SO301 - System Installation

Introduction

Solaris 11 was introduced in november 2011 by Oracle who purchased Sun Microsystems in early 2010. Solaris 11 is greatly inspired by Sun's Solaris 10 OS, introduced in 2005 combined with work from the OpenSolaris Community.

Solaris 10 was a major development in Operating Systems and introduced a number of innovative capabilities including:

- Fault and Service Management,
- Multiprocessor/Multicore performance scalability,
- The ZFS filesystem,
- Enhanced security with RBAC (Role Based Access Control),
- Virtualization with zones (also called containers),
- Hypervisor-based virtualisation for SPARC processors.

Solaris 11 introduces yet more capabilities as well as addressing those areas where Solaris 10 was weak (such as package management) compared to OSs such as Linux:

- The Image Packaging System (IPS),
- Simpler Automated Installation with AI, replacing jumpstart,
- Network virtualisation,
- Built-in CIFS support,
- Security enhancements,
- New ZFS features,
- CUPS
- Distribution Constructor,
- Boot environments,
- New container features,
- NIC auto-detection,
- Enhanced Multicore processor support.

Installation

Solaris 11 can be installed from one of three ISO images :

Method	Description
Text Install	CD sized ISO which can be used on both x86 and SPARC platforms to install a text only operating system.
Automated Installer	Same as above but also supports hands-free network-based minimal installations.
Live Media	DVD sized ISO which boots into a live x86 version of Solaris 11 containing the installation program.

This training module concentrates on the **Text Install** and **Live Media** methods of installation.

The minimum hardware specifications for Solaris 11 are as follows :

Hardware	SPARC	x86 (64-bit ONLY)
Processor Achitecture	Sun 4v (T Series) , SPARC 64	Intel Xeon, i3, i5, i7, AMD Opteron
Minimum Memory	1GB	1GB
Recommended Memory	1GB	1GB
Minimum Disk Space	Text Install: 2.9GB, Automated Installer: 2.5GB, Live Media: 5GB	Text Install: 2.9GB, Automated Installer: 2.5GB, Live Media: 5GB
Recommended Disk Space	Text Install: 4.9GB, Automated Installer: 13GB, Live Media: 7GB	Text Install: 4,9GB, Automated Installer: 13GB, Live Media: 7GB

Oracle's Hardware Compatibility List is available at their HCL web site: http://www.oracle.com/webfolder/technetwork/hcl/index.html.

Preparing for Installation

Dual Boot Environments

If you intend to install Solaris 11 alongside Linux:

- Deactivate the Linux swap partition under Linux before proceeding further. This is necessary because the swap partition is seen by Solaris 11 as **Linux Swap / Solaris** and therefore Solaris 11 will try to use it as a native Solaris partition,
- Note that you **must** use the Solaris 11 version of the bootloader **grub**. This is because the Solaris 11 grub has been enhanced to be able to boot both Solaris and Linux whereas the Linux version of grub **cannot** boot Solaris. You **must** copy the Linux boot stanza from the Linux grub configuration before installing Solaris so that you can paste it into the Solaris grub configuration,
- If you need to free up disk space on a Linux installation in order to install Solaris 11, you should use the Live Media installation process since it contains the **gparted** program that you will need to use prior to installing Solaris 11.

If you intend to install Solaris 11 alongside Windows™:

- You should use the native Windows™ disk management tools to free up space.

Virtualisation

Solaris 11 can be installed as a virtual appliance on many hypervisor applications :

- Oracle VirtualBox,
- Oracle VM for x86,
- Oracle VM Server for SPARC,
- VMware vSphere 5.1,
- Xen,
- Citrix XenServer.

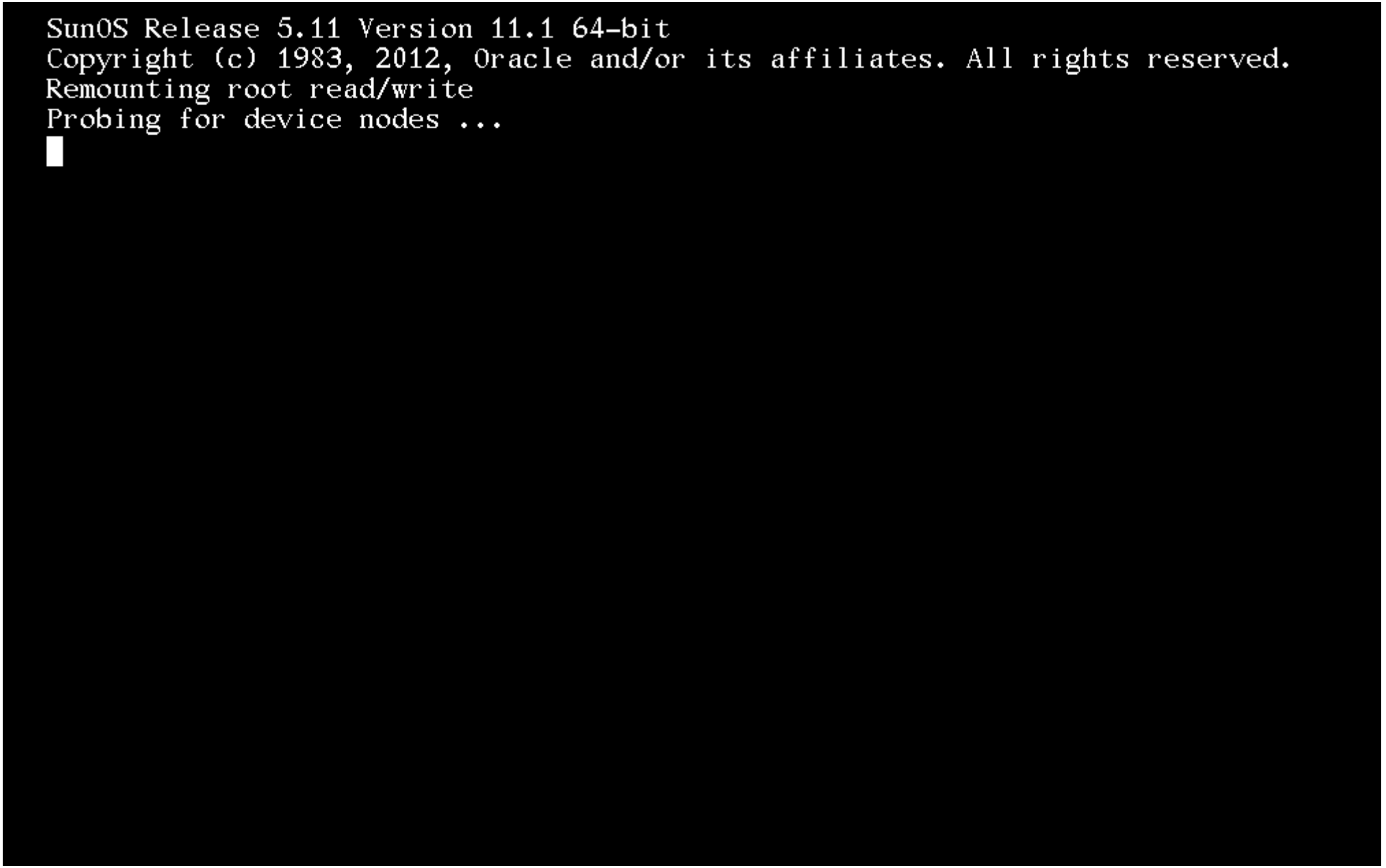
During this course you will be using the Oracle VirtualBox application to install and use Solaris 11.

LAB #1 - Installing via Text Install

Create a new virtual machine in VirtualBox with a 20GB **vmdk** hard disk and 2048MB of RAM.

Start the new machine and tell it to boot the Text Install ISO:

The process then starts to probe for devices:

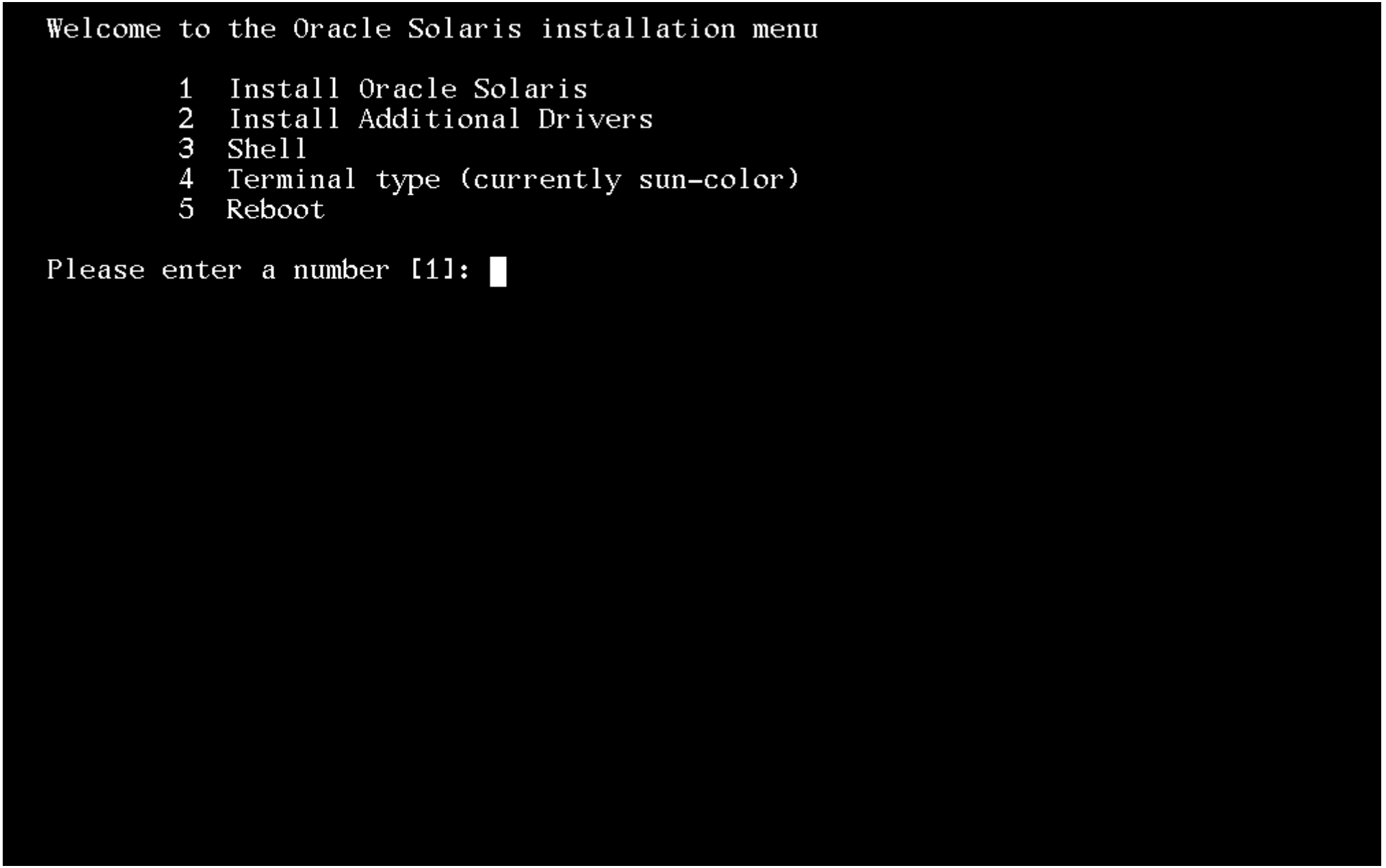


The system now prompts you to choose a keyboard layout:

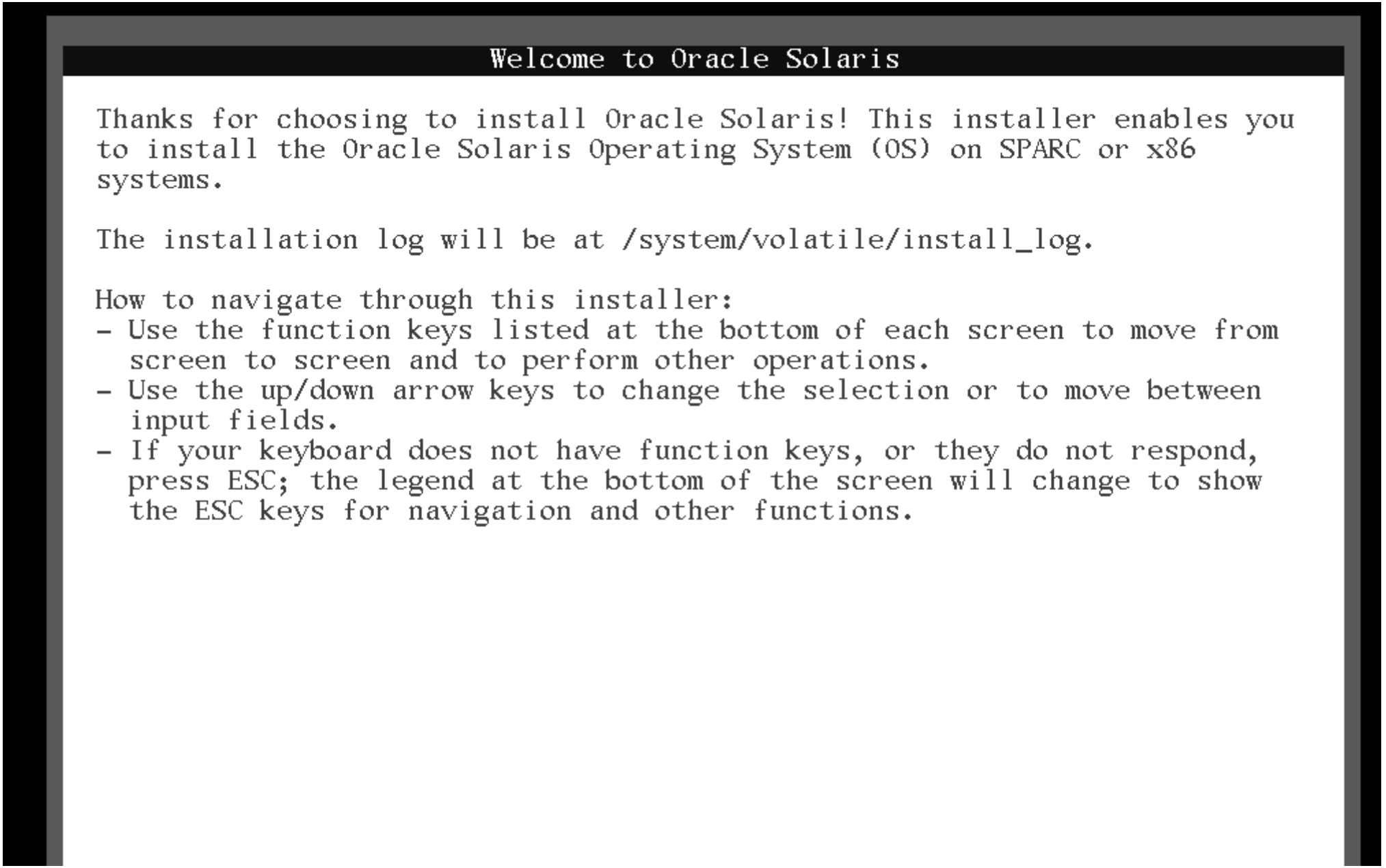
```
SunOS Release 5.11 Version 11.1 64-bit
Copyright (c) 1983, 2012, Oracle and/or its affiliates. All rights reserved.
Remounting root read/write
Probing for device nodes ...
Preparing image for use
Done mounting image
USB keyboard
 1. Arabic                          15. Korean
 2. Belgian                         16. Latin-American
 3. Brazilian                       17. Norwegian
 4. Canadian-Bilingual              18. Portuguese
 5. Canadian-French                 19. Russian
 6. Danish                          20. Spanish
 7. Dutch                           21. Swedish
 8. Dvorak                          22. Swiss-French
 9. Finnish                         23. Swiss-German
10. French                          24. Traditional-Chinese
11. German                          25. TurkishQ
12. Italian                         26. UK-English
13. Japanese-type6                  27. US-English
14. Japanese
To select the keyboard layout, enter a number [default 27]:
```

Followed by the choice of the installation language:

The system is now ready to be installed. Choose the default value of **1** and hit ↵ Enter:

