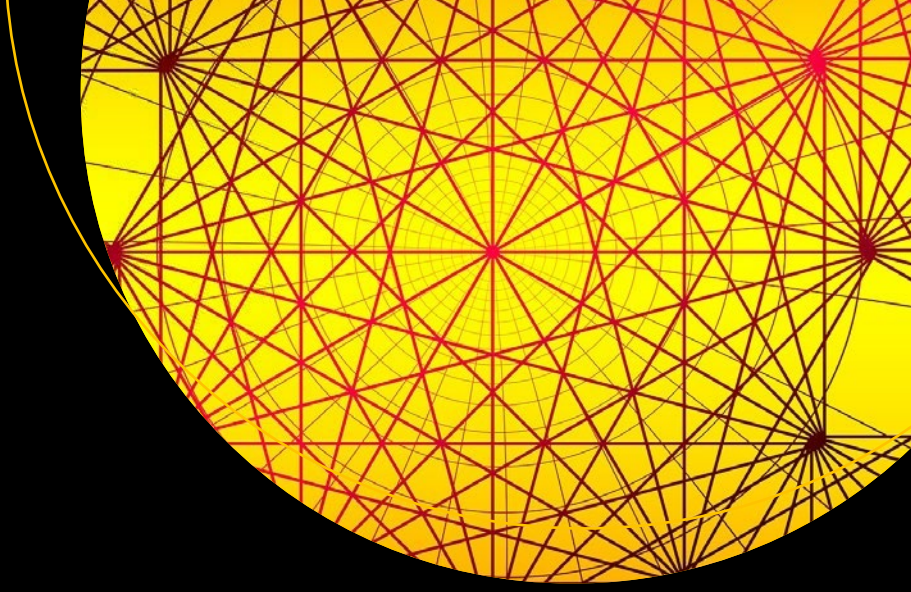

Learn CentOS Linux Network Services

Antonio Vazquez

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ISBN-13 (pbk): 978-1-4842-2378-9 ISBN-13 (electronic): 978-1-4842-2379-6

DOI 10.1007/978-1-4842-2379-6

Library of Congress Control Number: 2016960292

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This book is dedicated to my family, especially to my parents, who recently had to endure some difficult times. I love you both.

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About the Author

Antonio Vazquez is an IT professional who has been working with Linux for more than a decade. He studied computer engineering at university in Spain, and he currently holds many IT certifications from the main vendors in the industry. At present, he works for a public institution and is in charge of almost a thousand Linux servers spread across the country, providing web services, FTP services, file services, virtualization, and more.

About the Technical Reviewer

Massimo Nardone has more than 22 years of experience in security, web/mobile development, and cloud and IT architecture. His true IT passions are security and Android.

He has been programming and teaching how to program with Android, Perl, PHP, Java, VB, Python, C/C++, and MySQL for more than 20 years. He holds a master of science degree in computer science from the University of Salerno, Italy.

He has worked as a project manager, software engineer, research engineer, chief security architect, information security manager, PCI/SCADA auditor, and senior lead IT security/cloud/SCADA architect for many years. His technical skills cover security, Android, cloud, Java, MySQL, Drupal, Cobol, Perl, web and mobile development, MongoDB, D3, Joomla, Couchbase, C/C++, WebGL, Python, Pro Rails, Django CMS, Jekyll, and Scratch, among others. He currently works as Chief Information Security Officer (CISO) for Cargotec Oyj.

He was a visiting lecturer and supervisor for exercises at the Networking Laboratory of the Helsinki University of Technology (Aalto University). He holds four international patents (related to PKI, SIP, SAML, and Proxy).

Massimo has reviewed more than 40 IT books for various publishing companies, and he is the coauthor of *Pro Android Games* (Apress, 2015).

Acknowledgments

I'd like to extend my gratitude to everybody at Apress, especially to those with whom I've had the pleasure of working directly: Louise Corrigan and Nancy Chen. I would also like to thank the technical reviewer, Massimo Nardone. They all helped me a lot.

