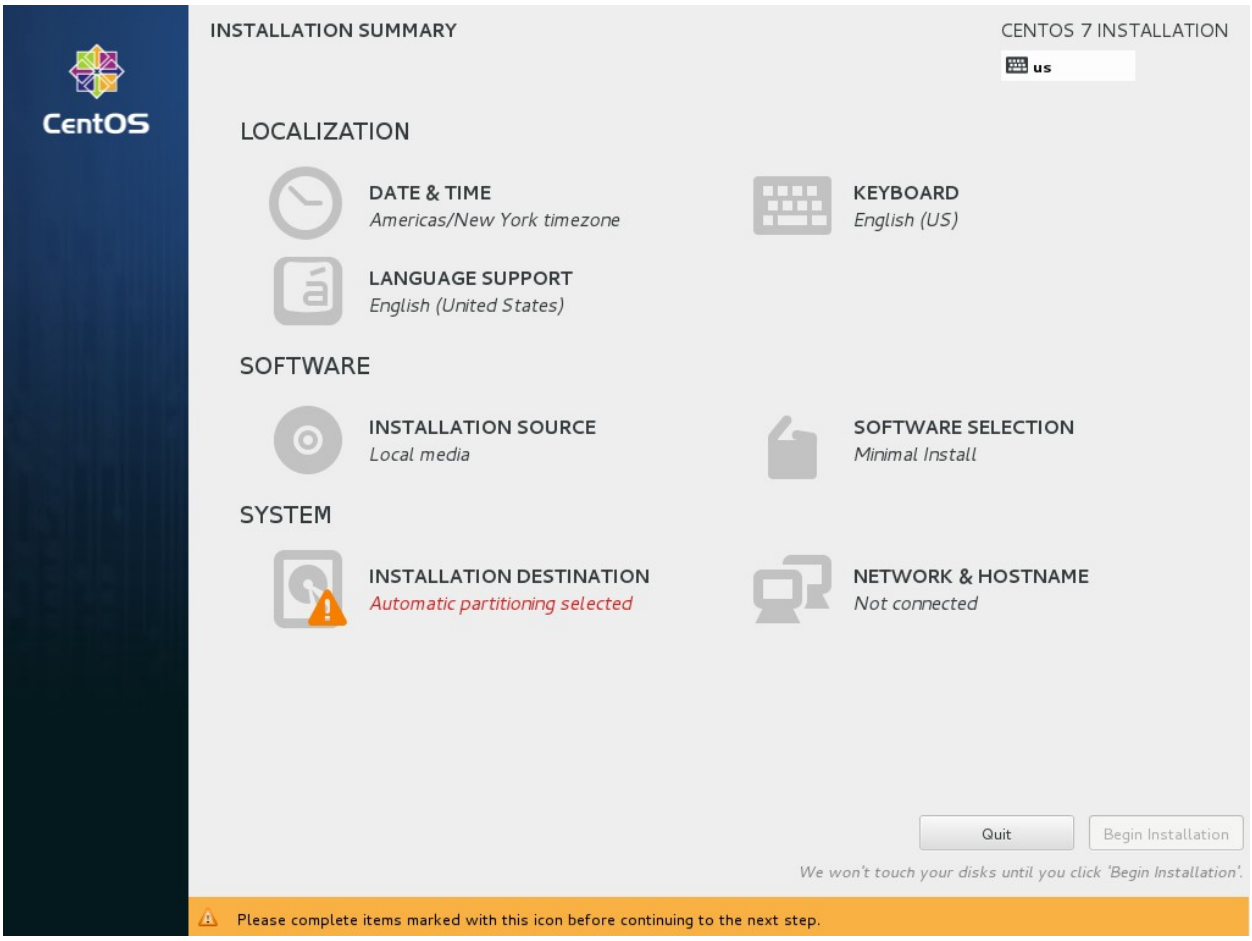

debian 8
Software selection
At the moment, only the core of the system is installed. To tune the system to your needs, you can choose to install one or more of the following predefined collections of software.
Choose software to install:
Debian desktop environment
... GNOME
... Xfce
... KDE
... Cinnamon
... MATE
... LXDE
web server
print server
SSH server
standard system utilities
Screenshot
Go Back
Continue

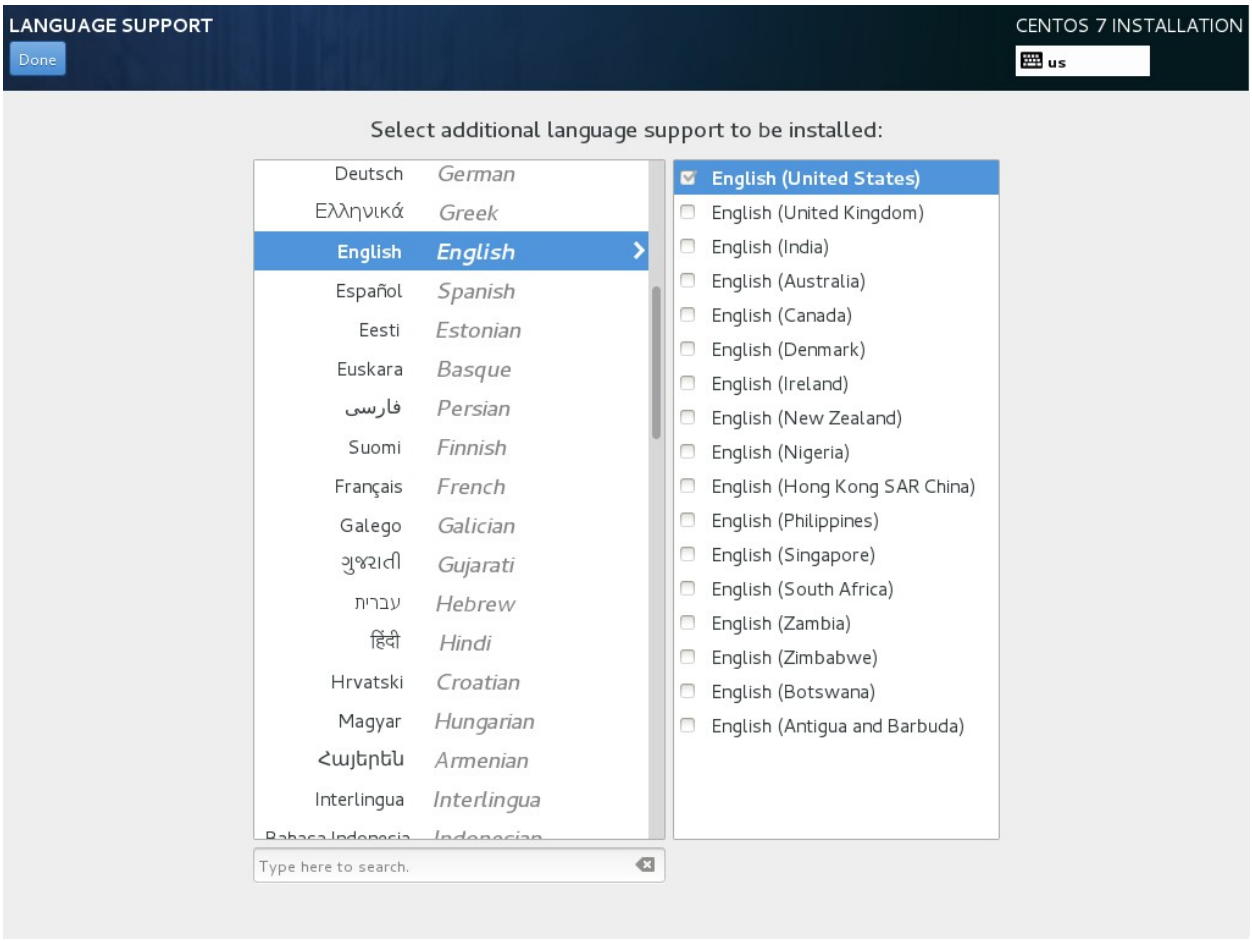

debian 8
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

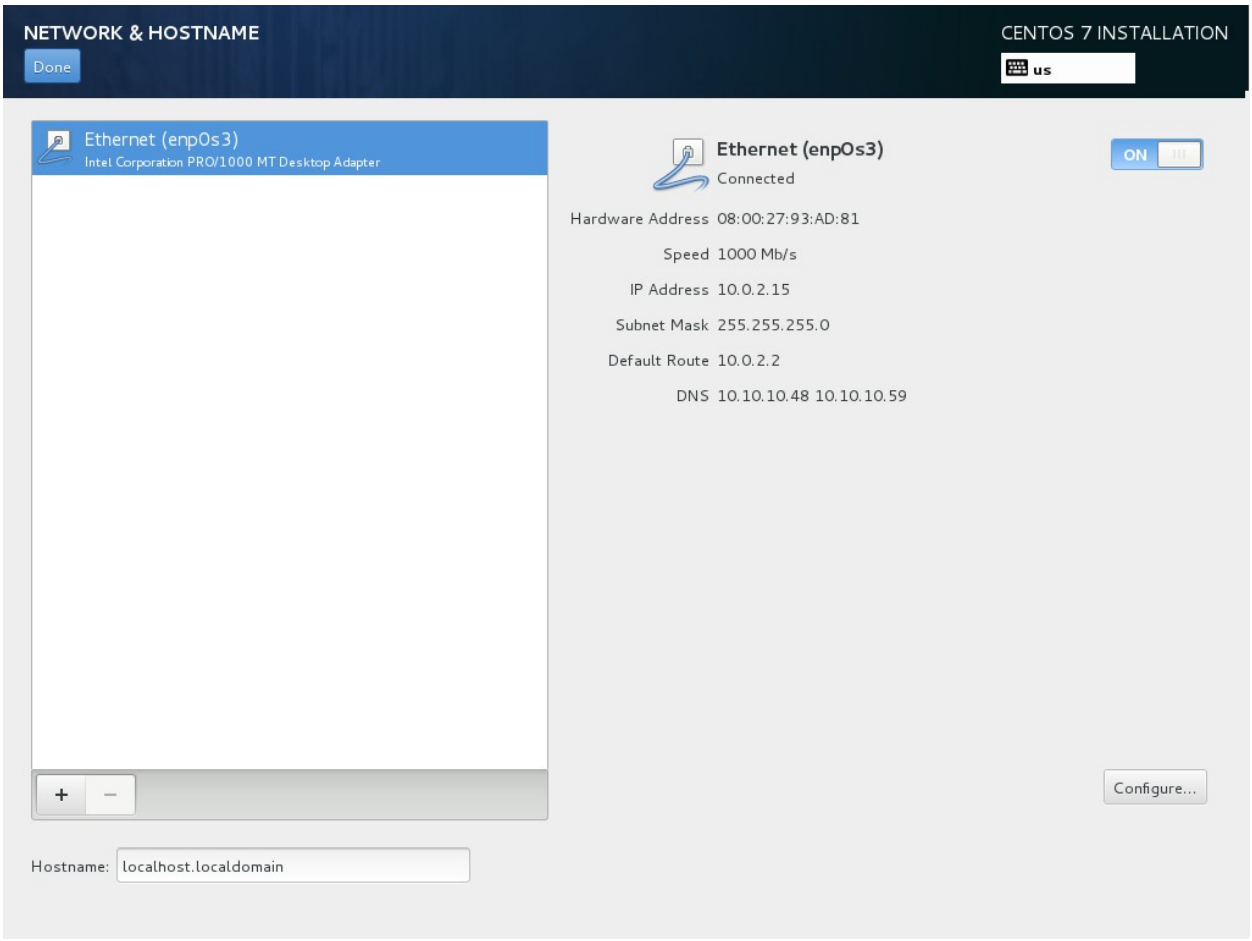

debian 8
Install the GRUB boot loader on a hard disk
You need to make the newly installed system bootable, by installing the GRUB boot loader on a bootable device. The usual way to do this is to install GRUB on the master boot record of your first hard drive. If you prefer, you can install GRUB elsewhere on the drive, or to another drive, or even to a floppy.
Device for boot loader installation:
Enter device manually
/dev/sda (ata-VBOX_HARDDISK_VB09f752e2-e2283b2d)
Screenshot
Go Back
Continue

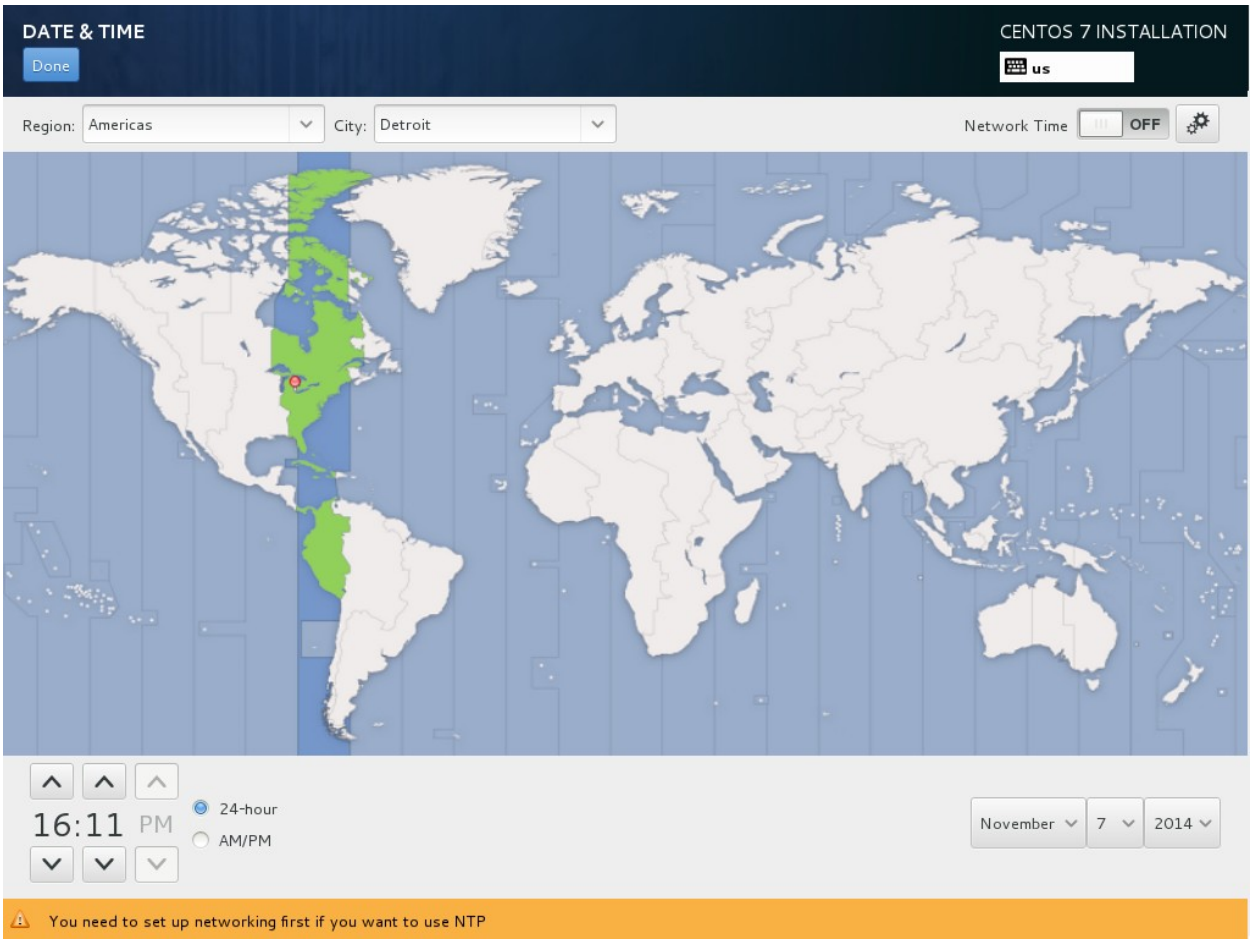

debian 8
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

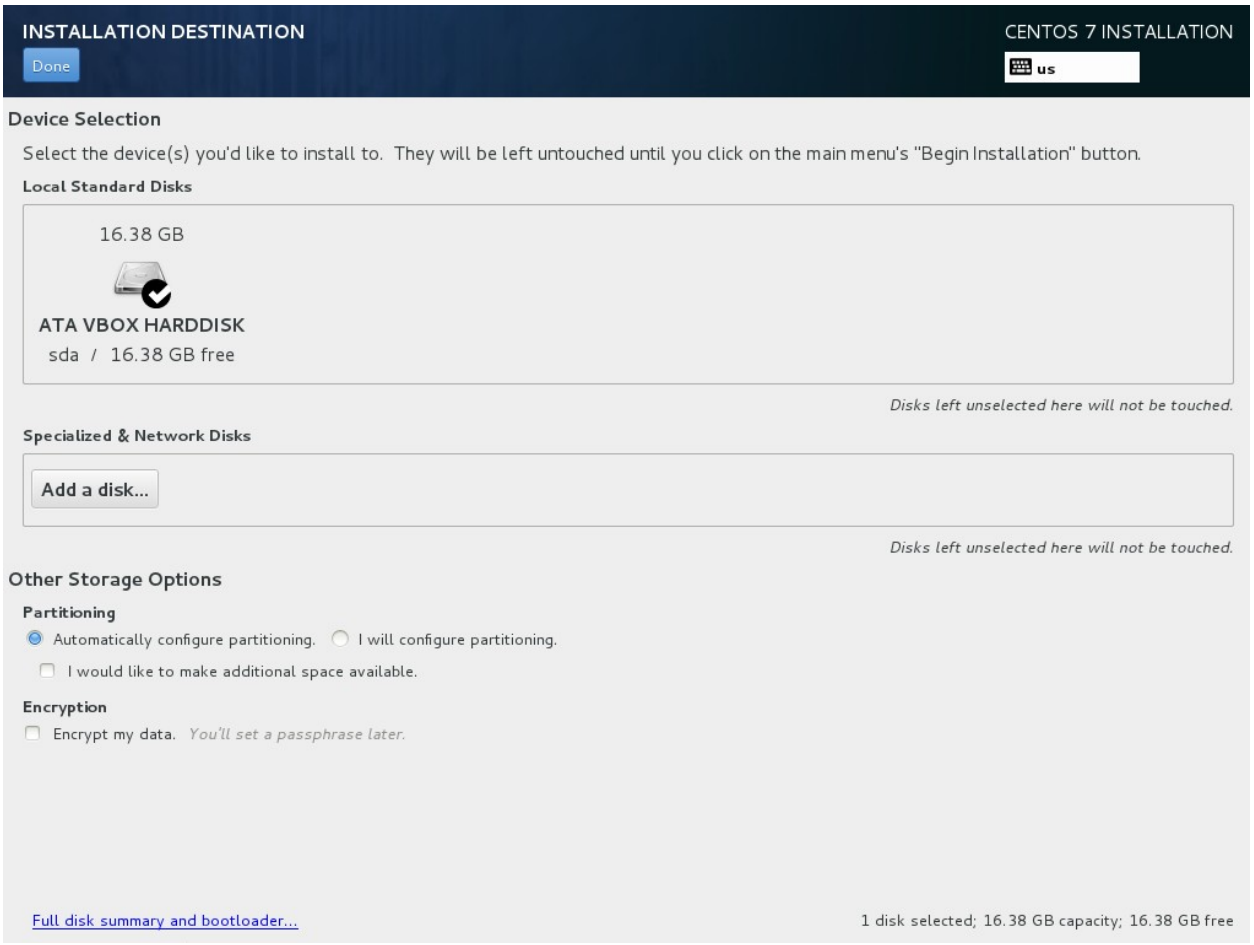

CentOS
CENTOS 7 INSTALLATION
us
WELCOME TO CENTOS 7.
What language would you like to use during the installation process?
English English
Afrikaans Afrikaans
አማርኛ Amharic
العربية Arabic
অসমীয়া Assamese
Asturianu Asturian
Беларуская Belarusian
Български Bulgarian
বাংলা Bengali
Bosanski Bosnian
Català Catalan
Čeština Czech
Cymraeg Welsh
Dansk Danish
English (United States)
English (United Kingdom)
English (India)
English (Australia)
English (Canada)
English (Denmark)
English (Ireland)
English (New Zealand)
English (Nigeria)
English (Hong Kong SAR China)
English (Philippines)
English (Singapore)
English (South Africa)
English (Zambia)
English (Zimbabwe)
English (Botswana)
Type here to search.
Quit
Continue