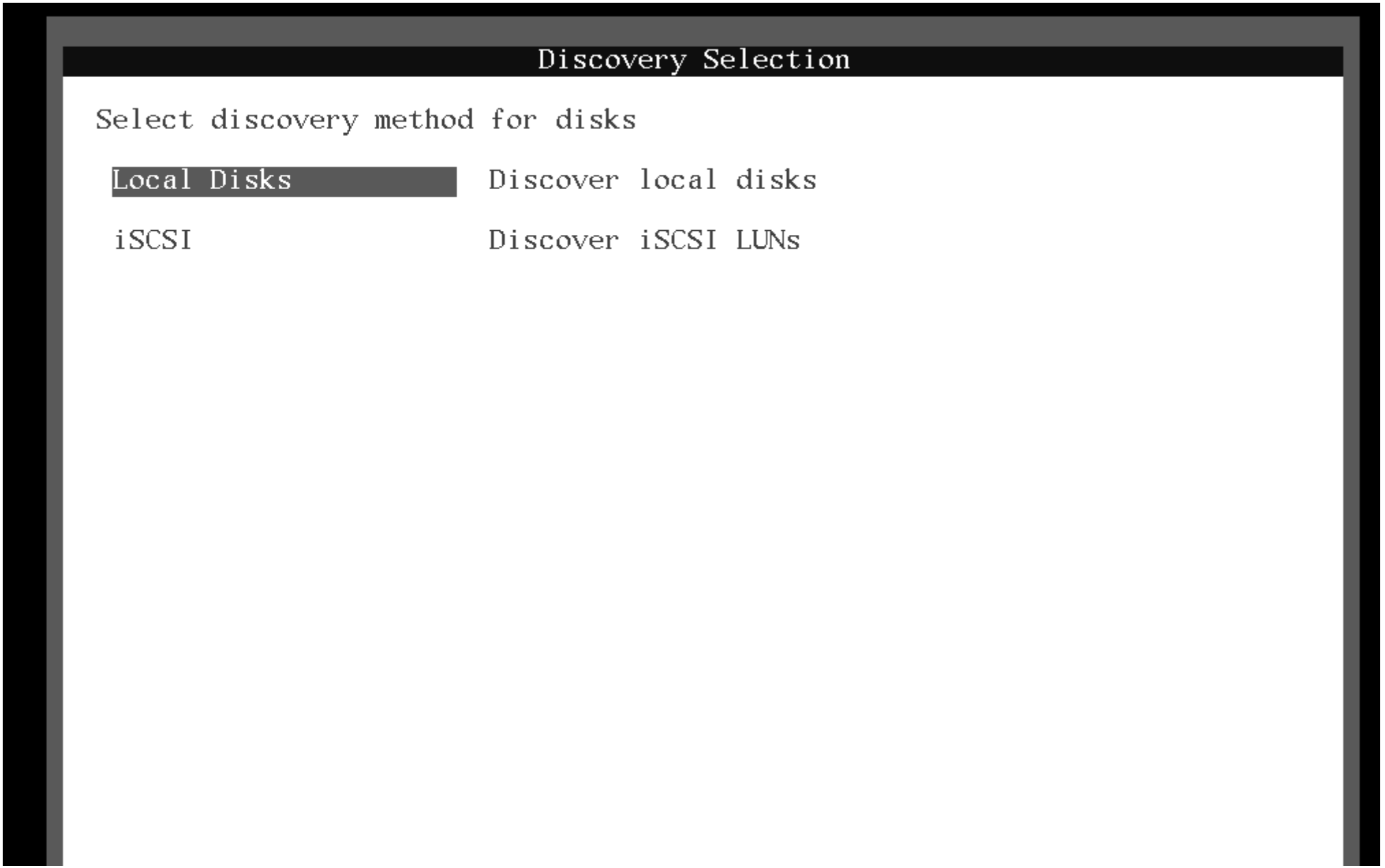


A screen showing both the installation log location and some instructions appears:



Move to the following screen using the F2 key. If the function key does not work or is absent, hit Esc then Esc 2 at the same time. This screen asks

you to choose either Local Disks or iSCSI LUN discovery. For the purpose of this installation, you should choose **Local Disks**:

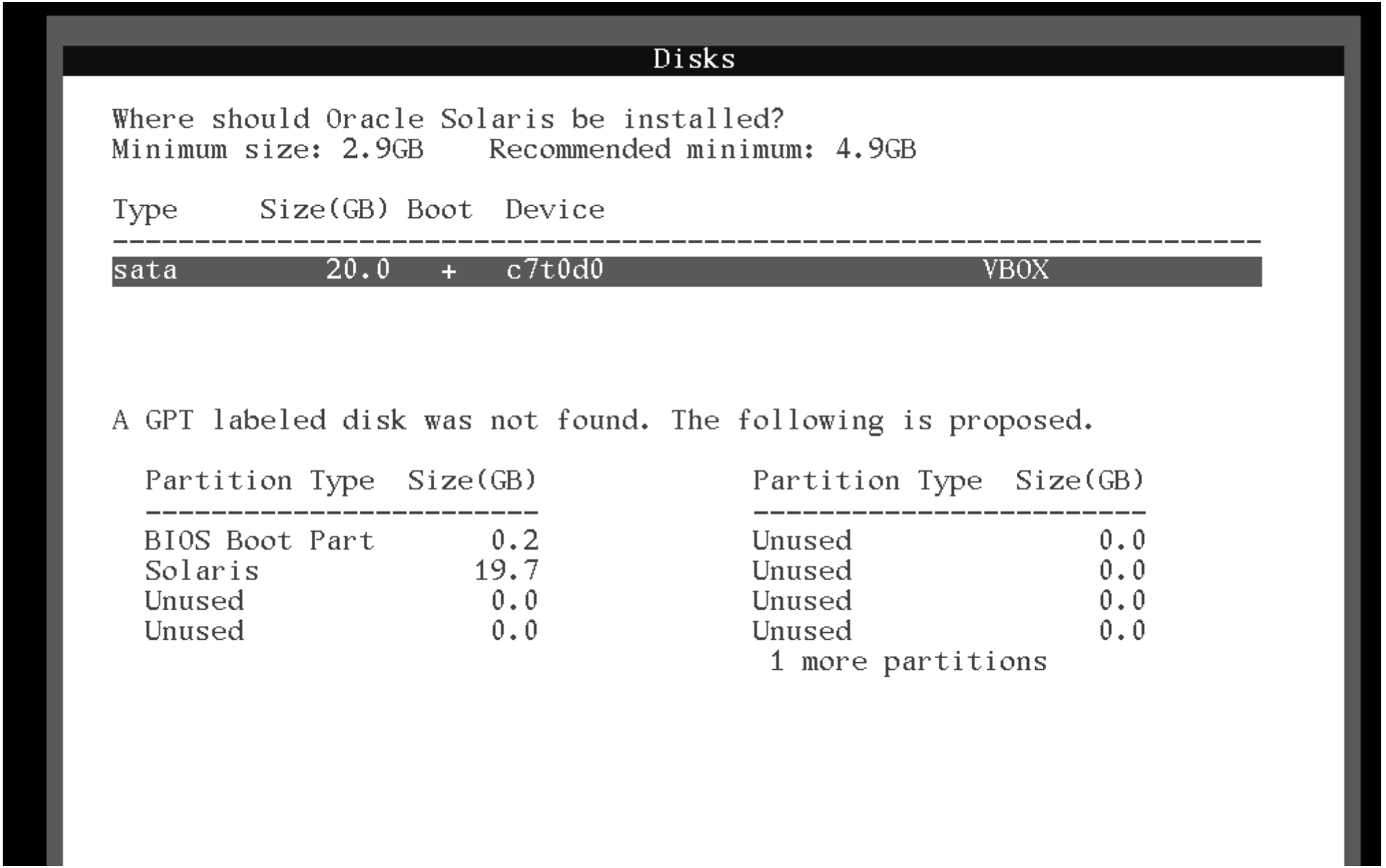


Move to the next screen using the F2 key or the Esc 2 keys as shown at the bottom of the current screen:

The system should now have discovered the local disk to install to. Since in the case of this example, we are installing to a new media, no GPT labeled disk has been found. The installation program suggests a partition table. Note the name of the device is of the following format **c?t?d?**:

Letter	Description	Starting Value
c	Disk controller device number	0
t	Controller's target number	0
d	Disk number on the controller	0

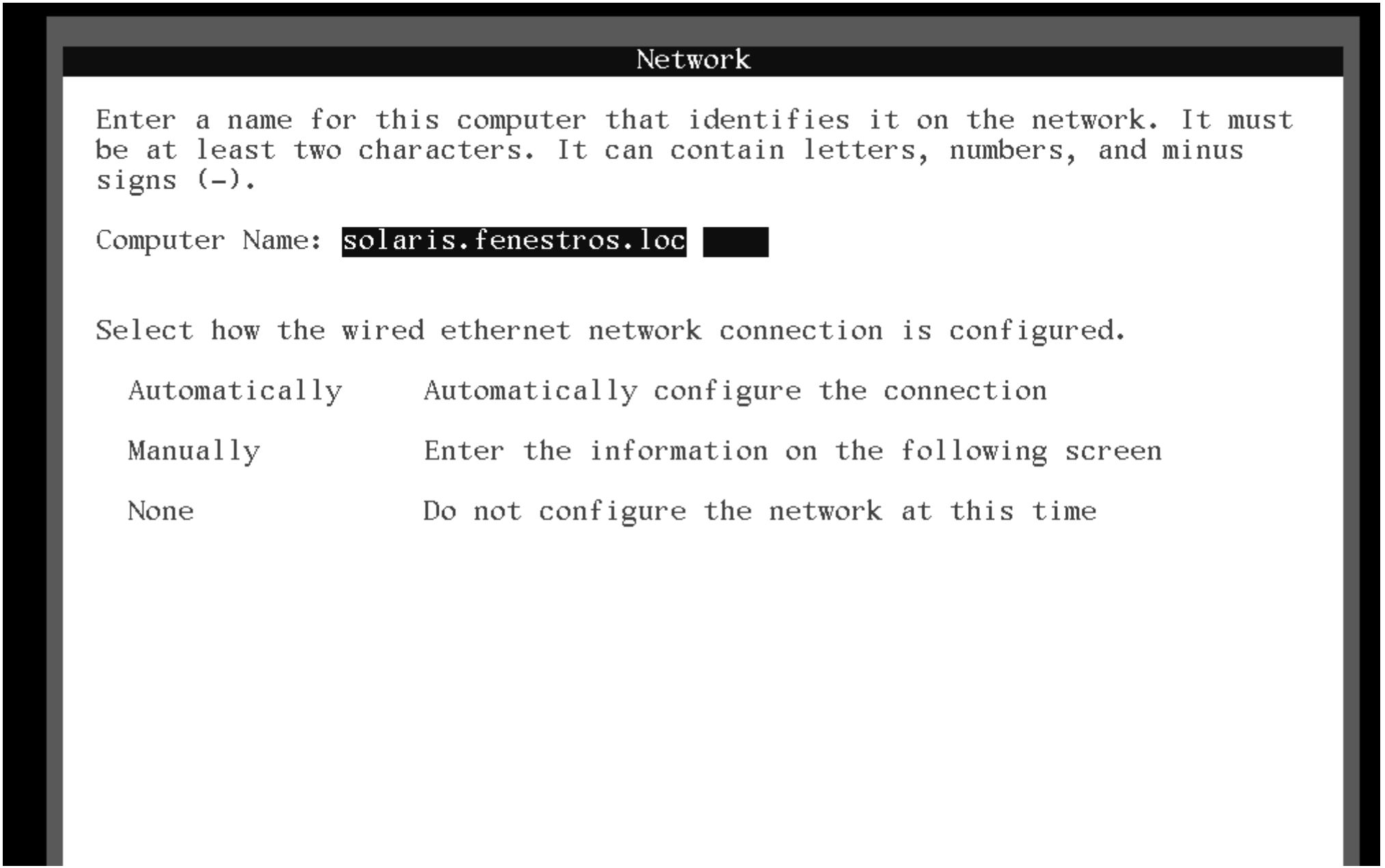
Make sure the disk is highlighted and then hit ↵ Enter:



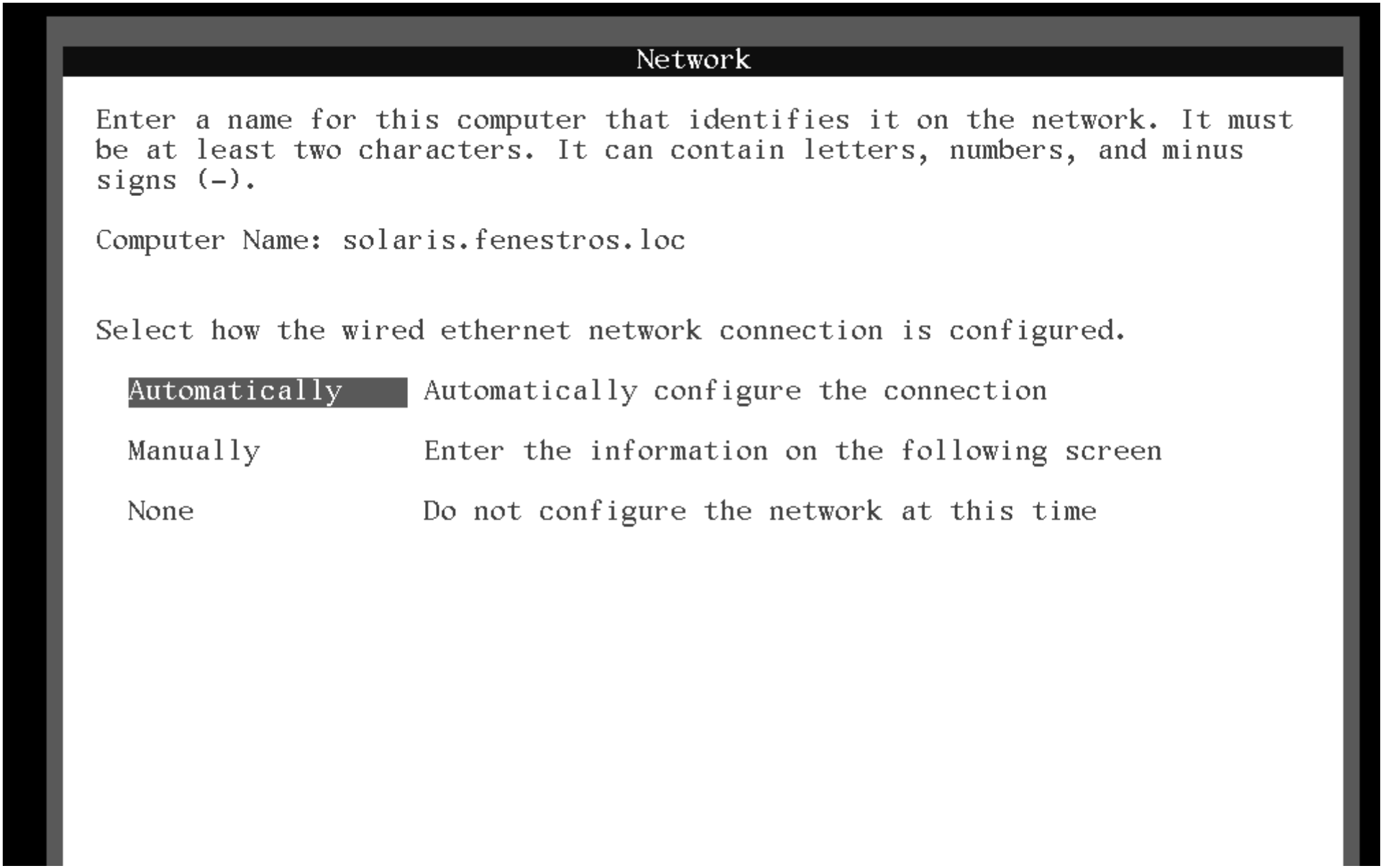
At this stage you can choose to either install to the entire disk (the default choice) or install to a partition in the case of a multiple boot environment.