Of course, I can't forget my wife, who is also my biggest fan and always offers me her support and patience.

Introduction

Many things have changed since that day in which a young Finnish student named Linus Torvalds decided to post a message in a forum, searching for help with the development of a new operating system. He hardly could have imagined that there would be so many people eager to collaborate. And what had started as a hobby became an efficient operating system (OS) used today by thousands of companies and users around the world.

Linus decided to make this OS free for everybody to use, share, study, and modify the code. So he licensed the code under the GNU license. This way, it was possible for everybody to have access to the source code and modify it according to their likes and/or needs. This resulted in many companies, universities, etc., having their own Linux distributions.

Even though many of these distributions have remained confined to small areas of influence, such as universities or official departments, a few have achieved general recognition over the years. A few well-known examples include Red Hat, SUSE, Debian, and Ubuntu.

The Red Hat Linux distribution system, developed by the Red Hat company is, undoubtedly, one of the most important and influential. Red Hat has made many relevant contributions to the Linux community, for example, the Red Hat Package Manager (RPM), used by several other distributions, and Suse.

Red Hat used to publish desktop, as well as server, editions of its OS, and these were made freely available for anyone to use. But in the year 2004, the company decided that its OS would be provided only to clients. Obviously, this concerns only the binary distributions, as the source code has to be made publicly available to comply with the GNU license.

From that moment on, two new projects emerged with the aim of trying to maintain a Red Hat clone that would be freely available to everyone. The first project was called Fedora. It was sponsored by Red Hat itself and was conceived as some sort of beta Red Hat platform.

Many users thought that Fedora was OK as a desktop platform, but it was by no means a reliable enterprise solution. In order to fulfill this gap, many Linux professionals and enthusiasts gathered around a new project called CentOS (Community Enterprise Operating System), whose main goal was to become a freely available robust enterprise operating system.

Today, CentOS is a reliable, efficient server operating system used by hundreds of companies to provide critical services.

Audience

Some experience with computers is expected of readers of this book. Some previous Linux experience is useful, if not absolutely necessary. The only requirement, however, is the will to learn!

Conventions

The `Code` style attribute has been applied to file names, paths, commands, and URLs.

Feedback

I would really appreciate your opinions, suggestions, questions, or criticisms regarding this book. Please feel free to e-mail me at `antoniojvv@yahoo.es`. Note, however, that I cannot promise to respond to everyone.

CHAPTER 1

Installation

1.1. CentOS 6

As it usually happens, there is more than one way to install CentOS on a computer. So, depending on the way we initially boot the server and the source of the installation packages, we have many options.

- We can boot and install the system from a DVD. This is probably the most straightforward option, and the right choice if you only have to install a couple of servers. We boot the server from the DVD, and we install all the software from the DVD too.
- We can also use a CentOS Network netinstall DVD to boot the server and then install the packages from a server in our local network or from the Internet. This is a good choice if we have to install a lot of servers.
- We could also use a USB device to boot the server. In this case, we first prepare the USB device by using software packages such as UNetbootin,[1] and we also have to download the CentOS installation files. Once the USB device is ready, we can use it to boot the server and then choose whether to install from a local or a network repository.

In addition, independent of the type of installation we choose, we can also automate the installation by using kickstart. The use of kickstart is beyond the scope of this book, but it basically consists of passing a special parameter to the installer with the location of a script file that contains instructions for the installation.

[1] SourceForge, "UNetbootin: Bootable live USB creator for Ubuntu, Fedora, and Linux distributions," https://sourceforge.net/projects/unetbootin/, 2016.

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A. Vazquez, *Learn CentOS Linux Network Services*, DOI 10.1007/978-1-4842-2379-6_1

Nevertheless, in order to keep things simple, in this book, we will avail ourselves only of the typical DVD installation. The first thing one must do is to get the installation DVDs. These can be downloaded from the CentOS official site.[2] At the time of writing this book, the ISO files could be downloaded from the links available from `http://wiki.centos.org/Download`.[3] We can choose the exact version we want to install, the architecture (32 or 64 bits), and the type of installation (minimal, network, etc.). We will download and burn the ISO files `CentOS-6.2-i386-bin-DVD1.iso` and `CentOS-6.2-i386-bin-DVD2.iso`. Once we have the DVDs, installation is fairly simple. We make sure that the computer is configured to boot from a DVD, and we restart it with the first installation DVD inside. After a few seconds, we'll see the screen in shown in Figure 1-1.

