



The following topics are covered in this chapter:

- Preparing to Install Red Hat Enterprise Linux
- Performing a Manual Installation

This chapter covers no exam objectives.

Installing Red Hat Enterprise Linux Server

To learn how to work with Red Hat Enterprise Linux Server as an administrator, you first need to install it. This chapter teaches you how to set up an environment in which you can perform all exercises in this book.

On the RHCSA exam, you do not need to install Red Hat Enterprise Linux Server. However, because you need to install an environment that allows you to test all items discussed in this book, you start by installing Red Hat Enterprise Linux in this chapter. This chapter describes all steps that you will encounter while performing an installation of RHEL 7. It also discusses how to set up an environment in which you can perform all exercises in this book.

“Do I Know This Already?” Quiz

The “Do I Know This Already?” quiz allows you to assess whether you should read this entire chapter thoroughly or jump to the “Exam Preparation Tasks” section. If you are in doubt about your answers to these questions or your own assessment of your knowledge of the topics, read the entire chapter. Table 1-1 lists the major headings in this chapter and their corresponding “Do I Know This Already?” quiz questions. You can find the answers in Appendix A, “Answers to the ‘Do I Know This Already?’ Quizzes and ‘Review Questions.’”

Table 1-1 “Do I Know This Already?” Section-to-Question Mapping

Foundation Topics Section	Questions
Preparing to Install Red Hat Enterprise Linux	1, 2, 6
Performing a Manual Installation	3–5, 7–10

- 1.** You want to install a test environment to practice for the RHCSA/RHCE exams. Which of the following distributions should you avoid?
 - a.** The most recent Fedora version
 - b.** CentOS 7
 - c.** Scientific Linux 7
 - d.** RHEL 7

- 2.** Which of the following features is not just available in RHEL but also in CentOS?
 - a.** Hardware certification
 - b.** Software certification
 - c.** The right to make support calls
 - d.** Software updates

- 3.** Why should you install the server with a GUI installation pattern?
 - a.** To prepare for RHCSA/RHCE, you need some tools that run in a GUI only.
 - b.** The minimal installation is incomplete.
 - c.** If you do not install a GUI immediately, it is very hard to add it later.
 - d.** The Server with GUI is the default installation that is recommended by Red Hat.

- 4.** Which is the default file system that is used in RHEL 7?
 - a.** Ext3
 - b.** Ext4
 - c.** XFS
 - d.** Btrfs

- 5.** Which feature is supported in Ext4 but not in XFS?
 - a.** Shrinking the file system
 - b.** Snapshots
 - c.** File system quota
 - d.** A maximum size that goes beyond 2TB

6. Which of the following is not a reason why Fedora should be avoided?
 - a. Fedora contains features that may or may not be available in future RHEL releases.
 - b. Fedora distributions show a much later state of development than RHEL.
 - c. Fedora software is not stable.
 - d. Software in Fedora may differ from the same software in RHEL.

7. Which of the following options is not available from the Installation Summary screen?
 - a. Date & Time
 - b. Keyboard
 - c. Language Support
 - d. Troubleshoot an Existing Installation

8. After setting the root password you want to use, you cannot proceed in the installation. What is the most likely cause that you cannot move on?
 - a. The password is unsecure, and unsecure passwords are not accepted.
 - b. The password does not meet requirements in the password policy.
 - c. You also need to create a user.
 - d. If an unsecure password is used, you need to click **Done** twice.

9. Which statement about the system language is *not* true?
 - a. You can change the system language from the Installation Summary screen.
 - b. You can change the system language directly after booting from the installation media.
 - c. When setting the installation language, you can also select a keyboard layout.
 - d. After installation, you cannot change the language settings.

- 10.** When installing a server that uses LVM logical volumes, you'll get at least three storage volumes (partitions or LVM). Which of the following is not part of them?
- a.** /boot
 - b.** /home
 - c.** /
 - d.** swap

Foundation Topics

Preparing to Install Red Hat Enterprise Linux

Before you start installing Red Hat Enterprise Linux, you want to take care of a few things. These things are discussed in this section. You'll first learn what exactly Red Hat Enterprise Linux is. Then you'll learn how you can get access to the software. We then discuss the Red Hat Enterprise Linux add-ons, as well as the setup requirements. After you know all about these, you move on to the next section, where you learn how to install Red Hat Enterprise Linux.

What Is Red Hat Enterprise Linux 7 Server?

RHEL 7 is a Linux distribution. As you probably know, Linux is a free operating system. That means that the source code of all programs is available for free, which is also the case for Red Hat Enterprise Linux 7. However, you cannot download RHEL 7 for free (with the exception of a 30-day evaluation version).

To use RHEL 7, you need a subscription. This subscription entitles you to a few additional items, such as support and patches. When you pay for Red Hat Enterprise Linux, Red Hat offers you a supported Enterprise Linux operating system. It is not just an operating system, but it is an operating system that is offered with some key benefits that are a normal requirement in corporate environments:

- Monitored updates and patches, which is not just updates and patches, but updates and patches that have gone through a thorough testing procedure
- Different levels of support and help, according to the kind of subscription that you have purchased
- A certified operating system that is guaranteed to run and to be supported on specific hardware models
- A certified platform for running enterprise applications such as SAP, Oracle Database, and many more
- Access to the Red Hat customer portal at access.redhat.com, where you can find much detailed documentation that is available to customers only

Red Hat understands that not all potential customers are interested in these enterprise features. That is why Red Hat is involved in two free alternatives also:

- CentOS 7
- Fedora

You'll learn more about these in the upcoming sections of this chapter.

Getting the Software

There are different ways to get the software required to perform all exercises in this book. In this section, you learn what your options are.

Using Red Hat Enterprise Linux Server

If you want to learn how to work with the different programs, tools, and services that are provided in Red Hat Enterprise Linux 7, the easiest way is to use Red Hat Enterprise Linux 7 on a paid version, not a free derivative such as CentOS or Scientific Linux. Red Hat Enterprise Linux 7 is not a freely available operating system, though. If you want to use it, you need to buy it. The only thing that you can get for free is a 30-day evaluation version, which you can get from <https://access.redhat.com/products/red-hat-enterprise-linux/evaluation>.