Highlight the **Use the entire disk** option and hit the F2 key or the the Esc 2 keys:

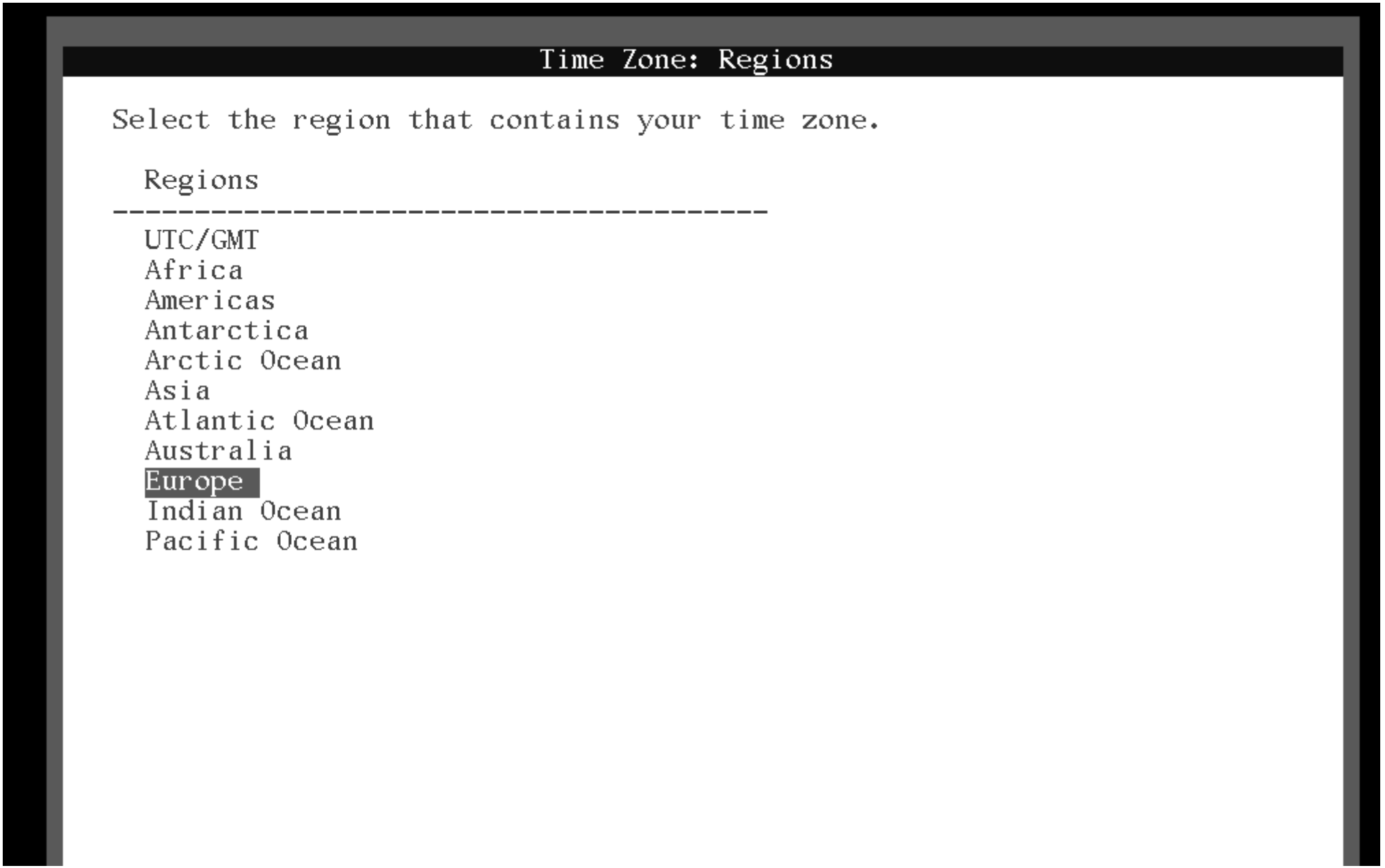
You now need to specify a name for the system. Use the same one as in the example - **fenestros.solaris.loc**:



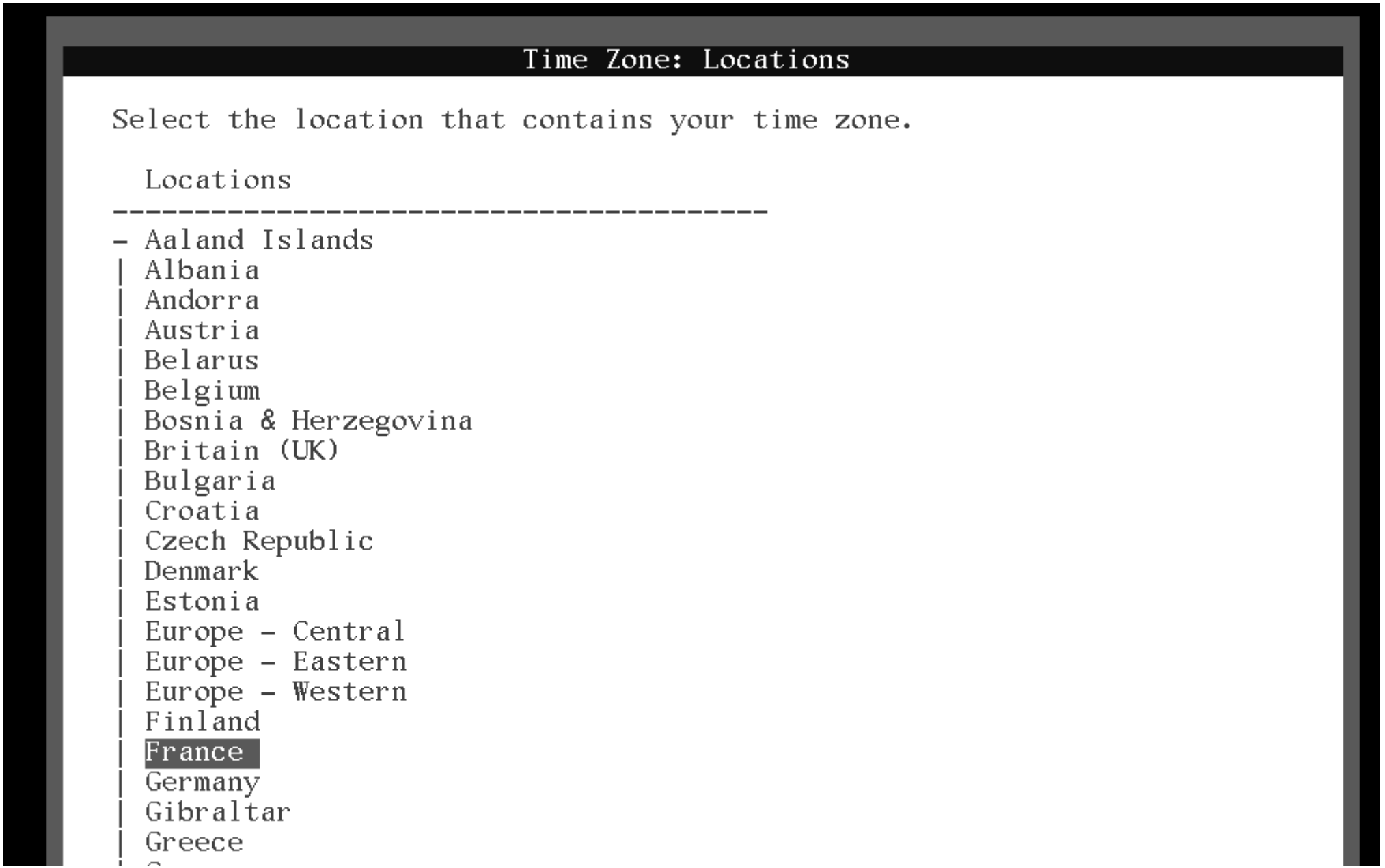
Highlight the **Automatically** option in order to automatically configure the network connection via **DHCP** and hit the F2 key or the the Esc 2 keys:



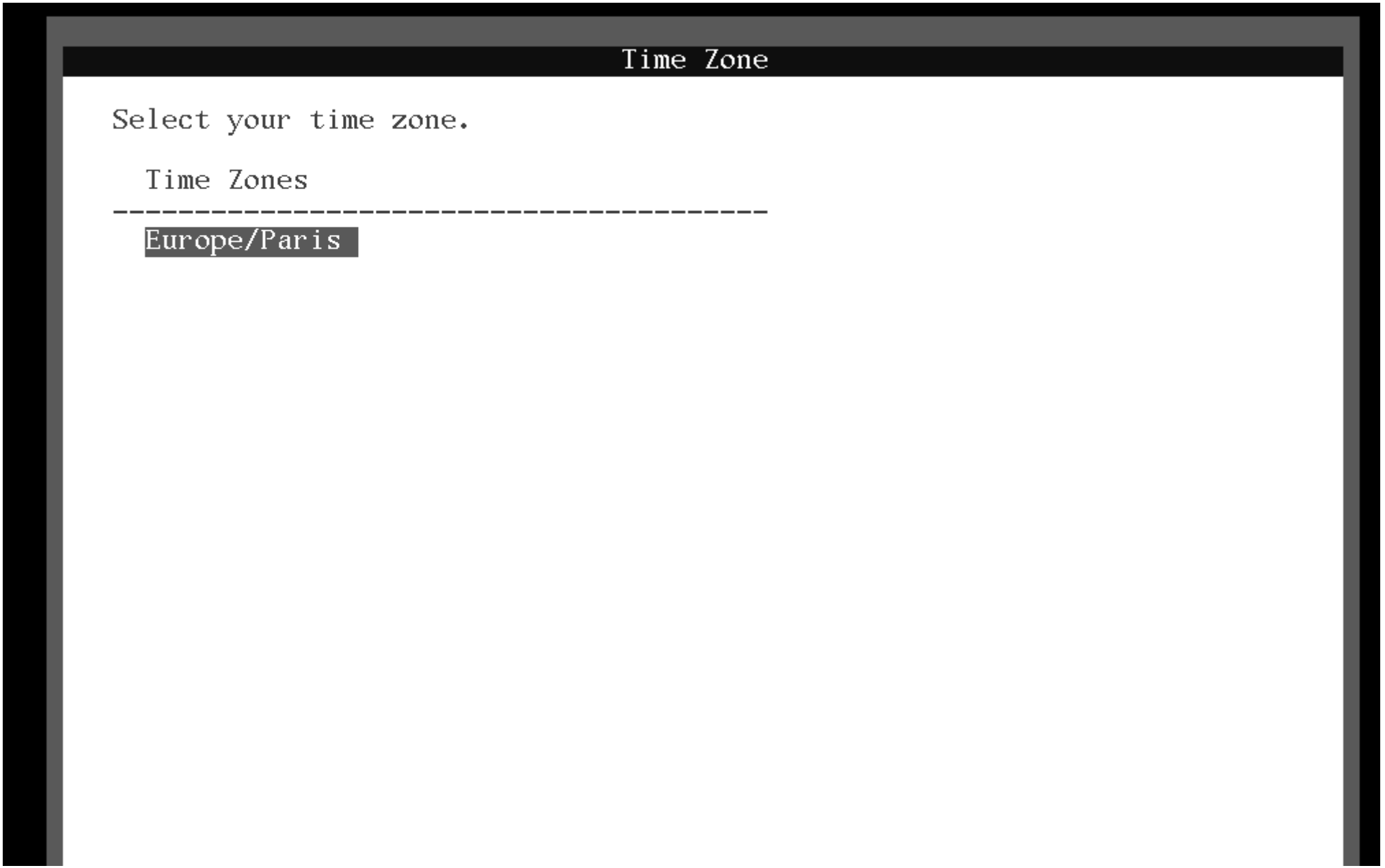
Select the region that contains your time zone and hit the F2 key or the the Esc 2 keys:



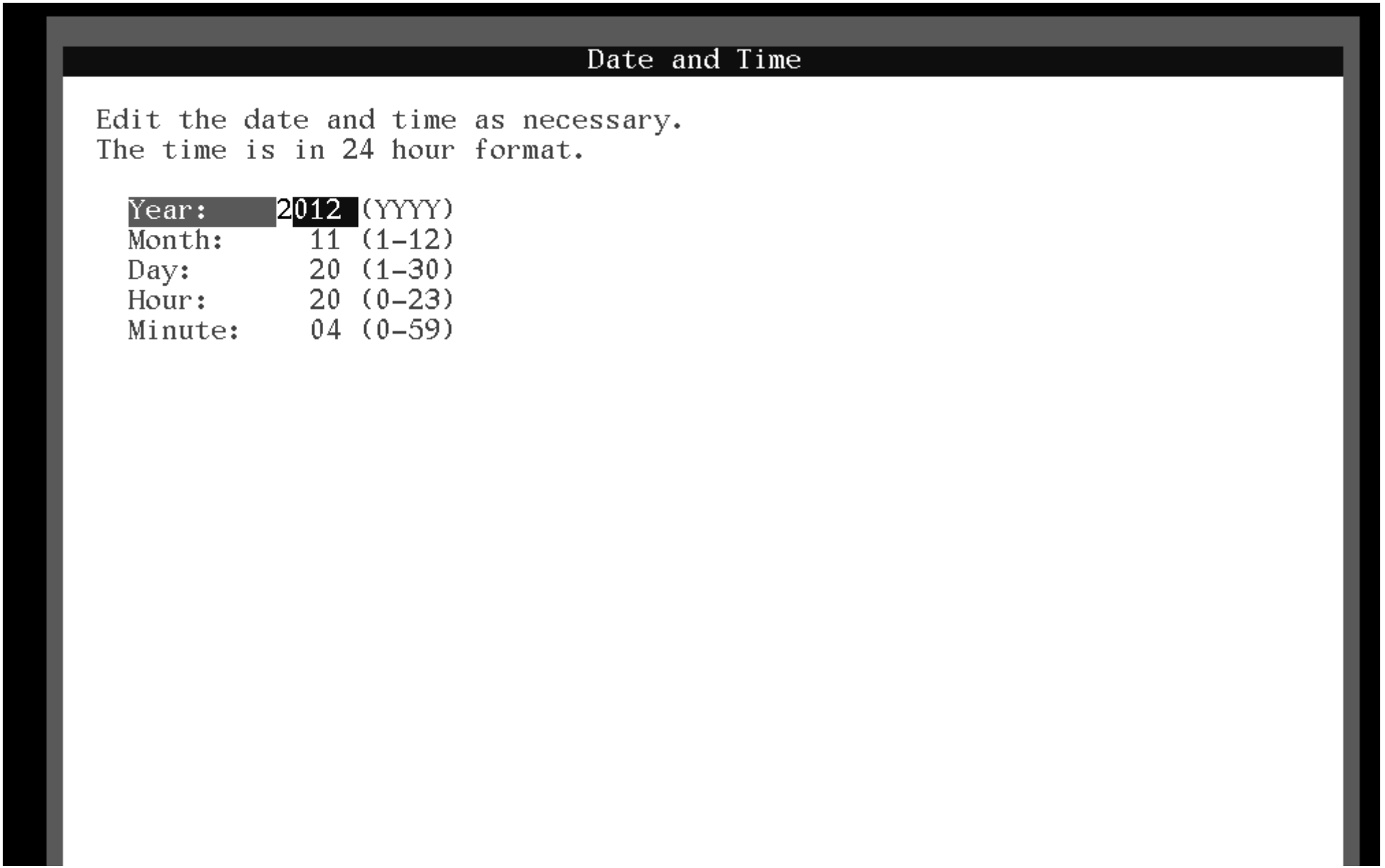
Select the location that contains your time zone and hit the F2 key or the the Esc 2 keys:



Select your time zone and hit the F2 key or the the Esc 2 keys:



Check the date and time and correct if necessary then hit the F2 key or the the Esc 2 keys:



You now need to specify the **root** (Administrator) password and the name and password of the first user on the system. Several points need to be considered here :

- The default password-hashing program in Solaris 11 is **SHA-256**. This means that the passwords are no longer limited to 8 characters as in the case of Solaris 10,
- The default password security policy requires that passwords contain at least one digit **and** one special character,
- Under Solaris 11, the **root** user is a **role** indicating that you cannot log in directly with the **root** account,
- The first user created on the system is assigned the **root** role so that he/she can become **root** using the **su** command.

For the purposes of this training course, specify **fenestr0$** as the password for **root** and **trainee/fenestr0$** as the username and password of the user to be created.

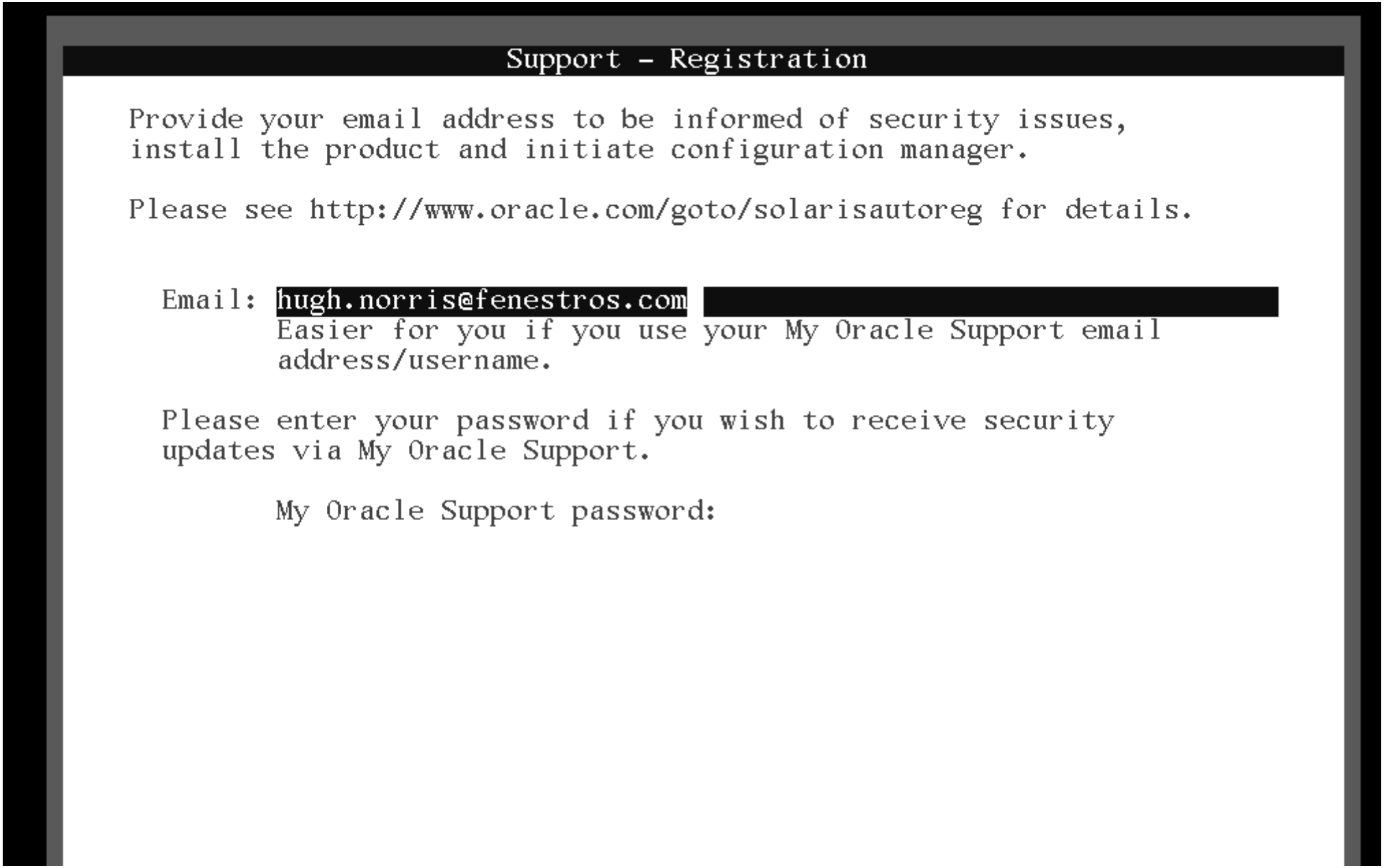
When installing a machine for production purposes, do **not** use the same password for the root and user account!