Figure 1-1. *Booting from the installation DVD*

We'll select the first option, "Install or upgrade an existing system." This will launch the actual installation program. Now we are offered the possibility of checking the installation media (Figure 1-2). Once we are sure that there is no problem with the DVDs, we click Skip.

[2]CentOS, "The CentOS Project," `http://centos.org/`, 2016.
[3]CentOS, `http://wiki.centos.org/Download`, 2016.

Figure 1-2. *Checking the installation media*

Now the system will init the graphical installer (Figure 1-3).

Figure 1-3. *The graphical installer*

From the next screens, we'll have to choose the language and the keyboard layout (Figures 1-4 and 1-5).

Figure 1-4. *Language*

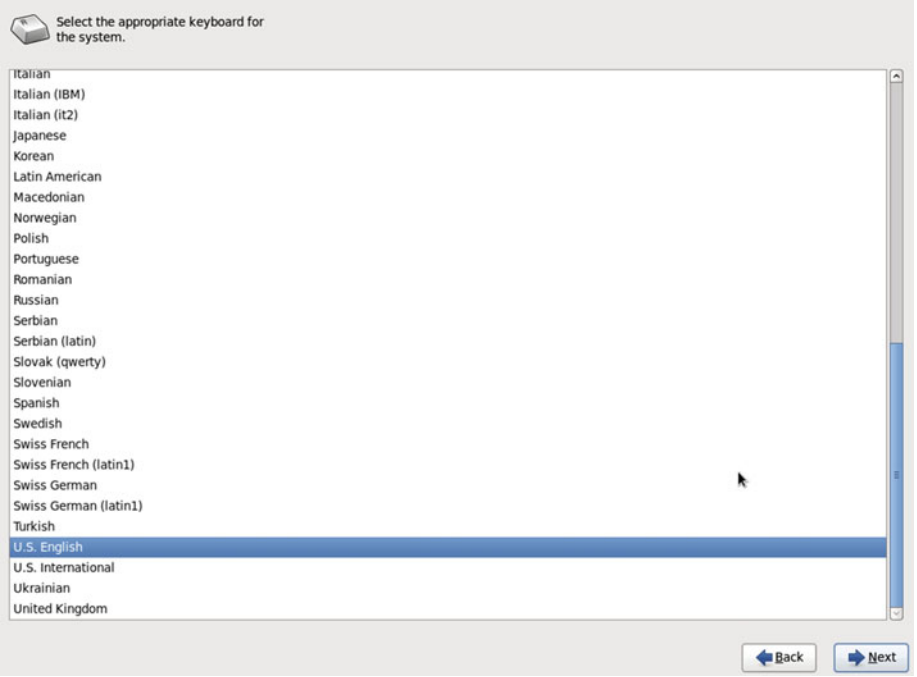

Figure 1-5. *Keyboard*

Now we have to choose whether to install CentOS in a standard disk or in a special device, such as a SAN, LUN, iSCSI drive, etc. As we'll be installing standard disks most of the time, we will choose the first option (Figure 1-6).