The most important thing that you get in the RHEL 7 Server evaluation version and which is not available in the freely available derivatives is access to the Red Hat customer portal. Through this portal, you have access to different kinds of information, in addition to updates provided through Red Hat Network.

After installing Red Hat Enterprise Linux and first registering it at the Red Hat Network, you'll get access to patches and updates for a period of 30 days. Once this period expires, you can still use Red Hat Enterprise Linux, but you can no longer install software through the Red Hat Network, nor update or patch the software, which makes RHEL a less-ideal candidate for use in this course if you do not want to pay for it.

Using CentOS

CentOS 7 is the Community Enterprise Operating System. CentOS 7 started as a recompiled version of RHEL, where all items that were not available for free were removed from the software. Basically, that meant that just the name was changed and that the Red Hat logo (which is proprietary) was removed from all the CentOS software packages. The result was an operating system that offered exactly the same functionality as RHEL 7 but was available for free (and without the enterprise support services).

Recently, Red Hat has incorporated CentOS. According to Red Hat CTO Brian Stevens in 2014, "That is to offer something to those customers that aren't ready for Enterprise support yet." The idea behind that is that eventually many customers will need enterprise support, because their Linux distribution is becoming increasingly important. And by giving away CentOS 7 for free, and under the Red Hat brand, it is just natural that the customer will upgrade to Red Hat Enterprise Linux 7.

CentOS 7 is also an excellent choice to work with in this book; it offers all that RHEL has to offer but you do not have to pay for it. That is why I'm using it myself, and I recommend you to use it as well. You can download CentOS 7 from <http://www.centos.org>.

TIP Another benefit of CentOS is that it has a bigger hardware compatibility list than RHEL 7, because more drivers are compiled in the CentOS 7 kernel.

Other Distributions

CentOS is not the only distribution that offers Red Hat packages without having to pay for them. Another commonly used Linux distribution that is doing the same is Scientific Linux, a Linux distribution that was developed at Fermi National Accelerator Laboratory. Even if Scientific Linux is known to be offering an excellent Linux distribution, while writing this book I have not used it, and so I do not guarantee the perfect working of all exercises in this book on Scientific Linux. In theory, it should work as well, though. In addition, it differs from CentOS because it provides additional repositories and its own updates and patches. So, you do run the risk of working with software in Scientific Linux that you will not find in the exact same way when taking the RHCSA or RHCE exams, which are based on Red Hat Enterprise Linux.

Another Linux distribution closely related to Red Hat Enterprise Linux is Fedora. Fedora is a completely open source Linux distribution available for free. Red Hat is dedicating a lot of staff to contribute to the Fedora project, because Red Hat uses Fedora as the development platform for RHEL. The result is that Fedora offers access to the latest and greatest software, which in most cases is much more recent than the thoroughly tested software components of Red Hat Enterprise Linux (which is why you should not use Fedora to prepare for the RHCSA or RHCE exam). Fedora is also used by Red Hat as a testing ground for new features that might or might not be included in future RHEL releases. In Fedora, you will work with items that are not available in RHEL, which means that you will have to do things differently on the exam. So, don't use it!

Understanding Access to Repositories

An important difference between RHEL and the other distributions is the access to repositories. A repository is the installation source used for installing software. If you are using free software such as CentOS, correct repositories are automatically set up, and no further action is required. If you are using Red Hat Enterprise Linux

with a subscription, you'll get access to the Red Hat repositories on the Red Hat Network (RHN).

TIP If you are installing Red Hat from the RHEL 7 installation disc, but you do not register it, you will not have access to any repository at all, which is why you need to know how to set up repository access manually. In Chapter 11, “Installing Software Packages,” you learn how to do this.

Understanding Red Hat Enterprise Linux 7 Server Variants and Add-Ons

This book focuses on the default version of RHEL 7. However, it is good to know that there are some server variants and add-ons available. A server variant is developed to be used for specific purposes or platforms. Server variants are modified versions of the RHEL 7 platform. A server add-on is an additional installation that offers functionality to RHEL 7 that is not available by default. Add-ons also require additional payment.

The following server variants are offered:

- **Red Hat Enterprise Linux Server for High-Performance Computing (HPC):** A tuned version of RHEL that is created to be used in an HPC cluster, so that challenging workloads can be handled in the most efficient way possible.
- **Red Hat Enterprise Linux Server for IBM Power:** IBM Power is a specific platform that is used in high-demand environments. To run RHEL on this hardware platform, Red Hat is offering the RHEL for IBM Power server variant.
- **Red Hat Enterprise Linux Server for IBM System z:** This platform-specific version of RHEL allows you to run RHEL on IBM mainframes.
- **Red Hat Enterprise Linux for SAP Business Applications:** This is a version of RHEL that was specifically developed for SAP application deployments. It contains the infrastructure software stack that is needed for the best operation of SAP apps, and the service and support that is required for running SAP on RHEL.
- **Red Hat Enterprise Linux for SAP HANA:** A version of RHEL that has been optimized to run SAP HANA, an enterprise relational database management system that was designed to run completely from server memory without needing any disk access.

Apart from the server variants, Red Hat also offers server add-ons to enrich the features offered through RHEL:

- **High Availability:** An add-on that helps you to make applications highly available through failover to another node after failure.
- **Resilient Storage:** A solution that allows you to access the same storage device over a network, through shared storage or a clustered file system.
- **Smart management:** An add-on that makes managing and updating RHEL systems easier, and integrates well with Red Hat Satellite.
- **Extended support:** This add-on offers 24 months of additional support after the ending of the default RHEL support life cycle.

Setup Requirements

RHEL 7 can be installed on physical as well as virtual hardware. For the availability of specific features, it does not really matter which type of hardware is used, as long as the following conditions are met:

- 512MB of RAM
- A 4GB hard disk
- A network card

The preceding requirements allow you to run a minimal installation of RHEL, but if you want to create an environment that enables you to perform all exercises described in this book, make sure to meet the following minimal requirements

- 64-bit platform support
- 1GB of RAM
- A 10GB hard disk
- A DVD drive
- A network card

NOTE Some resources on the Internet will mention different minimal requirements. This is not a big deal for the RHCSA or RHCE exams.