When you have finished, hit the F2 key or the the Esc 2 keys:

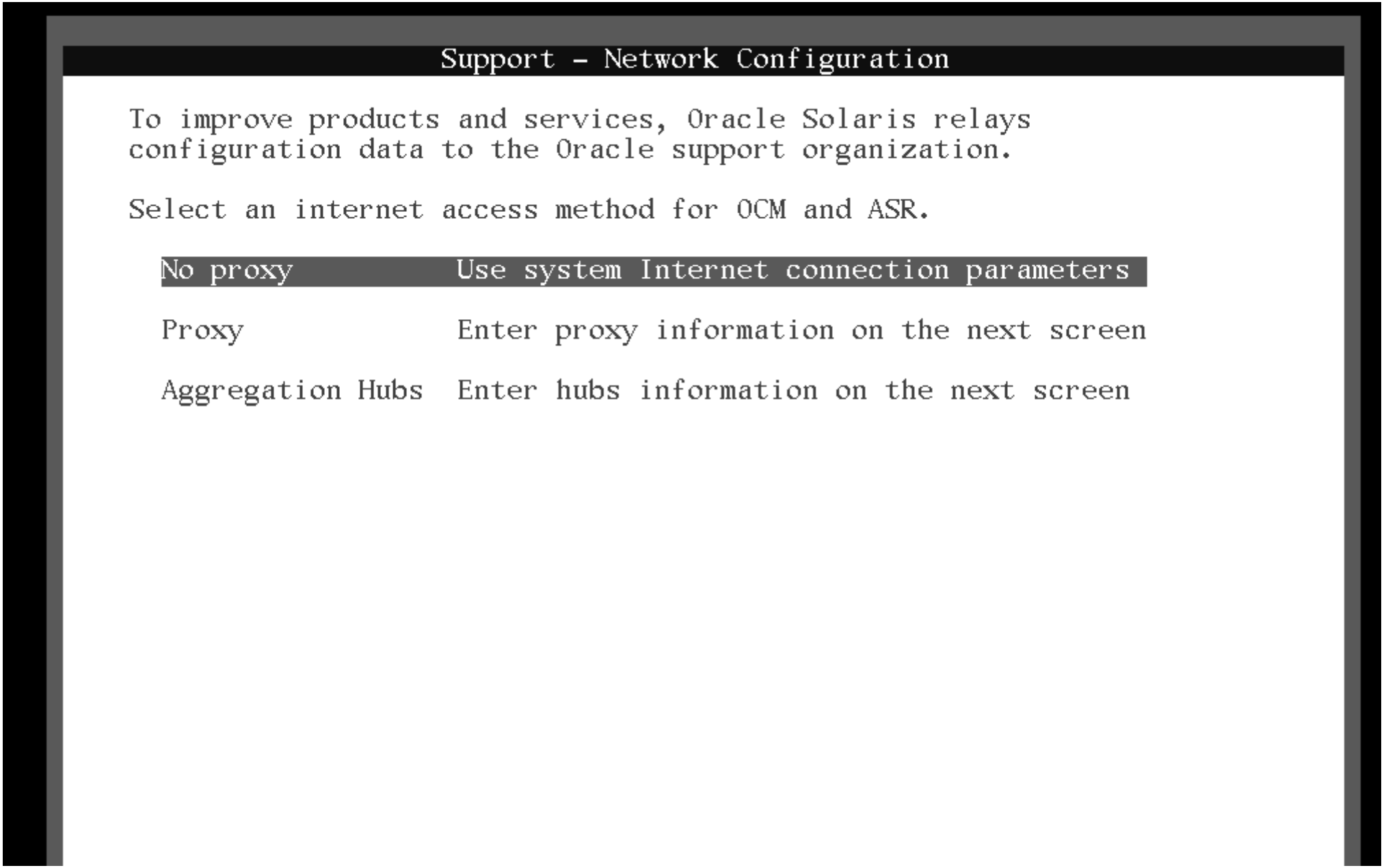
At this stage you should enter the email address and password of your Oracle Support Account.

Oracle's licensing policy for Solaris 11 does **not** permit you to put a Solaris 11 system into production without an Oracle Support Account.

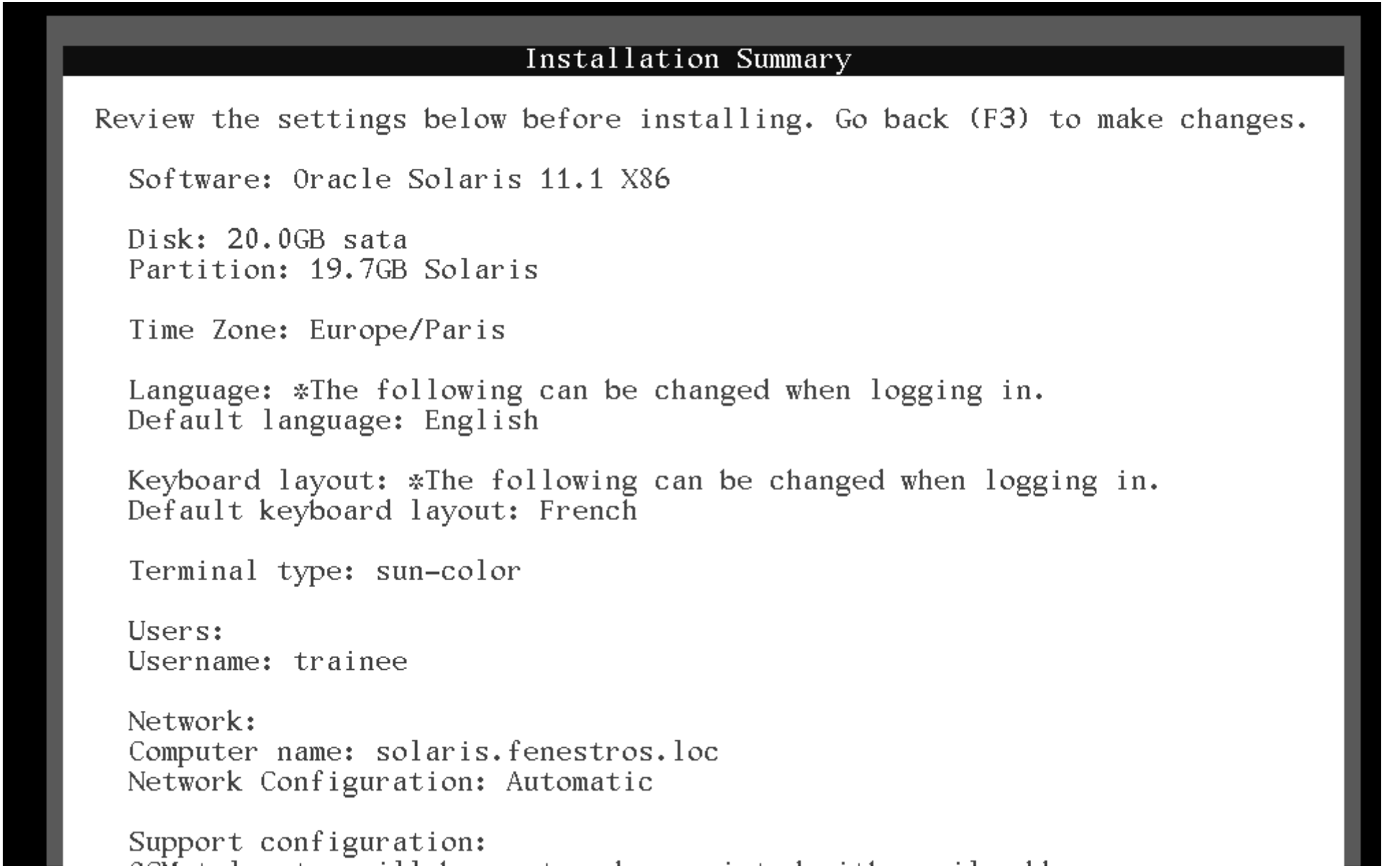
Since the licensing policy does allow you to evaluate Solaris 11 for an indefinite period, enter your email address but leave the password field empty. When finished hit the F2 key or the the Esc 2 keys:



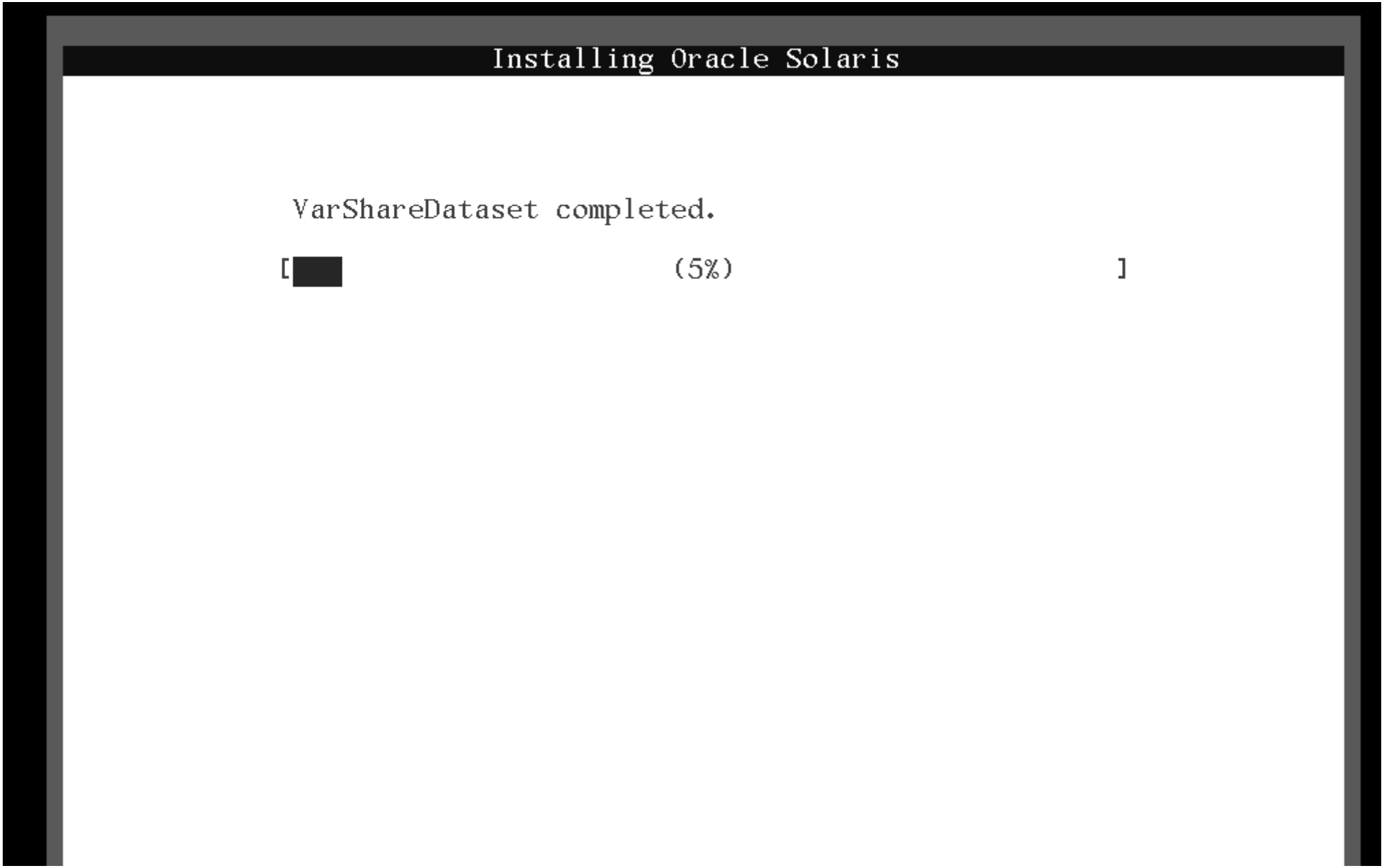
If your network uses a proxy, enter the details here. If not choose the **No proxy** option and hit the F2 key or the the Esc 2 keys:



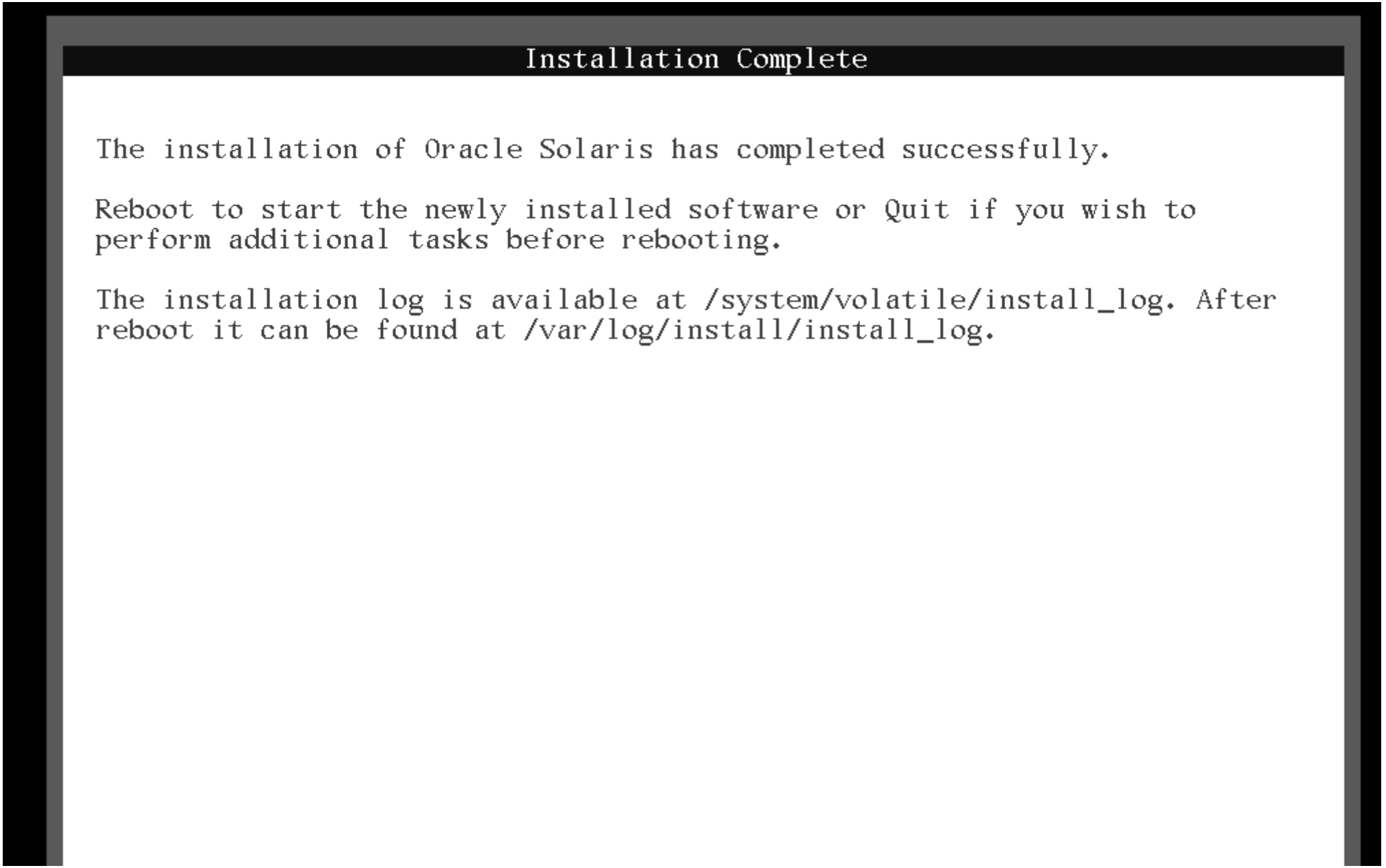
Review the Installation Summary and modify it if necessary. If not, hit the F2 key or the the Esc 2 keys:



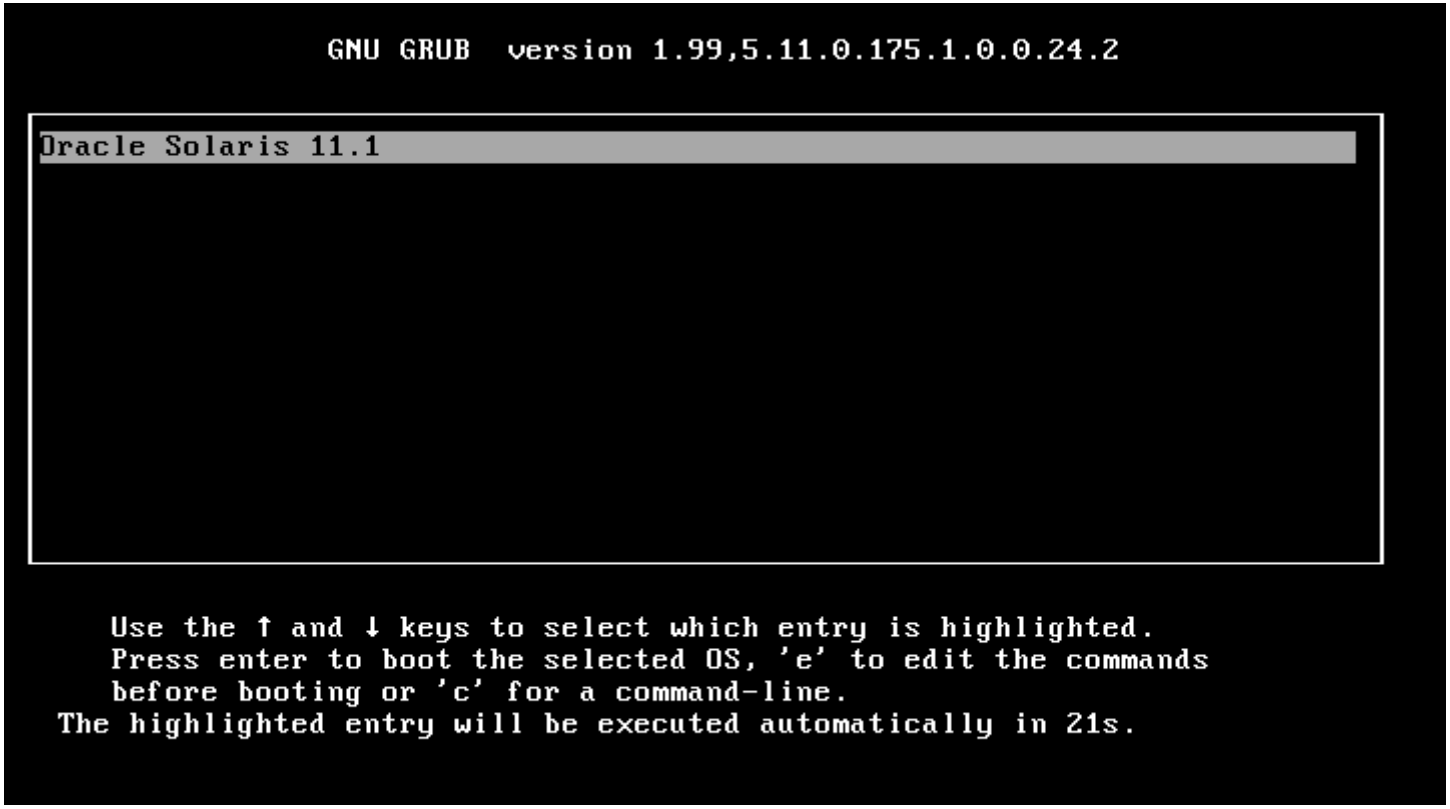
The system will now be installed:



At the end on the installation, the screen shows you where you will find the installation log after rebooting. Hit the F8 key to reboot:



Your newly installed Solaris 11 system will reboot:



Once booted, log into the system from the command line using the trainee/fenestr0$ account. In order to install the gnome desktop environement, use the following command :

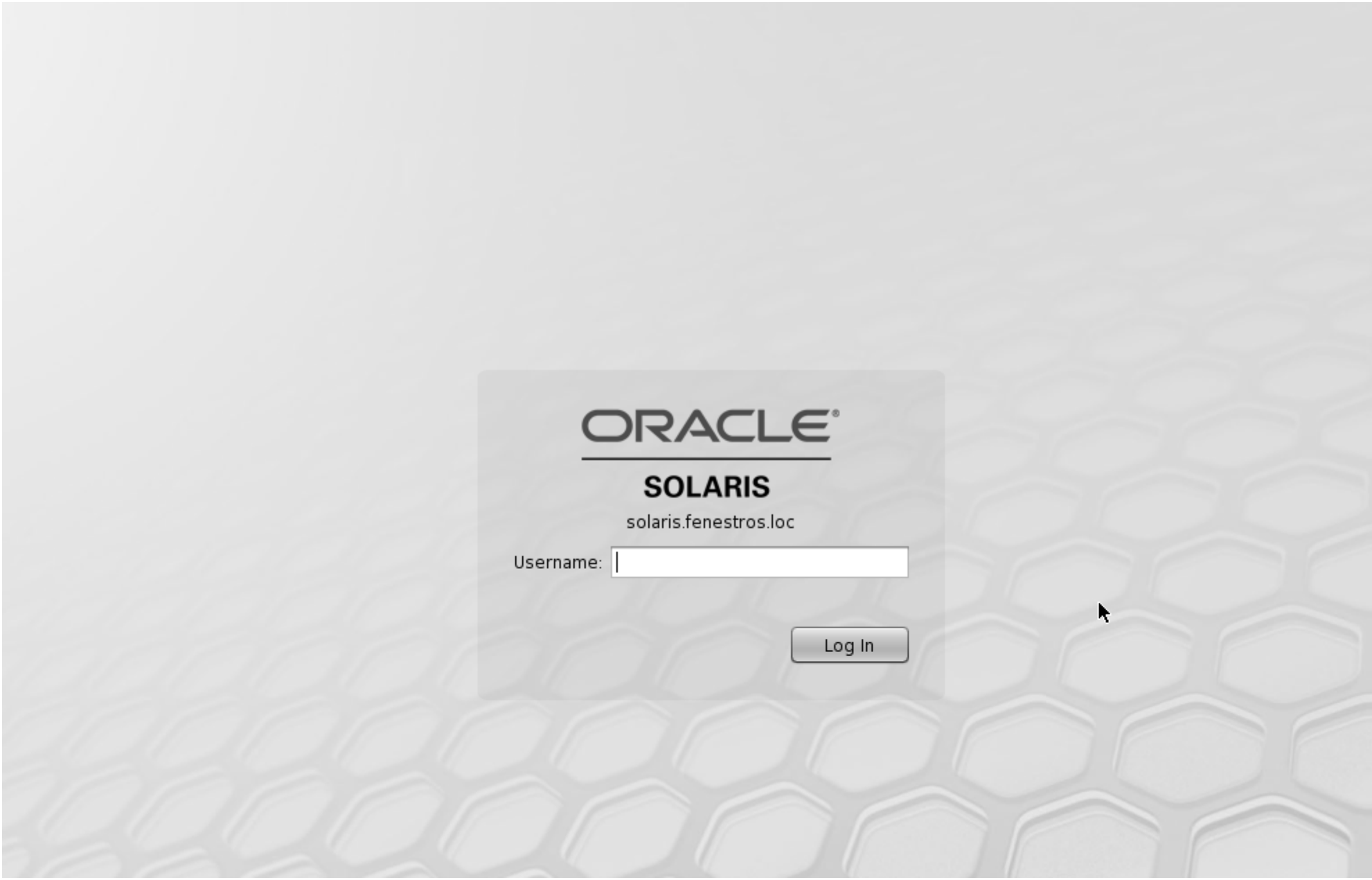
```
trainee@solaris:~$ sudo pkg install slim_install
Password: fenestr0$
```

The password will **not** be shown. It is so in the example above so that you do not forget what it is!

Once all the packages are installed, use the following command to start the graphical log in service at boot:

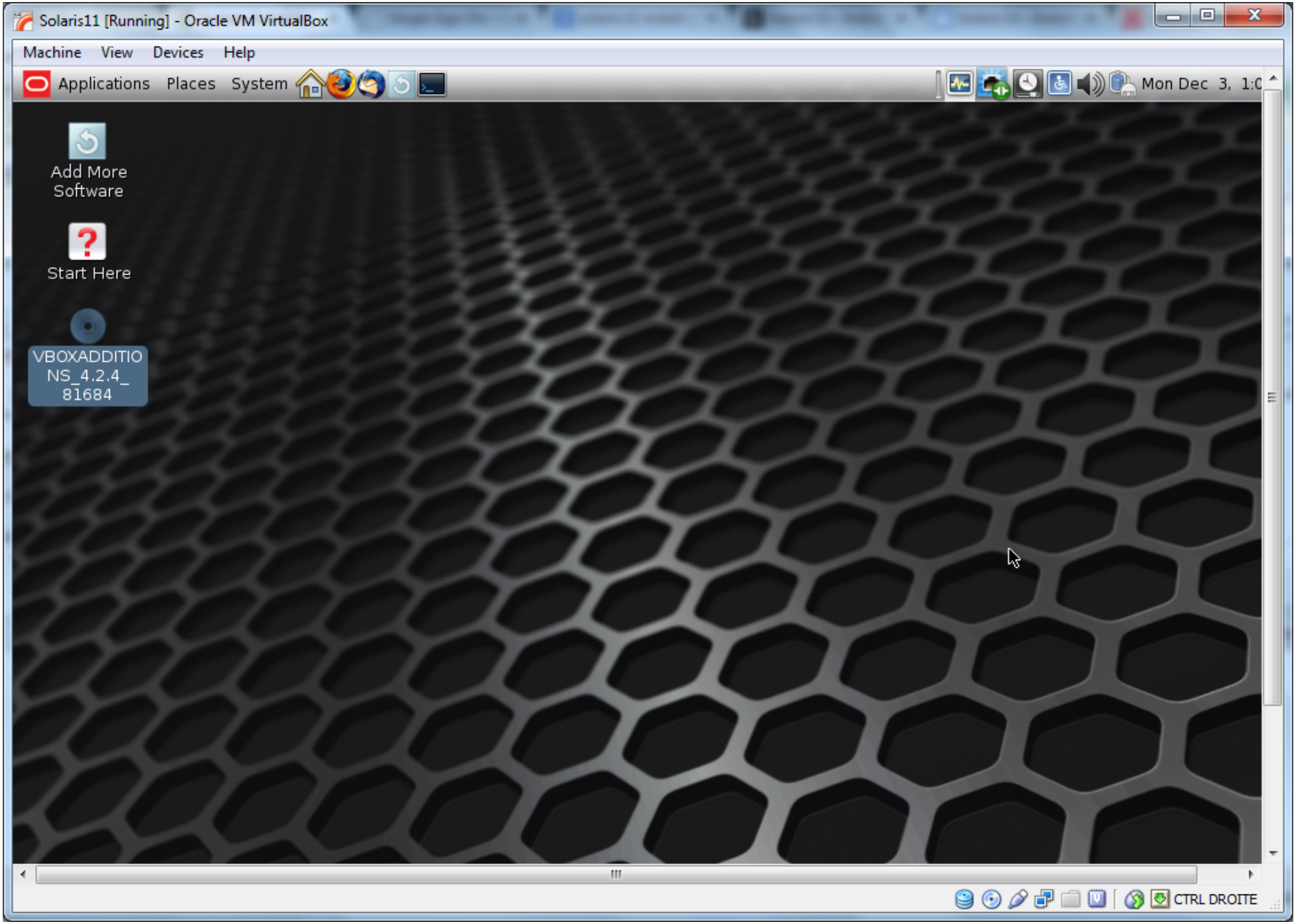
```
trainee@solaris:~$ sudo svcadm enable gdm
```

Re-boot the machine and log in graphically :

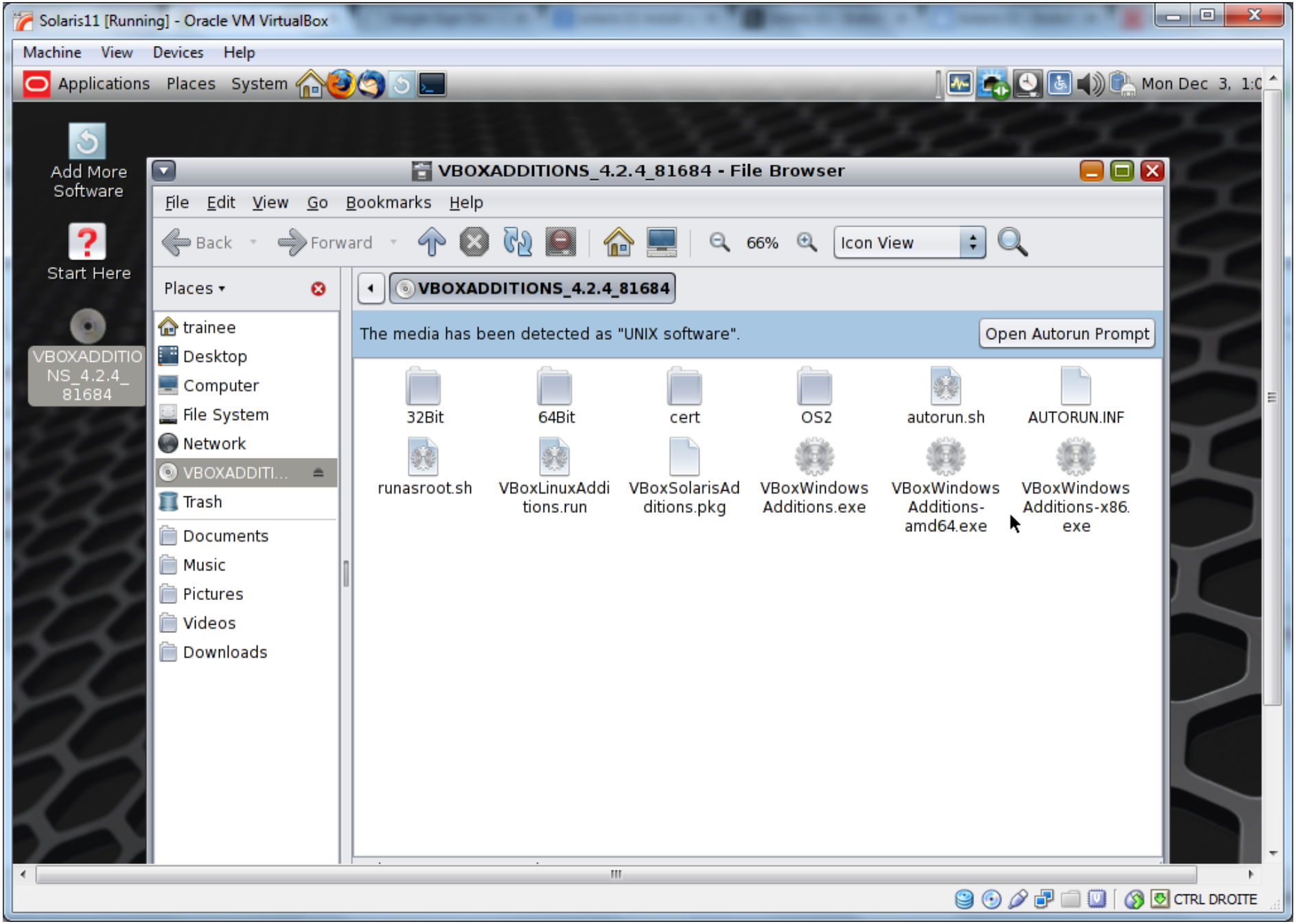


Once logged back in, you need to install the VirtualBox Guest Additions. To do so click on the VirtualBox **Devices** menu. Select the **Install Guest**