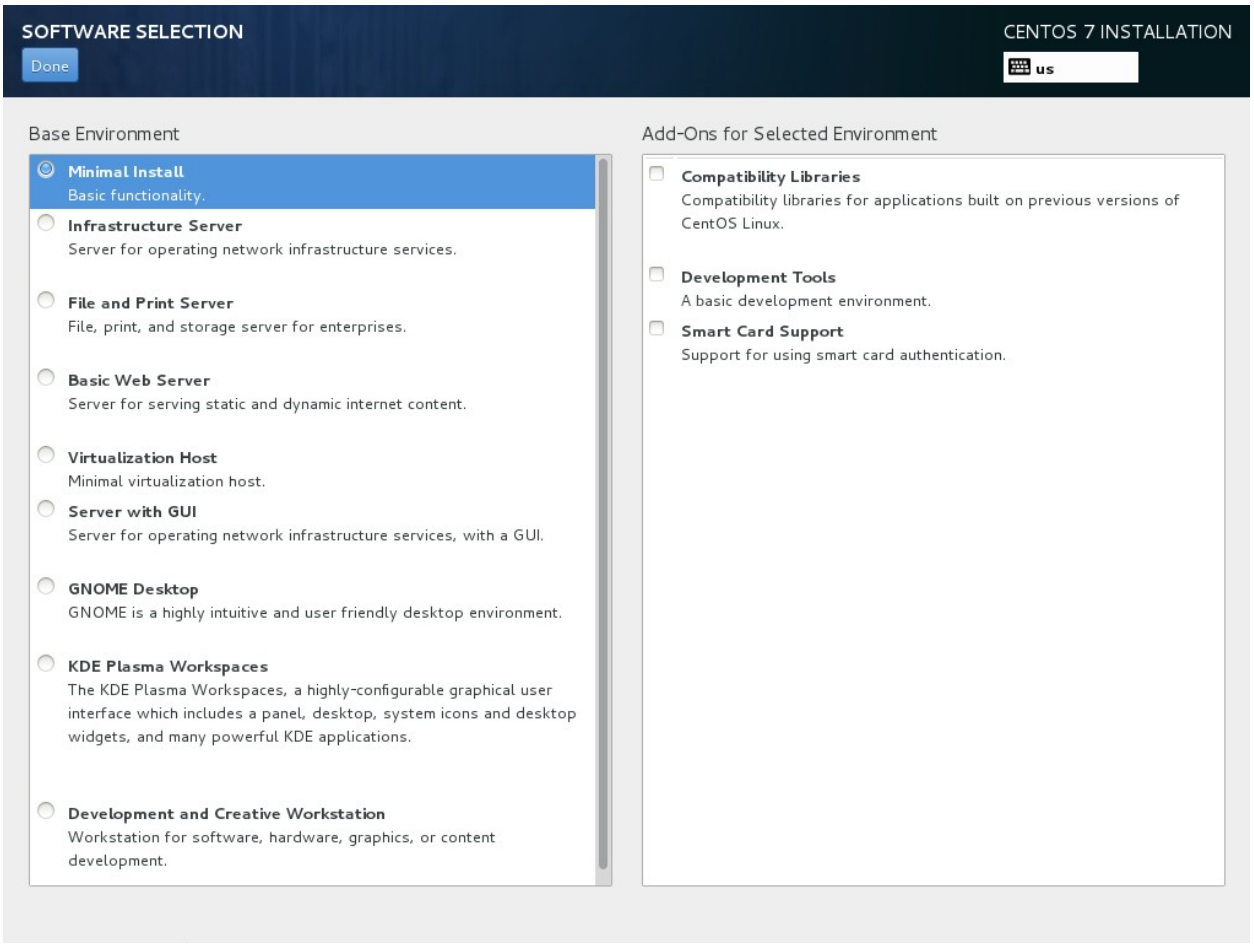

CentOS
INSTALLATION SUMMARY
CENTOS 7 INSTALLATION
us
LOCALIZATION
DATE & TIME
Americas/New York timezone
KEYBOARD
English (US)
LANGUAGE SUPPORT
English (United States)
SOFTWARE
INSTALLATION SOURCE
Local media
SOFTWARE SELECTION
Minimal Install
SYSTEM
INSTALLATION DESTINATION
Automatic partitioning selected
NETWORK & HOSTNAME
Not connected
Quit
Begin Installation
We won't touch your disks until you click 'Begin Installation'.
Please complete items marked with this icon before continuing to the next step.

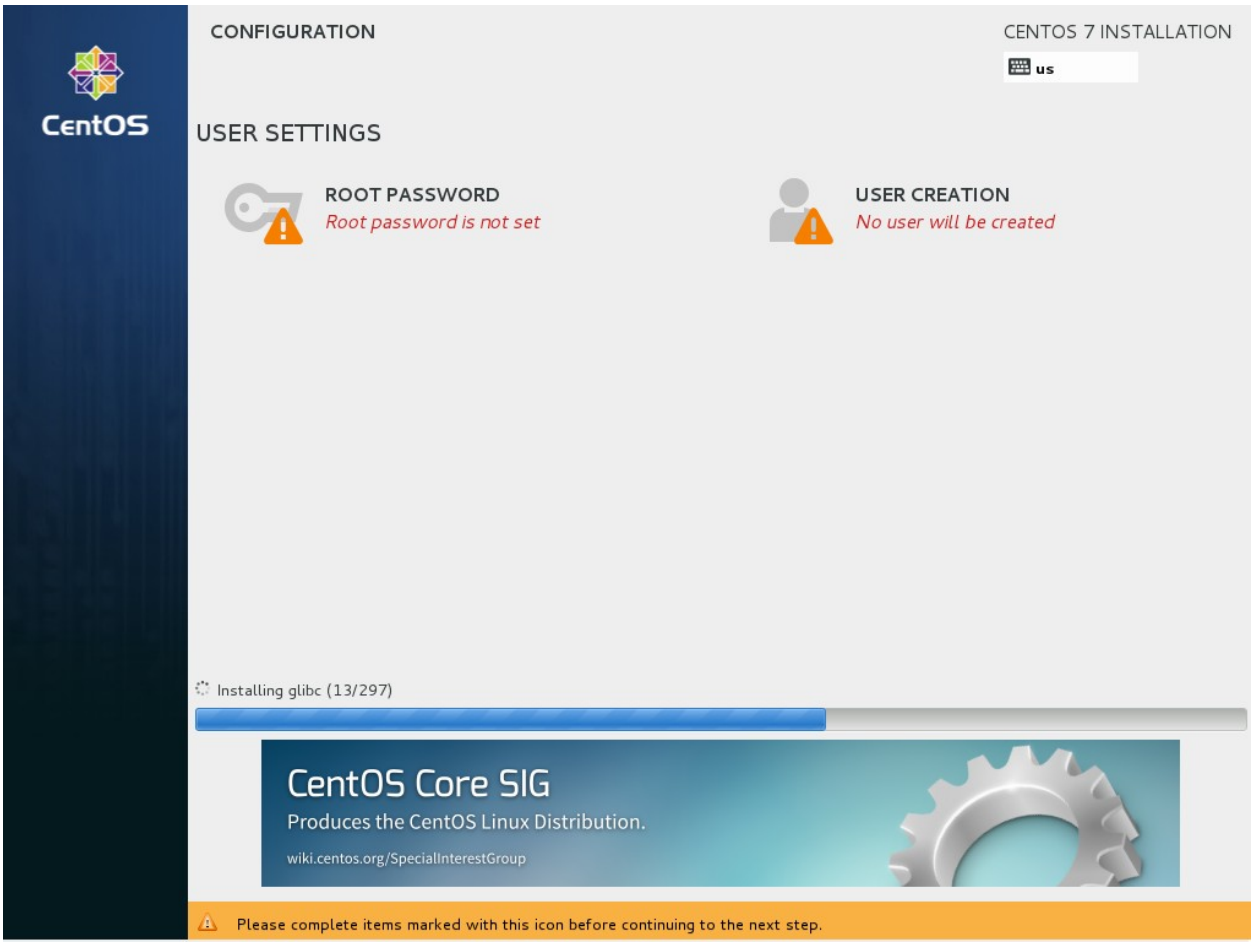

LANGUAGE SUPPORT
Done
CENTOS 7 INSTALLATION
us
Select additional language support to be installed:
Deutsch German
Ελληνικά Greek
English English
Español Spanish
Eesti Estonian
Euskara Basque
فارسی Persian
Suomi Finnish
Français French
Galego Galician
ગુજરાતી Gujarati
עברית Hebrew
हिंदी Hindi
Hrvatski Croatian
Magyar Hungarian
Հայերեն Armenian
Interlingua Interlingua
Type here to search.
English (United States)
English (United Kingdom)
English (India)
English (Australia)
English (Canada)
English (Denmark)
English (Ireland)
English (New Zealand)
English (Nigeria)
English (Hong Kong SAR China)
English (Philippines)
English (Singapore)
English (South Africa)
English (Zambia)
English (Zimbabwe)
English (Botswana)
English (Antigua and Barbuda)

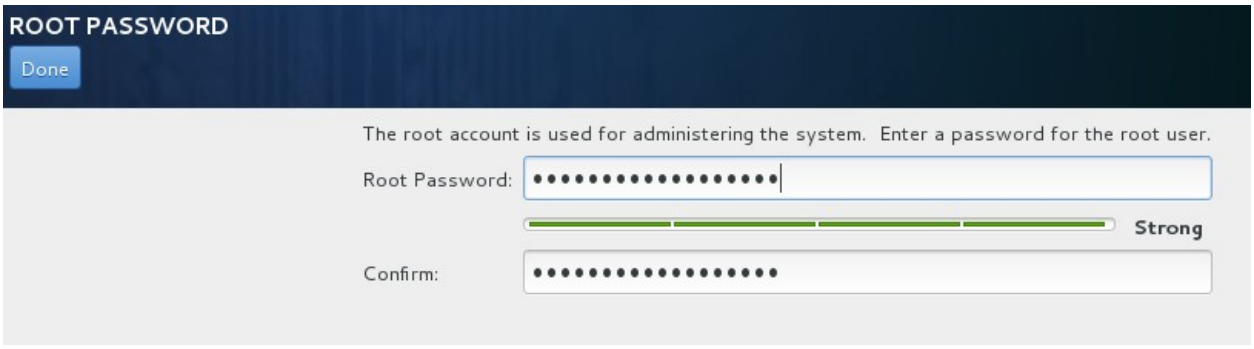

NETWORK & HOSTNAME
Done
CENTOS 7 INSTALLATION
us
Ethernet (enp0s3)
Intel Corporation PRO/1000 MT Desktop Adapter
Ethernet (enp0s3)
Connected
ON
Hardware Address 08:00:27:93:AD:81
Speed 1000 Mb/s
IP Address 10.0.2.15
Subnet Mask 255.255.255.0
Default Route 10.0.2.2
DNS 10.10.10.48 10.10.10.59
+
−
Configure...
Hostname:
localhost.localdomain

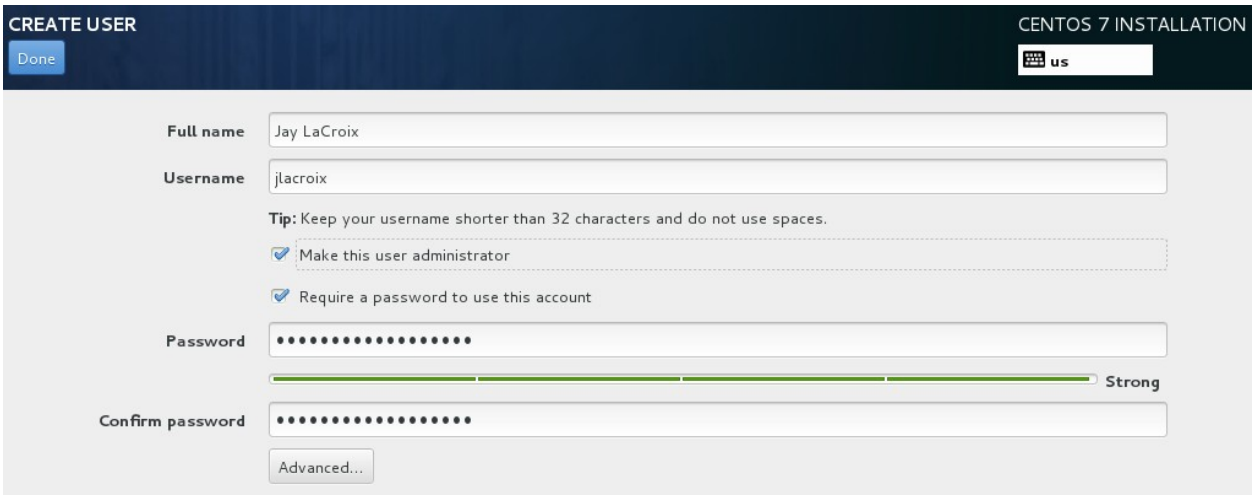

DATE & TIME
Done
CENTOS 7 INSTALLATION
us
Region: Americas
City: Detroit
Network Time
OFF
16:11 PM
24-hour
AM/PM
November
7
2014
You need to set up networking first if you want to use NTP

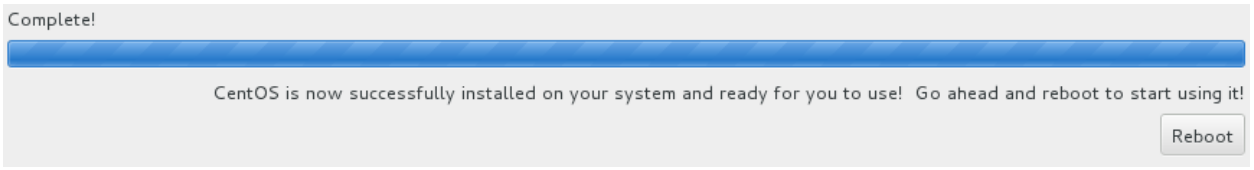

INSTALLATION DESTINATION
Done
CENTOS 7 INSTALLATION
us
Device Selection
Select the device(s) you'd like to install to. They will be left untouched until you click on the main menu's "Begin Installation" button.
Local Standard Disks
16.38 GB
ATA VBOX HARDDISK
sda / 16.38 GB free
Disks left unselected here will not be touched.
Specialized & Network Disks
Add a disk...
Disks left unselected here will not be touched.
Other Storage Options
Partitioning
Automatically configure partitioning.
I will configure partitioning.
I would like to make additional space available.
Encryption
Encrypt my data. You'll set a passphrase later.
Full disk summary and bootloader...
1 disk selected; 16.38 GB capacity; 16.38 GB free


SOFTWARE SELECTION
Done
CENTOS 7 INSTALLATION
us
Base Environment
Minimal Install
Basic functionality.
Infrastructure Server
Server for operating network infrastructure services.
File and Print Server
File, print, and storage server for enterprises.
Basic Web Server
Server for serving static and dynamic internet content.
Virtualization Host
Minimal virtualization host.
Server with GUI
Server for operating network infrastructure services, with a GUI.
GNOME Desktop
GNOME is a highly intuitive and user friendly desktop environment.
KDE Plasma Workspaces
The KDE Plasma Workspaces, a highly-configurable graphical user interface which includes a panel, desktop, system icons and desktop widgets, and many powerful KDE applications.
Development and Creative Workstation
Workstation for software, hardware, graphics, or content development.
Add-Ons for Selected Environment
Compatibility Libraries
Compatibility libraries for applications built on previous versions of CentOS Linux.
Development Tools
A basic development environment.
Smart Card Support
Support for using smart card authentication.

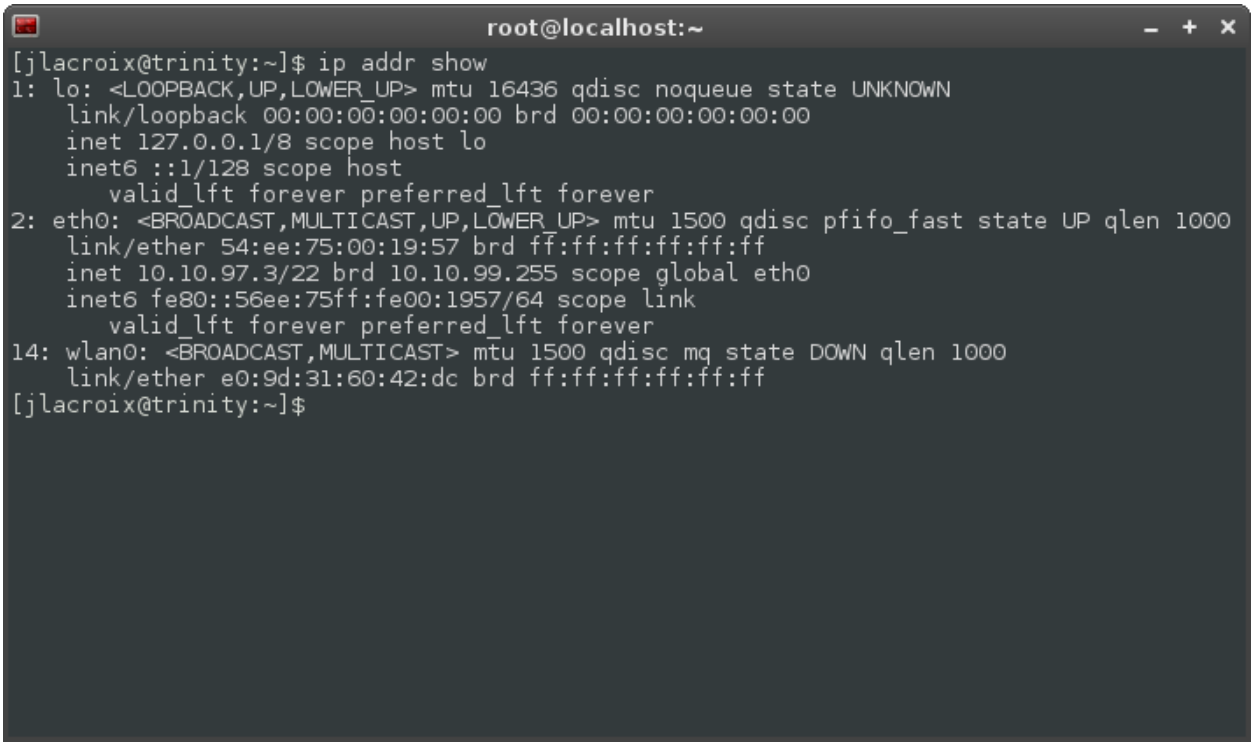

CONFIGURATION
CENTOS 7 INSTALLATION
us
CentOS
USER SETTINGS
ROOT PASSWORD
Root password is not set
USER CREATION
No user will be created
Installing glibc (13/297)
CentOS Core SIG
Produces the CentOS Linux Distribution.
wiki.centos.org/SpecialInterestGroup
Please complete items marked with this icon before continuing to the next step.