Course Environment Description

To perform all exercises in this book, I recommend installing three different servers, named as follows:

- Server1
- Server2
- FreeIPA

TIP Although I recommend setting up all parts that are required for this course manually, if you are having a problem you might like the environment that I provide at <http://www.rhatcert.com>. Go to the download area of this website to get access to all software required to work on the exercises in this book.

Server1 is a base RHEL 7 installation used in the RHCSA part of this book. Server2 is used when client/server functionality needs to be tested. The FreeIPA server is required in some of the labs related to authentication and Network File System (NFS). To install server1 and server2, you can follow the generic guidelines in this chapter; all specific parts of the setup are explained in the specific exercises. To install the FreeIPA server, you can follow the directions in Appendix D, “Setting Up Identity Management,” after you have installed a base installation of RHEL 7.

NOTE Even if in this book I’m using CentOS 7, because this is a book about RHEL and no functional difference exists between CentOS 7 and RHEL 7, I just refer to RHEL 7. If items are discussed that apply to RHEL7 only, and not to CentOS, I mention that specifically.

To set up the course environment, I recommend that you use a solution for desktop virtualization, such as VMware Workstation (or Fusion if you are on Mac) or Oracle VirtualBox. Using one of these has the benefit that you can use snapshots which enable you to easily revert to a previous state of the configuration. Other virtualization solutions, such as KVM, are supported as well. You can also install on real hardware, but you will be less flexible.

TIP In all chapters, you'll find step-by-step exercises that tell you exactly what to do to configure specific services. At the end of all chapters, you'll find end-of-chapter labs which provide assignments that are very similar to the types of assignments that you will get on the exam. To get the most out of the end-of-chapter labs, it is a good idea to start from a clean environment. The most efficient way to do this is by creating snapshots of the state of your virtual machines when you are starting the chapter. This allows you to revert to the state your virtual machines were in when you started working on the chapter, while still keeping all the work that you have done in previous chapters.

Performing a Manual Installation

Even if RHEL 7 can be installed from other media such as an installation server or a USB key, the most common installation starts from the installation DVD. So, take your installation DVD and boot the computer on which you want to install RHEL 7. The following steps describe how to proceed from the moment that you see the installation DVD boot screen:

1. After booting from DVD, you'll see the CentOS 7 boot menu. From this menu, you can choose from different options:
 - **Install CentOS 7:** Choose this for a normal installation.
 - **Test This Media & Install CentOS 7:** Select this if before installing you want to test the installation media. Notice that this will take a significant amount of time.
 - **Troubleshooting:** Select this option for some troubleshooting options. This option is useful if you cannot normally boot from your computer's hard drive anymore.



When the installation program starts, you can pass boot options to the kernel, so enable or disable specific features. To get access to the prompt where you can add these options, press **Tab** from the installation menu. This will show you the kernel boot line that will be used and offers an option to change boot parameters.

To start a normal installation, just select the **Install CentOS 7** boot option.

2. Once the base system from which you will perform the installation has loaded, you see the Welcome to CentOS 7 screen. From this screen, you can select the language and the keyboard setting. For the RHCSA and RHCE exams, it makes no sense to choose anything but English. If you are working on a non-US keyboard, from this screen you can select the keyboard setting. Make sure

to select the appropriate keyboard setting, after which you click **Continue** to proceed (see Figure 1.1).

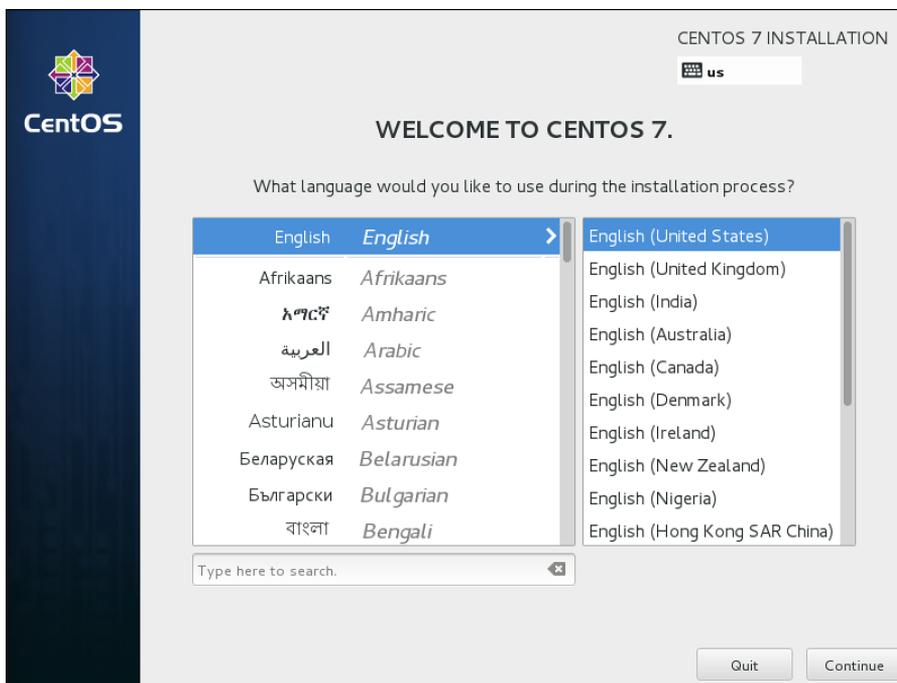


Figure 1.1 Select the appropriate language and keyboard setting before continuing.

3. After selecting the keyboard and language settings, you'll see the Installation Summary screen (see Figure 1.2). From this screen, you specify all settings you want to use. On this screen, you have seven different options:
 - Date & Time
 - Keyboard
 - Language Support
 - Installation Source
 - Software Selection
 - Installation Destination
 - Network & Hostname

From this overview screen, you can see whether items still need to be configured. So long as this is the case, you cannot click the **Begin Installation** button. You will not have to change settings at each option in all cases, but for completeness, you'll learn what is behind the different settings in the subsections that follow.