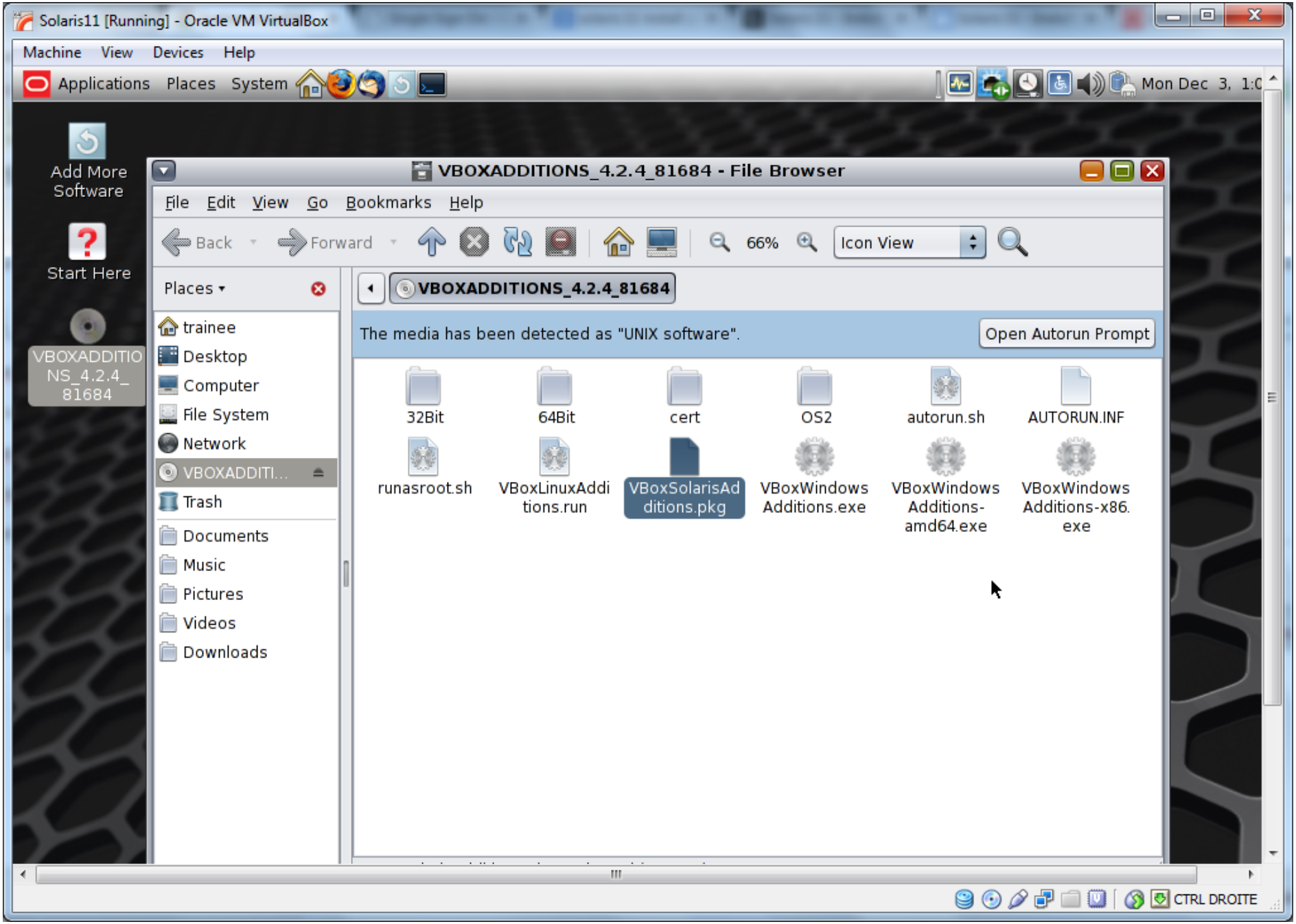
Additions menu item. VirtualBox will mount the VirtualBox Guest Additions ISO and an icon will appear on your desktop:


Solaris11 [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:0
Add More Software
Start Here
VBOXADDITIONS_4.2.4_81684
CTRL DROITE

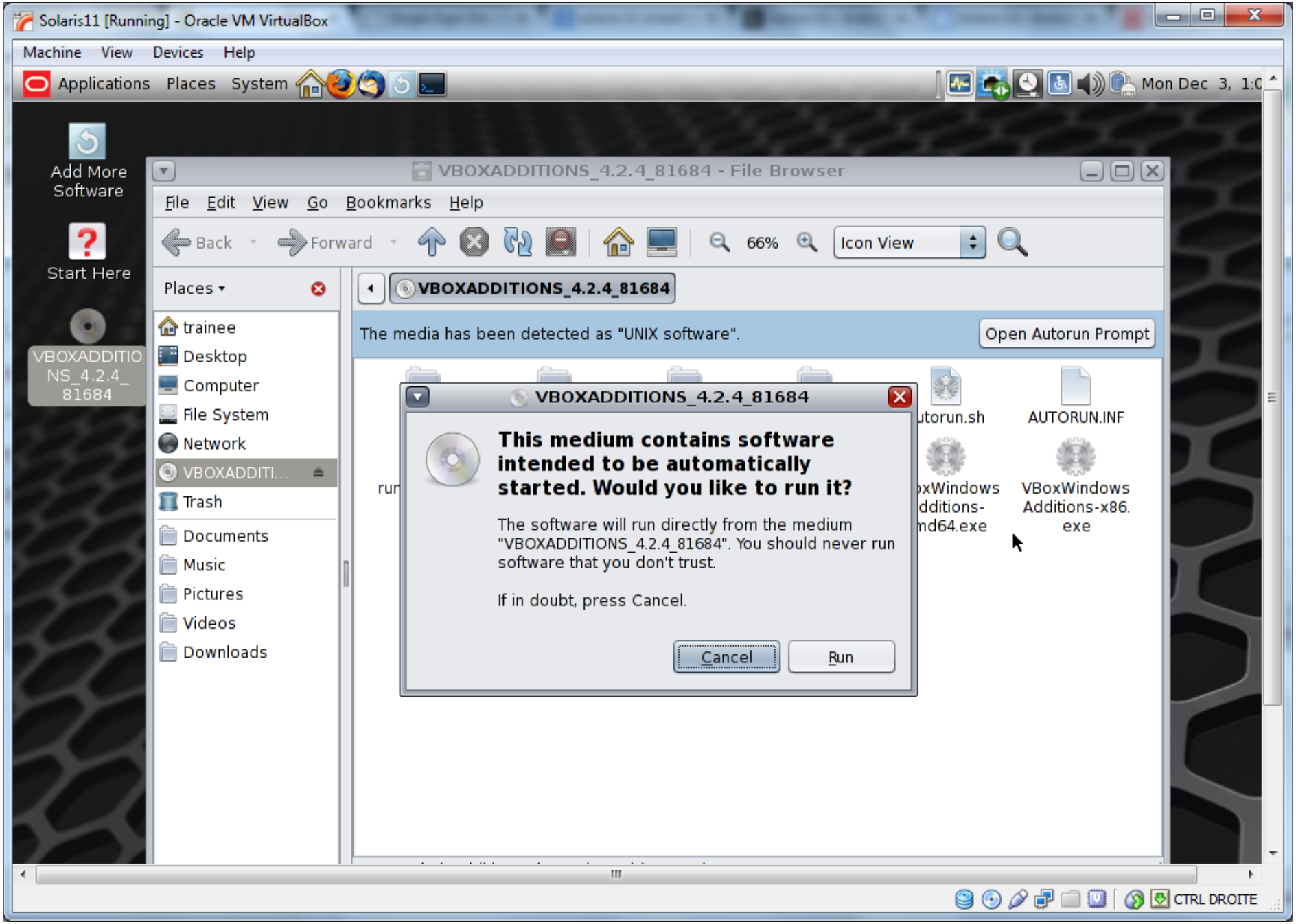
Double click on the icon to open the window containing it's contents:


Solaris11 [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:0
Add More Software
Start Here
VBOXADDITIONS_4.2.4_81684
VBOXADDITIONS_4.2.4_81684 - File Browser
File Edit View Go Bookmarks Help
Back Forward
66%
Icon View
Places
VBOXADDITIONS_4.2.4_81684
trainee
Desktop
Computer
File System
Network
VBOXADDITI...
Trash
Documents
Music
Pictures
Videos
Downloads
The media has been detected as "UNIX software".
Open Autorun Prompt
32Bit
64Bit
cert
OS2
autorun.sh
AUTORUN.INF
runasroot.sh
VBoxLinuxAdditions.run
VBoxSolarisAdditions.pkg
VBoxWindowsAdditions.exe
VBoxWindowsAdditions-amd64.exe
VBoxWindowsAdditions-x86.exe
CTRL DROITE

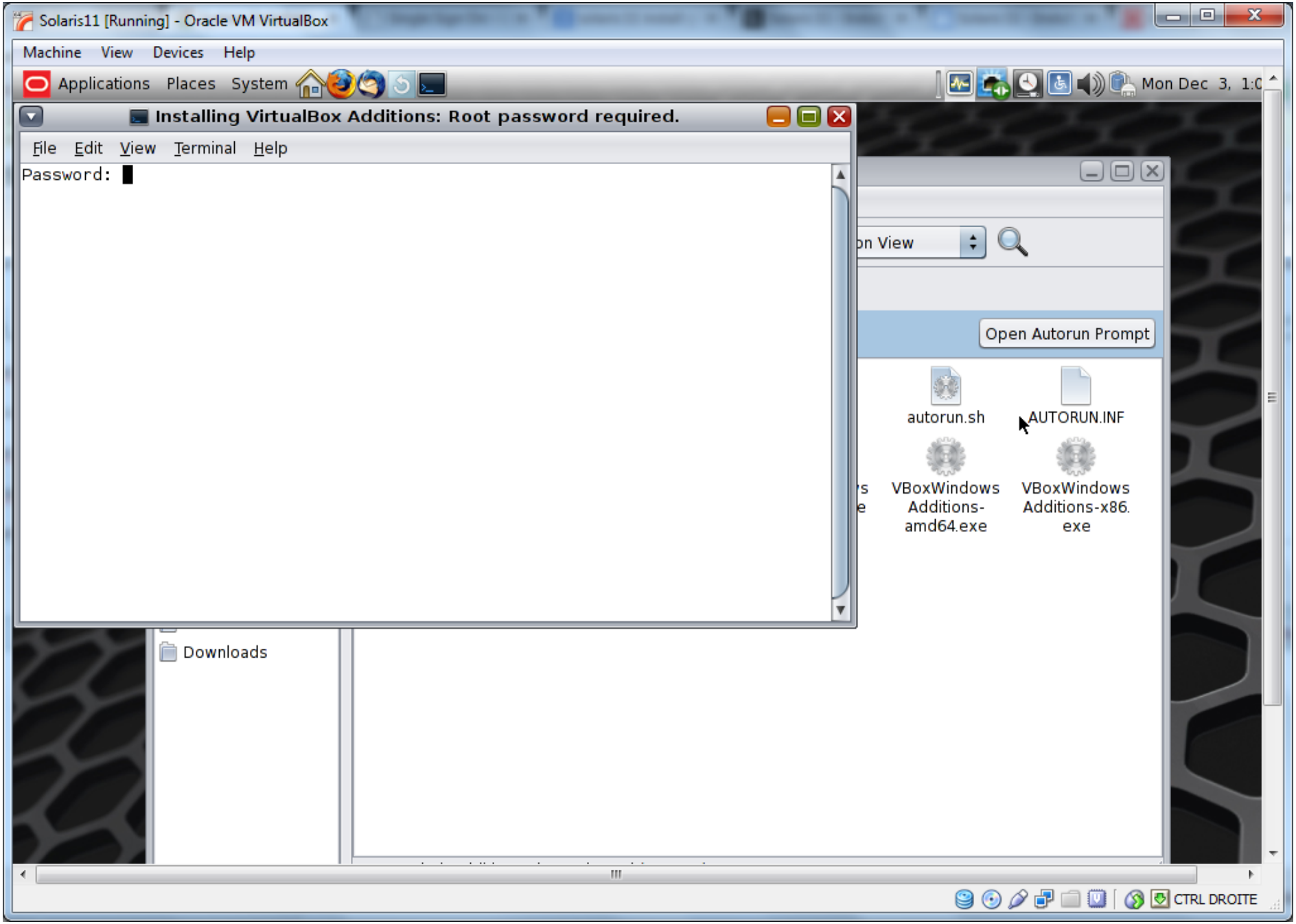
Highlight the **VBoxSolarisAdditions.pkg** package and click on the **Open Autorun Prompt** button:


Solaris11 [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:0
Add More Software
Start Here
VBOXADDITIONS_4.2.4_81684
VBOXADDITIONS_4.2.4_81684 - File Browser
File Edit View Go Bookmarks Help
Back Forward
66%
Icon View
Places
VBOXADDITIONS_4.2.4_81684
trainee
Desktop
Computer
File System
Network
VBOXADDITI...
Trash
Documents
Music
Pictures
Videos
Downloads
The media has been detected as "UNIX software".
Open Autorun Prompt
32Bit
64Bit
cert
OS2
autorun.sh
AUTORUN.INF
runasroot.sh
VBoxLinuxAdditions.run
VBoxSolarisAdditions.pkg
VBoxWindowsAdditions.exe
VBoxWindowsAdditions-amd64.exe
VBoxWindowsAdditions-x86.exe
CTRL DROITE

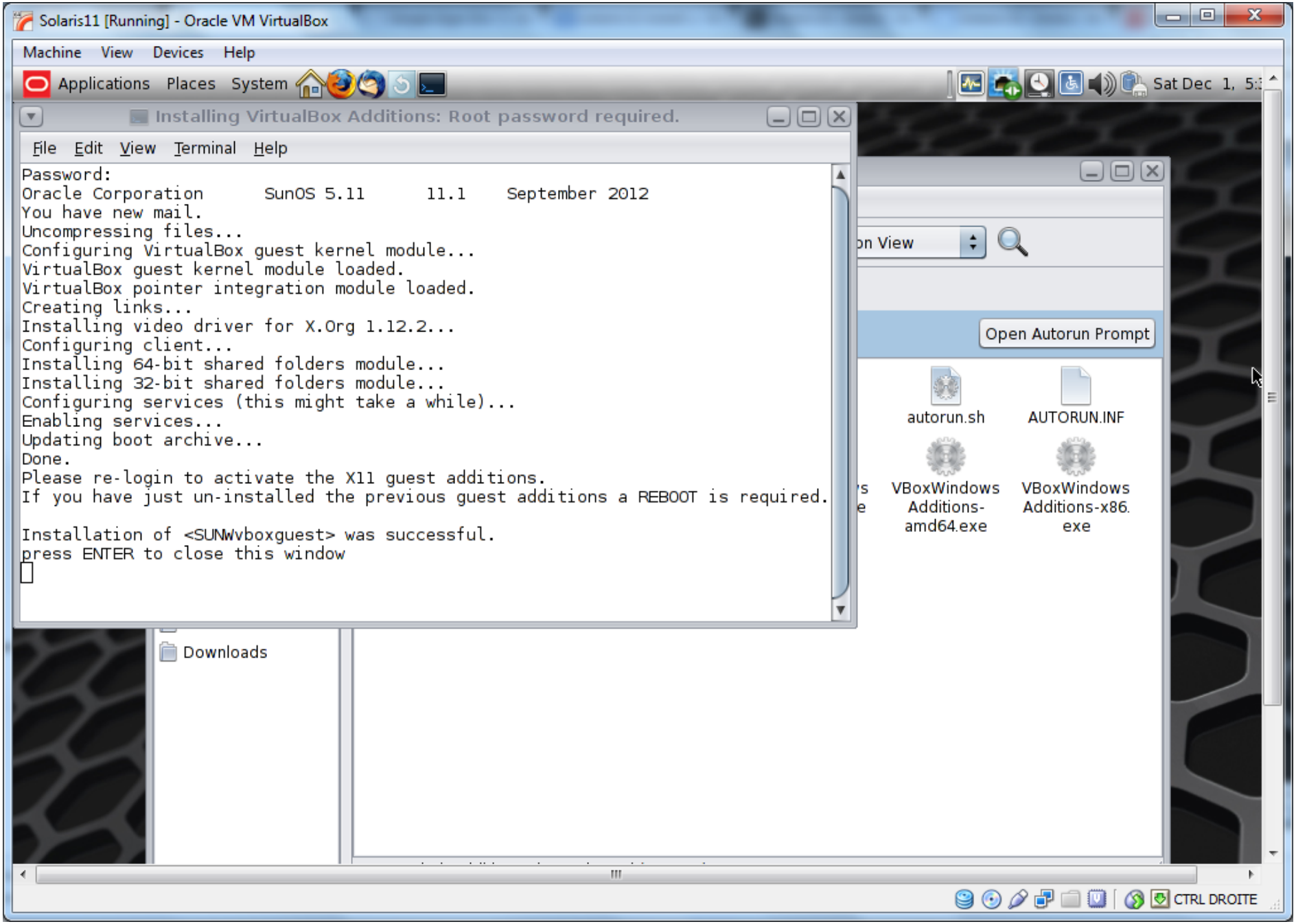
In the pop-up box, click on the **Run** button:


Solaris11 [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:0
Add More Software
Start Here
VBOXADDITIONS_4.2.4_81684
VBOXADDITIONS_4.2.4_81684 - File Browser
File Edit View Go Bookmarks Help
Back Forward
66%
Icon View
Places
trainee
Desktop
Computer
File System
Network
VBOXADDITI...
Trash
Documents
Music
Pictures
Videos
Downloads
VBOXADDITIONS_4.2.4_81684
The media has been detected as "UNIX software".
Open Autorun Prompt
utorun.sh
AUTORUN.INF
VBoxWindows Additions-x86.exe
VBOXADDITIONS_4.2.4_81684
This medium contains software intended to be automatically started. Would you like to run it?
The software will run directly from the medium "VBOXADDITIONS_4.2.4_81684". You should never run software that you don't trust.
If in doubt, press Cancel.
Cancel
Run
CTRL DROITE

In the terminal that pops up asking for a password, type **fenestr0$**:


Solaris11 [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:0
Installing VirtualBox Additions: Root password required.
File Edit View Terminal Help
Password:
Open Autorun Prompt
autorun.sh
AUTORUN.INF
VBoxWindows Additions-amd64.exe
VBoxWindows Additions-x86.exe
Downloads
CTRL DROITE