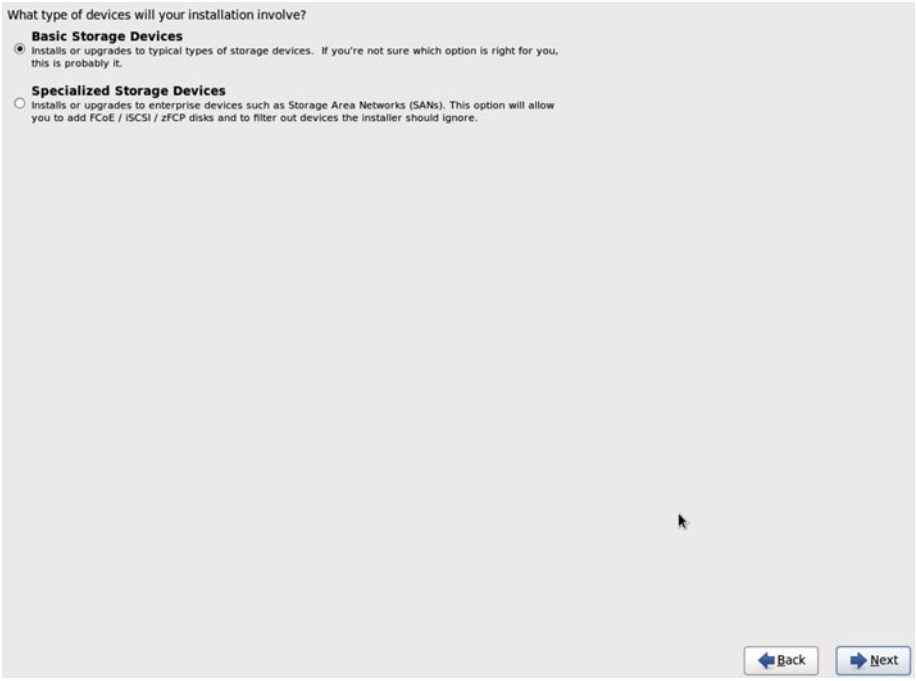

Figure 1-6. *Choosing where to install the OS*

After clicking the Next button, a warning appears (Figure 1-7), telling us that all data in the disk will be lost. As this is either a blank disk or a disk whose data are no longer needed, we click Yes.

Figure 1-7. *Storage device warning*

The program now requests us to enter the name and the domain of the computer we are about to install (Figure 1-8). We can write this information now or do it once the installation is complete. We click Next.

Figure 1-8. *Computer name and domain*

From the upcoming screens, we'll have to choose the time zone as well as the root password (Figures 1-9 and 1-10).

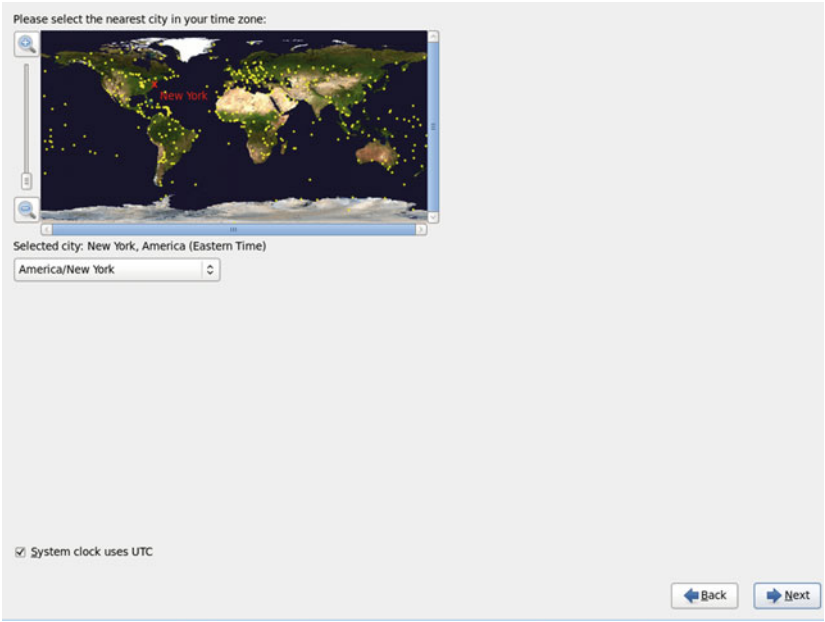

Figure 1-9. *Time zone*

Figure 1-10. *Root password*

Now we are offered several options before starting the actual installation (Figure 1-11). We can choose to use the whole disk, no matter what Linux or non-Linux partitions might exist on the disk, use only free disk space, customize the disk partitioning, etc. As the default partitioning scheme is acceptable to start, we choose the first option. Although, if we already had clearly in mind the role the server was to play in the network, we would probably have to customize the partitioning layout to create separate partitions or volumes for the different directories: `/home`, `/var`, etc.