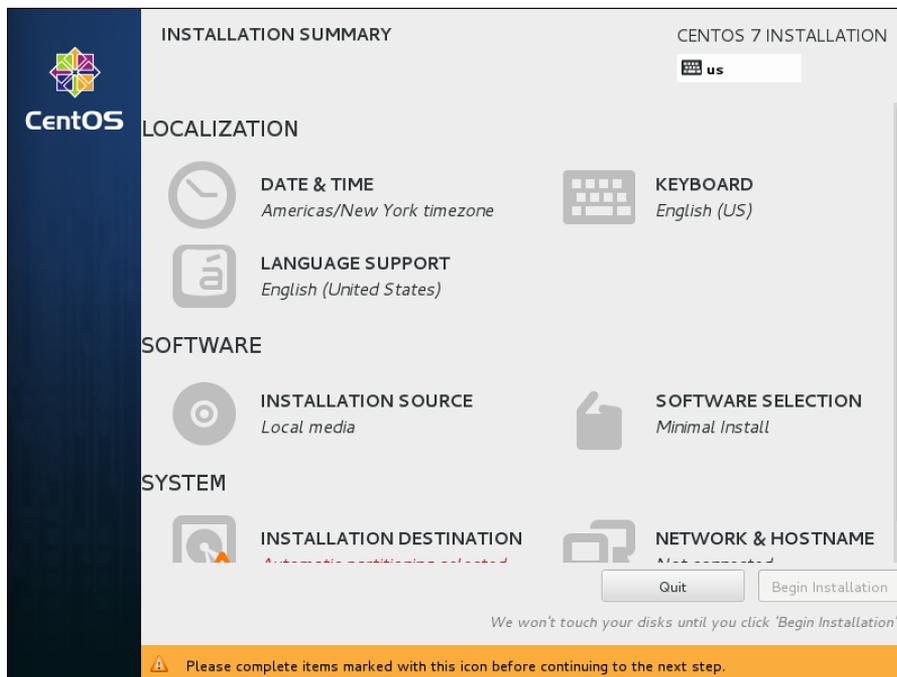


Figure 1.2 You specify the complete configuration of your server from the Installation Summary screen.

4. After selecting Date & Time, you'll see a map of the world on which you can easily click the time zone that you are in (see Figure 1.3). Alternatively, you can select the region and city you are in. You can also set the current date and time, and after setting the network, you can specify the Network Time Protocol (NTP) to be used. This option is not accessible if you have not configured the network yet. When using network time, you can add network time servers to be used by clicking the configuration icon in the upper-right part of the screen. After specifying the settings you want to use, click **Done** in the upper-left corner of the screen to write the settings.

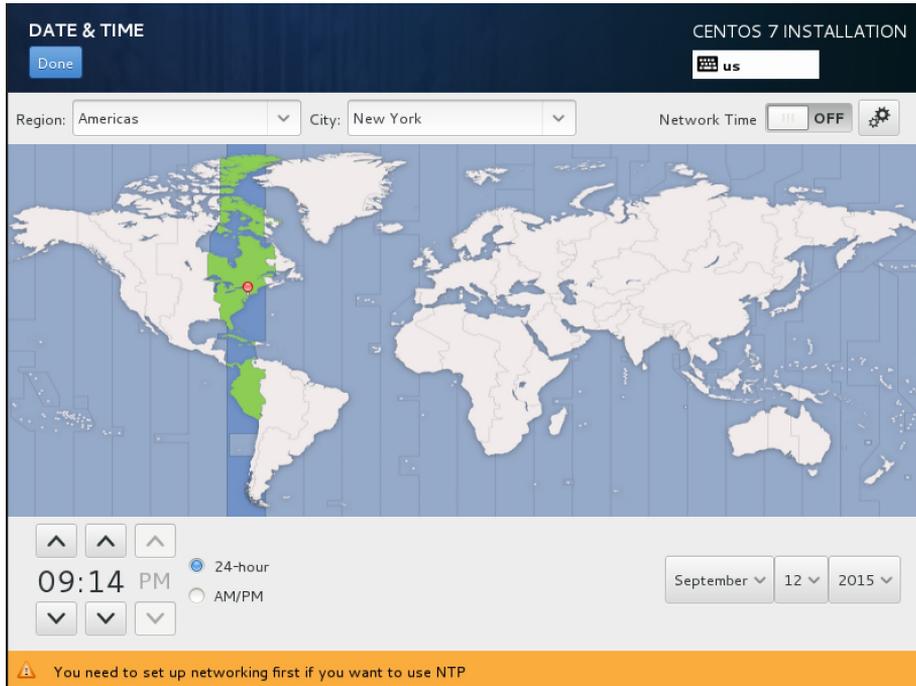


Figure 1.3 Selecting date and time settings.

5. Under the Keyboard Layout option, you'll find what you need to configure the keyboard layout. From this screen, shown in Figure 1.4, you can also select a secondary keyboard layout, which is useful if your server is used by administrators using different keyboard layouts. Not only different language settings are supported, but also different hardware layouts. If many administrators are using an Apple Macintosh computer, for instance, you can select the standard keyboard layout for Mac in the appropriate region.

After adding another keyboard layout, you can also configure layout switching options. This is a key sequence that is used to switch between different kinds of layout. Select **Options** to specify the key combination you want to use for this purpose. After specifying the configuration you want to use, click **Done** to complete.

6. The Language Support option is the same as the Language Support option that you used in Step 2 of this procedure. If you've already configured the language settings to be used, you do not need to change anything here.

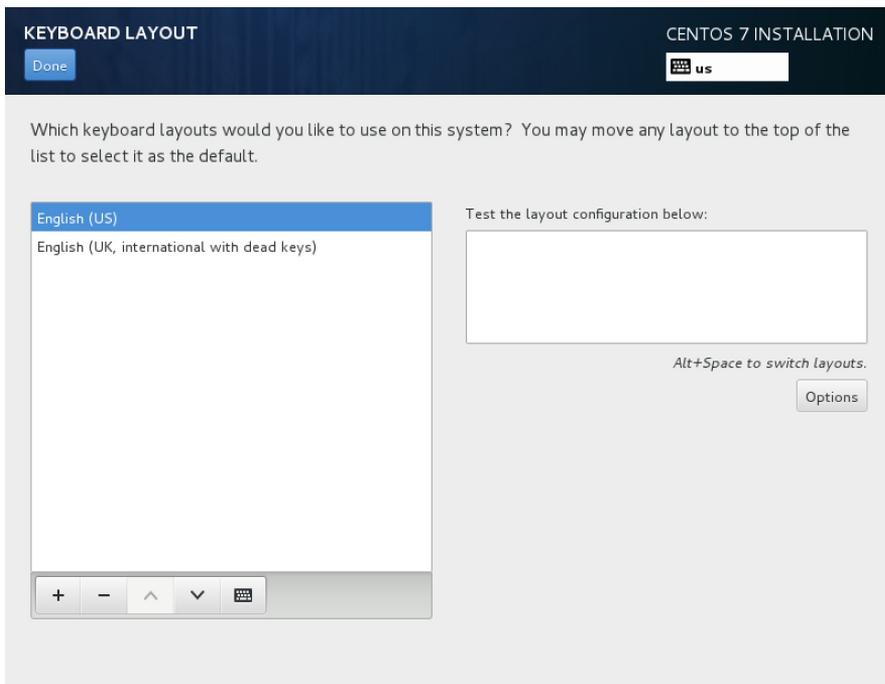


Figure 1.4 Selecting additional keyboard layout.