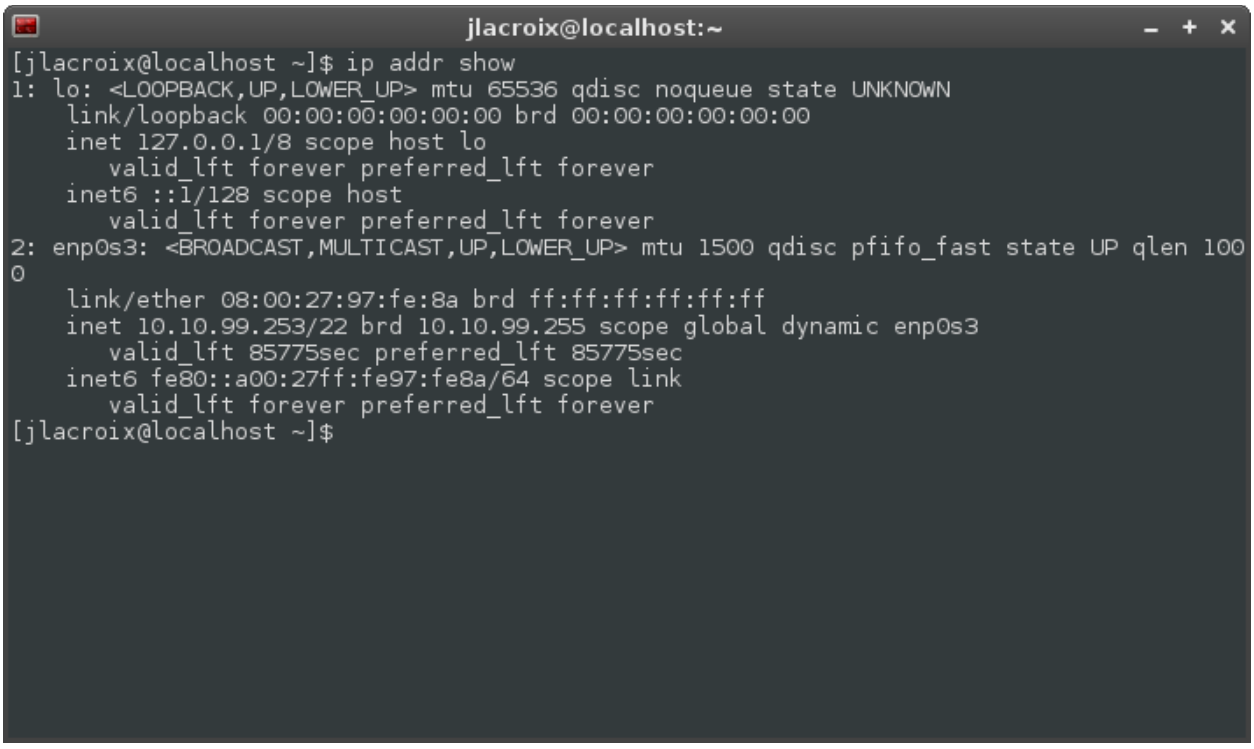

ROOT PASSWORD
Done
The root account is used for administering the system. Enter a password for the root user.
Root Password:
Strong
Confirm:

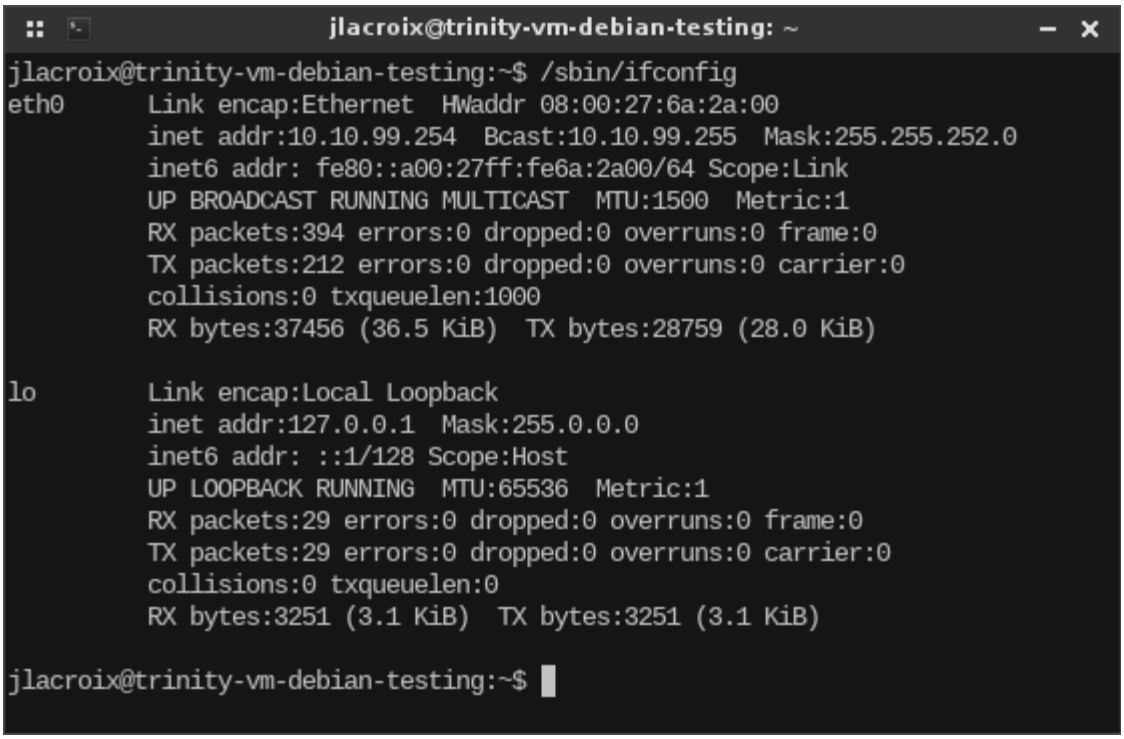


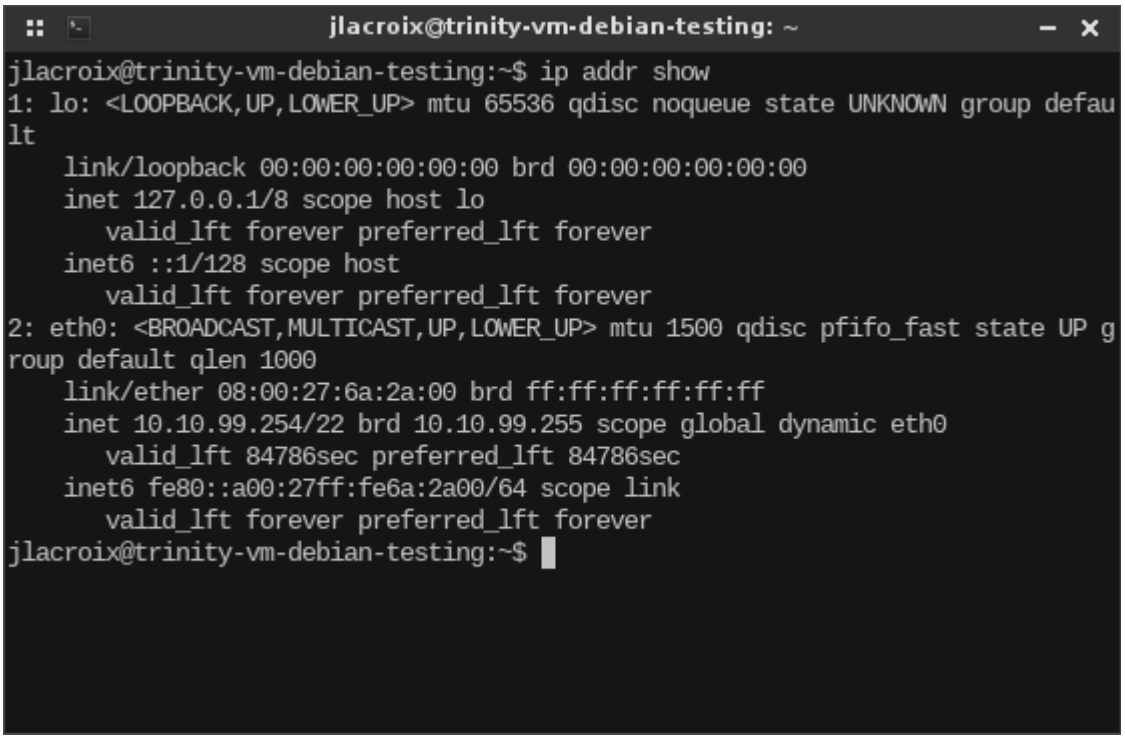


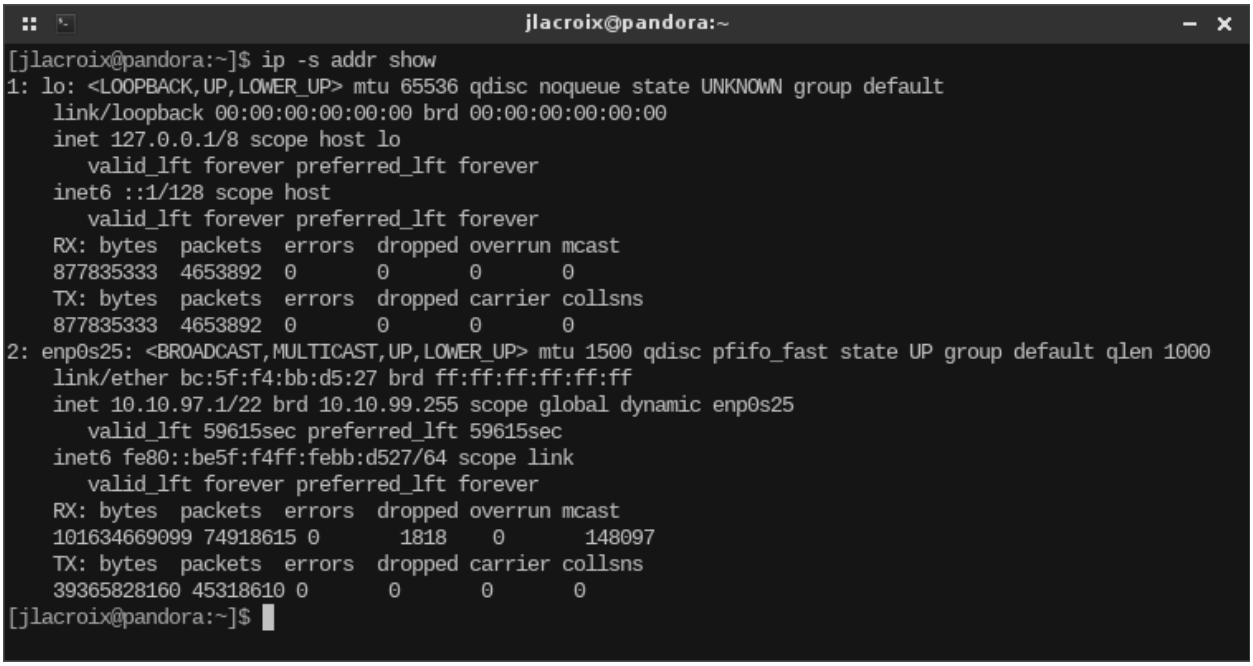
Chapter 2: Revisiting Linux Network Basics

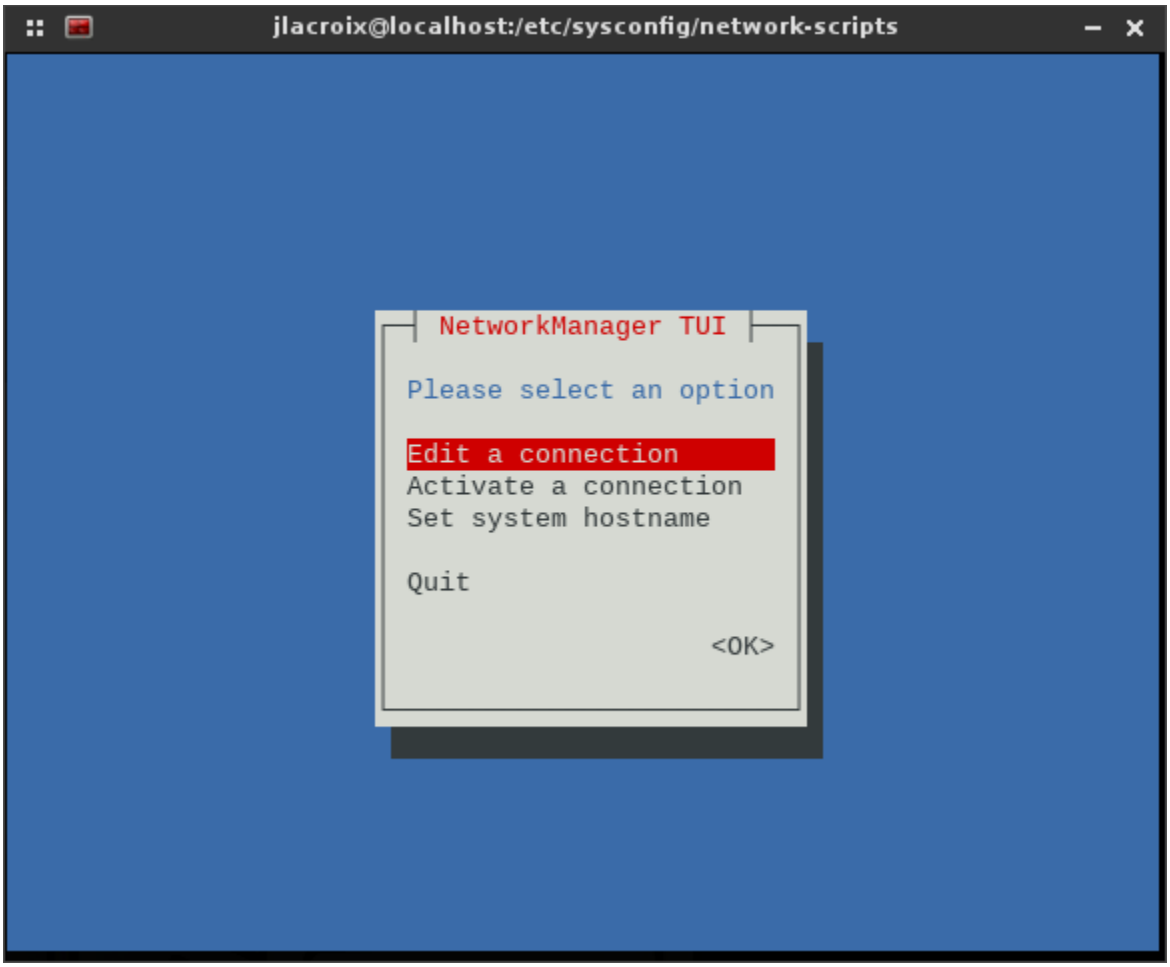


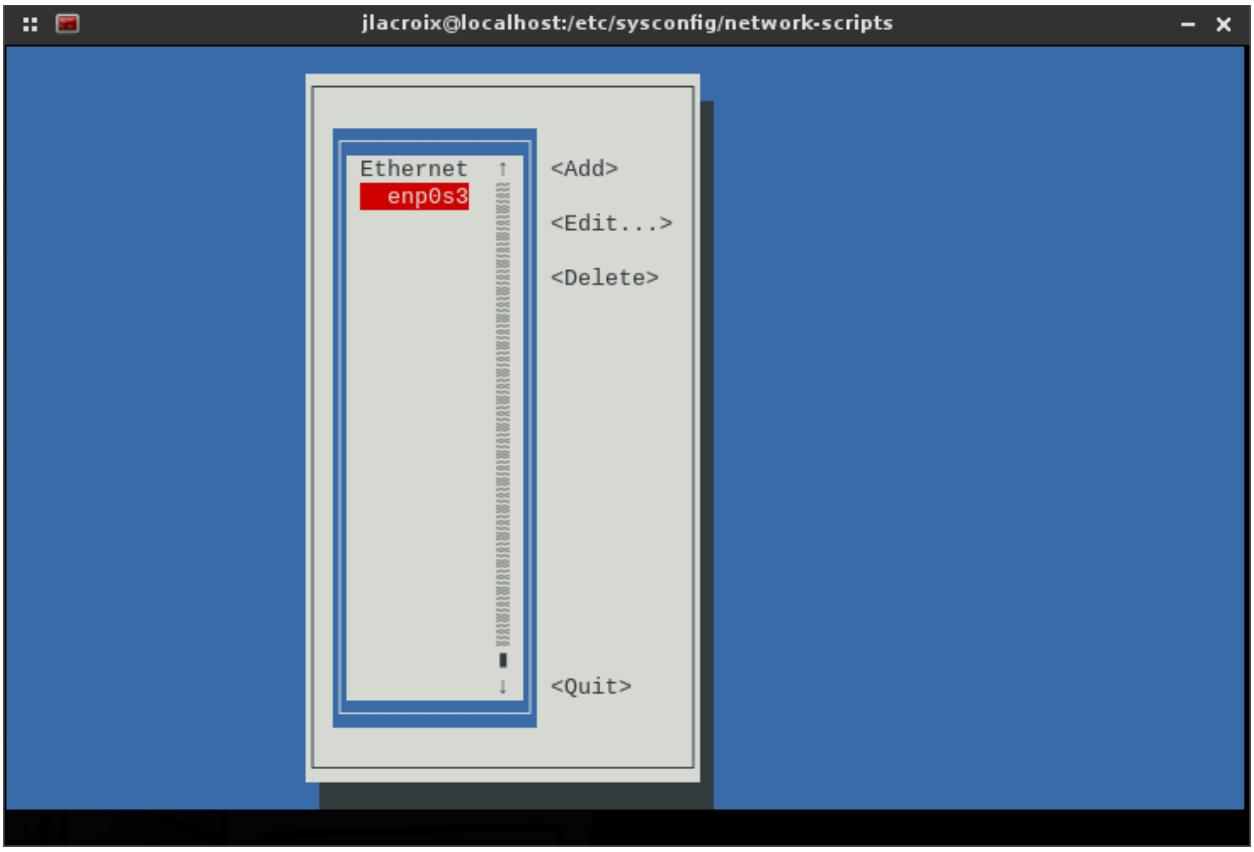

jlacroix@localhost:~
[jlacroix@localhost ~]$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 100
0
link/ether 08:00:27:97:fe:8a brd ff:ff:ff:ff:ff:ff
inet 10.10.99.253/22 brd 10.10.99.255 scope global dynamic enp0s3
valid_lft 85775sec preferred_lft 85775sec
inet6 fe80::a00:27ff:fe97:fe8a/64 scope link
valid_lft forever preferred_lft forever
[jlacroix@localhost ~]$