Wait until the installation has completed and then hit ↵ Enter to close the terminal:

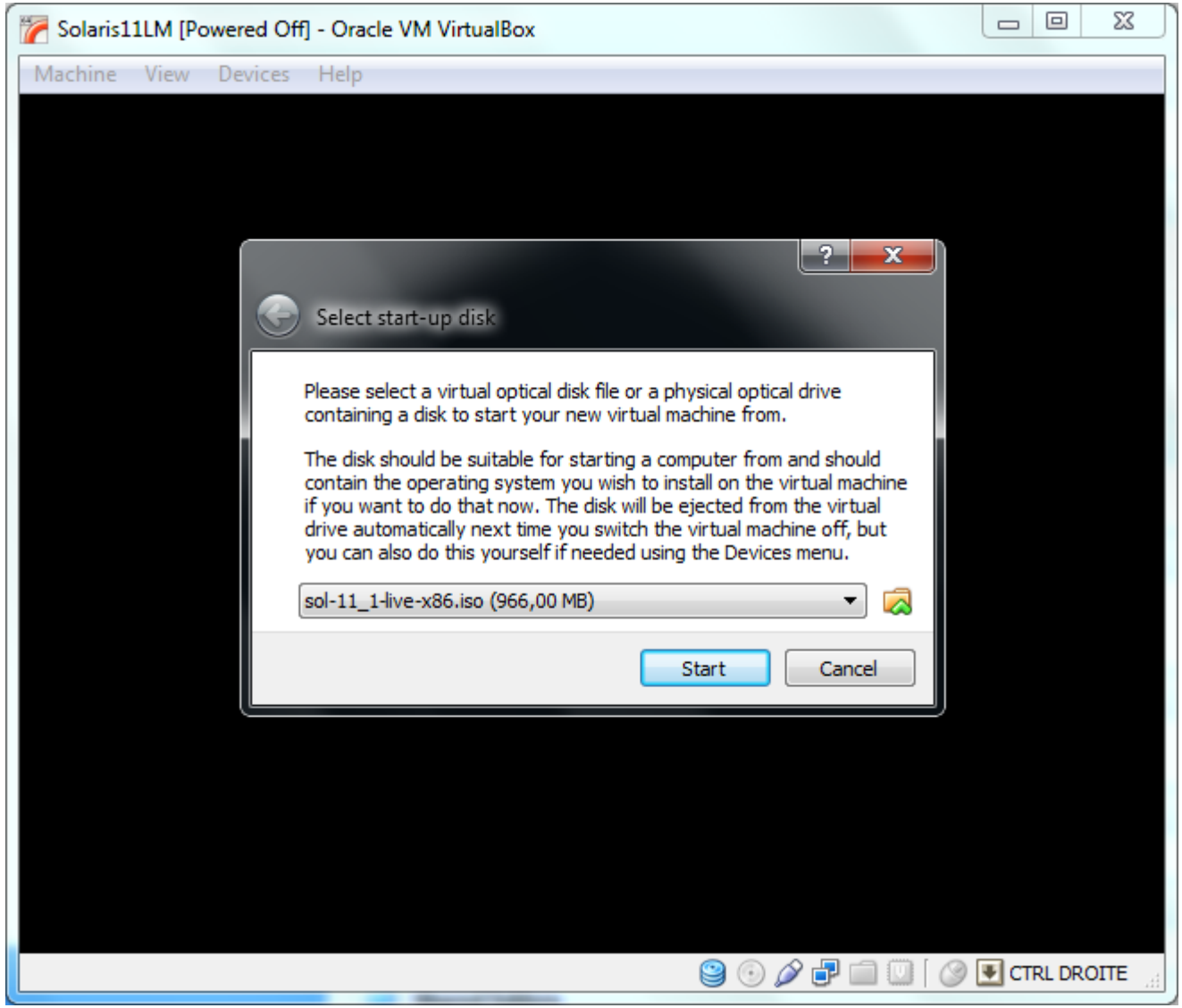

Solaris11 [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Sat Dec 1, 5:
Installing VirtualBox Additions: Root password required.
File Edit View Terminal Help
Password:
Oracle Corporation SunOS 5.11 11.1 September 2012
You have new mail.
Uncompressing files...
Configuring VirtualBox guest kernel module...
VirtualBox guest kernel module loaded.
VirtualBox pointer integration module loaded.
Creating links...
Installing video driver for X.Org 1.12.2...
Configuring client...
Installing 64-bit shared folders module...
Installing 32-bit shared folders module...
Configuring services (this might take a while)...
Enabling services...
Updating boot archive...
Done.
Please re-login to activate the X11 guest additions.
If you have just un-installed the previous guest additions a REBOOT is required.
Installation of <SUNWvboxguest> was successful.
press ENTER to close this window
Open Autorun Prompt
autorun.sh
AUTORUN.INF
VBoxWindows Additions-amd64.exe
VBoxWindows Additions-x86.exe
Downloads
CTRL DROITE

Eject the ISO image and reboot the system.

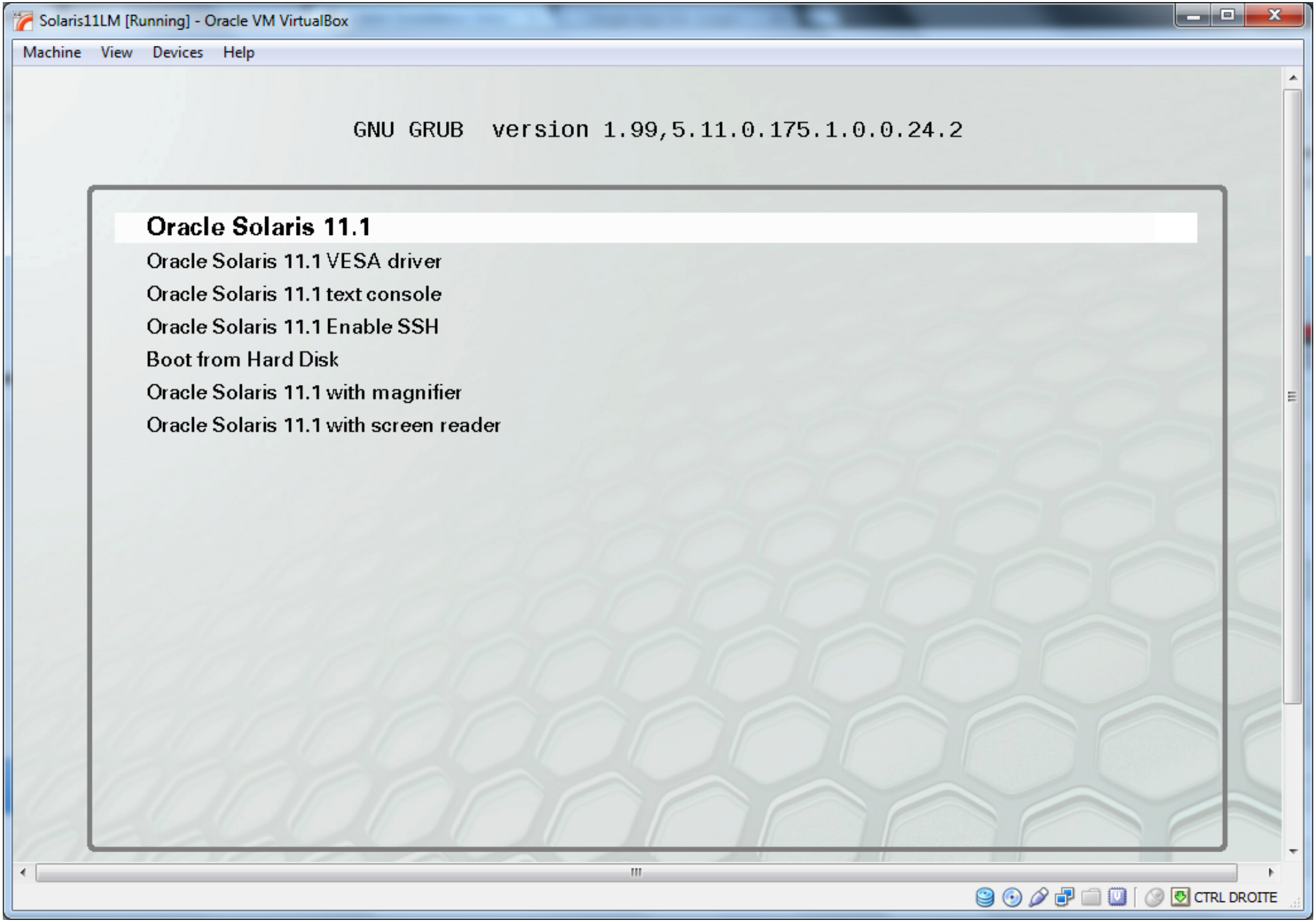
LAB #2 - Live Install in VirtualBox

Create a new virtual machine in VirtualBox with a 20GB **vmdk** hard disk and 2048MB of RAM.

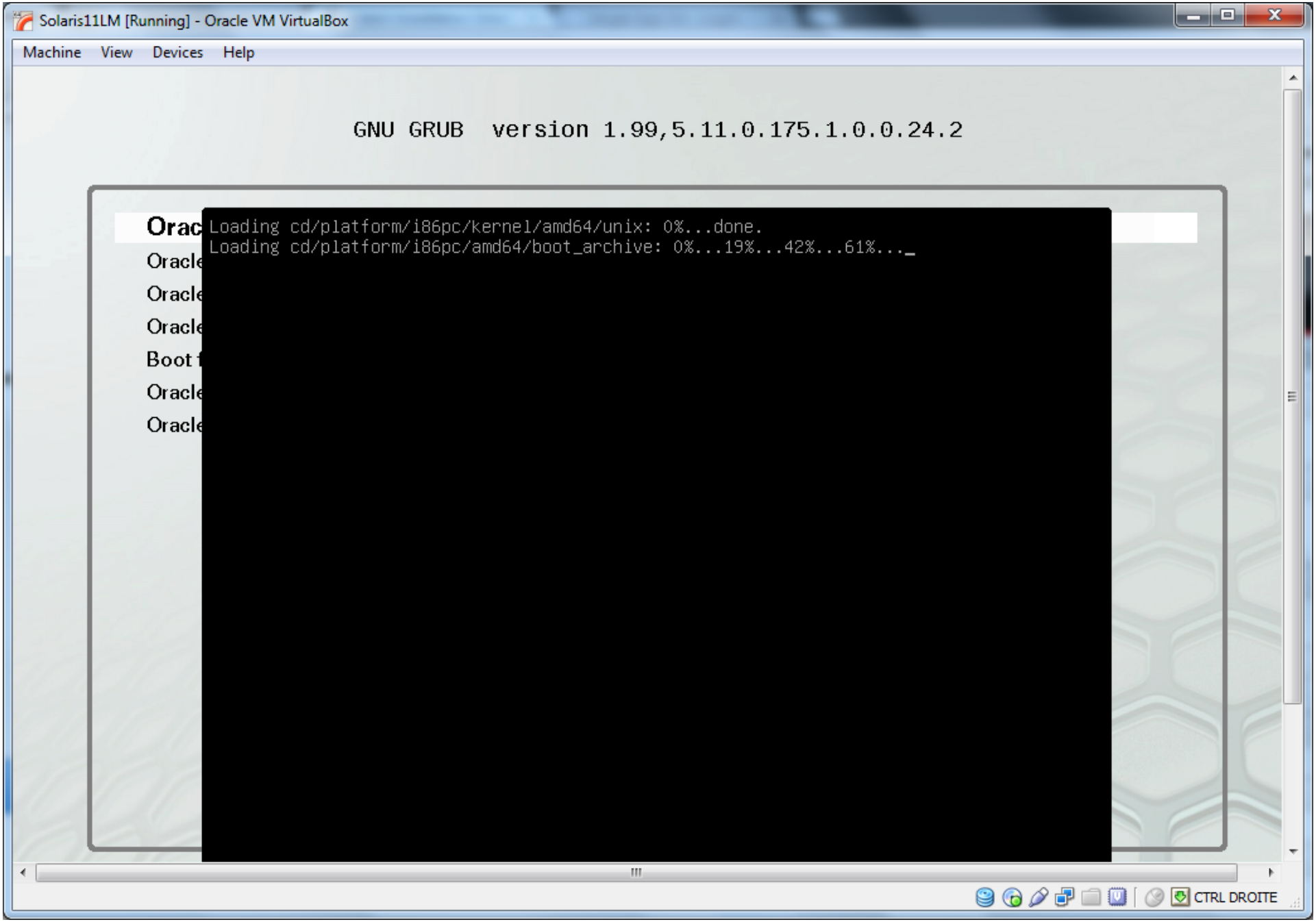
Start the new machine and tell it to boot the Live Media ISO:



From the grub boot menu, choose the **Oracle Solaris 11.1** item and hit ↵ Enter:


Solaris11LM [Running] - Oracle VM VirtualBox
Machine View Devices Help
GNU GRUB version 1.99,5.11.0.175.1.0.0.24.2
Oracle Solaris 11.1
Oracle Solaris 11.1 VESA driver
Oracle Solaris 11.1 text console
Oracle Solaris 11.1 Enable SSH
Boot from Hard Disk
Oracle Solaris 11.1 with magnifier
Oracle Solaris 11.1 with screen reader
CTRL DROITE

The Live system will boot:


Solaris11LM [Running] - Oracle VM VirtualBox
Machine View Devices Help
GNU GRUB version 1.99,5.11.0.175.1.0.0.24.2
Loading cd/platform/i86pc/kernel/amd64/unix: 0%...done.
Loading cd/platform/i86pc/amd64/boot_archive: 0%...19%...42%...61%...
CTRL DROITE

The system now prompts you to choose a keyboard layout:

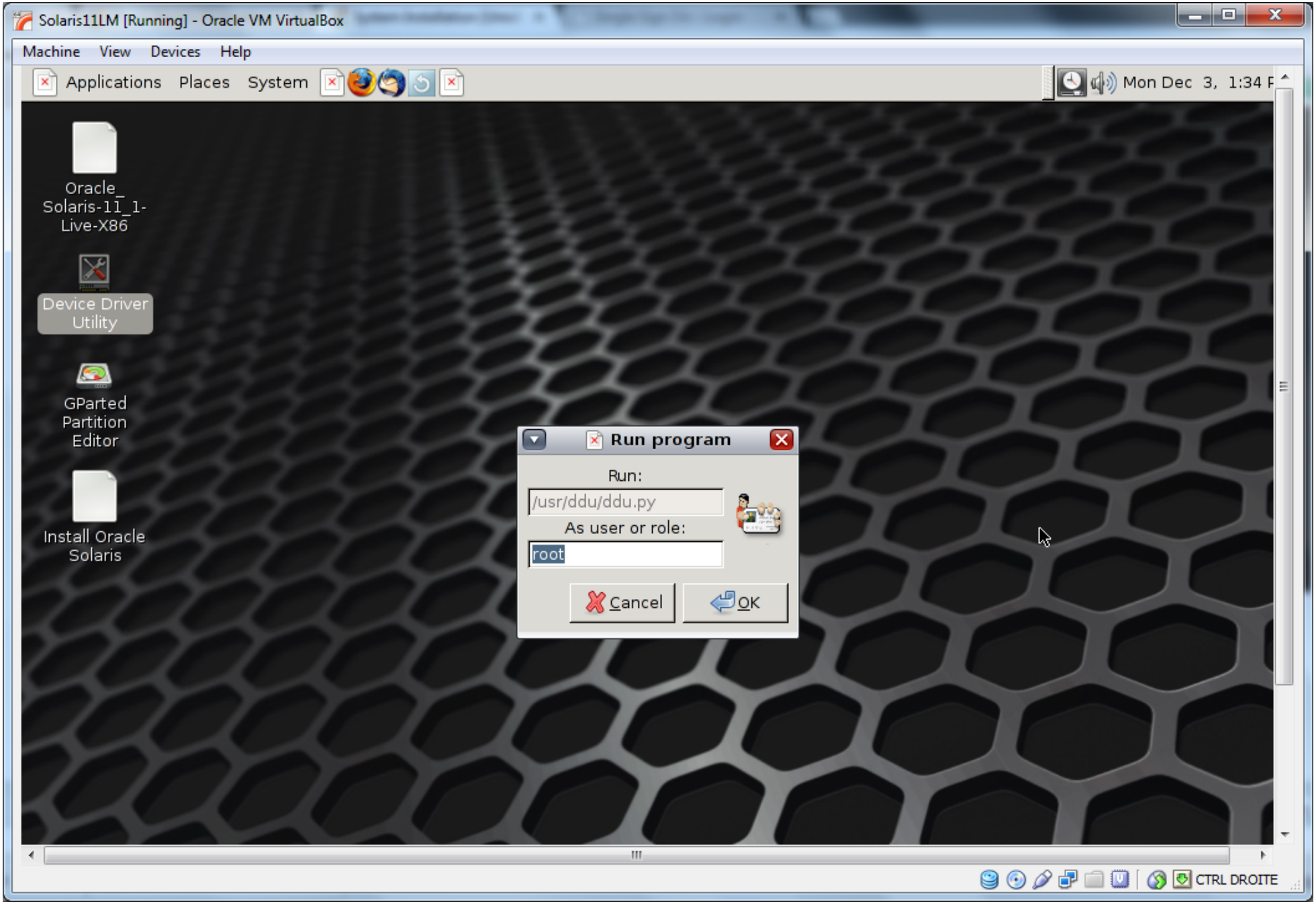
```
SunOS Release 5.11 Version 11.1 64-bit
Copyright (c) 1983, 2012, Oracle and/or its affiliates. All rights reserved.
Remounting root read/write
Probing for device nodes ...
Preparing image for use
Done mounting image
USB keyboard
 1. Arabic                          15. Korean
 2. Belgian                         16. Latin-American
 3. Brazilian                       17. Norwegian
 4. Canadian-Bilingual              18. Portuguese
 5. Canadian-French                 19. Russian
 6. Danish                          20. Spanish
 7. Dutch                           21. Swedish
 8. Dvorak                          22. Swiss-French
 9. Finnish                         23. Swiss-German
10. French                          24. Traditional-Chinese
11. German                          25. TurkishQ
12. Italian                         26. UK-English
13. Japanese-type6                  27. US-English
14. Japanese
To select the keyboard layout, enter a number [default 27]:
```