7. In the Software section, the first option available is Installation Source (see Figure 1.5). If you have booted from a regular installation disc, there is nothing to be specified from this option. If you have booted from a minimal boot environment, you can specify the network URL where additional packages are available, as well as additional repositories that need to be used. You do not have to do this for the RHCSA or RHCE exam, but if ever you are setting up an installation server, it is useful to know that this option exists.
8. An important part of the installation procedure is the Software Selection screen. From here, you select the base environment (see Figure 1.6) and additions that are available for the selected environment. By default, a Minimal Installation is selected. This base environment allows you to install RHEL on a minimal-size hard disk. For this course, I assume that you install the **Server with GUI** option. To perform the tasks that need to be performed on the RHCSA and RHCE exams, some easy-to-use graphical tools are available, so it does make sense to install a server with a graphical user interface (GUI) (even if you would never do this in a production environment). All additional packages can be added later. At this point, you do not have to select any additional packages.

INSTALLATION SOURCE CENTOS 7 INSTALLATION

Done us

Which installation source would you like to use?

Auto-detected installation media:

Device: sr0
Label: CentOS_7_x86_64

On the network:

http://

This URL refers to a mirror list.

Additional repositories

Enabled	Name

Name:

http://

This URL refers to a mirror list.

Proxy URL:

Username:

Password:

Figure 1.5 Selecting the installation source.

SOFTWARE SELECTION CENTOS 7 INSTALLATION

Done 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**

Add-Ons for Selected Environment

- Backup Server**
Software to centralize your infrastructure's backups.
- DNS Name Server**
This package group allows you to run a DNS name server (BIND) on the system.
- Directory Server**
Machine and user identity servers.
- E-mail Server**
Allows the system to act as a SMTP and/or IMAP e-mail server.
- FTP Server**
Allows the system to act as an FTP server.
- File and Storage Server**
CIFS, SMB, NFS, iSCSI, iSER, and iSNS network storage server.
- Hardware Monitoring Utilities**
A set of tools to monitor server hardware.

Figure 1.6 Make sure you select **Server with GUI** for every server you are going to use for the exercises in this book.

NOTE Some people say that *real* administrators do not use the Server with GUI installation pattern. Preparing for the RHCSA and RHCE exams is not about being a real administrator. The big advantage of using the Server with GUI installation pattern is that it provides a GUI. Some tools discussed in this book only run on a GUI. Also, you'll notice that an increasing number of Linux servers run with a GUI.

9. Next, you need to specify where you want to install to. By default, automatic partitioning is selected and you only need to approve the disk device you want to use for automatic partitioning (see Figure 1.7). Many advanced options are available, as well. To prepare your installation for all the exercises that are in later chapters in this book, you cannot just use the default partitioning. Instead, you need a setup that uses LVM and also keeps some disk space available. To do this, from the screen you see in Figure 1.7, select **I Will Configure Partitioning**. Then, make sure that the disk you want to use is selected and click **Done** to proceed. Notice that sometimes not all options are shown, and you'll see a scrollbar to the right of the screen. If this is the case, scroll down to show additional installation options. You'll see the Encryption option, which allows you to set up an encrypted disk.

TIP If you want to use this server to perform the exercises in the upcoming chapters, make sure you keep some disk space that is not allocated to any partition. You need unpartitioned disk space to work through the partitioning and LVM exercises, which is an essential part of the RHCSA exam objectives.

After specifying that you want to set up disk layout manually, you'll see the screen that is in Figure 1.8. From this screen, click **+** to add new disk devices. For setting up the environment that is required in this course, I recommend using the following disk layout (based on a 20GB hard disk).

- /boot mounted on an XFS formatted traditional partition, size 500MB
- An XFS formatted logical volume with a size of 10GB that is mounted on /
- A 1GB logical volume that is used as swap space

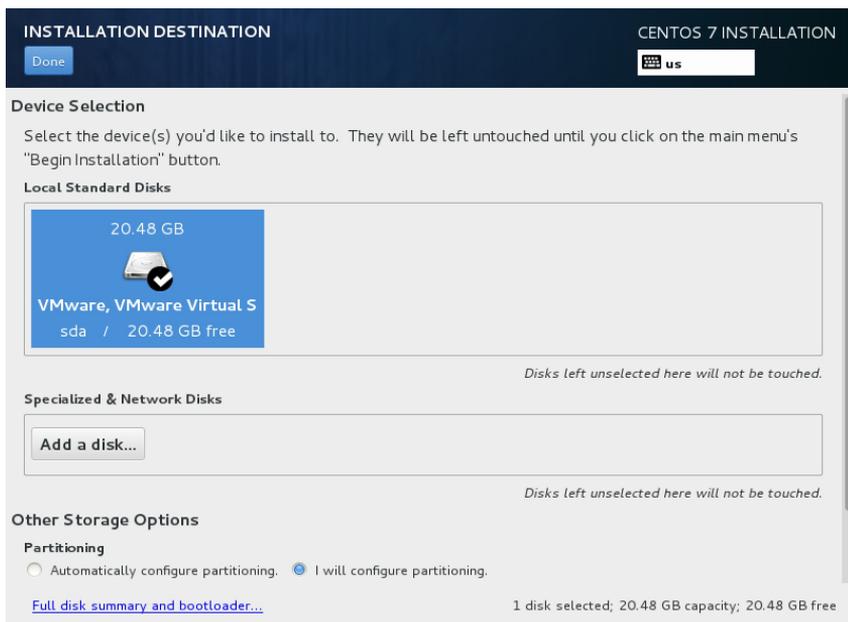


Figure 1.7 Select **I Will Configure Partitioning**, and click **Done** to proceed.