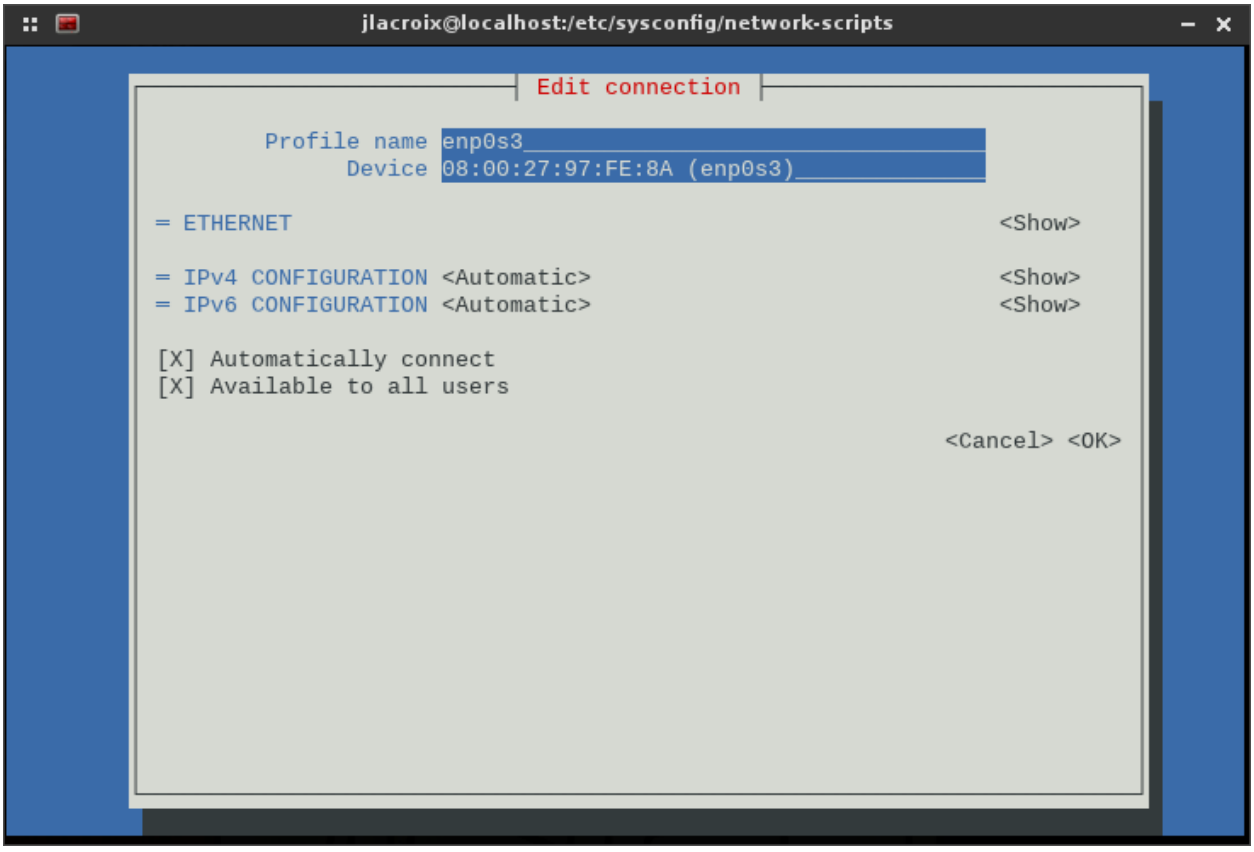

jlacroix@trinity-vm-debian-testing: ~
jlacroix@trinity-vm-debian-testing:~$ /sbin/ifconfig
eth0 Link encap:Ethernet HWaddr 08:00:27:6a:2a:00
inet addr:10.10.99.254 Bcast:10.10.99.255 Mask:255.255.252.0
inet6 addr: fe80::a00:27ff:fe6a:2a00/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:394 errors:0 dropped:0 overruns:0 frame:0
TX packets:212 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:37456 (36.5 KiB) TX bytes:28759 (28.0 KiB)
lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
inet6 addr: ::1/128 Scope:Host
UP LOOPBACK RUNNING MTU:65536 Metric:1
RX packets:29 errors:0 dropped:0 overruns:0 frame:0
TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:3251 (3.1 KiB) TX bytes:3251 (3.1 KiB)
jlacroix@trinity-vm-debian-testing:~$

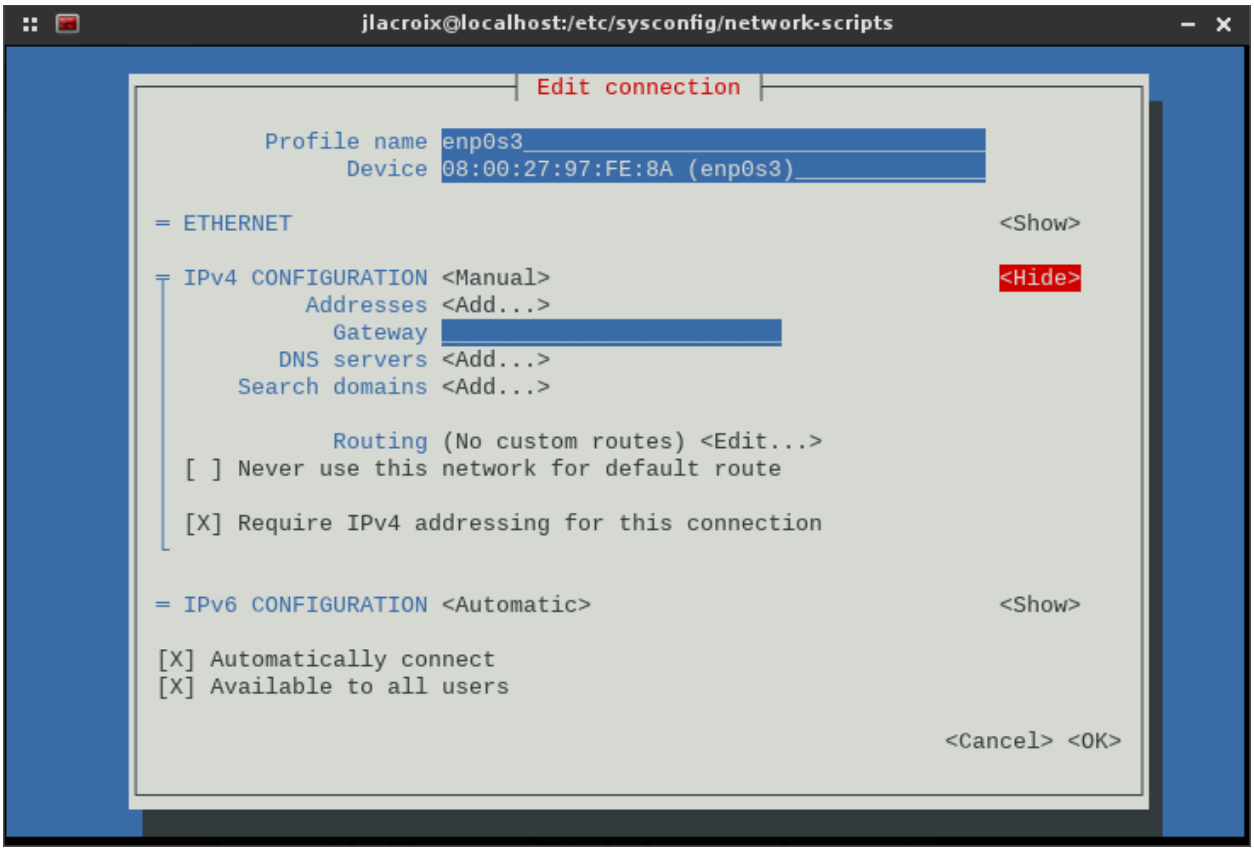

jlacroix@trinity-vm-debian-testing: ~
jlacroix@trinity-vm-debian-testing:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP g
roup default qlen 1000
link/ether 08:00:27:6a:2a:00 brd ff:ff:ff:ff:ff:ff
inet 10.10.99.254/22 brd 10.10.99.255 scope global dynamic eth0
valid_lft 84786sec preferred_lft 84786sec
inet6 fe80::a00:27ff:fe6a:2a00/64 scope link
valid_lft forever preferred_lft forever
jlacroix@trinity-vm-debian-testing:~$

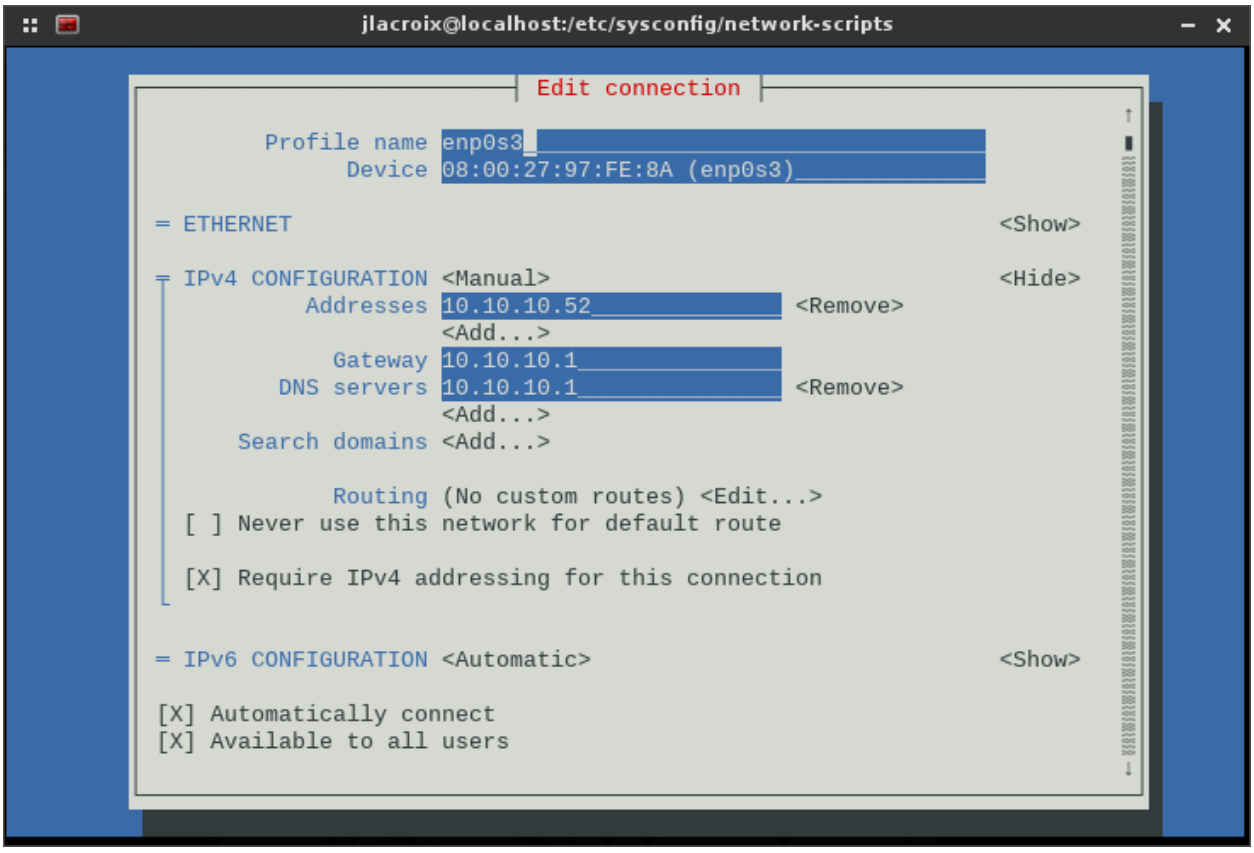

jlacroix@pandora:~
[jlacroix@pandora:~]$ ip -s addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
RX: bytes packets errors dropped overrun mcast
877835333 4653892 0 0 0 0
TX: bytes packets errors dropped carrier collsns
877835333 4653892 0 0 0 0
2: enp0s25: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
link/ether bc:5f:f4:bb:d5:27 brd ff:ff:ff:ff:ff:ff
inet 10.10.97.1/22 brd 10.10.99.255 scope global dynamic enp0s25
valid_lft 59615sec preferred_lft 59615sec
inet6 fe80::be5f:f4ff:febb:d527/64 scope link
valid_lft forever preferred_lft forever
RX: bytes packets errors dropped overrun mcast
101634669099 74918615 0 1818 0 148097
TX: bytes packets errors dropped carrier collsns
39365828160 45318610 0 0 0 0
[jlacroix@pandora:~]$


jlacroix@localhost:/etc/sysconfig/network-scripts
NetworkManager TUI
Please select an option
Edit a connection
Activate a connection
Set system hostname
Quit
<OK>

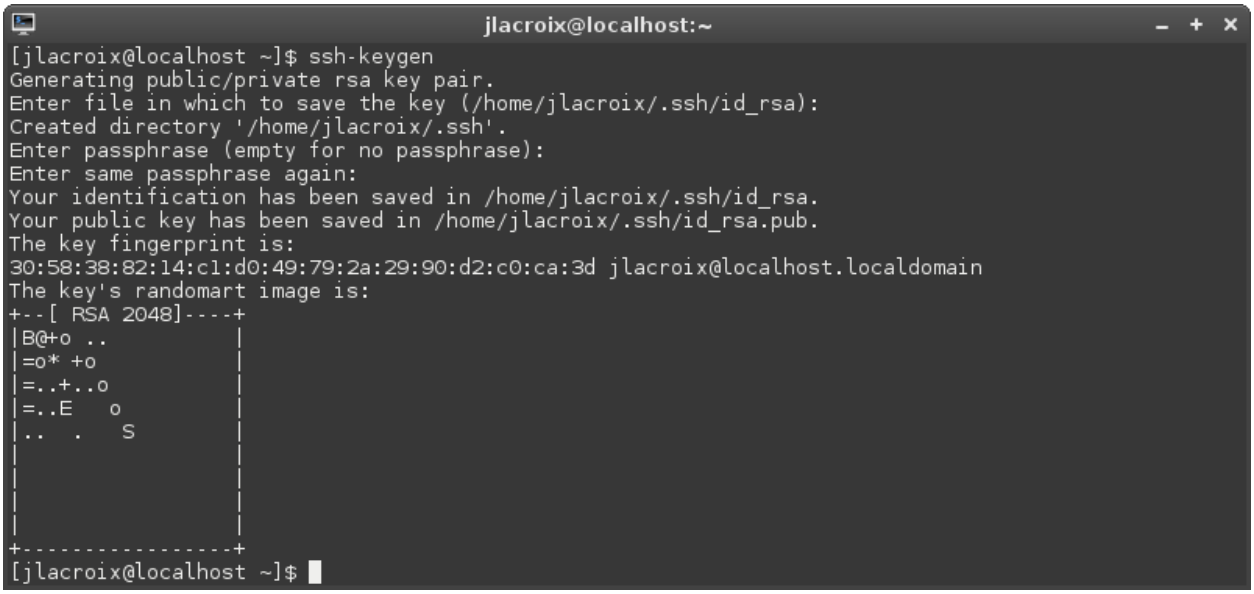

jlacroix@localhost:/etc/sysconfig/network-scripts
Ethernet
enp0s3
<Add>
<Edit...>
<Delete>
<Quit>

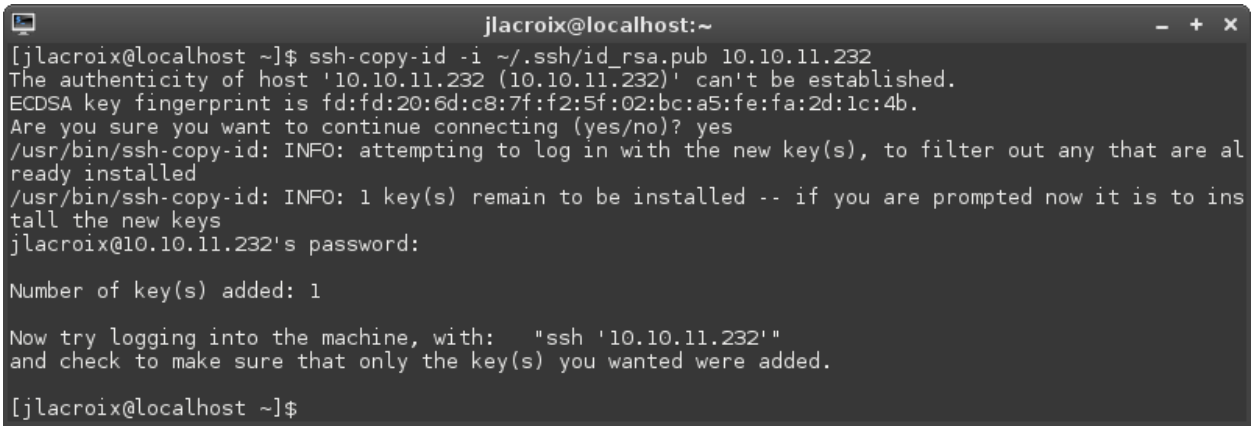

jlacroix@localhost:/etc/sysconfig/network-scripts
Edit connection
Profile name enp0s3
Device 08:00:27:97:FE:8A (enp0s3)
= ETHERNET <Show>
= IPv4 CONFIGURATION <Automatic> <Show>
= IPv6 CONFIGURATION <Automatic> <Show>
[X] Automatically connect
[X] Available to all users
<Cancel> <OK>


jlacroix@localhost:/etc/sysconfig/network-scripts
Edit connection
Profile name enp0s3
Device 08:00:27:97:FE:8A (enp0s3)
= ETHERNET <Show>
= IPv4 CONFIGURATION <Manual> <Hide>
Addresses <Add...>
Gateway
DNS servers <Add...>
Search domains <Add...>
Routing (No custom routes) <Edit...>
[ ] Never use this network for default route
[X] Require IPv4 addressing for this connection
= IPv6 CONFIGURATION <Automatic> <Show>
[X] Automatically connect
[X] Available to all users
<Cancel> <OK>