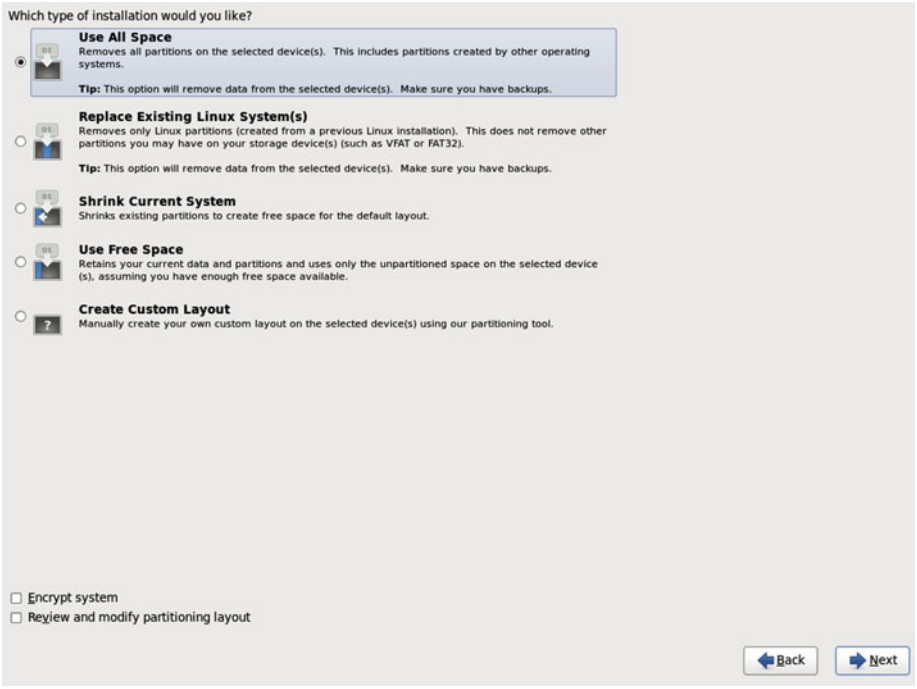

Figure 1-11. *Partitioning layout*

We receive another warning (Figure 1-12), reminding us that the changes are going to be written on disk, and we are requested to specify what software package we want to install. There are several predefined sets of software, database server, web server, etc. We'll choose the Minimal option (Figure 1-13) and install later the different software packages, as we need them.