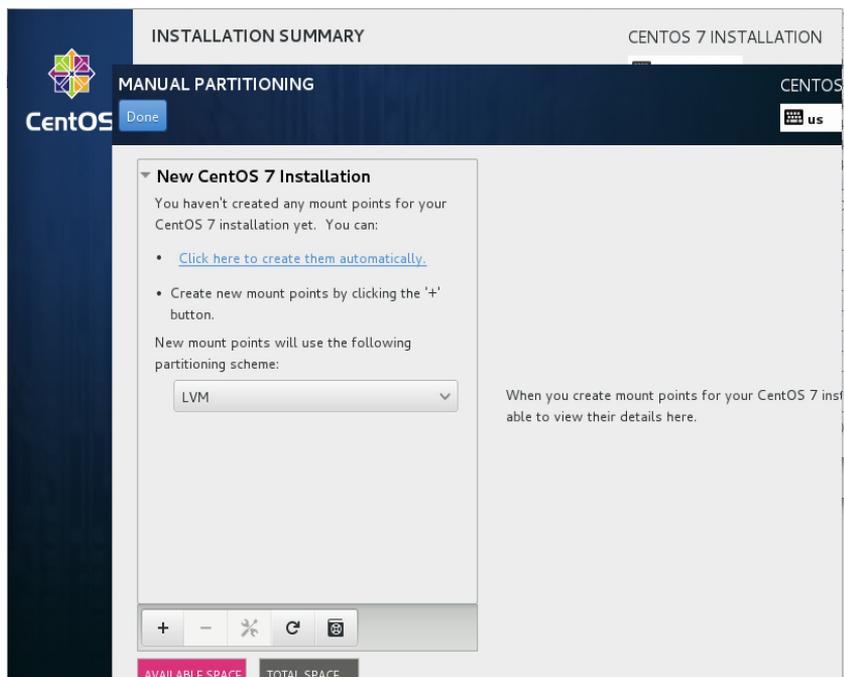


Figure 1.8 Configuring advanced disk layout.

NOTE RHEL 7 by default uses the XFS file system. This file system cannot be shrunk; it can only be expanded. Therefore, it is sometimes a better choice to use ext4.

To create this configuration, from the screen in Figure 1.8, click the **+** sign. You'll now see a pop-up in which you can specify a mount point and the desired capacity. From the Mount Point drop-down list, select **/boot** and add the desired capacity **500M**. Then, click **Add Mount Point**. You'll now get to the screen that you see in Figure 1.9, in which you can specify specific details about the mount point you just created.

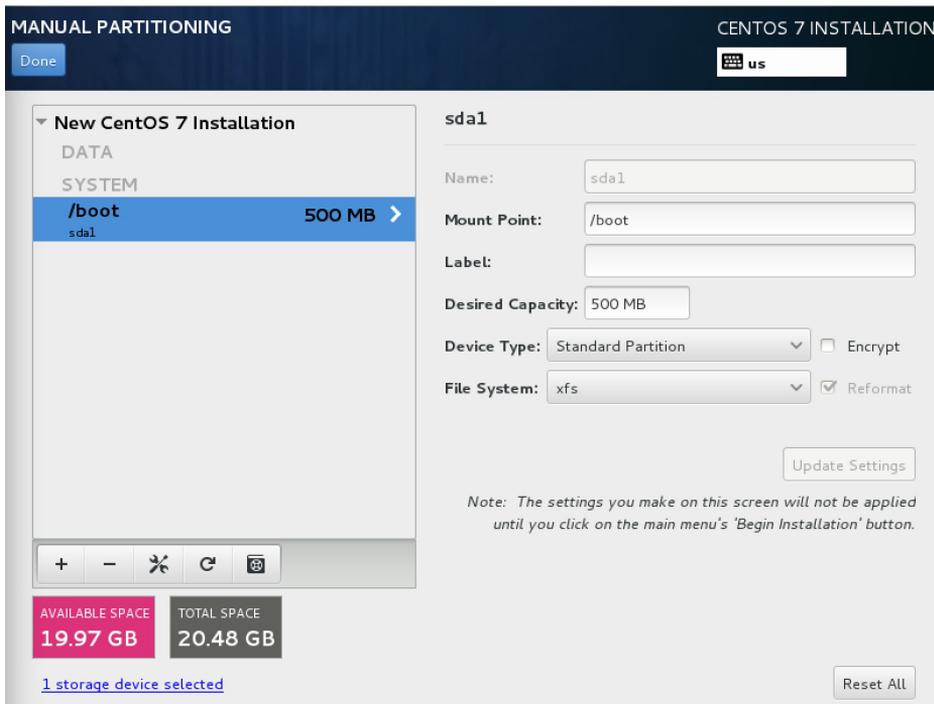


Figure 1.9 Specifying details for the mount point you just created.

At this point, from the interface that you see in Figure 1.9, click the **+** sign again and specify the mount point **/** and a capacity of **10G**. On the Mount Point Details screen that you see now, make sure that the device type LVM is set and that the file system XFS is selected. You do not have to modify anything else.

Now click the **+** sign once more to add a swap device. From the Mount Point drop-down list, select **swap**, and specify the desired capacity of **1G**. Then, click **Add Mount Point**. The layout at this point should look like Figure 1.10. If this is the case, click **Done** to write the configuration.