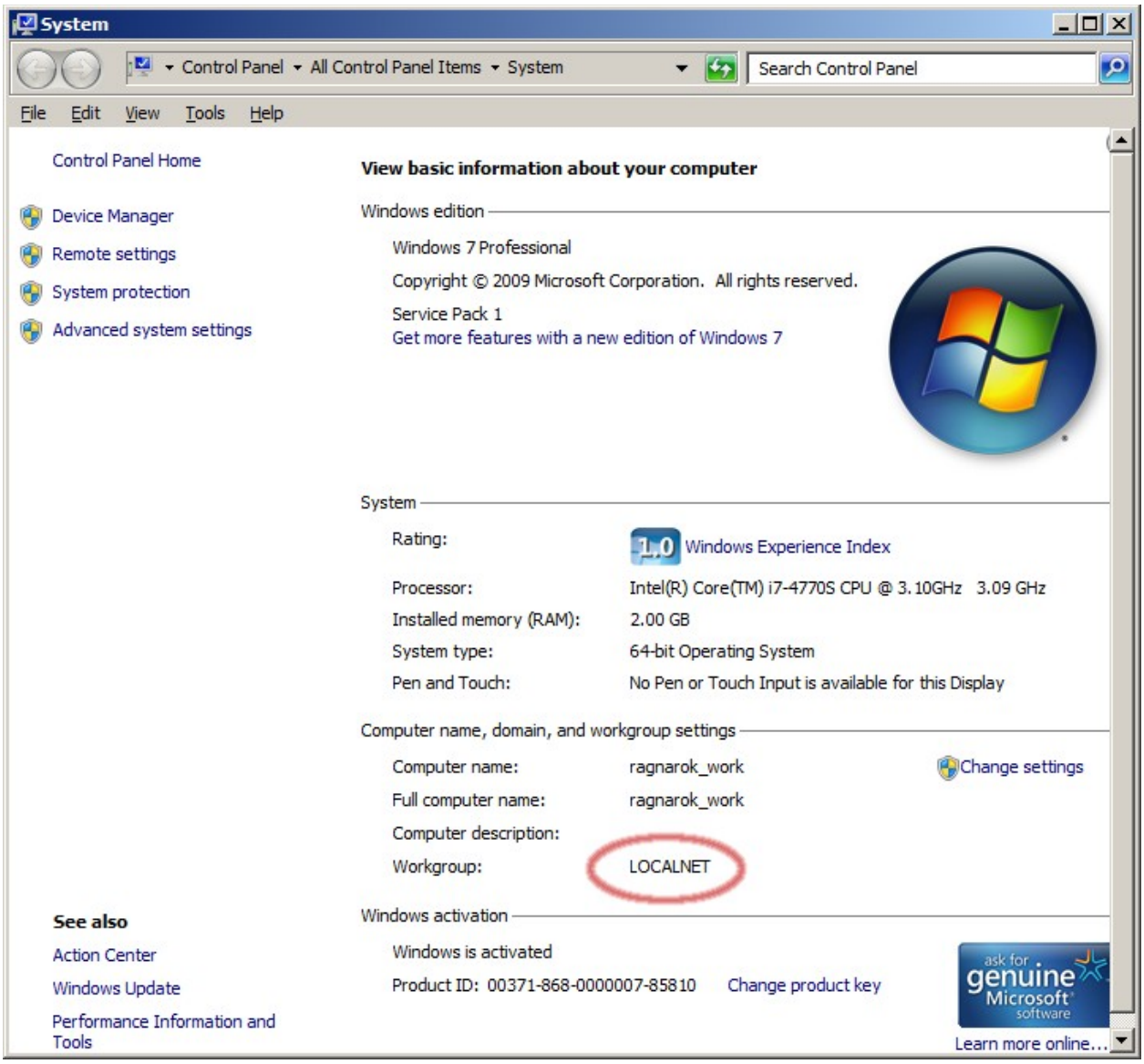

jlacroix@localhost:/etc/sysconfig/network-scripts
Edit connection
Profile name enp0s3
Device 08:00:27:97:FE:8A (enp0s3)
= ETHERNET <Show>
= IPv4 CONFIGURATION <Manual> <Hide>
Addresses 10.10.10.52 <Remove>
<Add...>
Gateway 10.10.10.1
DNS servers 10.10.10.1 <Remove>
<Add...>
Search domains <Add...>
Routing (No custom routes) <Edit...>
[ ] Never use this network for default route
[X] Require IPv4 addressing for this connection
= IPv6 CONFIGURATION <Automatic> <Show>
[X] Automatically connect
[X] Available to all users

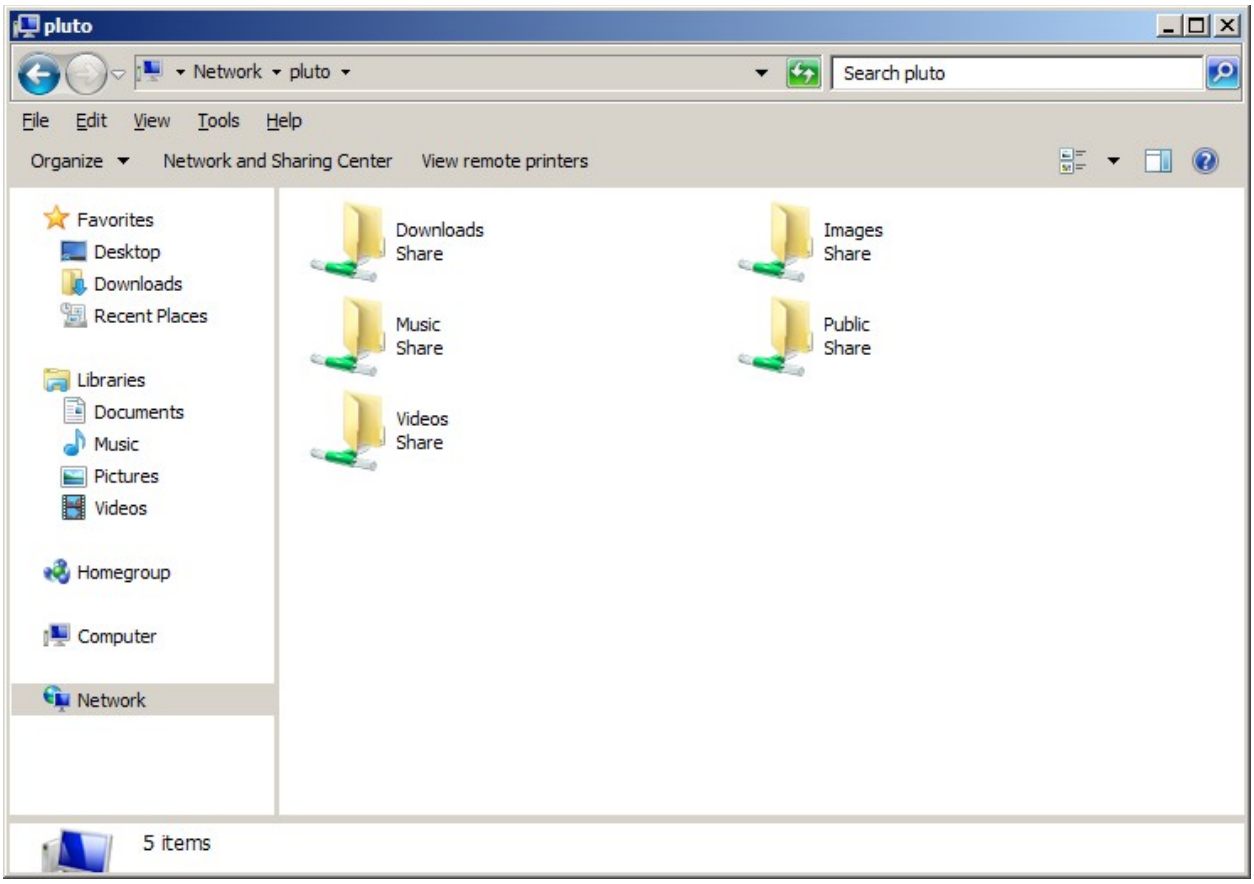
Chapter 3: Communicating Between Nodes via SSH

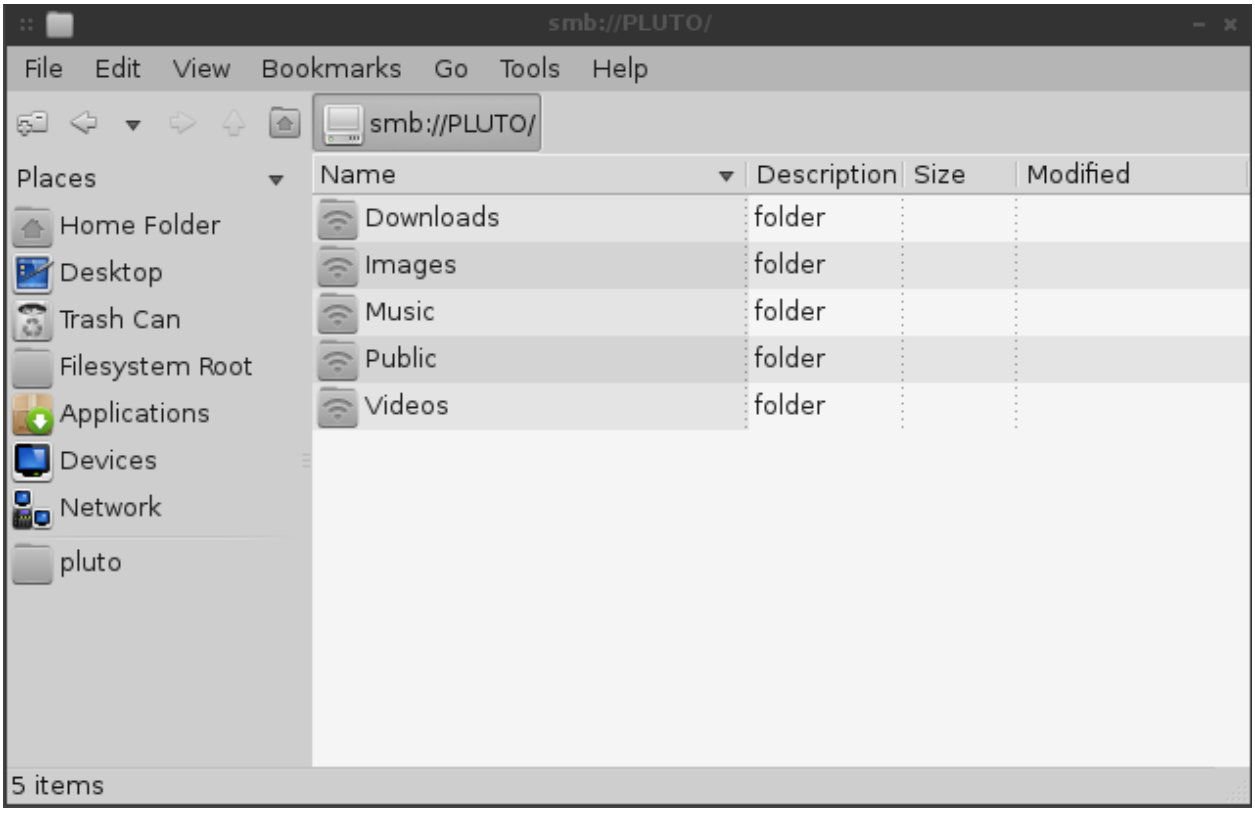




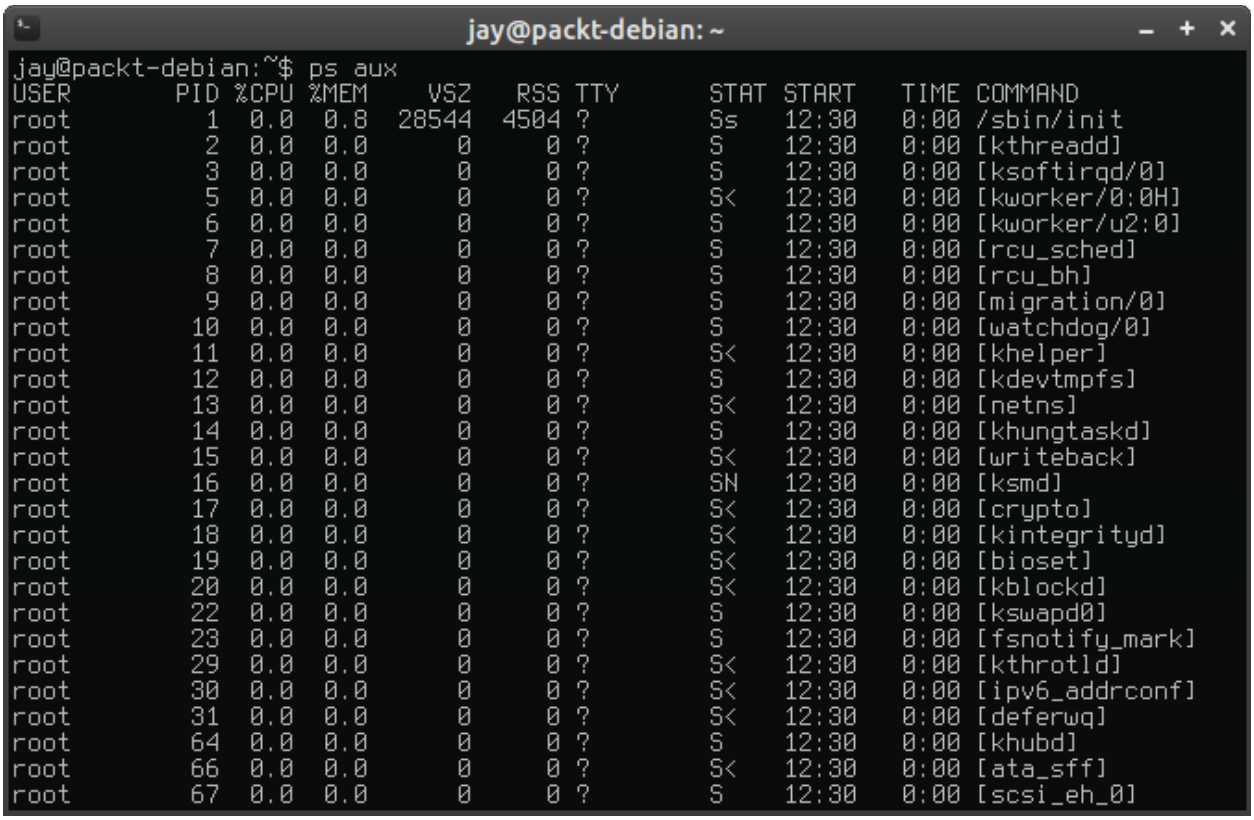
Chapter 4: Setting up a File Server


System
Control Panel ▸ All Control Panel Items ▸ System
Search Control Panel
File Edit View Tools Help
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
View basic information about your computer
Windows edition
Windows 7 Professional
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
System
Rating:
1.0 Windows Experience Index
Processor: Intel(R) Core(TM) i7-4770S CPU @ 3.10GHz 3.09 GHz
Installed memory (RAM): 2.00 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: ragnarok_work
Change settings
Full computer name: ragnarok_work
Computer description:
Workgroup: LOCALNET
Windows activation
Windows is activated
Product ID: 00371-868-0000007-85810
Change product key
ask for genuine Microsoft software
Learn more online...
See also
Action Center
Windows Update
Performance Information and Tools


pluto
Network ▸ pluto ▸
Search pluto
File Edit View Tools Help
Organize
Network and Sharing Center
View remote printers
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Homegroup
Computer
Network
Downloads Share
Images Share
Music Share
Public Share
Videos Share
5 items


smb://PLUTO/
File Edit View Bookmarks Go Tools Help
smb://PLUTO/
Places
Home Folder
Desktop
Trash Can
Filesystem Root
Applications
Devices
Network
pluto
Name
Description
Size
Modified
Downloads folder
Images folder
Music folder
Public folder
Videos folder
5 items

Chapter 5: Monitoring System Resources

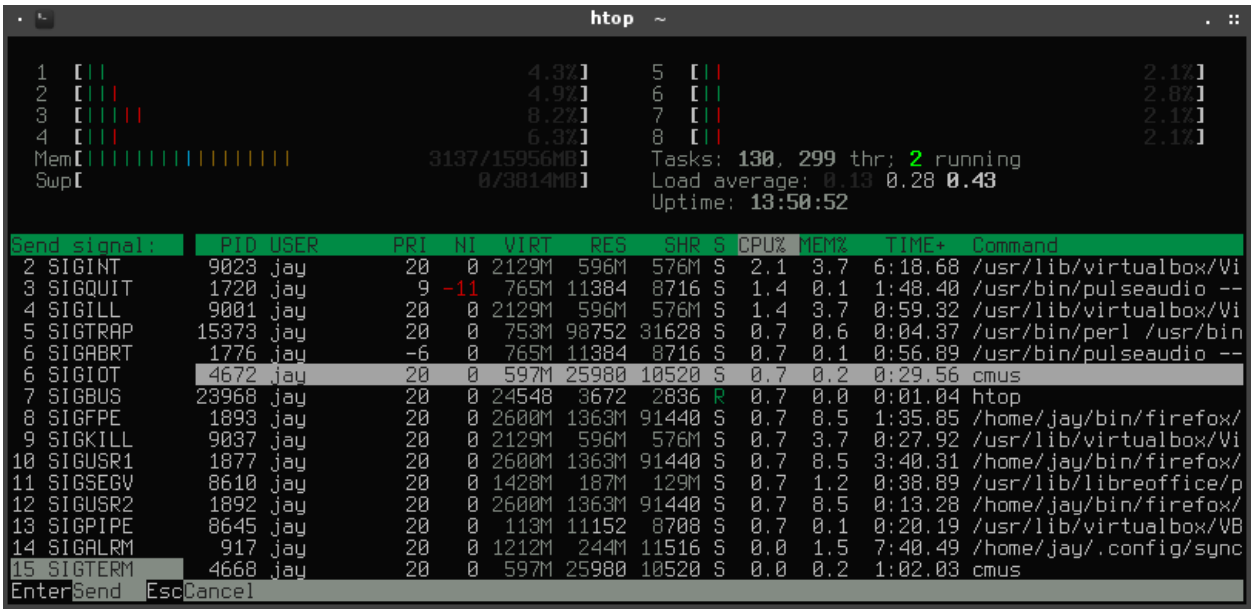


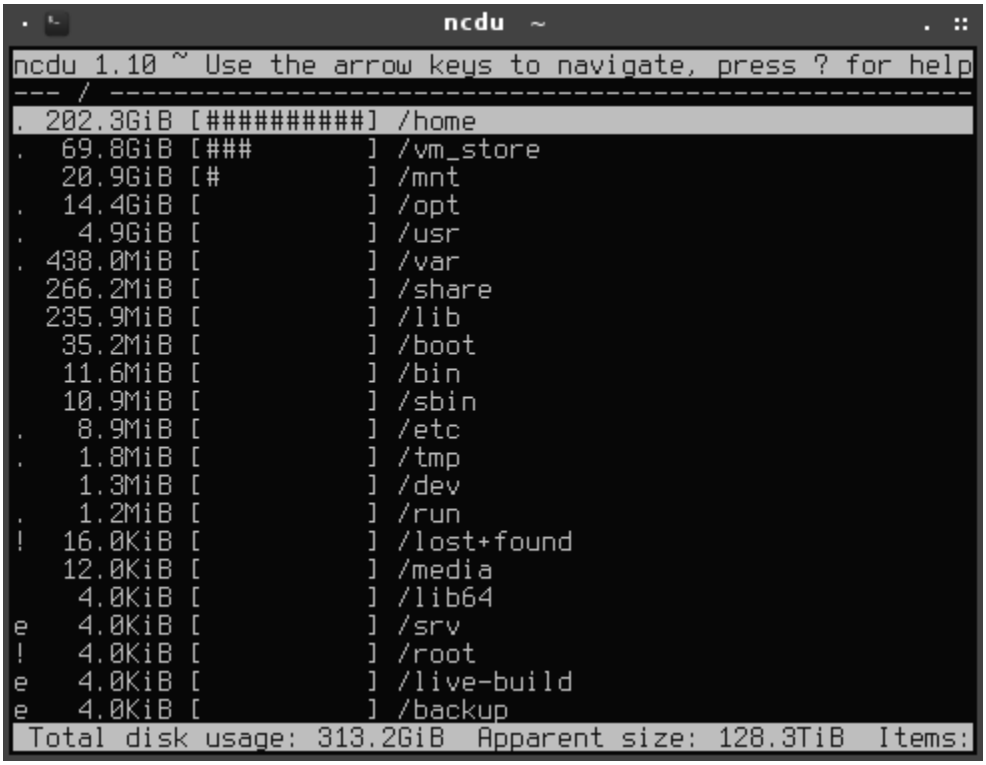
```
bash ~
11:05:51 [bahamut:~]$ free -m
             total       used       free     shared    buffers     cached
Mem:          7923       6995        927        120        441       2367
-/+ buffers/cache:       4186       3736
Swap:         1906        118       1788
11:05:56 [bahamut:~]$
```