Followed by the choice of the installation language:

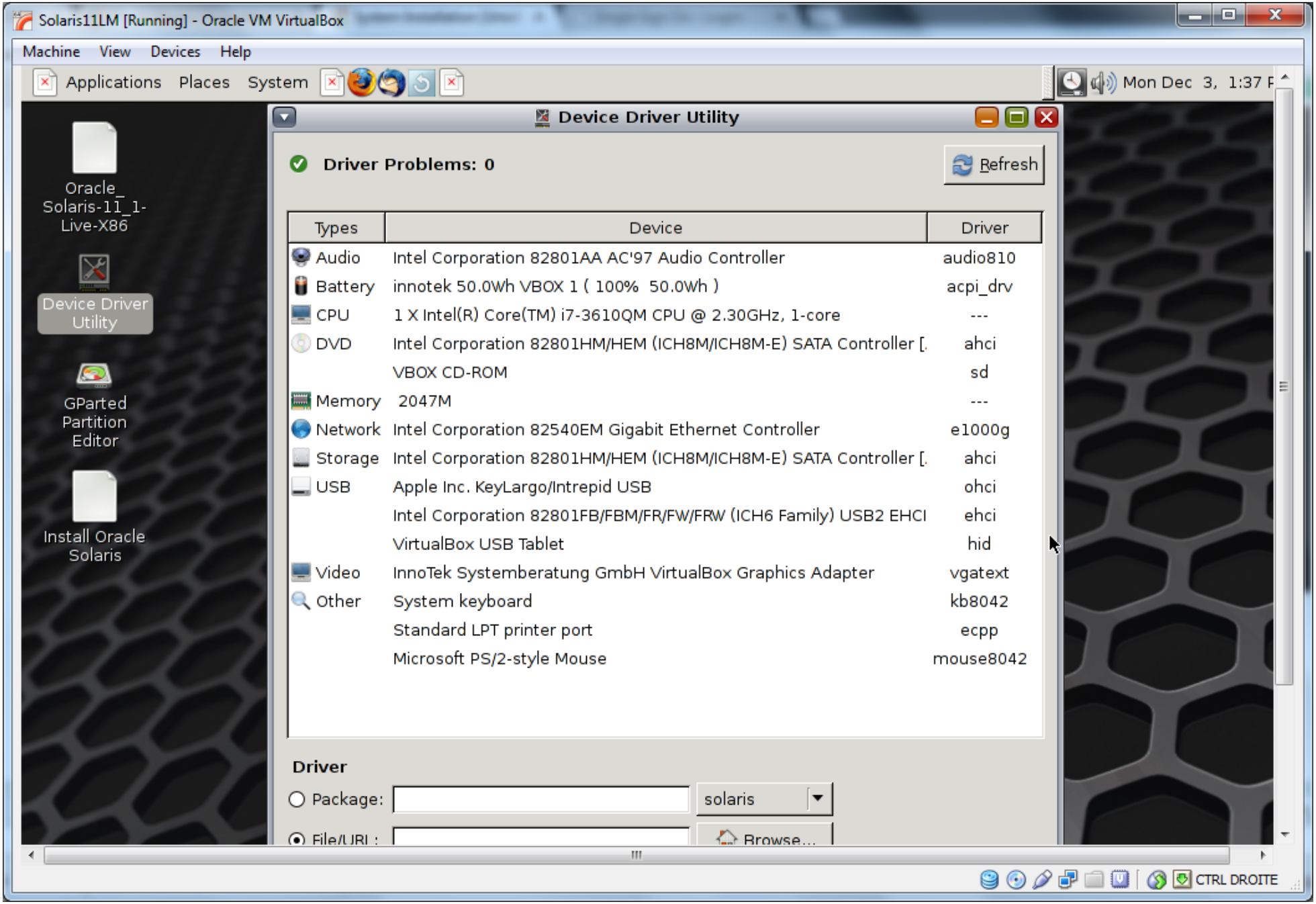
```
USB keyboard
 1. Arabic                          15. Korean
 2. Belgian                         16. Latin-American
 3. Brazilian                       17. Norwegian
 4. Canadian-Bilingual              18. Portuguese
 5. Canadian-French                 19. Russian
 6. Danish                          20. Spanish
 7. Dutch                           21. Swedish
 8. Dvorak                          22. Swiss-French
 9. Finnish                         23. Swiss-German
10. French                          24. Traditional-Chinese
11. German                          25. TurkishQ
12. Italian                         26. UK-English
13. Japanese-type6                  27. US-English
14. Japanese
To select the keyboard layout, enter a number [default 27]:10

 1. Chinese - Simplified
 2. Chinese - Traditional
 3. English
 4. French
 5. German
 6. Italian
 7. Japanese
 8. Korean
 9. Portuguese - Brazil
10. Spanish
To select the language you wish to use, enter a number [default is 3]:
```

When the system asks you to log in at the command line, do **NOTHING**. Wait until the graphical interface launches.

Once the graphical interface has launched, double click on the **Device Driver Utility** icon and click on the **OK** button to run the program as **root**. When prompted enter **solaris** as the **root** password:


Solaris11LM [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:34 P
Oracle_ Solaris-11_1-Live-X86
Device Driver Utility
GParted Partition Editor
Install Oracle Solaris
Run program
Run:
/usr/ddu/ddu.py
As user or role:
root
Cancel
OK
CTRL DROITE

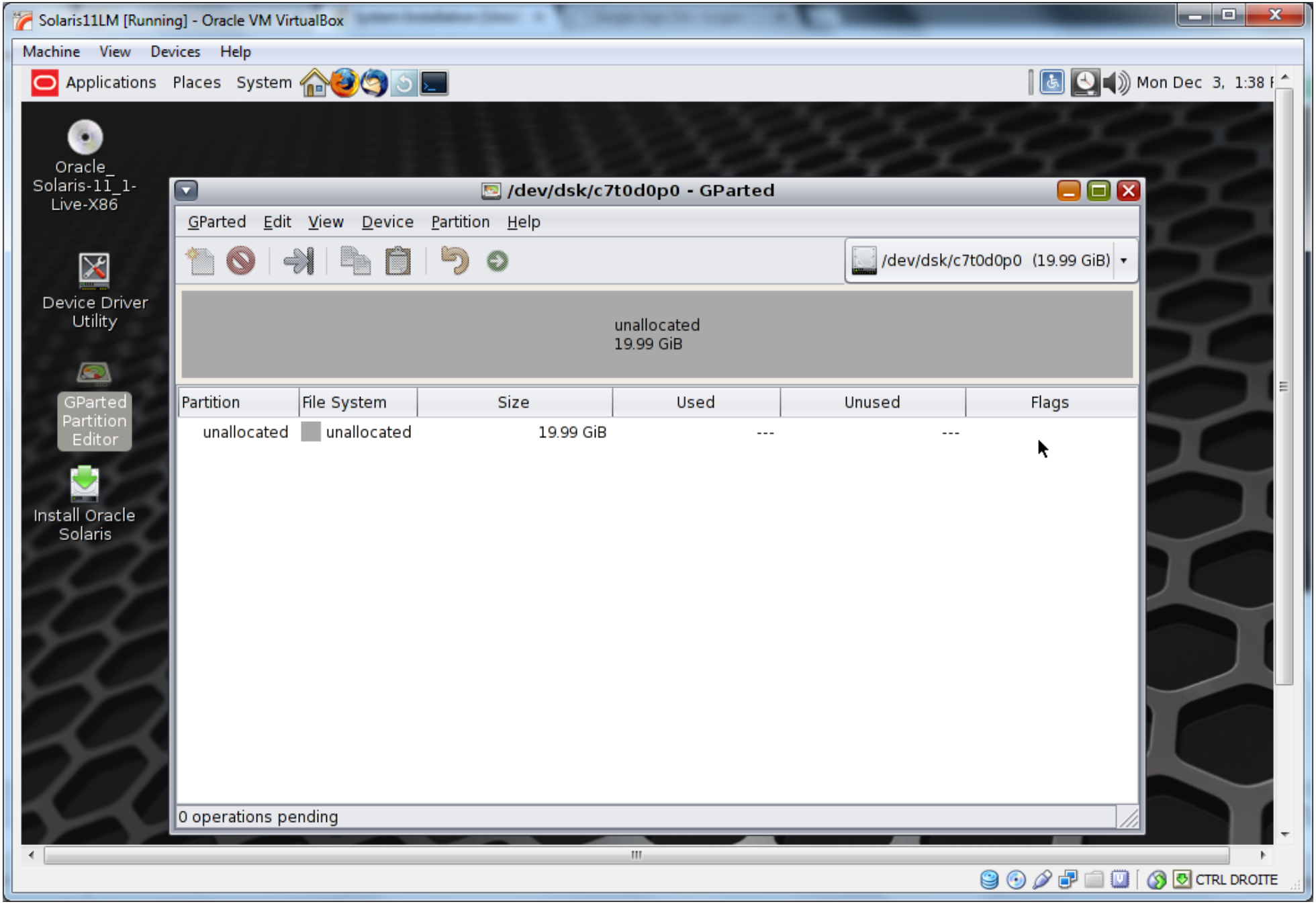
After a little while, the Device Driver Utility will show you any eventual driver problems:


Solaris11LM [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:37 P
Oracle_ Solaris-11_1-Live-X86
Device Driver Utility
GParted Partition Editor
Install Oracle Solaris
Device Driver Utility
Driver Problems: 0
Refresh
Types
Device
Driver
Audio
Intel Corporation 82801AA AC'97 Audio Controller
audio810
Battery
innotek 50.0Wh VBOX 1 (100% 50.0Wh)
acpi_drv
CPU
1 X Intel(R) Core(TM) i7-3610QM CPU @ 2.30GHz, 1-core

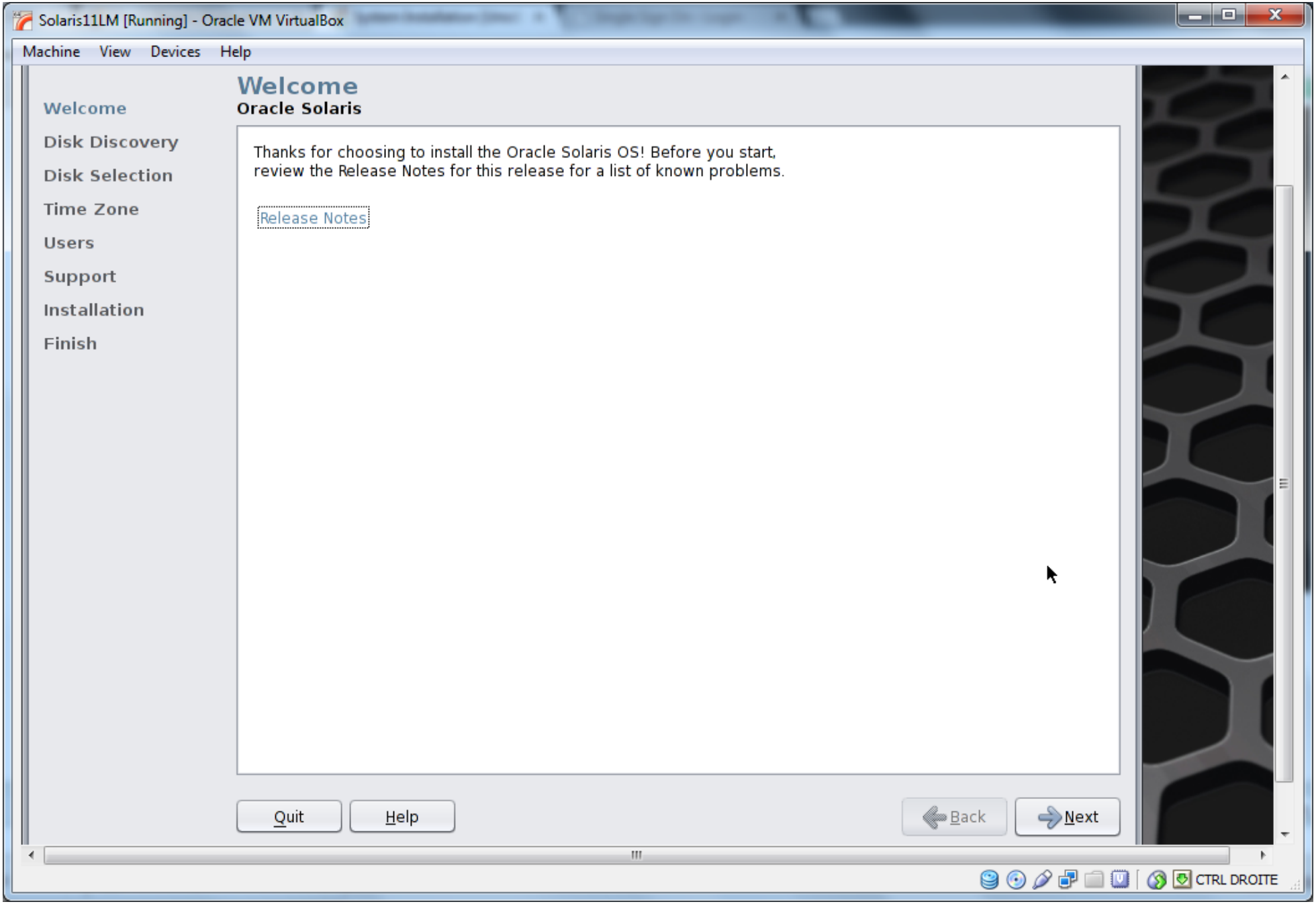
DVD
Intel Corporation 82801HM/HEM (ICH8M/ICH8M-E) SATA Controller [.
ahci
VBOX CD-ROM
sd
Memory
2047M

Network
Intel Corporation 82540EM Gigabit Ethernet Controller
e1000g
Storage
Intel Corporation 82801HM/HEM (ICH8M/ICH8M-E) SATA Controller [.
ahci
USB
Apple Inc. KeyLargo/Intrepid USB
ohci
Intel Corporation 82801FB/FBM/FR/FW/FRW (ICH6 Family) USB2 EHCI
ehci
VirtualBox USB Tablet
hid
Video
InnoTek Systemberatung GmbH VirtualBox Graphics Adapter
vgatext
Other
System keyboard
kb8042
Standard LPT printer port
ecpp
Microsoft PS/2-style Mouse
mouse8042
Driver
Package:
solaris
File/URI :
Browse...
CTRL DROITE

Close the Device Driver Utility window and double-click on the **GParted Partition Editor** icon. Using this application you can make space on a disk that already contains a Linux system in order to install Solaris 11:


Solaris11LM [Running] - Oracle VM VirtualBox
Machine View Devices Help
Applications Places System
Mon Dec 3, 1:38
Oracle_ Solaris-11_1-Live-X86
Device Driver Utility
GParted Partition Editor
Install Oracle Solaris
/dev/dsk/c7t0d0p0 - GParted
GParted Edit View Device Partition Help
/dev/dsk/c7t0d0p0 (19.99 GiB)
unallocated
19.99 GiB
Partition File System Size Used Unused Flags
unallocated unallocated 19.99 GiB --- ---
0 operations pending
CTRL DROITE

Close the GParted window and double-click on the **Install Oracle Solaris** icon:


Solaris11LM [Running] - Oracle VM VirtualBox
Machine View Devices Help
Welcome
Oracle Solaris
Welcome
Disk Discovery
Disk Selection
Time Zone
Users
Support
Installation
Finish
Thanks for choosing to install the Oracle Solaris OS! Before you start, review the Release Notes for this release for a list of known problems.
Release Notes
Quit
Help
Back
Next
CTRL DROITE

Using what you have learnt in the **Text Install** section of this lesson, install Solaris 11 using the **Live Media**. Once installed, log in, open a terminal and try to switch to the root role. Note that the root password has expired. Set the new root password to **wind0w$**. Finally install the VirtualBox Additions.