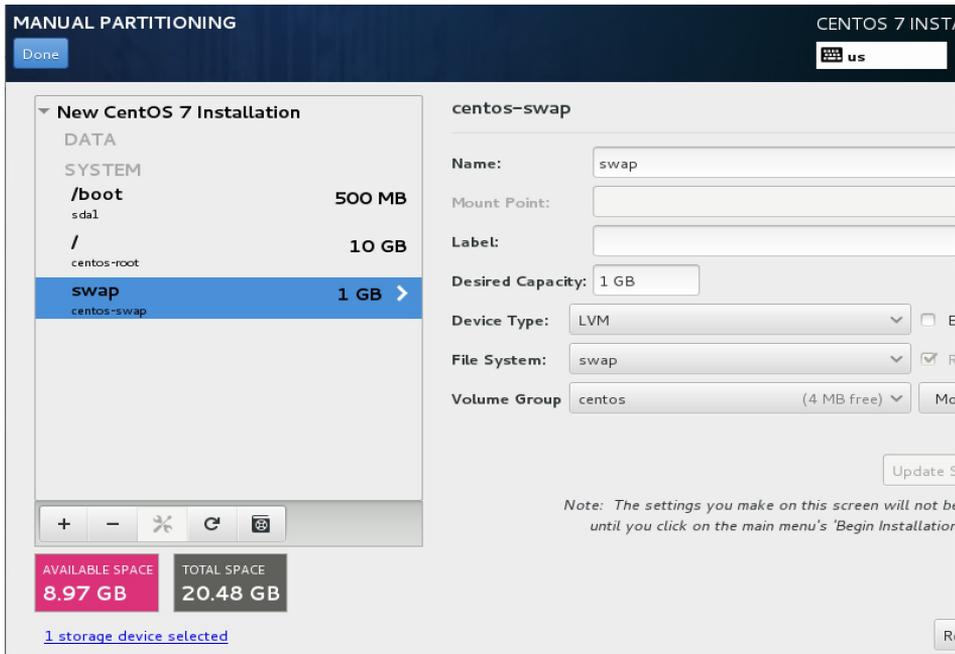


Figure 1.10 If the configuration looks like this, you can write it to disk.

Before the configuration is committed to disk, you'll see a screen showing a summary of the changes that you have applied. If it all looks good, click **Accept Changes** to write your configuration.

10. The last part of the installation summary allows you to set up networking. Notice that you must configure something. If you do not do anything, your server will not be able to connect to any network. From the Installation Summary screen, click **Network & Hostname** to set up networking. This shows the screen that you see in Figure 1.11.

The network connection by default is set to off. Make sure to switch it on. After switching on the network connection, you could click **Configure** to add the further configuration. Networking is discussed in detail in Chapter 8, “Configuring Networking,” and so you do not have to do that now and can

just leave the default settings that get an IP address from the Dynamic Host Configuration Protocol (DHCP) server. You can also leave the hostname at its default setting; you learn how to change it in Chapter 8 as well.

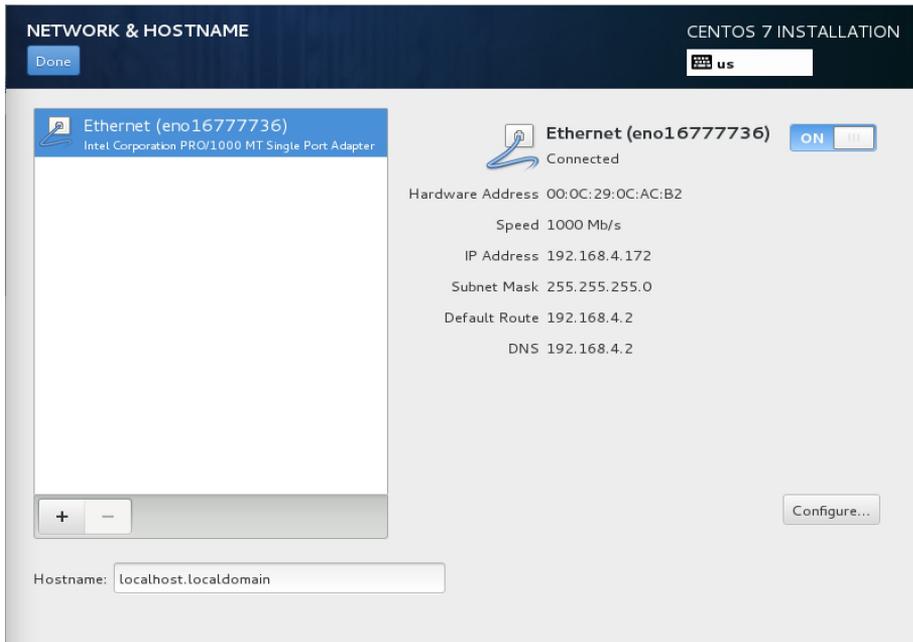
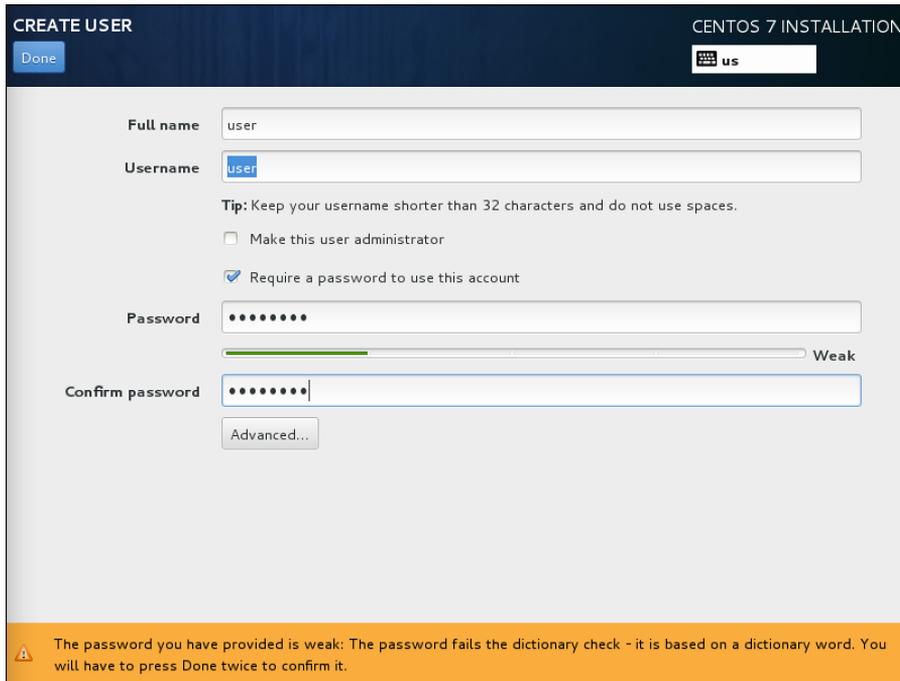


Figure 1.11 In the Network & Hostname screen, you must set the network card to on.