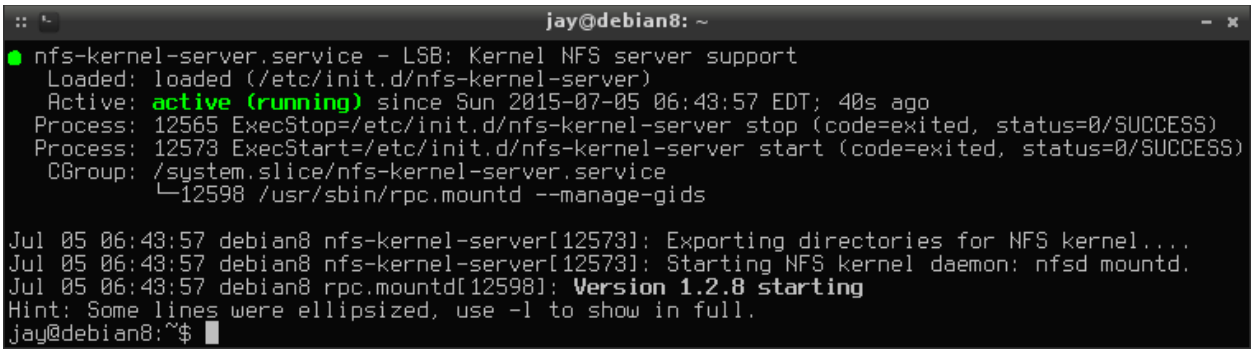
```
jay@centos7:~
top - 14:35:30 up 11 min,  3 users,  load average: 0.00, 0.04, 0.05
Tasks:  86 total,   2 running,  84 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :   501400 total,   101536 free,    91048 used,   308816 buff/cache
KiB Swap:   839676 total,   839668 free,        8 used.   305932 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
11902 jay       20   0  129892   1660   1204 R  0.3  0.3   0:00.05 top
    1 root      20   0   56632   6684   3912 S  0.0  1.3   0:00.56 systemd
    2 root      20   0       0      0      0 S  0.0  0.0   0:00.00 kthreadd
    3 root      20   0       0      0      0 S  0.0  0.0   0:00.21 ksoftirqd/0
    5 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 kworker/0:0H
    6 root      20   0       0      0      0 S  0.0  0.0   0:00.02 kworker/u2:0
    7 root      rt   0       0      0      0 S  0.0  0.0   0:00.00 migration/0
    8 root      20   0       0      0      0 S  0.0  0.0   0:00.00 rcu_bh
    9 root      20   0       0      0      0 S  0.0  0.0   0:00.00 rcuob/0
   10 root      20   0       0      0      0 S  0.0  0.0   0:00.53 rcu_sched
   11 root      20   0       0      0      0 R  0.0  0.0   0:00.37 rcuos/0
   12 root      rt   0       0      0      0 S  0.0  0.0   0:00.00 watchdog/0
   13 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 khelper
   14 root      20   0       0      0      0 S  0.0  0.0   0:00.00 kdevtmpfs
   15 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 netns
   16 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 writeback
   17 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 kintegrityd
   18 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 bioset
   19 root       0 -20       0      0      0 S  0.0  0.0   0:00.00 kblockd
```

```
sudo ~
Total DISK READ :       125.13 K/s | Total DISK WRITE :       23.46 K/s
Actual DISK READ:       125.13 K/s | Actual DISK WRITE:       62.56 K/s
  TID  PRIO  USER     DISK READ>  DISK WRITE  SWAPIN      IO    COMMAND
 4669 be/4 jay        125.13 K/s    0.00 B/s  0.00 %  0.00 % cmus
    1 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % init
    2 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [kthreadd]
    3 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [ksoftirqd/0]
    5 be/0 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [kworker/0:0H]
    7 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [rcu_sched]
    8 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [rcu_bh]
    9 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [migration/0]
   10 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [watchdog/0]
   11 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [watchdog/1]
   12 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [migration/1]
   13 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [ksoftirqd/1]
   15 be/0 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [kworker/1:0H]
   16 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [watchdog/2]
   17 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [migration/2]
   18 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [ksoftirqd/2]
 8211 be/4 jay          0.00 B/s    0.00 B/s  0.00 %  0.00 % firefox [DNS Res~ver #53]
   20 be/0 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [kworker/2:0H]
   21 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [watchdog/3]
   22 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [migration/3]
   23 be/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [ksoftirqd/3]
   25 be/0 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [kworker/3:0H]
   26 rt/4 root         0.00 B/s    0.00 B/s  0.00 %  0.00 % [watchdog/4]
```

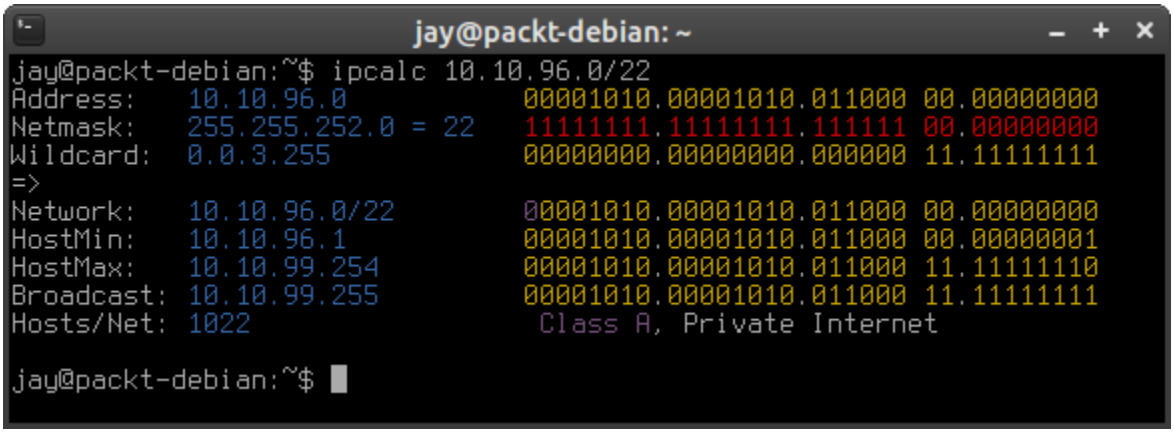
```
htop ~
  1  [|||                                  4.3%]     5  [||                                 1.9%]
  2  [||                                   2.9%]     6  [||                                 1.9%]
  3  [|||                                  5.3%]     7  [||                                 1.4%]
  4  [|||                                  4.7%]     8  [|                                  0.5%]
  Mem[||||||||||||||||          3199/15956MB]     Tasks: 130, 300 thr; 1 running
  Swp[                             0/3814MB]     Load average: 0.23 0.38 0.49
                                                 Uptime: 13:46:26

  PID USER      PRI  NI  VIRT   RES   SHR S CPU% MEM%   TIME+  Command
 1870 jay        20   0 2607M 1418M 91440 S  6.2  8.9  1h07:23 /home/jay/bin/firefox/firefox
 1323 root       20   0  185M 44932 24296 S  2.8  0.3 33:11.79 /usr/bin/X :0 -seat seat0 -auth /var/
 8989 jay        20   0 2129M  596M  576M S  2.4  3.7 11:39.63 /usr/lib/virtualbox/VirtualBox --comm
15355 root       20   0 58460 17896  7736 S  2.4  0.1  9:06.33 /usr/bin/python /usr/sbin/iotop
15679 root       20   0 58468 17828  7636 S  1.4  0.1  8:38.50 /usr/bin/python /usr/sbin/iotop --onl
15373 jay        20   0  754M 99036 31628 S  1.4  0.6  0:03.79 /usr/bin/perl /usr/bin/shutter
 9023 jay        20   0 2129M  596M  576M S  0.9  3.7  6:15.18 /usr/lib/virtualbox/VirtualBox --comm
 1720 jay         9 -11  765M 11384  8716 S  0.9  0.1  1:45.73 /usr/bin/pulseaudio --start
 4668 jay        20   0  597M 25980 10520 S  0.9  0.2  1:00.14 cmus
 4672 jay        20   0  597M 25980 10520 S  0.9  0.2  0:28.69 cmus
 1798 jay        20   0  435M  5400  4484 S  0.9  0.0  3:57.14 conky
 1893 jay        20   0 2607M 1418M 91440 S  0.9  8.9  1:35.15 /home/jay/bin/firefox/firefox
 1776 jay        -6   0  765M 11384  8716 S  0.5  0.1  0:55.49 /usr/bin/pulseaudio --start
 1803 jay        20   0  435M  5400  4484 S  0.5  0.0  2:20.46 conky
 8633 jay        20   0  783M 46820 37760 S  0.5  0.3  0:26.94 /usr/lib/virtualbox/VirtualBox
F1Help  F2Setup F3SearchF4FilterF5Tree  F6SortByF7Nice -F8Nice +F9Kill  F10Quit
```

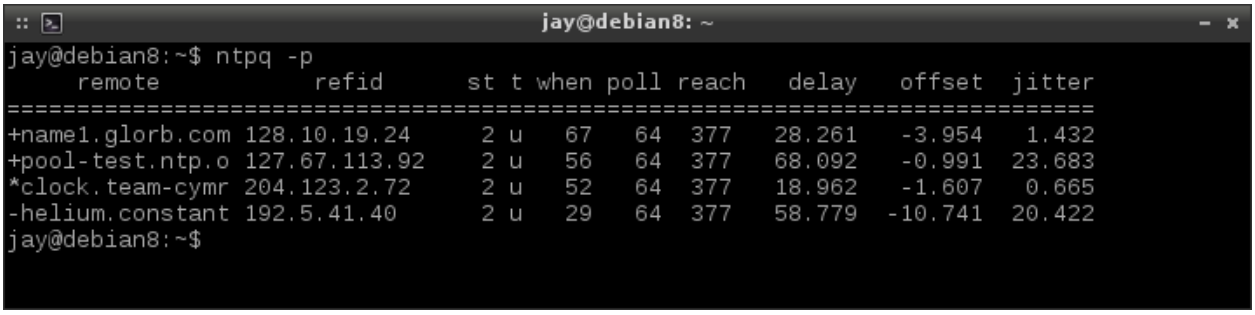

htop ~
1 [|| 4.3%]
2 [||| 4.9%]
3 [||||| 8.2%]
4 [||| 6.3%]
5 [|| 2.1%]
6 [|| 2.8%]
7 [|| 2.1%]
8 [|| 2.1%]
Mem[|||||||||||||||| 3137/15956MB]
Swp[0/3814MB]
Tasks: 130, 299 thr; 2 running
Load average: 0.13 0.28 0.43
Uptime: 13:50:52
Send signal:
2 SIGINT
3 SIGQUIT
4 SIGILL
5 SIGTRAP
6 SIGABRT
6 SIGIOT
7 SIGBUS
8 SIGFPE
9 SIGKILL
10 SIGUSR1
11 SIGSEGV
12 SIGUSR2
13 SIGPIPE
14 SIGALRM
15 SIGTERM
Enter Send Esc Cancel
PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
9023 jay 20 0 2129M 596M 576M S 2.1 3.7 6:18.68 /usr/lib/virtualbox/Vi
1720 jay 9 -11 765M 11384 8716 S 1.4 0.1 1:48.40 /usr/bin/pulseaudio --
9001 jay 20 0 2129M 596M 576M S 1.4 3.7 0:59.32 /usr/lib/virtualbox/Vi
15373 jay 20 0 753M 98752 31628 S 0.7 0.6 0:04.37 /usr/bin/perl /usr/bin
1776 jay -6 0 765M 11384 8716 S 0.7 0.1 0:56.89 /usr/bin/pulseaudio --
4672 jay 20 0 597M 25980 10520 S 0.7 0.2 0:29.56 cmus
23968 jay 20 0 24548 3672 2836 R 0.7 0.0 0:01.04 htop
1893 jay 20 0 2600M 1363M 91440 S 0.7 8.5 1:35.85 /home/jay/bin/firefox/
9037 jay 20 0 2129M 596M 576M S 0.7 3.7 0:27.92 /usr/lib/virtualbox/Vi
1877 jay 20 0 2600M 1363M 91440 S 0.7 8.5 3:40.31 /home/jay/bin/firefox/
8610 jay 20 0 1428M 187M 129M S 0.7 1.2 0:38.89 /usr/lib/libreoffice/p
1892 jay 20 0 2600M 1363M 91440 S 0.7 8.5 0:13.28 /home/jay/bin/firefox/
8645 jay 20 0 113M 11152 8708 S 0.7 0.1 0:20.19 /usr/lib/virtualbox/VB
917 jay 20 0 1212M 244M 11516 S 0.0 1.5 7:40.49 /home/jay/.config/sync
4668 jay 20 0 597M 25980 10520 S 0.0 0.2 1:02.03 cmus

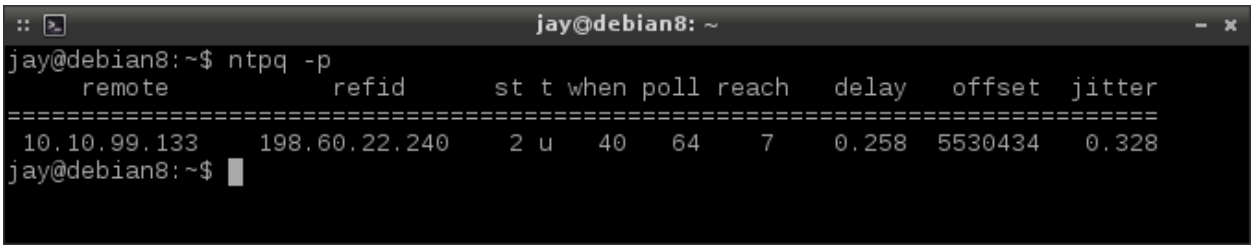

ncdu ~
ncdu 1.10 ~ Use the arrow keys to navigate, press ? for help
--- / ----------
. 202.3GiB [##########] /home
. 69.8GiB [###] /vm_store
20.9GiB [#] /mnt
. 14.4GiB [ ] /opt
. 4.9GiB [ ] /usr
. 438.0MiB [ ] /var
266.2MiB [ ] /share
235.9MiB [ ] /lib
35.2MiB [ ] /boot
11.6MiB [ ] /bin
10.9MiB [ ] /sbin
. 8.9MiB [ ] /etc
. 1.8MiB [ ] /tmp
1.3MiB [ ] /dev
. 1.2MiB [ ] /run
! 16.0KiB [ ] /lost+found
12.0KiB [ ] /media
4.0KiB [ ] /lib64
e 4.0KiB [ ] /srv
! 4.0KiB [ ] /root
e 4.0KiB [ ] /live-build
e 4.0KiB [ ] /backup
Total disk usage: 313.2GiB Apparent size: 128.3TiB Items:



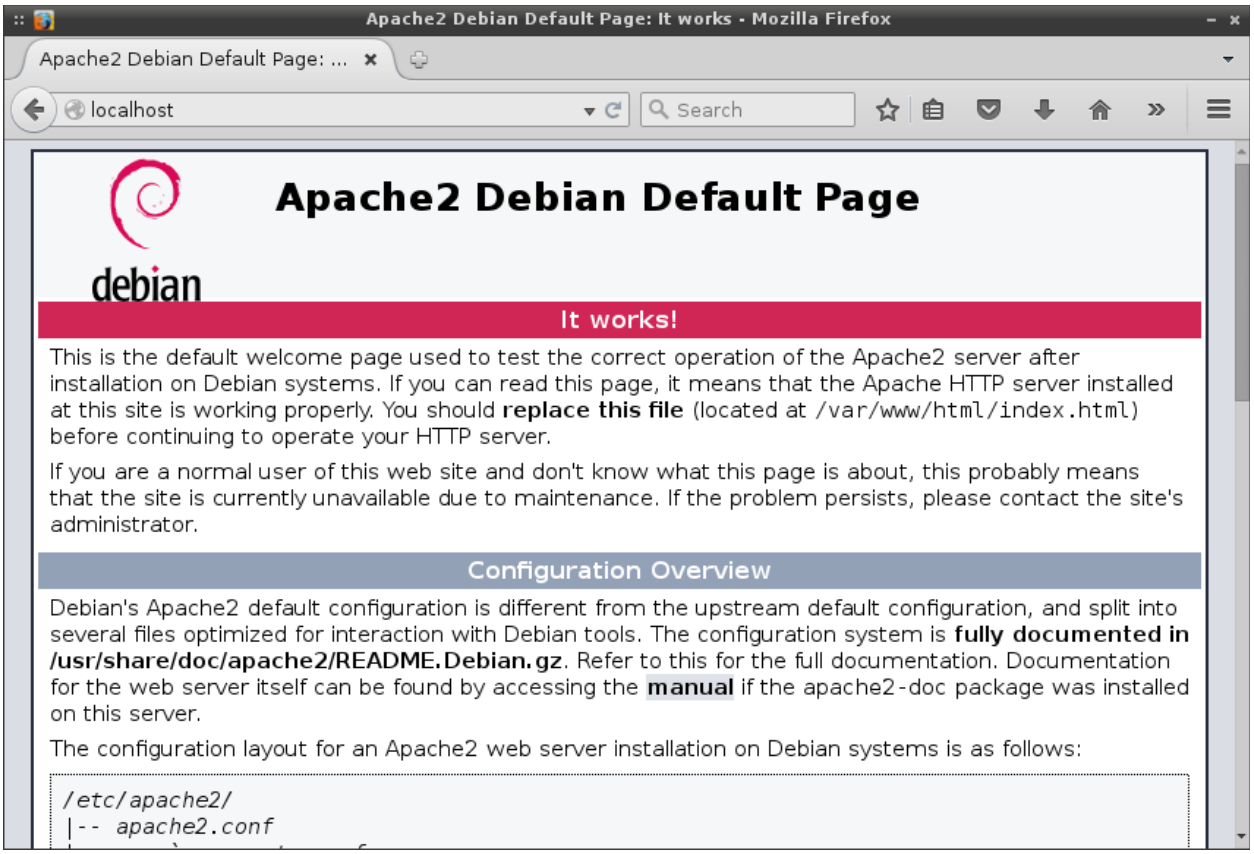
Chapter 6: Confi guring Network Services