Figure 1-12. *Writing to disk*

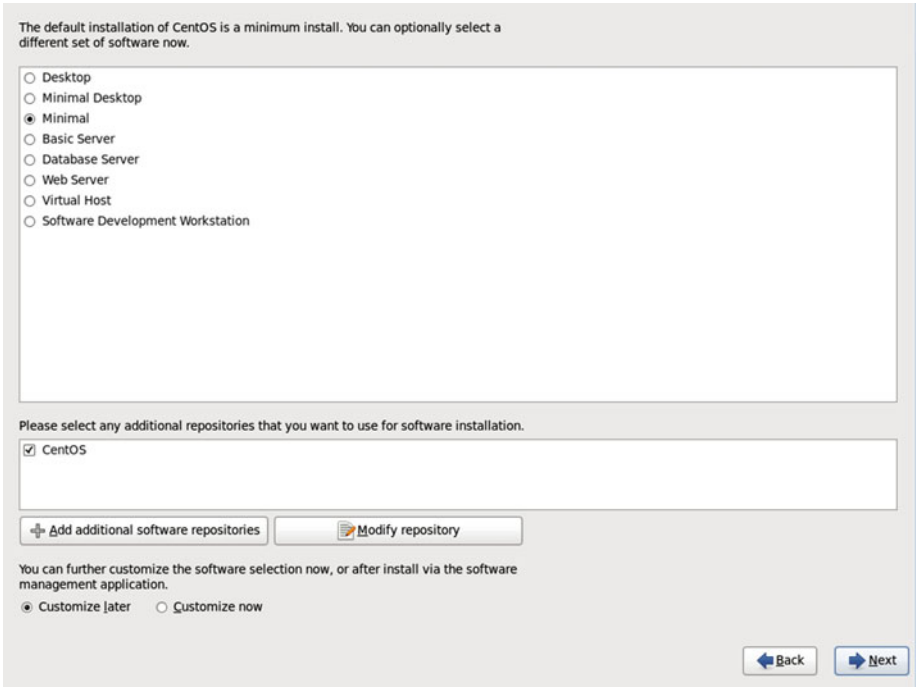

Figure 1-13. *Software selection*

And, finally, the actual installation process begins (Figure 1-14).

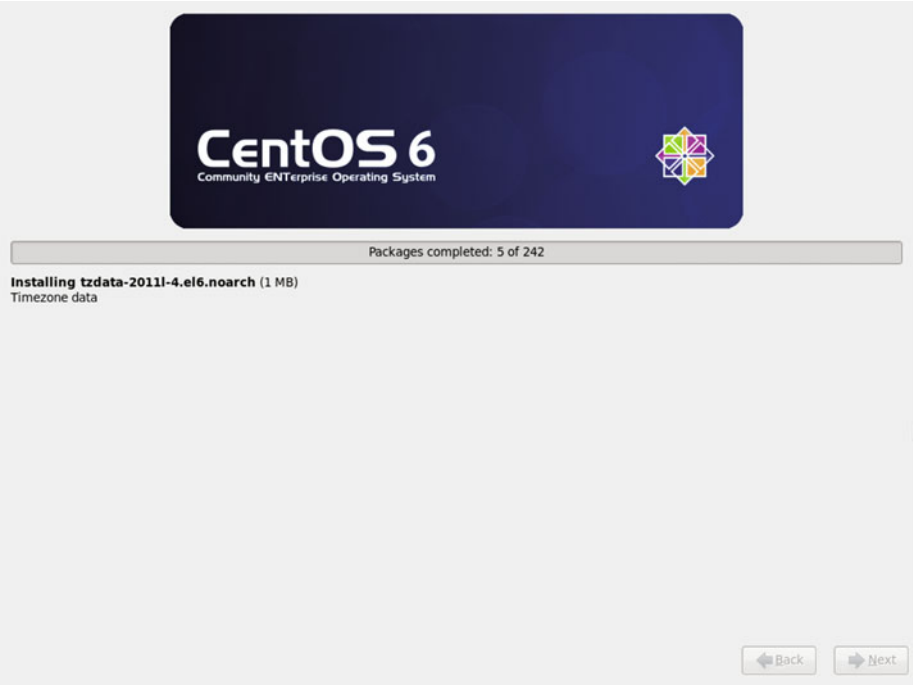

Figure 1-14. *Installing the software packages*

After a few minutes, the installation will be over (Figure 1-15), and we'll have to reboot the system.