11. After specifying all settings in the installation summary, you can click **Begin Installation** to start the installation. This immediately starts the installation procedure but also prompts for user settings (see Figure 1.12).

From this screen, click **Root Password** first, and set the password to **password**. That is not very secure, but by using a simple password like this, you'll avoid the issues later on that might result from not remembering the password. You have to specify the password twice, and you also need to click **Done** twice. This is because you have to confirm that you really want to use a weak password.

Next, click **User Settings** to create a user. Enter the full name and username you want to use, and for this user, set the password to **password** also. Again, you have to click **Done** twice to confirm that you really want to use a weak password.



CREATE USER CENTOS 7 INSTALLATION

Done us

Full name

Username

Tip: Keep your username shorter than 32 characters and do not use spaces.

Make this user administrator

Require a password to use this account

Password

Confirm password

Advanced...

Warning: The password you have provided is weak: The password fails the dictionary check - it is based on a dictionary word. You will have to press Done twice to confirm it.

Figure 1.12 Specifying additional user settings.

12. When the installation has completed, you'll see the screen shown in Figure 1.13. You'll now need to click **Reboot** to restart the computer and finalize the installation.
13. After rebooting, you have to go through a couple of additional setup steps. First, you need to accept the license agreement. To do this, click the red text **License Not Accepted**, select **I Accept the License Agreement**, and then click **Done** to complete. You can now click **Finish the Configuration** to finalize the configuration, which brings you to the graphical login prompt.

NOTE The procedure described above is based on the installation of version 7.0. In 7.1, once the step has been added, you can now configure Kdump from the installer. Kdump is used to set up a process that is started with your server to allow you to create a memory core dump in case the kernel crashes. As Linux kernel crashes don't occur very frequently, and as setting up Kdump is not a part of the RHCSA or RHCE objectives, you can just click Next on this step to accept the default settings. If your server does have enough RAM available, that will result in Kdump being active automatically. If your server is low on memory, you won't have it running by default.

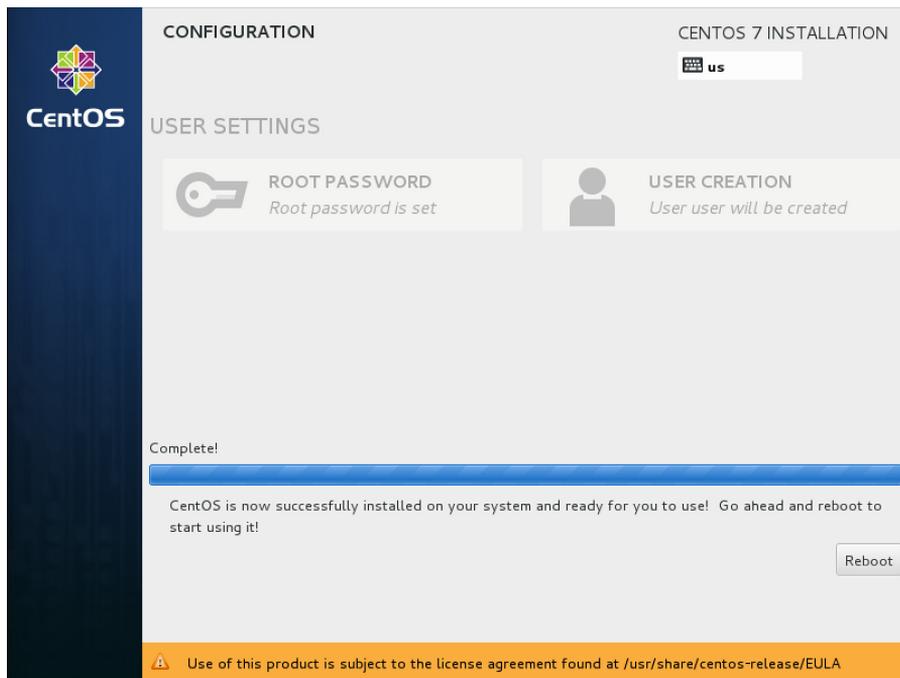


Figure 1.13 Reboot to finalize the installation.

Summary

In this chapter, you learned what Red Hat Enterprise Linux is and how it relates to some other Linux distributions. You also learned how to install Red Hat Enterprise Linux 7. You are now ready to set up a basic environment that you can use to work on all the exercises in this course.

Exam Preparation Tasks

Review All Key Topics

Review the most important topics in the chapter, noted with the Key Topic icon in the outer margin of the page. Table 1.2 lists a reference of these key topics and the page numbers on which each is found.

Table 1.2 Key Topics for Chapter 1

Key Topic Element	Description	Page Number
Step List	How to perform a manual CentOS 7 installation	

Define Key Terms

Define the following key terms from this chapter and check your answers in the glossary:

distribution, Linux, Red Hat, CentOS, Fedora, Scientific Linux

Review Questions

1. You do not want to buy a RHEL license, but you want to create an environment to practice for the exam. Which distribution should you use?
2. Why can't you use a 32-bit version of RHEL to prepare for the exam?
3. You want to install a minimal system. How much RAM do you need?
4. Why is it a good idea to have Internet access on all servers you are installing?
5. You want to install a virtual machine on a computer that does not have an optical disk drive. What is the easiest alternative to perform the installation?
6. Why is it a good idea to install a GUI?
7. What is the default file system on RHEL 7?
8. Can you install RHEL if you do not have Internet access?
9. What is the most important feature offered through RHN?
10. Which installation pattern should you use if you have a very limited amount of disk space available?

End-of-Chapter Labs

In this chapter, you learned how to set up Red Hat Enterprise Linux. At this point, you should have one server up and running. For exercises in later chapters in this book, two additional servers are needed.

Lab 1.1

Repeat the procedure “Performing a Manual Installation” to install two more servers. Details about the additional configuration on these servers follow in exercises in later chapters. For now, it is sufficient to ensure that the following conditions are met:

- Use the server names `server1` and `server2`.
- Set the obtain an IP address automatically.
- Make sure to keep at least 1GB of disk space as unallocated disk space (which is not assigned to any partition) so that you have free space to work on the partitioning exercises in later chapters.
- Install one server using the Minimal installation pattern, and another server using the Server with GUI installation pattern.