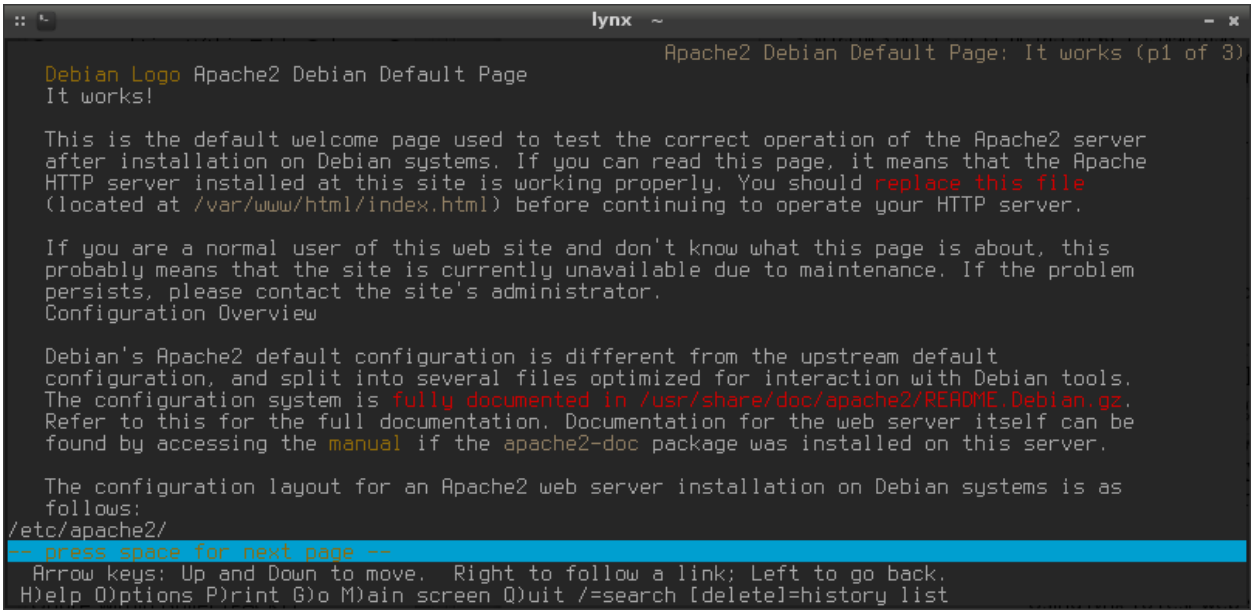


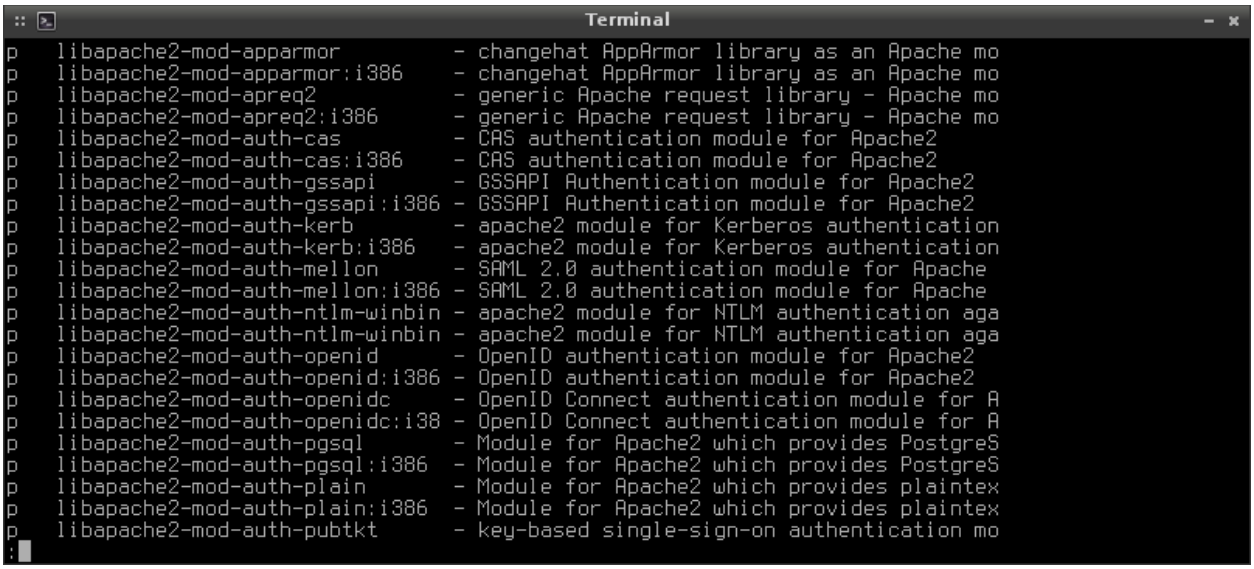


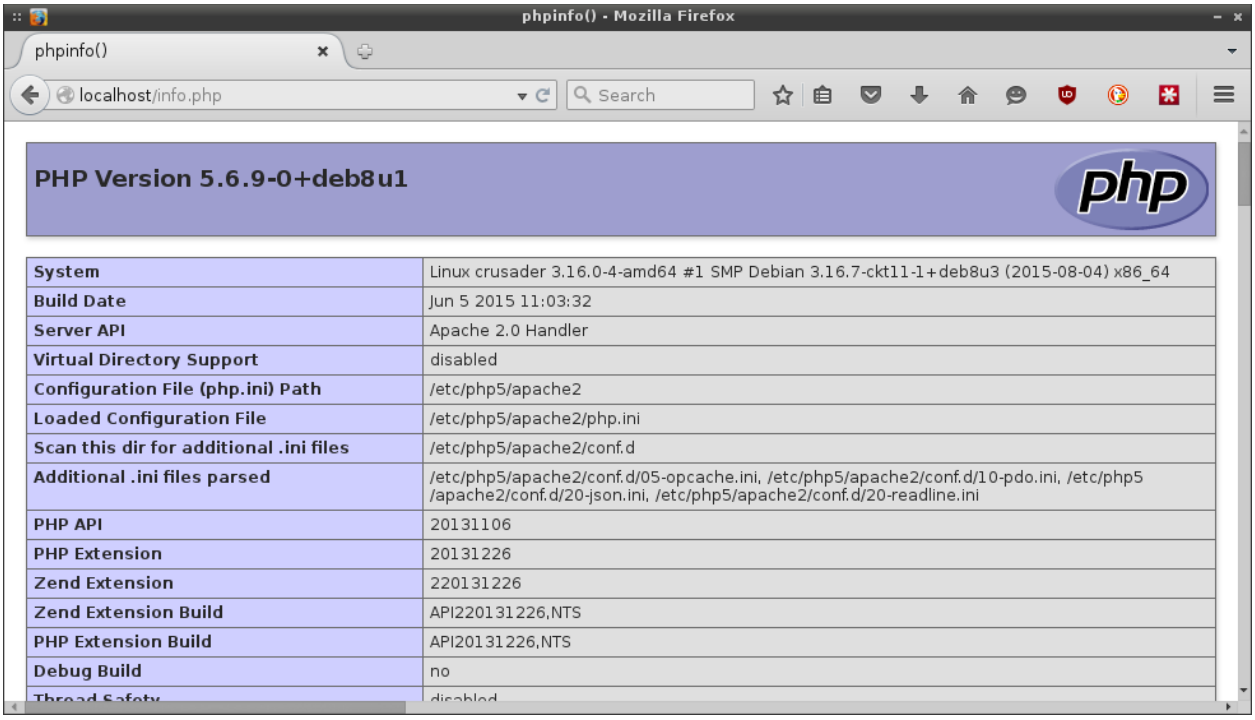


Chapter 7: Hosting HTTP Content via Apache

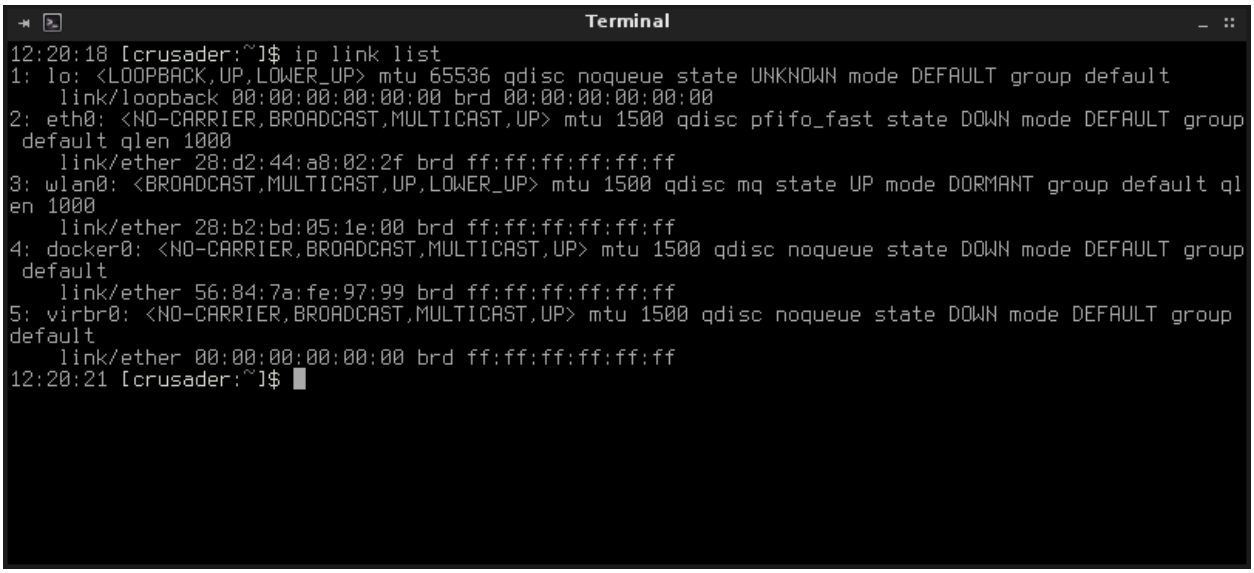

Apache2 Debian Default Page: It works - Mozilla Firefox
Apache2 Debian Default Page: ...
localhost
Search
Apache2 Debian Default Page
debian
It works!
This is the default welcome page used to test the correct operation of the Apache2 server after installation on Debian systems. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.
If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.
Configuration Overview
Debian's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Debian tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.
The configuration layout for an Apache2 web server installation on Debian systems is as follows:
/etc/apache2/
|-- apache2.conf

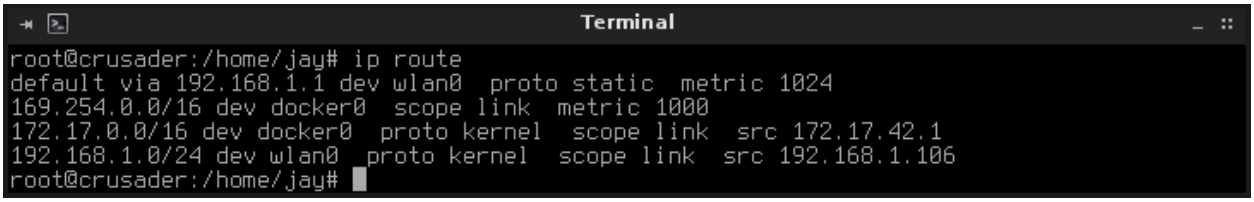

lynx ~
Apache2 Debian Default Page: It works (p1 of 3)
Debian Logo Apache2 Debian Default Page
It works!
This is the default welcome page used to test the correct operation of the Apache2 server after installation on Debian systems. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.
If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.
Configuration Overview
Debian's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Debian tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.
The configuration layout for an Apache2 web server installation on Debian systems is as follows:
/etc/apache2/
-- press space for next page --
Arrow keys: Up and Down to move. Right to follow a link; Left to go back.
H)elp O)ptions P)rint G)o M)ain screen Q)uit /=search [delete]=history list

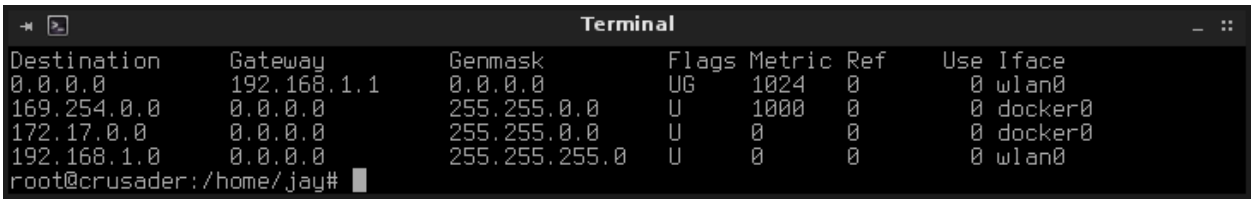




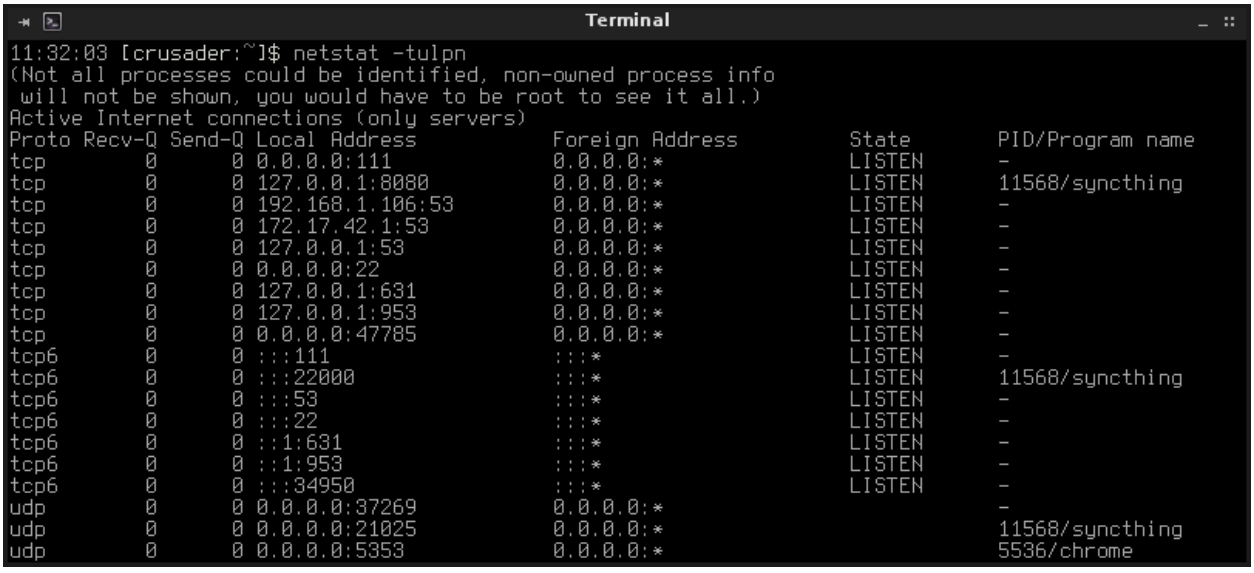
Chapter 8: Understanding Advanced Networking Concepts