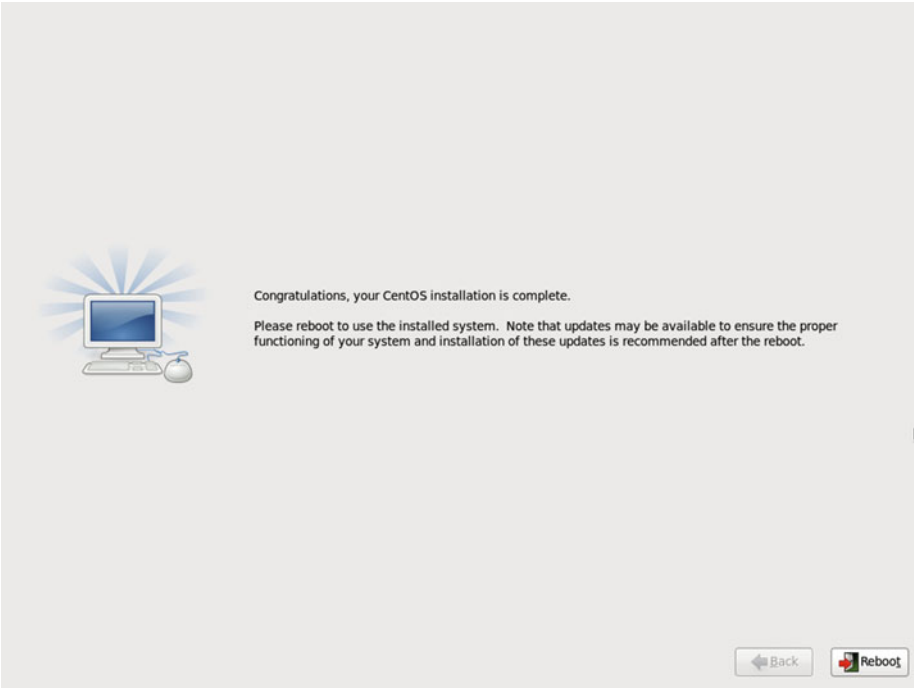

Figure 1-15. *Congratulations!*

Once the boot process is complete, we have a working CentOS server (Figure 1-16).

Figure 1-16. *Our brand new server*

1.2. CentOS 7

As you saw in section "CentOS 6," there are many types of installations to choose from. As we did previously when installing CentOS 6, we'll also install CentOS 7 from the installation DVD. At the time of writing of this book, this could be downloaded from the official site.[4] After downloading the ISO file, we can burn it onto a DVD. After that, we are ready to boot a server with the installation DVD inserted, as long as the computer is configured to boot from a DVD. After a few seconds, we'll see the screen shown in Figure 1-17.

Figure 1-17. *Booting from the CentOS 7 DVD*

[4]CentOs, http://www.centos.org/download/, 2016.

We select the first option: Install CentOS 7. The computer now will start the graphical installer, and we'll be asked about the language we want to use during the install (Figure 1-18).

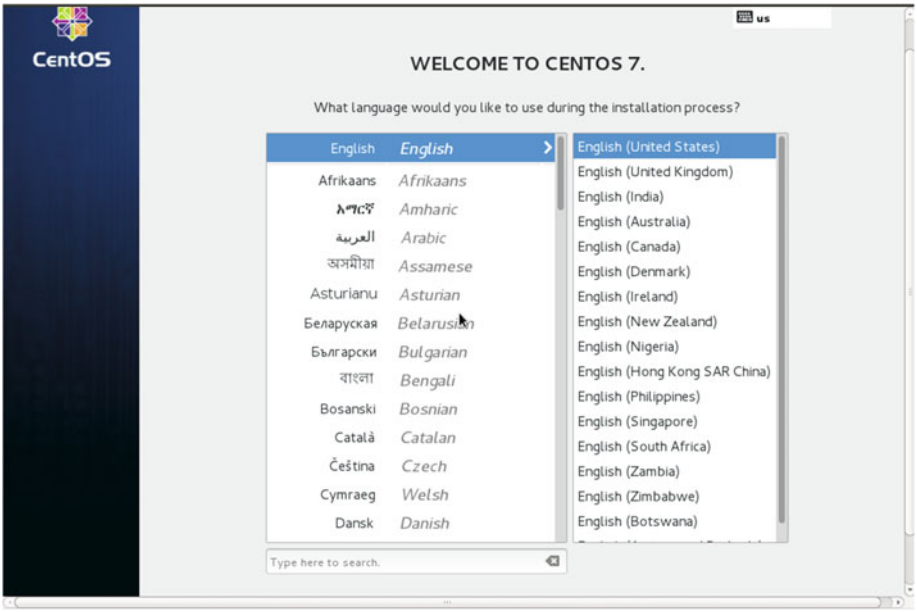

Figure 1-18. *Installing CentOS 7*