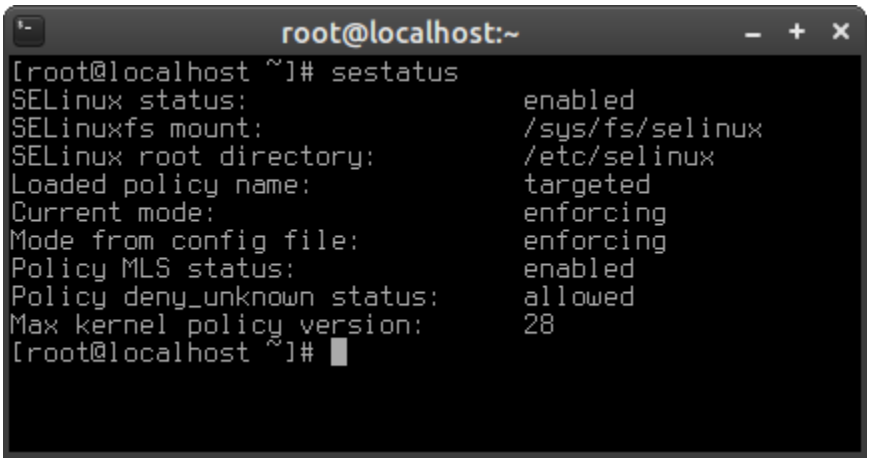




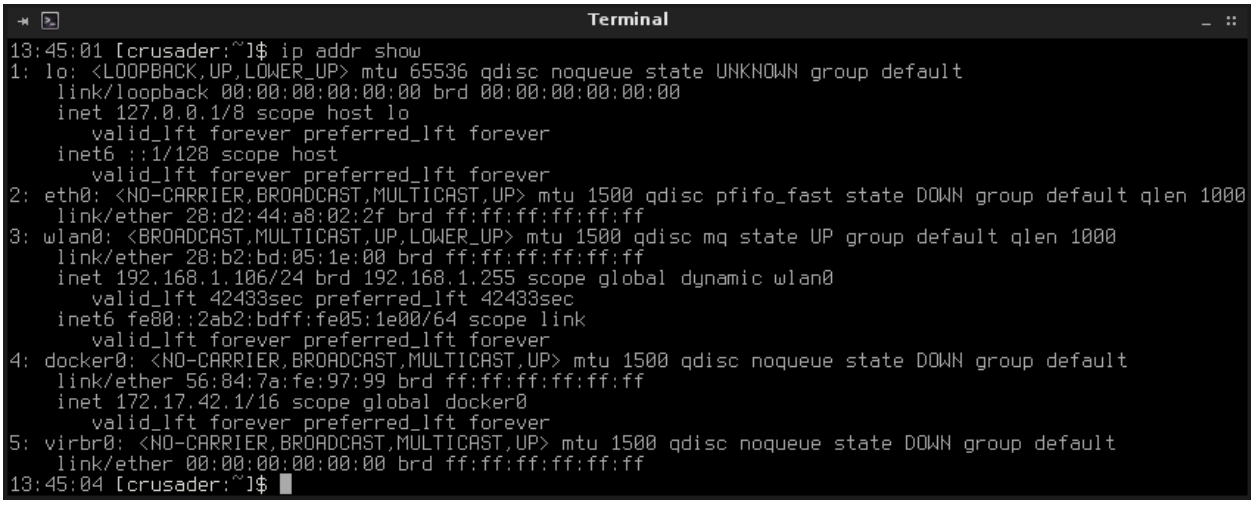


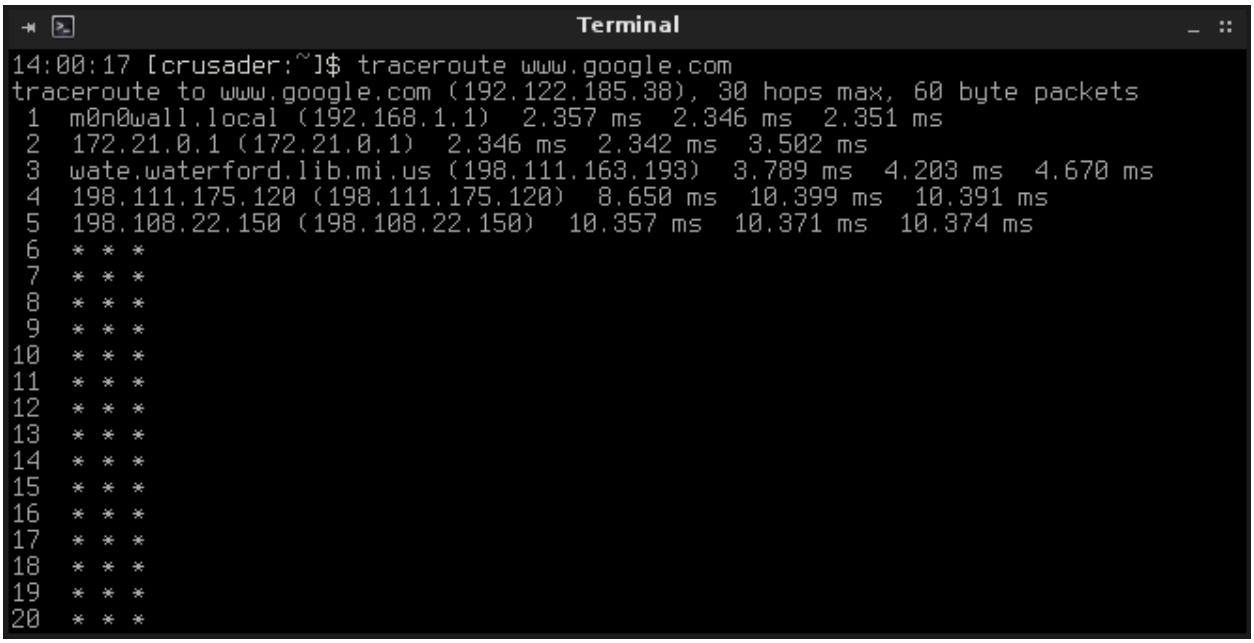
Chapter 9: Securing Your Network

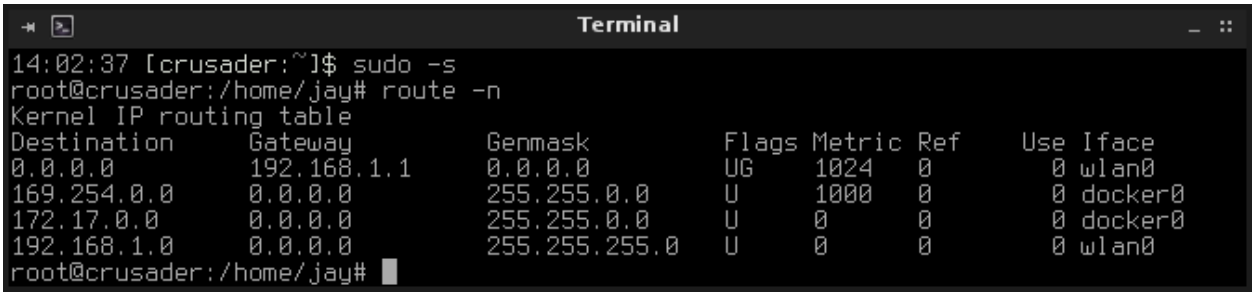


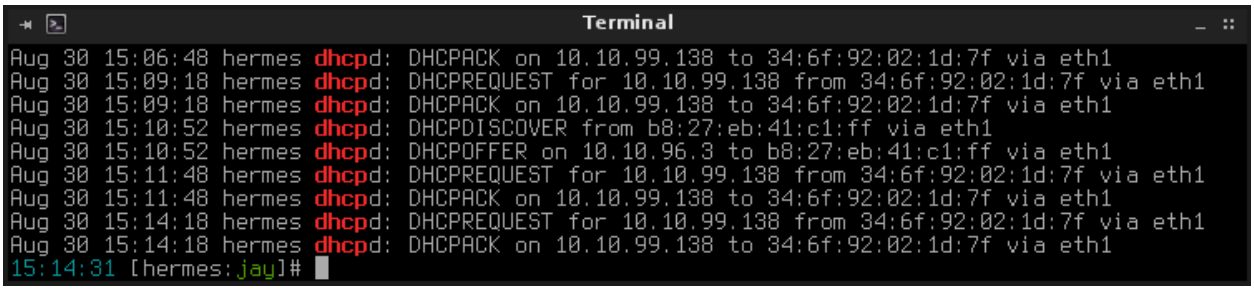


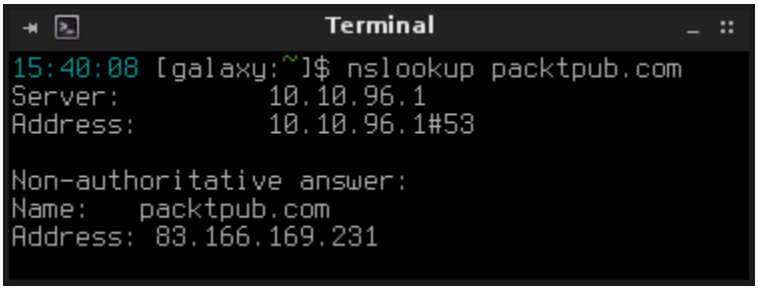
Chapter 10: Troubleshooting Network Issues



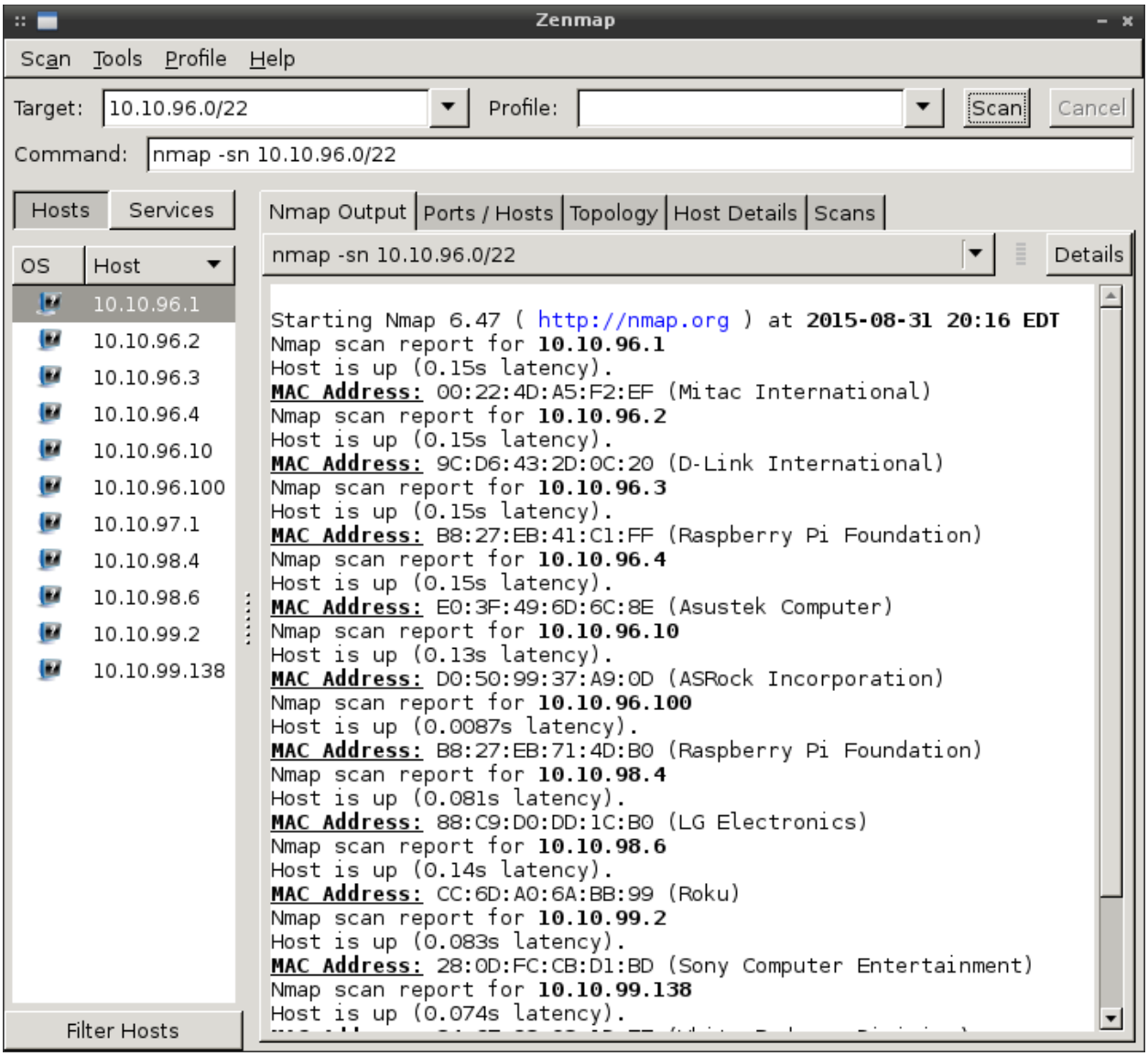

Terminal
14:00:17 [crusader:~]$ traceroute www.google.com
traceroute to www.google.com (192.122.185.38), 30 hops max, 60 byte packets
 1 m0n0wall.local (192.168.1.1) 2.357 ms 2.346 ms 2.351 ms
 2 172.21.0.1 (172.21.0.1) 2.346 ms 2.342 ms 3.502 ms
 3 wate.waterford.lib.mi.us (198.111.163.193) 3.789 ms 4.203 ms 4.670 ms
 4 198.111.175.120 (198.111.175.120) 8.650 ms 10.399 ms 10.391 ms
 5 198.108.22.150 (198.108.22.150) 10.357 ms 10.371 ms 10.374 ms
 6 * * *
 7 * * *
 8 * * *
 9 * * *
10 * * *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 * * *
17 * * *
18 * * *
19 * * *
20 * * *

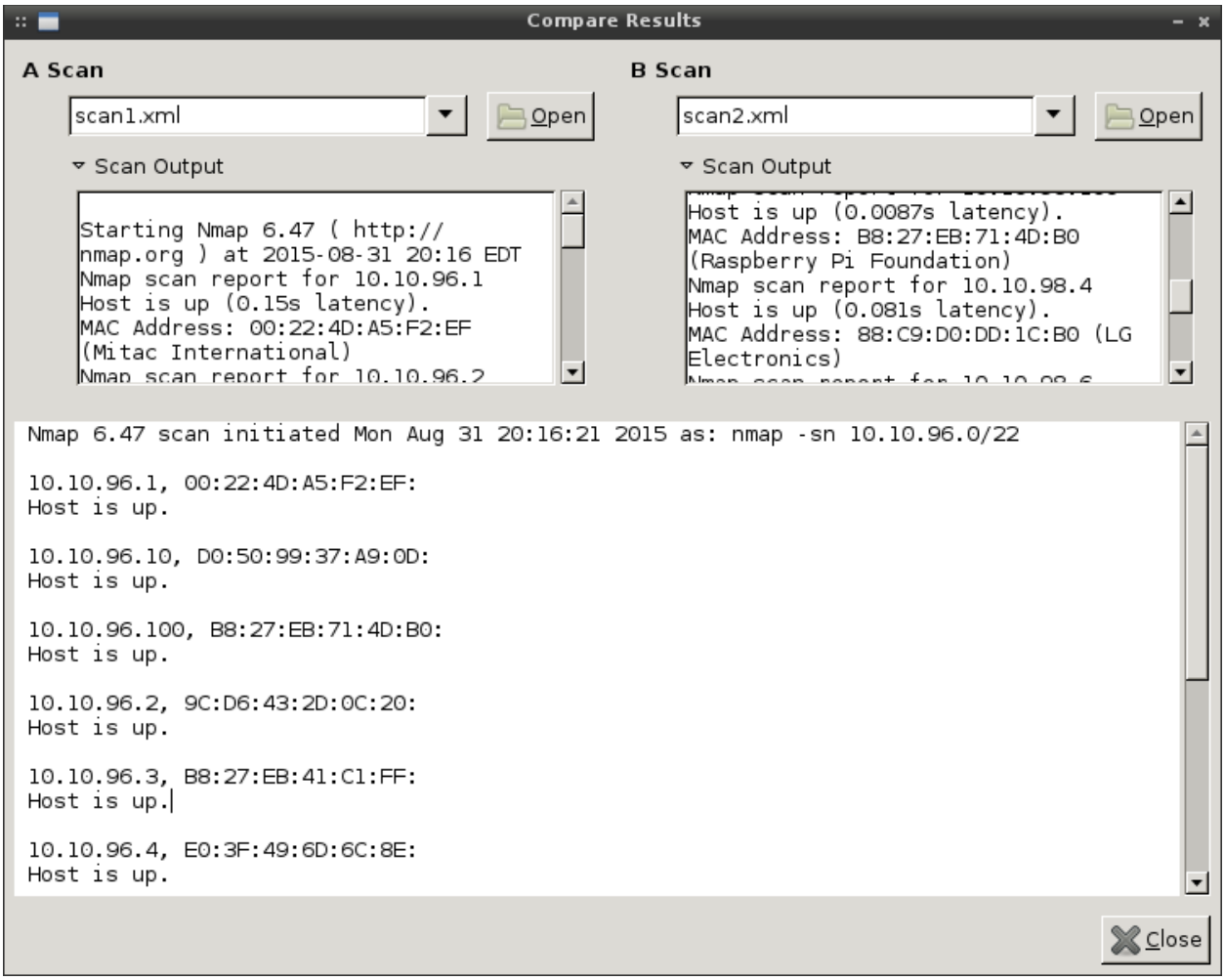

Terminal
14:02:37 [crusader:~]$ sudo -s
root@crusader:/home/jay# route -n
Kernel IP routing table
Destination   Gateway   Genmask   Flags Metric Ref   Use Iface
0.0.0.0   192.168.1.1   0.0.0.0   UG   1024   0   0 wlan0
169.254.0.0   0.0.0.0   255.255.0.0   U   1000   0   0 docker0
172.17.0.0   0.0.0.0   255.255.0.0   U   0   0   0 docker0
192.168.1.0   0.0.0.0   255.255.255.0   U   0   0   0 wlan0
root@crusader:/home/jay#


Terminal
Aug 30 15:06:48 hermes dhcpd: DHCPACK on 10.10.99.138 to 34:6f:92:02:1d:7f via eth1
Aug 30 15:09:18 hermes dhcpd: DHCPREQUEST for 10.10.99.138 from 34:6f:92:02:1d:7f via eth1
Aug 30 15:09:18 hermes dhcpd: DHCPACK on 10.10.99.138 to 34:6f:92:02:1d:7f via eth1
Aug 30 15:10:52 hermes dhcpd: DHCPDISCOVER from b8:27:eb:41:c1:ff via eth1
Aug 30 15:10:52 hermes dhcpd: DHCPOFFER on 10.10.96.3 to b8:27:eb:41:c1:ff via eth1
Aug 30 15:11:48 hermes dhcpd: DHCPREQUEST for 10.10.99.138 from 34:6f:92:02:1d:7f via eth1
Aug 30 15:11:48 hermes dhcpd: DHCPACK on 10.10.99.138 to 34:6f:92:02:1d:7f via eth1
Aug 30 15:14:18 hermes dhcpd: DHCPREQUEST for 10.10.99.138 from 34:6f:92:02:1d:7f via eth1
Aug 30 15:14:18 hermes dhcpd: DHCPACK on 10.10.99.138 to 34:6f:92:02:1d:7f via eth1
15:14:31 [hermes:jay]#


Terminal
15:40:08 [galaxy:~]$ nslookup packtpub.com
Server: 10.10.96.1
Address: 10.10.96.1#53

Non-authoritative answer:
Name: packtpub.com
Address: 83.166.169.231


Zenmap
Scan Tools Profile Help
Target: 10.10.96.0/22
Profile:
Scan
Cancel
Command: nmap -sn 10.10.96.0/22
Hosts Services
OS Host
10.10.96.1
10.10.96.2
10.10.96.3
10.10.96.4
10.10.96.10
10.10.96.100
10.10.97.1
10.10.98.4
10.10.98.6
10.10.99.2
10.10.99.138
Filter Hosts
Nmap Output Ports / Hosts Topology Host Details Scans
nmap -sn 10.10.96.0/22
Details
Starting Nmap 6.47 (http://nmap.org) at 2015-08-31 20:16 EDT
Nmap scan report for 10.10.96.1
Host is up (0.15s latency).
MAC Address: 00:22:4D:A5:F2:EF (Mitac International)
Nmap scan report for 10.10.96.2
Host is up (0.15s latency).
MAC Address: 9C:D6:43:2D:0C:20 (D-Link International)
Nmap scan report for 10.10.96.3
Host is up (0.15s latency).
MAC Address: B8:27:EB:41:C1:FF (Raspberry Pi Foundation)
Nmap scan report for 10.10.96.4
Host is up (0.15s latency).
MAC Address: E0:3F:49:6D:6C:8E (Asustek Computer)
Nmap scan report for 10.10.96.10
Host is up (0.13s latency).
MAC Address: D0:50:99:37:A9:0D (ASRock Incorporation)
Nmap scan report for 10.10.96.100
Host is up (0.0087s latency).
MAC Address: B8:27:EB:71:4D:B0 (Raspberry Pi Foundation)
Nmap scan report for 10.10.98.4
Host is up (0.081s latency).
MAC Address: 88:C9:D0:DD:1C:B0 (LG Electronics)
Nmap scan report for 10.10.98.6
Host is up (0.14s latency).
MAC Address: CC:6D:A0:6A:BB:99 (Roku)
Nmap scan report for 10.10.99.2
Host is up (0.083s latency).
MAC Address: 28:0D:FC:CB:D1:BD (Sony Computer Entertainment)
Nmap scan report for 10.10.99.138
Host is up (0.074s latency).


Compare Results
A Scan
scan1.xml
Open
Scan Output
Starting Nmap 6.47 (http://
nmap.org) at 2015-08-31 20:16 EDT
Nmap scan report for 10.10.96.1
Host is up (0.15s latency).
MAC Address: 00:22:4D:A5:F2:EF
(Mitac International)
B Scan
scan2.xml
Open
Scan Output
Host is up (0.0087s latency).
MAC Address: B8:27:EB:71:4D:B0
(Raspberry Pi Foundation)
Nmap scan report for 10.10.98.4
Host is up (0.081s latency).
MAC Address: 88:C9:D0:DD:1C:B0 (LG
Electronics)
Nmap 6.47 scan initiated Mon Aug 31 20:16:21 2015 as: nmap -sn 10.10.96.0/22
10.10.96.1, 00:22:4D:A5:F2:EF:
Host is up.
10.10.96.10, D0:50:99:37:A9:0D:
Host is up.
10.10.96.100, B8:27:EB:71:4D:B0:
Host is up.
10.10.96.2, 9C:D6:43:2D:0C:20:
Host is up.
10.10.96.3, B8:27:EB:41:C1:FF:
Host is up.
10.10.96.4, E0:3F:49:6D:6C:8E:
Host is up.
Close